

IR Number: 1
Source: North Slave Metis Alliance
To: Deze Energy Corporation
Issue: Human environment, present & historic land use

This has the same title as #9, can they be combined though they discuss different issues?
Both are from NSMA.

Preamble

The Terms of Reference for the Developer's Assessment Report required Deze Energy Corporation to specify the methods used to identify, inform and solicit input from potentially interested parties and persons, as well as a description of issues that remain unresolved, and efforts to resolve them. It also required a discussion of the developer's community engagement plan dealing specifically with the holders of Aboriginal and Treaty rights in the project area. The concordance table provided following the executive summary indicates that this information should be found in Chapter 3(Community Engagement) and Chapter 6 (Development Description).

We are, however, unable to locate any reference to methodology for identification of potentially interested parties or persons in the North Slave Region, or any plan for engagement of aboriginal and treaty rights holders in the North Slave Region. There is no description of the issues identified by the North Slave Métis Alliance, so far, or any discussion of mitigation measures or efforts to resolve identified and other potential issues.

The traditional territory of the indigenous North Slave Métis overlaps the South Slave Region from the south shore of the Great Slave Lake, near Fort Resolution, northwards and eastwards towards the Thelon Game Sanctuary, including the area of Nonacho Lake and the proposed East Arm National Park. The transmission line and the new winter roads cross through our territory. The switchyards and substations are also proposed to be placed within our territory. The North Slave Métis Alliance has had meetings and other correspondence with Deze Energy Corporation about the extent of its territory and its concerns, yet there is no mention of these discussions, concerns or mitigations in the DAR.

Request

1. Please explain the methodology for identifying and soliciting input from potentially interested parties and persons in the North Slave Region.
2. Please report on community engagement efforts and results with the North Slave Métis Alliance, including mitigation commitments and unresolved issues.
3. Please discuss the community engagement plan for the North Slave Métis.

IR Number: 2
Source: MVEIRB
To: Dezé Energy Corporation
Subject: Detailed Structural Geology Review of Dam, Powerhouse Spillway Sites

Preamble

The Taltson River hydro system was constructed in the 1960's. Limited information is apparently available regarding the design details and construction of the various facilities. From a geological perspective, waterfalls and gorges are frequently located in areas of complicated geology where faults and other discontinuities may be present in the bedrock. A dam safety review of the site was carried out in 2006 by Klohn Crippen Berger, however, the scope of the study did not include examining the fundamentals of the site of the hydro facilities.

Request

1. Given the lack of background study information available for the Twin Gorges and other facilities, additional information is requested regarding the structural geology of the hydro sites.
2. Has an engineering geologist or geological engineer reviewed the proposed expansion areas and provided a professional opinion regarding the suitability of the sites from a structural geology perspective?
3. Have any recommendations been made regarding measures to improve the bedrock conditions (i.e. grouting, rock bolting etc.) in preparation for expansion of the hydro system?

IR Number: 3
Source: MVEIRB
To: Dezé Energy Corporation
Subject: Detailed Geotechnical Information

Preamble

Reference: Twin Gorges Expansion, March 2006 Drilling Program, letter report prepared for Northwest Territories Energy Corporation by Klohn Crippen Berger, dated 26 May 2006.

The referenced report presents the findings of a two borehole geotechnical investigation program for the Twin Gorges hydro facility expansion. Difficult field conditions limited the investigation work. Up to 16 m of overburden was encountered along the alignment with poor recovery of these soils reported. Review of the report indicates the following was not carried out:

- Standard penetration tests in overburden
- Shelby tube and/or field vane tests in silty clay and clayey silt soils
- Geotechnical laboratory strength testing of soils
- Hydraulic conductivity testing of bedrock
- Compressive strength testing of bedrock

While not specifically titled as such, the geotechnical report is in our opinion preliminary in nature and relies on the results of previous seismic refraction survey work.

Request

Given the above, the following questions are raised:

1. What will be the scope of work for the detailed geotechnical investigation to be carried out at the Twin Gorges site?

2. What geotechnical investigation and testing programs are planned for the other dam and spillway sites?
3. Given the identified silt and clay overburden at the Twin Gorges site, has a local source of sand or sand and gravel been identified on site to provide the granular materials recommended for use in the expansion of the site?
4. The report indicates that the excavated rock will provide a good source for rip rap, coarse concrete aggregate and crushed rock for roads and fill material. Will further testing been carried out to confirm the suitability of the excavated rock for these purposes considering issues including:
 - alkali – aggregate potential of the rock which can result in swelling and cracking of the concrete.
 - rock durability and strength characteristic which determines their suitability for use as rip-rap, concrete aggregate or road base material.
 - detailed information on bedrock mineralization characteristics.

IR Number: 4
Source: North Slave Metis Alliance
To: Deze Energy Corporation
Issue: Water quality, water quantity, ramping events

Preamble

On page 10 of the Executive summary, section 3.2.4 states that the bypass spillway gates will open automatically in case of outages at both new and existing plants.

Sudden changes to water quality (turbidity, taste, temperature), water level and water velocity can affect existing downstream water users. Campers may find the water level rises to inundate their campsites which may wash away clothing or supplies left close to the shore. Boats that are not securely tied can be washed away or if they are too securely tied they can be swamped. It may become more dangerous or difficult to swim in the water. If the water becomes colder in a swimming hole, swimming will become less enjoyable. Fishing may be interrupted as changes in the water may cause fish to leave an area or stop feeding. The sudden increase in water volume and velocity can cause turbidity, which will affect the taste of fish and also may affect the palatability and nutritional characteristics of the water for drinking. Sedimentation or washout can affect fish eggs at certain times of the year. Canoeists may experience difficulty travelling upstream if water velocity increases and they may not be able to travel as far or as fast as planned.

Request

1. How and when will the gates be opened when one or both of the plants are not experiencing an outage?
2. Is it possible that the either (or both) of the automatic or other opening system for the spillway gates will affect water users downstream?

3. How will the public, including traditional users, be informed and protected from negative impacts before there is any sudden change in water?

IR Number: 5
Source: Environment Canada, INAC
To: Deze Energy Corporation.
Issue: Waste management, waste water

Preamble

On page 10, section 3.1.5.3, the Terms of Reference required:

The DAR must provide a plan for waste management during construction and operation, including:

a) Camp sewage;...

In the DAR, the proponent has indicated that treatment of domestic wastewater at the temporary and permanent camps may occur with on-site sewage treatment systems or regularly transporting the waste off-site (section 3.1.3 and 3.3.3). No mention is made about the sewage treatment proposed for barge camp facilities. No further information is provided on the type of treatment system to be used, its treatment capacity and effluent quality or where the effluent would be discharged except to say it will “be treated according to all applicable regulations.” In section 6.8.4.3 a sewage lagoon is mentioned that may require clean-up and restoration if utilized. No other mention of this lagoon can be found in the DAR.

Domestic wastewater has the potential to adversely impact both surface and ground waters. Evaluation of the proposal cannot be conducted without further information.

Waters in the project area are highly sensitive to eutrophication. EC is responsible for administering Section 36(3) of the Fisheries Act, which ensures that deleterious substances do not enter fish bearing waters. Therefore, EC requires information on the project’s proposed wastewater discharges.

Request

1. Provide a description of the proposed disposal method for sewage and wastewater generated at the camps, including the barge camps. The description should include the type of treatment system proposed, its treatment capacity, effluent quality and where the effluent would be discharged.
2. Provide a description of how barge camps will be addressed as part of the draft spill contingency plan.
3. Provide a more detailed description of the potential sewage lagoon including location and justification for its requirement.

IR Number: 6
Source: Environment Canada
To: Deze Energy Corporation.
Issue: Air Quality, Incineration

Preamble

The Taltson Hydroelectric Expansion Project (THEP) will include 2 main work camps: Twin Gorges and Nonacho Lake (DAR Section 6.5.3.2); and small work camps along the transmission line corridor (DAR Section 6.5.3.3). At each camp, the proponent is planning to use incineration to dispose of camp waste (DAR Section 3.3.1).

EC recognizes that timely disposal of camp waste - specifically food waste - is of critical importance to minimize safety risks associated with wildlife attraction. Timely disposal is usually achieved through burning. However, burning of waste products releases numerous contaminants into the air, many of them persistent, bioaccumulative and toxic (e.g. polycyclic aromatic hydrocarbons - PAH's - heavy metals, chlorinated organics – dioxins and furans). These contaminants can result in serious impacts to human and wildlife health through direct inhalation and they can also be deposited onto land and into water, where they bioaccumulate through food chains affecting wildlife and country foods. Therefore, burning should only be considered after all other alternatives for waste disposal have been explored.

Request

1. Will the incineration device meet the emission limits established under the Canada-wide Standards (CWS) for Dioxins and Furans and the CWS for Mercury Emissions? Both the Government of Canada and the Government of the Northwest Territories (GNWT) are signatories to these Standards and are required to implement them according to their respective jurisdictional responsibility. The minimum requirement for incineration technology should be a dual-chamber incinerator.

2. Will the developer develop and implement an Incineration Management Plan in consultation with EC and the GNWT Department of Environment and Natural Resources? The objective of the management plan is to minimize the amount of waste to be incinerated and to ensure that appropriate incineration equipment is used and operated properly. The Incineration Management Plan should include:
 - a. Purchasing policies that focus on reduced packaging;
 - b. On-site diversion and segregation programs (i.e. the separation of non-food waste items suitable for storage and subsequent transport and disposal or recycling);
 - c. A waste audit of the types and quantities of waste to be incinerated;
 - d. Selection of incineration equipment suitable to burn these types of waste;
 - e. Staff training to ensure that the incineration equipment is operated properly;
3. Will incineration ash be tested to ensure the ash is suitable for the landfill?

Incineration ash can be contaminated with incineration byproducts, such as dioxins and furans.
4. EC requests that the proponent provide the following information:
 - a. Type and quantities of waste to be incinerated at each camp; and
 - b. Type, model, and year of the incinerator to be used at each camp.

IR Number: 7
Source: MVEIRB
To: Deze Energy Corporation
Issue: Twin Gorges Transformer PCB Management

Preamble

The existing substation and Twin Gorges site will need to be decommissioned and replaced.

Request:

1. Are there any PCB management issues or concerns associated with the decommissioning of this facility?

IR Number: 8

Source: MVEIRB

To: Deze Energy Corporation, DFO

Subject: Stream crossings

Preamble:

Neither the effects of water crossings by winter roads and transmission lines nor the potential aquatic effects of the various transmission line routings were considered in the DAR (Table 8.4.3; Section 8.4.3). This approach was rationalized on the basis that DFO Operational Guidelines would be followed. While it streamlines the Developer's effects assessments this approach does not provide the information necessary to assess the sensitivity of aquatic habitats that may be affected by these crossings. Consequently it will be difficult to factor potential environmental impacts into the consideration of alternative transmission line routings. The Developer may not be able to avoid particularly sensitive habitats or ensure that mitigative measures are adequate, and there will not be a baseline against which to measure whether adverse effects have occurred.

Request:

1. How will the Proponent and DFO ensure that particularly sensitive aquatic habitats are not affected by crossings and that the potential aquatic environmental effects of alternative transmission line routes are adequately considered?
2. How will project-related impacts be assessed?

IR Number: 9
Source: MVEIRB
To: Dezé Energy Corporation
Subject: Winter Road Portage Areas

Preamble

The winter road construction activities will require the establishment of numerous portages between different lakes along the transmission line corridors. In order to construct these portages, the clearing of trees, grading of approaches and placement of fill will be required. Construction of these portages will be carried out in wet land areas, river valleys, areas underlain by permafrost and other environmentally sensitive areas.

Request

1. Further information is requested as to how these portages are to be constructed.
2. What measures will be taken to protect areas of sloping ground from future erosion and instability?
3. What measures will be taken to ensure that permafrost conditions within the portage areas are not adversely altered by construction and operation activities.
4. How will these portage areas be decommissioned and rehabilitated following use?

IR Number: 10
Source: Natural Resources Canada
To: Deze Energy Corporation
Issue: Canal construction and other blasting, required authorizations

Preamble

The DAR refers to a potential need for both an “Explosives Magazine Permit” and a “Blasting Permit” under the Explosives Act, as administered by NRCan. To clarify, regulatory responsibilities under the Explosives Act include licenses and certificates for manufacturing (e.g., Temporary Factory License), licenses for storage (e.g., Explosives User Magazine Licenses) and permits for transportation (e.g., Explosives Transportation Permits). These would fall under the authority of NRCan.

Request:

2. The proponent is asked to confirm whether a factory to make explosives may be required at or near the site. If so, will this project use an existing factory license for its operations or will a temporary explosives factory be used for the project?
3. The proponent is asked to confirm whether it is a magazine license under the federal Explosives Act that they expect to require for this project. The proponent is also requested to describe, to the extent practical, the type of storage structures, footprints, site access and other ancillary works associated with these magazines (where a magazine is defined under the Explosives Act as any building, storehouse, structure or place in which any explosive is kept or stored, with exceptions defined under the Act).
4. Will any third party contractor retained by the developer for the transport, handling, storage and use of explosives during construction activities be required to maintain commitments undertaken by Deze Energy Corporation?

IR Number: 11

Source: MVEIRB

To: Deze Energy Corporation

Subject: Blasting

Preamble:

The Proponent plans to use a 100 m buffer for in-stream blasting (Table 10.2), and to isolate areas affected by blasting from fish (15.2.12)

Request:

1. How will this be accomplished at the intake and outfall of the new channels?
2. Will there be blasting near water when ice cover is present and, if so, has the effect of ice cover on instantaneous pressure and peak particle velocity been taken into account in estimates of aquatic effects?

IR Number: 12
Source: Environment Canada, INAC, MVEIRB
To: Deze Energy Corporation.
Issue: Water Quality; Canal Construction

Preamble

On page 25, section 5.2.1, the Terms of Reference state:

...Planning and management strategies for the extracted rock and overburden, which should include:

- I. Amount of land proposed to be affected by spoil pile;
- II. Potential impact of runoff that may contain sediment and/or residual explosives;
- III. Water management for potentially contaminated runoff;**
- IV. Spoil pile reclamation options;

The DAR indicates for "terrestrial blasting away from in-stream habitat" pellet ANFO [ammonium nitrate-fuel oil] explosives would be used. Fisheries and Oceans Canada's (DFO) Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters state, "no use of ammonium nitrate-fuel oil mixtures occurs in or near water due to the production of toxic by-products (ammonia)." As you are aware, the deposit of deleterious substances of any type in water frequented by fish, or in any place under any conditions where the deleterious substance, or any other deleterious substance that results from the deposit of the deleterious substance, may enter any such water is prohibited under Section 36(3) of the Fisheries Act.

The DAR states, "a significant proportion of the excavated rock material would be processed and used entirely for either concrete aggregates, structural fills, or as material for the dam rehabilitation. The production of fine aggregates would likely require washing, and settling ponds would be required for this process (page section 6.5.4.7.4)." The DAR does not provide the measures/plan that would be used to manage potentially contaminated runoff or treat the wash water.

Request

1. What amount of explosives will be used and how much nitrogen and other blasting residues will remain that may enter the aquatic environment?
2. Given DFO's Guidelines and the proposed use of ANFO pellets for terrestrial blasting, what will be the setback distance from waterbodies/watercourses for the terrestrial blasting to protect the aquatic environment from blasting residues?
3. What are the measures and/or plan to be employed to prevent blasting residues from entering water or forming contaminated runoff if the ANFO explosives used for terrestrial blasting do not fully vapourize upon detonation or parts of them remain undetonated?
4. How would contaminated water be collected, stored and treated? Where would the proposed settling ponds be located? Is there a plan for pumping out the water that may collect within the blasting area?
5. What is the vapourizing potential of the water resistant explosives proposed for use at stream blasting areas?

IR Number: 13
Source: MVEIRB
To: Dezé Energy Corporation
Subject: Borrow Source Identification, Management and Closure

Preamble

Construction of the expansion of the Taltson Hydro system will require the use of rock fill, gravel, concrete aggregate and sand primarily at the Twin Gorges site but to a lesser extent at other facilities. At Twin Gorges it is understood that a substantial volume of granitic gneiss will be excavated from the canal alignment, however, limited detail has been provided as to where other aggregate material will be obtained.

Request

Further information is requested on:

1. Proposed sand, gravel and concrete aggregate sources at the various sites.
2. Anticipated quantities of each material type required.
3. How aggregate source areas will be investigated and developed.
4. How aggregate materials will be transported to each work area.
5. How environmental concerns regarding borrow source operations and aggregate transportation will be addressed during the construction period.
6. How borrow sources, as well as haul routes, will be closed out and returned to a natural state upon completion of the expansion project.

IR Number: 14
Source: MVEIRB
To: Dezé Energy Corporation
Subject: Excess Overburden and Bedrock Management

Preamble

Construction of the expansion of the proposed Twin Gorges intake canal will require the excavation of a substantial quantity of bedrock as well as silty clay/clayey silt native soil. Overburden thicknesses of up to 16 m, and potentially more, are expected.

It is understood that the surplus blast rock will be stockpiled on the strip of land separating the new intake canal from the existing penstock and powerhouse facility.

Request

Additional information is requested on:

1. What quantity of overburden will be required to be stripped from the Twin Gorges expansion area?
2. Where will the excess overburden be temporarily, as well as permanently, placed?
3. What measures will be taken to control soil migration from these areas and the siltation of adjacent water bodies?
4. What height of blast rock will be placed within the excess rock stockpile area?
5. Are there sufficient areas of shallow depth to bedrock conditions such that the blast rock does not have to be stockpiled within deep overburden areas?
6. If it is necessary to place blast rock on areas underlain by clayey silt/silty clay overburden, have analyses been carried out to confirm that the placement of the rock will not result in an unstable slope condition which could potentially result in a slope failure in the vicinity of the powerhouse, penstocks, intake canal, intake structure or earth dam, etc.?

7. Is there an alternate location where the excavated rock could be stored, so that it could be more readily accessed should there be a need for blast rock or crushed granular material near the site in the future?

IR Number: 15
Source: MVEIRB
To: Dezé Energy Corporation
Subject: Nonacho Lake Control Structure Under Sluice Decommissioning Procedures

Preamble

It is understood that the three timber under sluices associated with the Nonacho Lake Control Structure are to be decommissioned. Very little information is available regarding these installations. The configuration of these installations means they are not readily accessible for inspection or repair.

Request

1. The under sluices will need to be decommissioned in such a manner that they are permanently sealed. Further information is requested on how the decommissioning of these under sluices will be carried out and what assurances can be given that they will not leak or otherwise fail in the future.

IR Number: 16
Source: Environment Canada, DFO
To: Deze Energy Corporation.
Issue: Water Quality

Preamble

The Taltson Hydroelectric Expansion Project will use concrete for building new structures and enhancing existing structures (e.g. spillway). Concrete may be used to seal the existing sluice gates at the control structure on Nonacho Lake (section 6.5.5.3), and grout used for the transmission line tower foundations and anchors (section 6.5.4.4.4). Concrete batch plants to produce concrete are proposed at the Twin Gorges and Nonacho Lake sites (section 6.5.4.6.5 and 6.5.4.7.2). As well, the use of premixed concrete in bags is being considered (section 6.5.4.7.5), and grout will be mixed on-site (section 6.5.4.4.4).

Concrete is a mixture of Portland cement, aggregate, water and additives. Portland cement is the ingredient that gives concrete wash water the highly corrosive and highly alkaline properties that make it a deleterious substance as defined by the Fisheries Act. Portland cement is also the active ingredient of mortar and grout. Concrete wash water is formed when water comes into contact with uncured or incompletely hardened concrete (e.g. washing of concrete mixers, pumps, cranes, equipment etc.). The wash water will typically have a high-suspended sediment load and high pH. Wastewater effluent generated by concrete batch plants will also have a high pH and high-suspended sediment content. Discharges to fish-frequented waters are subject to the general provisions of the Fisheries Act (e.g. section 36(3)).

The Developer's Assessment Report (DAR) indicates that water use and discharge for concrete activities may require a water licence from the Mackenzie Valley Land and Water Board (section 2.2.2.2). In section 3.3.2 of the Draft Erosion and Sediment Control Plan it states, "water used to clean concrete trucks, chutes and mixers will not be allowed to enter any surface waters directly. To reduce the concentration of lime, such wash waters will be treated in a temporary impoundment system and/or percolated through the soil, after hardened

concrete has been removed.” No treatment system is described for waste and wash water effluent generated by the batch plants.

Deposition of concrete wash water and effluent can have adverse impacts on aquatic ecosystems. The high pH of concrete wash water and effluents can kill fish in minutes. Every attempt to conduct the works in the dry, isolated from water, should be undertaken.

Request

1. Are settling ponds proposed to be used to collect effluent and wash water from both of the concrete batch plants? If so, what treatment is planned before the wash water and effluent are released to a water body to ensure the effluent will not be deleterious?
2. Where are the settling ponds to be located? Are these settling ponds the same proposed to collect wastewater from blasting areas and aggregate washing activities?
3. Confirm that all concrete work for the construction of the Taltson project will be isolated from any waterbody/watercourse, that is, completed in the dry.
4. On page 15.2.33 and 20.3, a commitment is made that states “when concrete works cannot be completed in the dry, site-specific operational and management plans would be developed with the contractor, and submitted to DFO prior to conducting the works.” Will EC be included in the review of those plans prior to conducting the work? Will there be measures included in these plans that describe how adverse impacts to the aquatic environment will be prevented?

IR Number: 17
Source: DFO
To: Deze Energy Corporation
Issue: Construction activities, in-stream works

Preamble

The Terms of Reference states that the proponent must identify all proposed mitigation measures for the pathways where predicted impacts are likely to occur. In-stream works are proposed in order to complete the rehabilitation or replacement of the dam, the excavation of a new inlet channel and the raising of the spillway at Nonacho Lake, at the new inlet canal, tailrace, the connection of a by-pass canal at the Twin Gorges site, and the construction of the minimum release facility at the South Valley Spillway.

In section 7.3, the proponent states that DFO has standard operating procedures that relate to issues surrounding erosion and sedimentation. DFO has developed operational statements that describe conditions and mitigation measures for specific routine projects that are known to be of low risk to fish and fish habitat. The above-mentioned in-water works do not appear to comply with any of these operational statements. Copies of DFO's Operational Statements applicable for the Northwest Territories can be found on the DFO website at <http://www.dfo-mpo.gc.ca/regions/central/habitat/os-eo/provinceterritories-territoires/nt/index-eng.htm>.

The proponent should develop mitigation during the construction of these in-water works that are adequate to avoid or reduce impacts to fish and fish habitat.

With regard to fish species potentially impacted during the lowering of Nonacho Lake starting in October, in order to complete the rehabilitation or replacement of the control structure, section 15.2.3.2.9 states:

“Of the known fish species present in Nonacho Lake (Fig. 15.2.6) northern pike, lake chub, lake cisco, longnose sucker and burbot are shallow water spawners.”

As per section 13.9.1, lake trout may spawn at shallow in-shore areas at depths of 0.12m to 55m. Lake trout in northern lakes can spawn at very shallow depths. Given that the spawning period is in September through October, lake trout are likely to be impacted by the lowering of the water level in Nonacho Lake in October. As lake trout were omitted as potentially impacted species, no mitigation measures have been identified to prevent impacts to spawning lake trout or incubating eggs during the completion of these works.

Request:

1. Identify the source of the “standard operating procedures that relate to issues surrounding erosion and sedimentation” that was used in the development of the Erosion and Sediment Control Plan, or was intended to be used in the implementation of the plan during construction.
2. Complete an assessment of impacts to lake trout as a result of the lowering of water level in Nonacho Lake necessary for the completion of in-water works on the Nonacho Lake Control Structure. This assessment should include a description of mitigation measures that will be implemented to prevent impacts to spawning or incubating eggs.

IR Number: 18
Source: MVEIRB
To: Dezé Energy Corporation
Subject: Dam Safety Measures Implementation

Preamble

Reference: Taltson Hydro System, 2006 Comprehensive Dam Safety Review, prepared for Northwest Territories Power Corporation by Klohn Crippen Berger, dated December 2006

A comprehensive Dam Safety review of the Taltson Hydro System was carried out by Klohn Crippen Berger (KCB) in 2006. The report to Northwest Territories Power Corporation included a number of recommendations some of which were given a high priority classification thereby requesting that they be completed within one year.

Request

Information is requested on the progress, as of 2009, in completing the recommended measures. Of particular interest is the status of the following:

Existing Facilities:

1. Has an operations, maintenance and surveillance (OMS) plan been established for the facilities?
2. Has an emergency preparedness plan (EPP) been established for the facilities?
3. Has an engineer been appointed to be responsible for dam safety?
4. Has a more detailed inspection/investigation of the Twin Gorges existing intake structure been undertaken and has it included any underwater inspection?
5. Has a stability check of the Twin Gorges intake been carried out, based upon detailed structural drawings?

6. Has a dam seepage inspection, instrumentation and monitoring plan been implemented for the Twin Gorges dam?

Proposed Facilities:

7. With respect to the proposed Taltson Hydro System, will the design, construction, operation and monitoring of all facilities be carried out in accordance with the most current version of the Canadian Dam Association, Dam Safety Guidelines?
8. Will Items 1, 2, and 3 listed above be implemented for the new facilities if not already in place?
9. How will possible foundation permafrost thaw settlement of the North Valley Dam embankment (page 27, KCB 2006) be investigated and addressed during redevelopment of the facilities?
10. What structures within the proposed Taltson Hydro System will be subject to significant ice pressures and will any special measures be needed to address this issue?

IR Number: 19
Source: MVEIRB
To: Dezé Energy Corporation
Subject: Operation and Maintenance of Hydro Transmission Lines

Preamble

An extensive network of hydro electric transmission lines is to be constructed to deliver electricity to users. These transmission lines will be constructed across wetlands, river valleys, areas underlain by permafrost and other sensitive environments.

Request

1. What height of tree growth will be permitted along the transmission line corridor?
2. What equipment and methods will be utilized to cut trees and control vegetation along the corridors following construction?
3. Will heavy equipment access be permitted along the transmission line corridor at times when frozen winter conditions are not present?
4. What measures will be taken to protect and preserve the ground surface conditions in the event heavy equipment access is necessary along the transmission alignment?
5. What measures will be put in place to ensure that construction and/or maintenance activities do not result in the loss or similar adverse affects of permafrost, erosion, slumping or translational migration of sloping soils along the transmission line alignment?

IR Number: 20
Source: Environment Canada
To: Deze Energy Corporation.
Issue: Waste management, open burning

Preamble

As part of the closure and restoration of construction camps (Section 6.8.4.2), the proponent plans to burn “all materials that are approved for disposal via open-fire burning at an approved on-site location.”

Request

1. Will the developer follow the Government of the Northwest Territories (GNWT) open burning policy, which states that only paper and untreated wood are suitable for open burning?
2. Will the developer consider providing any reusable building materials to local communities?

IR Number: 21
Source: MVEIRB
To: Dezé Energy Corporation
Subject: Construction Camp Site Reclamation

Preamble

The Developers Assessment Report indicate a number of construction camps will be provided along the transmission line route. In addition various laydown areas will be established. These camps will be located in areas of varied vegetation, overburden and permafrost conditions.

Request

1. Further information is requested as to how these camps and laydown areas will be constructed so as to minimize their impact on the environment including the site vegetation and the underlying soils.
2. What measures will be taken to ensure the vegetation present is not disturbed and permafrost conditions lost?
3. How will the construction camps, laydown areas and associated routes be reclaimed upon decommissioning?
4. How will natural vegetation be reintroduced to the site to minimize future erosion?
5. Will floating barge camp locations require any special construction or reclamation measures?

IR Number: 22
Source: DFO
To: Deze Energy Corporation
Issue: Water quantity, minimum flow release levels

Preamble

The Terms of Reference require the proponent to provide a description of the biological environment, which includes:

- d) Any known issues currently affecting fish and aquatic life forms in the development (e.g. contamination of food sources, changes in water level and temperature).

As stated in section 6.4.4 and Table 6.10.3 of section 6.10.4, the existing water license (#N1L4-0154) for the Taltson facility requires a minimum flow of 28 m³/s into the Taltson river below Elsie Falls and 14 m³/s between the outflow of the Nonacho Lake control structure and the Forebay. Maintaining these minimum flow requirements during operation of the Project has been described as one of the mitigation measures to reduce impacts to aquatic resources in the Taltson River Basin. The information collected on the aquatic ecosystem for this environmental assessment may prove useful in verifying that the prescribed minimum flows are indeed adequate to maintain the ecological integrity of the aquatic resources in the Taltson River.

Request:

1. That the Deze Energy Corporation conduct an assessment of the adequacy of the minimum flows prescribed in the existing water license (#N1L4-0154) in maintaining the ecological integrity of the aquatic resources of the Taltson River.

IR Number: 23

Source: MVEIRB

To: Deze Energy Corporation

Subject: Characterization of Durations and Rates of Change

Preamble:

Section 9.3.3 (Taltson Basin Flow Model) states that five model scenarios were run: a calibration scenario, two hypothetical historical scenarios (Pine Point era and current/baseline era) and two hypothetical future expansion scenarios (36 MW and 56 MW expansions of the existing Twin Gorges power facility). The calibration scenario was used to calibrate model parameters in order to optimize model performance and, therefore, potentially impacts all other model scenarios and results. Model calibration is further described in Section 3.1 (Model Calibration) of Appendix 9.3A; however, it seems, certain aspects of calibration would need to be covered in more detail.

Request:

Could you provide additional information regarding the following aspects of model calibration:

1. Which model parameters have been measured/observed versus calibrated versus assumed?
2. How was calibration conducted -- what aspects of model optimization were considered most important (e.g., high flows, low flows, average flow volumes, timing) and what model efficiency metrics (objective functions) were used (e.g., Nash-Sutcliffe, RMSE, etc.)?
3. How was the Flow Model validated? Section 9.3.3.2 (Model Calibration) states that "in order to assess the performance of the Flow Model, a calibration exercise was undertaken whereby the model was run for the period of January 1978 through December 1990 and compared to observed data for the same period". What datasets were used for model validation versus those used for model calibration? Did validation include data not directly used for calibration?

IR Number: 24

Source: MVEIRB

To: Deze Energy Corporation

Subject: Precipitation

Preamble:

In section 9.4.3, meteorological stations used as data sources were located in Yellowknife, Hay River, and Fort Smith. It was noted that annual precipitation was weighted more strongly toward the data from Fort Smith.

Request:

1. How was the statistical weighting and interpolation of the precipitation from the three stations performed?
2. In Section 13.6.2.1, Fort Resolution was mentioned as a meteorological data source. Does data exist for this station and, if so, why was it not included in Section 9.4.3.1?

IR Number: 25

Source: MVEIRB

To: Deze Energy Corporation

Subject: Lake Effect Precipitation and Wind

Preamble:

It is noted in Section 9.4.3 that, “lake – effect precipitation may also play a role in the fall precipitation.” With an increase of temperature resulting from climate change, lake-effect precipitation from Great Slave Lake may have a more pronounced impact on its surrounding environment. Combining wind and temperature analysis would highlight the potential for lake-effect precipitation. It is noted that some in-situ measurements were conducted but only during the summer months.

Request:

1. Was there any wind direction, frequency, and intensity analysis conducted for the area and correlated with temperature? If not, why was this not done? Was this analysis conducted for all seasons where lake-effect precipitation is likely to occur?

IR Number: 26

Source: MVEIRB

To: Deze Energy Corporation

Subject: Wetland baseline conditions in Taltson Watershed and Trudel Creek

Preamble

Wetlands mapping, particularly as it is linked to wildlife habitat and their residences, is somewhat enigmatic. Different project components have been mapped with different methods, some have not been mapped, and an accuracy analysis appears to be missing. It is difficult to evaluate the effects on wildlife using the wetlands. The DAR states that “detailed discussion of the current wetlands in the Project area is presented in sections 13.7, 14.6, and Appendix 13.7A”. Indeed, the relative abundance of wetland types is presented as percentages. However, it is unclear how the amount of the existing wetlands and the condition of the wetlands were measured, given that “the total wetland area in the study area is unknown.” (Section 13.7.10.1.2, and Appendix 13.7A Section 2.2.1). The total area of wetland must be known for future measurements of the change in wetland area. A percentage is not useful for this purpose.

Request

1. For the wetlands that are currently mapped, please provide an accuracy analysis for the mapping.
2. For the wetlands that are currently mapped, is it possible to provide data on the density of individuals and residences of the wildlife VCs that inhabit them?
3. Why were no wetlands mapped or surveyed in hydrological Zones 2, 3 and 4?
4. Are hydrological Zones 2, 3 and 4 assumed to have similar wetland composition as that of Zone 1?
5. Why was no baseline wetland information obtained for Zone 3, which contains the Twin Gorges Dam site?
6. Why were more wetland communities surveyed in the Trudel Creek area as compared to the larger Zone 1?
7. Does Zone 5 contain a greater variety of wetland communities than the other Zones?

IR Number: 27

Source: MVEIRB

To: Deze Energy Corporation

Subject: Passerines (and upland birds) (Section 9.5.3.2)

Preamble:

A number of Traditional Knowledge sources have been quoted to state that people are concerned about the effects to upland birds. Yet no baseline studies appear to have been conducted on upland birds or passerines. Baseline data are essential in conducting effective monitoring programs because any predictions on the effects to birds can only be verified if the baseline conditions are known. Without a passerine dataset specific to the Project, species-specific habitat use and loss cannot be monitored. A passerine dataset may be required for protecting birds under the Migratory Birds Convention Act and the Species at Risk Act.

Request:

1. Please provide a rationale for not conducting baseline surveys for passerines.
2. Please discuss how and when the necessary baseline data could be collected if during the approval process it is determined that the effectiveness of mitigating effects on passerines needs to be monitored.
3. Please indicate what type of parameters would need to be measured for the purpose of such monitoring.
4. Please comment on whether it would be economically and logistically feasible to measure such parameters for the baseline as well as for the monitoring program.

IR Number: 28

Source: MVEIRB

To: Deze Energy Corporation

Subject: Waterfowl Habitat Use and Distribution (Section 9.5.3.3.1)

Preamble:

Waterfowl data from the Diavik Diamond Mine study area is referenced, stating that important staging areas for waterfowl are present. Also, it is stated that 3 federally significant Important Bird Areas (IBA) exist.

Request

1. Please provide a map of the locations of these IBAs and important staging areas if they fall within or near the Project area.
2. Is similar data available from the other diamond mines falling within the Taltson Project area? If so, please provide this information.
3. If any of these IBAs fall within the Project area, was this critical waterfowl habitat surveyed? If not, why not?

IR Number: 29

Source: MVEIRB

To: Deze Energy Corporation

Subject: Raptor Population Characteristics (Section 9.5.3.4.2 – p. 9.5.24)

Preamble:

Ekati, Diavik, and Snap Lake mines offer long-term data on raptors, which was referenced. Section 9.5.3.4.3.1 (p. 9.5.25) states that in August of 2006 and 2008, surveys for raptor nests were completed for the Project. A consistent data set will simplify future monitoring programs targeting raptors.

Request

Was the data from 2006 and 2008 collected in a similar manner (i.e., timing, methods)? Has nest productivity been recorded? Are data sets across the various surveys comparable?

IR Number: 30

Source: MVEIRB

To: **Deze Energy Corporation**

Subject: Moose (Section 9.5.5.3 – p. 9.5.72)

Preamble

“Surveys to determine the abundance and distribution of moose within the Project area were carried out in 2003 and 2004 (see Rescan 2004a for survey methods), as well as 2006 (see Section 9.1.1.2.1 for methods).”

Request

Section 9.1.1.2.1 could not be located; please provide this Section.

IR Number: 31

Source: MVEIRB

To: Deze Energy Corporation

Subject: Land Cover Units Within the Project Footprint (Section 9.5.6.6)

Preamble

It is stated that: “To complete the land cover disturbance analysis, GIS shapefiles were created to estimate the layout and extent of all components of the Project (i.e., transmission line, winter roads, staging areas, barge landing sites, and improvements to the facilities at Twin Gorges and Nonacho Lake).” It seems to be implied that these shapefiles were used to calculate the disturbance to various land cover classes. To do so, ground-truthing should provide the required information for an accuracy assessment of the mapping of land cover types (for both natural vegetation and disturbed areas).

Request

1. What was the accuracy of the vegetation cover data used?
2. Does Table 9.4.14 represent vegetation values before or after land cover disturbance estimates?

IR Number: 32

Source: MVEIRB

To: **Deze Energy Corporation**

Subject: Key Mammals (Section 9.5.5 – p. 9.5.69)

Preamble

Habitat use information specific to the Project area is lacking and it appears that this data was not collected for several of the Key Mammals (i.e., moose, muskox, marten, and lynx). The proposed Project may result in changes in habitat use by these species. This information should be available for future monitoring programs.

Request

Is habitat use information available in any format (i.e., Habitat Suitability Index (HSI) models, or Resource Selection Functions) for the study areas?

IR Number: 33

Source: MVEIRB

To: Deze Energy Corporation

Subject: Wildlife Species at Risk (Section 9.5.7.3 – p. 9.5.106)

Preamble

It is stated that: “Under the General Status Ranks for NWT, only the whooping crane is considered At Risk (Working Group on General Status of NWT Species 2006). The remaining eight species included in Table 9.5.17 are considered Secure or Sensitive in the NWT indicating that the risk of extirpation for NWT populations of the species is less than populations elsewhere in Canada.”

Request

There is an error in this statement. The Rusty Blackbird is listed in Table 9.5.17 as May Be At Risk (not Secure or Sensitive). The Rusty Blackbird is listed by COSEWIC as a species of Special Concern. Is the developer aware of this and will the developer be updating this information?

IR Number: 34

Source: MVEIRB

To: Deze Energy Corporation

Subject: Human Environment (Section 9.6)

Preamble:

During the Technical Sessions on 27/28 May 2009 it was discussed that the assessment of Project effects on harvesting and traditional land use was done at a general level across the entire RSA, not for any particular area that may be of special concern to communities. A cultural landscape should be determined where areas of particular relevance to harvesting, cultural, or spiritual needs would be determined. These areas may or may not be affected by the Project. A number of questions in that regard remain outstanding.

Request:

1. Do any trap-lines fall within the Project area?
2. Do any areas of special concern exist for Aboriginal communities? If so, has adequate consultation with communities or individual community members been conducted? Please provide results on maps.
3. Was First Nation and Aboriginal community input used on the design of mitigation and follow-up programs? Please provide a plan of how such input will be collected and used in time to develop mitigation and follow-up programs.

IR Number: 35
Source: Deninu Kue First Nation
To: Deze Energy Corporation
Issue: Key furbearing species and ungulates

Preamble

Deninu Kue First Nation has an obligation to its membership to ensure the respect for its culture and the environment on which its culture has relied on since time immemorial are conserved for generations to come, “as long as the sun shines, grass grows and rivers flow”.

Deninu Kue First Nation requests further information on how Deze Energy Corporation will mitigate any potential environmental impacts on moose, caribou and wolves among several other species and their habitat from the construction and maintenance of the power line corridor.

Request:

1. How will the traditional knowledge of Akaitcho Dene of Deninu Kue First Nation be utilized in the mitigation process?
2. How will the Akaitcho Dene of Deninu Kue First Nation be compensated for this infringement?

IR Number: 36
Source: North Slave Metis Alliance
To: Deze Energy Corporation
Issue: Human environment, present & historic land use

This has the same title as #9, can they be combined though they discuss different issues?
Both are from NSMA.

Preamble

The Terms of Reference for the Developer's Assessment Report required Deze Energy Corporation to specify the methods used to identify, inform and solicit input from potentially interested parties and persons, as well as a description of issues that remain unresolved, and efforts to resolve them. It also required a discussion of the developer's community engagement plan dealing specifically with the holders of Aboriginal and Treaty rights in the project area. The concordance table provided following the executive summary indicates that this information should be found in Chapter 3(Community Engagement) and Chapter 6 (Development Description).

We are, however, unable to locate any reference to methodology for identification of potentially interested parties or persons in the North Slave Region, or any plan for engagement of aboriginal and treaty rights holders in the North Slave Region. There is no description of the issues identified by the North Slave Métis Alliance, so far, or any discussion of mitigation measures or efforts to resolve identified and other potential issues.

The traditional territory of the indigenous North Slave Métis overlaps the South Slave Region from the south shore of the Great Slave Lake, near Fort Resolution, northwards and eastwards towards the Thelon Game Sanctuary, including the area of Nonacho Lake and the proposed East Arm National Park. The transmission line and the new winter roads cross through our territory. The switchyards and substations are also proposed to be placed within our territory. The North Slave Métis Alliance has had meetings and other correspondence with Deze Energy Corporation about the extent of its territory and its concerns, yet there is no mention of these discussions, concerns or mitigations in the DAR.

Request

1. Please explain the methodology for identifying and soliciting input from potentially interested parties and persons in the North Slave Region.
2. Please report on community engagement efforts and results with the North Slave Métis Alliance, including mitigation commitments and unresolved issues.
3. Please discuss the community engagement plan for the North Slave Métis.

IR Number: 37
Source: MVEIRB
To: Deze Energy Corporation
Subject: Magnitude Definitions (Section 10.8.2 – Table 10.4)

Preamble

The definition of magnitude refers to a “range” or “limits of baseline values”. This implies that in order to make a determination of the magnitude of an effect, the natural range of variation needs to be known. This appears to be a theoretically correct and robust approach to impact evaluations; however, little if any of the baseline data exhibit limits of baseline values.

Request

1. Please explain how the range of natural variation was used to determine magnitude. Use concrete examples. For assessments that could not be based on the range of values please explain how professional judgment was used, and provide an alternative definition of magnitude. To help focus this discussion, we suggest you use the example of effects on muskrats (Section 13.10.7.1.1.1), where it is said that mortality “slightly exceeds the range of baseline values”.

IR Number: 38
Source: MVEIRB
To: Deze Energy Corporation
Subject: Pathway Validation (Section 10.6.3)

Preamble

The assessment approach is based on “pathway validation”. This approach dismisses all pathways that are “invalid” or “minor”. These pathways are not assessed. This is incorrect for two reasons. First, an invalid pathway can only be assumed if a Valued Component (VC) does not interact with the project (e.g. nesting whooping cranes will not be affected by the project because they do not nest anywhere near the project). As soon as there is any possibility for interaction between the VC and the project, the pathway is valid, no matter how small the potential effect is. As such, an effect that is assumed to be small or “minor” is still an effect and needs to be presented as a result of the effects assessment. Second, a pathway cannot be invalid if it is assumed that mitigation exists which would remove the effects. In this case, the VC actually interacts with the project but mitigation makes the impact low or negligible. The mitigation, however, does not remove the pathway or linkage. This may appear to look like an argument about semantics, but it is not: what if the mitigation does not work as expected and an effect actually occurs? By dismissing the validity of the pathway, this potential effect is never assessed or monitored.

Request

1. We developed a number of IRs that relate to “invalid” or “minor” pathways for wildlife, most notably the mortality of Frogs and the effects of increased access. Please carefully review the validity of pathways throughout the assessment and provide a rationale for all “invalid” or “minor” pathways where the mitigation measure is assumed to remove the linkage. In other words, it may be useful for the reviewers to understand for each of the wildlife mitigation measures why it is assumed that the said mitigation measure will work with certainty so as to remove residual effects. A table format may be useful showing the mitigation measure in one column and the evidence for its efficiency in the other column.

IR Number: 39
Source: GNWT
To: Deze Energy Corporation
Issue: Barren-ground caribou, effects of the transmission line on caribou

Preamble

The DAR references information available regarding caribou behaviour in relation to power transmission lines (see DAR references below). Based on GNWT's assessment of the DAR, Deze Energy Corporation has identified uncertainty about how power lines may influence caribou behavior but has not identified approaches to address this uncertainty.

Specific to transmission lines, research has been completed on the sensory disturbance effects of transmission line noise or physical presence of towers on caribou. Available studies were used to qualitatively describe the likely range of caribou reactions to transmission lines during operations. For example, in Scandinavia, domestic reindeer (of the same species as Barren-ground caribou, *Rangifer tarandus*) resist crossing under power lines. Researchers attribute this behavior to the habitat alteration created by the combination of the power line hum noise and changes in snow conditions with large forest openings (Villmo 1975) (refer to Section 9.5.2.4)(Page 12.3.12).

Review of the satellite-collar data from the Bathurst caribou herd indicates that Bathurst caribou cross under the proposed transmission line ROW during northern migration, summer dispersal, fall migration and winter dispersal (Table 9.5.7). During the northern migration, 26 collared caribou made a total of 56 crossings of the proposed transmission line ROW. During the post-calving and summer dispersal, 57 collared caribou made a total of 228 crossings, while 41 collared caribou crossed a total of 162 times during the rut and fall migration. During the winter dispersal period, 33 collared caribou made a total of 158 crossings of the proposed transmission line ROW (Page 9.5.40).

The effect of the transmission line during operations on caribou behaviour, movements and distribution is another source of uncertainty. Baseline surveys have indicated that Bathurst

caribou would forage and bed below the existing Snare Hydro to Yellowknife transmission line (Golder 2008), which is larger than the proposed Project's transmission line. However, the data from the Snare Hydro to Yellowknife transmission line represent only the winter range for barren-ground caribou. Published literature regarding the response of caribou to transmission lines in tundra settings was very limited. The best available examples were the responses of Scandinavian reindeer to alpine transmission lines (Section 9.5.4 Caribou Existing Environment). Movements of satellite-collared caribou indicate that the proposed transmission line intersects the usual post-calving migration route. As such, it can be assumed that the majority of the Bathurst herd cows and calves would pass under the transmission line at least once per year, and likely more frequently. The effect that this may have on caribou behaviour and movement, particularly on a tundra environment where such features are visible for long distances, is largely uncertain. The rate of habituation to such features is also not well understood (Page 12.7.2).

Request:

1. Given the uncertainty of the effect(s) of the transmission line during operation on caribou behaviour, movements and distribution please explain how Dezé Energy Corporation plans on addressing this uncertainty? Specifically have or will actions be taken that will reduce the likelihood of such an impact and will actions be taken to detect residual impacts?

IR Number: 40
Source: GNWT
To: Deze Energy Corporation
Issue: Barren-ground caribou, access

Preamble

Dezé Energy Corporation has put much effort into identifying, evaluating and proposing mitigations to control the potential for increased harvesting in the area of the proposed project.

Dezé Energy Corporation concludes that,

“Given the travel distance, planned access control mitigation, and the variability in barren-ground caribou winter distribution, it is predicted that the magnitude for the effect of increased access on caribou abundance may only approach or slightly exceed the limits of existing conditions.” (Page 12.3.37)

And

“In addition to the proposed mitigation practices, information on the densities and distribution of caribou indicate that there would be no clear advantage to using the Twin Gorges to Nonacho Lake winter road for hunting. The southern extent of the Bathurst caribou range (determined using movements of satellite-collared caribou, ENR 2007a) ends near the southern end of Taltson Lake (approximately 180 km driving distance from Fort Smith). Collared caribou movements indicate that Bathurst caribou do not frequent this area. Since 2002, collared caribou have been present within the RSA south of the Snowdrift River in only one winter ENR,2008).” (Page 12.2.9)

The current winter distribution of caribou in the regional study area is heavily influenced by the age of the extensive burns in the area. Based on extensive work by Don Thomas (CWS), it is expected that caribou use of the area will increase in about 20 years as caribou habitat recovers in the caribou range north east of Fort Smith. It is anticipated that movement,

distribution and use of winter habitat of caribou will return to its pre late 1970's utilisation as vegetation succession favours presence of lichen growth again.

Work done by Don Thomas is most quoted, by others, when it comes to understanding winter habitat and forest of different ages used by barren-ground caribou, influence of forest fires on vegetation change, movement and distribution, and overall condition of caribou.

Request:

1. How does the predicted range recovery and resulting change in caribou distribution affect the conclusion that the magnitude for the effect of increased access on caribou abundance may only approach or slightly exceed the limits of existing conditions?
Please include an assessment of how hunters from the NWT and Saskatchewan may change their access routes in response to changing caribou distribution.

IR Number: 41
Source: MVEIRB
To: Deze Energy Corporation
Issue: Barren-ground caribou, access

Preamble

Blocking winter and permanent roads is the key proposed mitigation to preventing increased access for use for caribou harvesting. Given the importance of the issues, the developer has provided insufficient information to support their assertion that this mitigation will be successful?. In the NWT, there is a history of public use of private roads and the large areas and distances make this road use difficult to detect and monitor.

Request:

1. Please provide more information on the rationale behind the developer's proposed mitigation strategies to prevent access for use for caribou harvesting. This should include further analysis to support the proposed mitigation found in Section 12.2.2.2.1 of the DAR, including case studies or data demonstrating how effective the blocking techniques have been in other projects (ex. using slash to block access roads and trails).

IR Number: 42
Source: MVEIRB
To: Deze Energy Corporation
Issue: Barren-ground caribou

Preamble

The DAR is required to describe “the geographical scope includes the portion of the range of any herd that may be potentially affected by any component or activity of the Expansion Project”. However, material in Chapter 12 (Barren-ground caribou) and Chapter 9 (Existing Environment) is limited by the selection of data. The proponent only used 1996-2007 data from satellite-collared cows.

Reliance on satellite-collared caribou, while useful, is limited for two reasons. Firstly, it only reveals the movements of cows, as only cows are collared. Typically bull caribou in winter are distributed further south than the cows so reliance on the cows may under-estimate contact between the project and caribou. Secondly the time period of collar location data (1996-2007) is during a period of decline. Typically, caribou declines are accompanied by a contraction of the southern boundary of winter distribution. Given that the project life is 40-60 years, the DAR should use historic information to describe changes in herd distribution, especially winter distribution, and how those changes relate to contact between caribou and the Project.

However, while Map 9.5.6 refers to Bathurst seasonal distribution, Map 9.5.7 refers to annual ranges of Ahiak, Bathurst and Beverly herds. Table 9.5.7 has the seasonal distribution of collared caribou cows relative to the Proposed Transmission Line Route. The table includes cows from the Ahiak herd crossing the transmission line corridor in summer and winter. Seasonal distribution of the Ahiak herd, especially taiga wintering, is mentioned but not shown in maps or analyses. This raises questions about mitigation during winter construction

Characteristically, caribou winter distribution varies annually. An analysis of the probability of caribou encountering the project would reveal the scale of the annual variability which in turn would relate to the scale of monitoring and mitigation – the analyses would reveal for example, what is the chance (out of a 50 years) that more than half the herd could encounter the project or some such similar way of describing the probability and frequency of encounters. Similarly the analyses would reveal where within the footprint of the project, which areas are most likely to be encountered by caribou and thus where monitoring and mitigation may need to be concentrated.

Request:

1. Please provide an analysis on the seasonal distribution of the Ahiak and Beverly herds and assess the seasonal probability of caribou encountering the project. Specifically, provide historic information and available local knowledge on seasonal caribou distribution. Satellite telemetry should be used to analyze the probability of caribou present near the tundra areas of the transmission corridor.
2. Provide a more specific analysis of the scale of annual variation in the seasonal probability of caribou encountering the project over time.
3. Some impact assessment pathways were rejected by the developer as they related to structures not considered within the caribou ranges. Please provide more information to substantiate this assertion that includes historic data, as the data used dates to 1996.

IR Number: 43

Source: MVEIRB

To: Deze Energy Corporation

Subject: Characterization of Durations and Rates of Change

Preamble:

Characterization of hydrological regime of a system typically addresses five principal aspects of flows and levels: (1) magnitude, (2) frequency, (3) timing, (4) duration, and (5) rate of change. Chapters 9.3 and 13 address the first three aspects: magnitudes of flows/levels are characterized by their mean values and range; frequency is described by exceedance curves and flood return periods; timing is addressed via mean monthly graphs, daily time series and discussion of the timing of the max and min flows.

While magnitudes, frequencies and timing of flows and levels are well covered in the report, durations of flow/level events and ramping rates do not seem to be addressed directly. Such changes would likely have an effect on the valued ecosystem components (VECs), such as fisheries and aquatic ecosystems in general.

Durations may be important for characterizing consecutive periods of very high or low flows/levels. Rates of change in flows and levels also have implications for VECs. For example, on average, flows through the Tronka Chua Gap will be reduced substantially; however, flows could ramp up, especially for high flow events, and in fall and winter.

Request:

1. Could you comment on how the baseline hydrologic conditions are likely to change in the proposed expansion scenarios with respect to durations and rates of change of key flows and levels in the Taltson River basin?

For example, both expansion scenarios entail more active storage of freshet in Nonacho Lake compared to the baseline scenario. With respect to durations, how would this affect typical length of time when consecutive daily outflows to Taltson River are low (e.g., approaching the lowest allowed limit of 14 m³/s)?

IR Number: 44

Source: Indian and Northern Affairs Canada

To: Deze Energy Corporation

Issue: Flood hydrology

Preamble

INAC notes that no flood hydrology was provided in the DAR. This would be useful in the discussion surrounding effects of altered flows and changes to water quality on water bodies both upstream and downstream of the Taltson Twin Gorges (as per section 4.1.2 of the Terms of Reference).

Request:

1. That the Deze Energy Corporation provide the Flood Hydrology .
2. That the Deze Energy Corporation indicate the source of the inflow design flood information used for planning the expansion project (i.e., the latest dam safety assessment or NTPC Dillon Engineering flood hydrology ca. 1996).

IR Number: 45
Source: DFO
To: Deze Energy Corporation
Issue: Taltson River watershed, changes to annual flow

Preamble

As per 13.3.3, under the 36 MW option, peak annual flows for Zones 1, 3, 4 and below the Twin Gorges facilities would occur during winter months (January or February) as opposed to the summer (July) under baseline conditions.

Request:

1. That the Deze Energy Corporation assess the possibility that higher flows in the winter will initiate early spawning by fish species that normally spawn in the spring, in correlation with the annual freshet.

IR Number: 46
Source: DFO
To: Deze Energy Corporation
Issue: Water quantity, water fluctuations in the Taltson River watershed,
flow control over Tronka Chua Gap

Preamble

The continued unregulated release of flow into the Tronka Chua system through Tronka Chua Gap is identified in Table 6.10.1 as a mitigation feature for potential environmental effects to Zone 2 as it would maintain some flow into the upper reaches of that system when Nonacho Lake levels are above the natural saddle. In section 13.3.3.3.1 of the DAR, it states that under baseline conditions Tronka Chua Gap always carries some flow, while over a 13-year period under the 36 MW and 56 MW options, unregulated releases from Nonacho Lake would only result in flow occurring 65% and 30% of the time, respectively. Based on the Tronka Chua Gap Flow Exceedance Curves (Figure 13.3.19) the baseline flow for 95% exceedance is around 4m³/s while the same flow rate shows exceedance rates of 50% for the 36 MW option and only 15% for the 56 MW option. Changes to flow predicted at Tronka Chua Gap would continue downstream through Zone 2 until Lady Grey Lake where Zone 2 would return flow back into the mainstem of the Taltson River.

As per Table 13.9.7, due to the change in flow over Tronka Chua Gap associated with the Project, effects to fish habitat structure, cover and food supply are predicted in Zone 2. The Deze Energy Corporation has not conducted any baseline studies on aquatic or fisheries resources, or provided an assessment of fish habitat in Zone 2. Should the flow regime, as described above, be considered for the Project operation, a more detailed examination of the influence of hydrological changes and effect assessment on fish and fish habitat as a result of the changes to flow through Tronka Chua Gap associated with the Project should be conducted for Zone 2.

Request:

1. That Dezé Energy Corporation provide a flow control plan for the new Nonacho Dam underflow gates that allow flow under the hydro expansion options to be routed via the Gap which will maintain flow rates that are more consistent with existing flows. The plan should include an assessment that demonstrates how the proposed flows will mitigate potential impacts to fish and fish habitat in Zone 2 downstream of the Gap and eliminate the need for a more detailed assessment of impacts within Zone 2.

IR Number: 47

Source: MVEIRB

To: Deze Energy Corporation

Subject: High Level Summary of Changes in Water Quantity

Preamble:

The DAR provides detailed assessment of the baseline hydrologic conditions and the estimated impacts on flows/levels in the two expansion scenarios. These assessments are presented in the report in three ways, using graphs and associated tables:

- Daily time series (1978-1990);
- Mean monthly values; and
- Difference between mean monthly values of the Baseline and the Expansion scenarios.

While the detailed estimates are valuable, a higher level summary of baseline conditions and expected changes seems to be missing. Such a summary, perhaps based on using overall mean values, would allow easier comparison of basic hydrologic characteristics for the key points in the Taltson River basin.

For example, consider a summary table of overall mean levels in Nonacho Lake, which was calculated from the monthly mean values presented in the report. This table would present, at a glance, how the two expansion scenarios would affect the level of Nonacho Lake:

	Mean Annual Level (m)	Difference from Baseline(monthly mean)	Min (monthly mean)	Max(monthly mean)	Range(monthly mean)
Baseline	323.20	0.00	322.95	323.44	0.49
36 MW Expansion	322.91	-0.29	322.36	323.23	0.87
56 MW	322.53	-0.67	322.20	322.84	0.64

Expansion					
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As another example, while the report states (sections 13.3.3.2, 13.3.3.3) that the uncontrolled flows via Tronka Chua Gap would decrease and those into the Taltson River increase, the magnitude of this reallocation is not made obvious. A table listing overall mean baseline and expected flows (again, calculated from the mean monthly values given in the report) would make the expected changes clearer:

	Mean annual outflow to Taltson River (m ³ /s)	Mean annual outflow via Tronka Chua Gap (m ³ /s)	Sum (check)
Baseline	75.00	14.00	89.00
36 MW Expansion	78.00	11.65	89.65
56 MW Expansion	87.86	3.14	91.00

Request:

1. Would the Developer be able to provide such a high level summary of baseline water quantity conditions and their expected changes in the two expansion scenarios for key points in the Taltson River basin?

IR Number: 48

Source: MVEIRB

To: Deze Energy Corporation

Subject: Application of Lag Times in the Flow Model

Preamble:

Section 13.3.2.2.1 (Nonacho Dam Control Structure) describes how flow lag times (between release of flow from Nonacho Lake and arrival to Twin Gorges Forebay) were applied in the Taltson Basin Flow Model. The section states that, "the lag is approximately 15 to 30 days depending on the base flows within the system. Therefore, the target release from Nonacho Lake for any day in a specific month was based on the estimated average monthly flows from the unregulated portions of the basin estimated for the following month."

Request:

1. Could you clarify specifically how the lag was applied in daily modeling? For example, were unregulated flows for any day in June 1980 taken to be equal to the mean unregulated monthly flow for July ($140 \text{ m}^3/\text{s}$ according to Table 13.3.2), or estimated based on the actual daily unregulated flows for the next 30 days?

IR Number: 49

Source: MVEIRB

To: Deze Energy Corporation

Subject: Application of the Monthly Target Flow Releases from Nonacho Lake

Preamble:

Section 13.3.2.2.1 describes the target monthly release rates from Nonacho Lake as flows that are necessary to complement the inflows from the uncontrolled portions of the basin (Tazin River and local watersheds downstream of Nonacho Lake) to the full generation flow values (180.6 or 240 m³/s). Table 13.3.2 lists the monthly target release values for the two expansion scenarios.

The Flow Model was used to represent a 13 year time period (1978-1990) at a daily time step. During this time frame the uncontrolled flows from the Tazin River basin and local watersheds have varied in magnitude, therefore, the amount of necessary flow release from the Nonacho Lake would have been variable as well.

Request:

1. Could you clarify how these target release rates were applied in the Flow Model? Specifically, were the monthly target release rates from Nonacho Lake held constant over the period of 1978-1990 while uncontrolled flows from the Tazin River basin and local watersheds varied in magnitude?

IR Number: 50
Source: DFO
To: Deze Energy Corporation
Issue: Erosion & sediment impacts below the Twin Gorges

Preamble

As per 13.3.4.2, flows into the Twin Gorges power facilities are to increase from 30 to 50 m³/s under baseline conditions to 180 m³/s and 240 m³/s for the 36MW and 56MW options, respectively. In the event of an outage, the South Gorge by-pass spillway would be opened to allow for up to 30 m³/s of excess flow to enter the Taltson River just below the Twin Gorges site.

Request:

1. Provide an assessment of the potential for localized scour and erosion at the points where:
 - a. flow from where the Twin Gorges facilities enters the Taltson River; and,
 - b. flow directed into the spillway and enters the river below the Twin Gorges Dam.
2. If there is the potential for scour or erosion, identify any mitigation measures that may be implemented, including features within the spillway intended to reduce the velocity of flow.

IR Number: 51
Source: Indian and Northern Affairs Canada
To: Deze Energy Corporation
Issue: Water Quality

Preamble

In the Terms of Reference it was stated that the developer must provide "...existing water quality for major water bodies identified as being potentially affected by the development". The DAR, specifically section 13.4.2, presented baseline water quality data for Nonacho Lake and zone 3, while 14.4.2 presented the same data for zone 5. No baseline data was collected for zones 1, 2 and 4. Construction at the Nonacho Dam could lead to water quality changes in zone 1. With the 56MW option there could be significant water level changes in zone 2; and preconstruction water quality data in zone 4 could be compared to post construction data to ensure no water quality changes occur downstream of Twin Gorges.

It would be beneficial to have baseline water quality data for all zones in the event that water quality is affected due to project construction or operation. Without baseline data for all zones there could be no before and after comparison of water quality data.

Request:

1. Why was baseline water quality data not collected in zones 1, 2 and 4?
2. Does Deze Energy Corporation plan to collect additional water quality data for these zones? If so, please identify a time frame for the collection of that data.

IR Number: 52

Source: MVEIRB

To: Deze Energy Corporation

Subject: Erosion at Tronka Chua Gap

Preamble:

The 36MW expansion proposal will cause more frequent peak flows from Nonacho Lake through the Tronka Chua Gap. Depending on the shoreline and bed conditions downstream of Tronka Chua Gap, this may increase erosion and sediment transport along this reach.

Request:

1. What information is available on the existing shoreline downstream of Tronka Chua Gap? To what extent, if any, has this area eroded since the beginning of the Baseline era when flow began over the Tronka Chua Gap?

IR Number: 53

Source: MVEIRB

To: Deze Energy Corporation

Subject: Mercury uptake in lake trout

Preamble:

The model used to predict mercury uptake by lake trout used parameters from lake whitefish as a proxy (Section 13.5.6.3). This was justified on the basis that the species have similar diets, and predicted little change in lake trout tissue mercury concentrations (e.g., Sections 13.11.3.1 and 13.11.3.2). However, lake trout are the top-level fish predators in these lakes and eat whitefish, so the species' mercury uptake patterns are quite different (e.g., Kidd et al. 1995; Stewart et al. 2003). Past studies of this system have found mercury concentrations in lake trout that were on average four to five times greater than those in lake whitefish (Stewart 1999, pg. 53). While these samples may not be directly comparable they suggest that lake whitefish may not be a good proxy for lake trout. Based on the model predictions the Proponent does not plan to monitor tissue mercury concentrations in the fish (Section 13.5.8).

Request:

1. Can the Proponent re-run the model using data from lake trout or another top level fish predator to generate a revised estimate of how lake trout tissue mercury might be affected by future development?
2. Can the Proponent explain how their predictions will be tested without monitoring tissue mercury?

IR Number: 54

Source: MVEIRB

To: Deze Energy Corporation

Subject: Ice conditions and Climate Change

Preamble:

The impact on ice conditions for the proposed development scenarios is discussed in Section 13.6. The emphasis of assessment was on changes in water depth and velocities leading to changes in ice conditions.

Request:

1. Was there consideration of how climate trends and climate change (as identified in Section 16.1) might impact each development scenario's predicted ice conditions, for example consideration of an increase in precipitation and the observed increases in annual temperatures?

IR Number: 55

Source: MVEIRB

To: Deze Energy Corporation

Subject: Ice observation locations

Preamble:

In section 13.6.2 a discussion on ice observations is presented indicating where and when observations were made. The Report states that there were two sets of monitoring activities: field visits at 17 locations and the 2003 Water Effect Monitoring Program (WEMP).

Request:

Please elaborate on the strategy used to select ice observation locations illustrated in Section 13.6.2. Specifically,

1. Were the 17 field visit locations an augmentation or a repeat of the locations used in the 2003 WEMP?
2. Why were additional field observations required? Were there different requirements for the Field Visits vs. the WEMP? Were the Field Visit locations identified as critical areas for alteration of ice structure not covered in WEMP? Why specifically were these locations selected for the three observation periods?
3. Is there a table showing results of the measurements obtained from the 17 locations? Is there a table showing the results of ice thickness vs. time and location and estimate of flows?
4. Is there information relating expected changes in ice conditions under the development scenarios to the effects they would have on wildlife?

IR Number: 56
Source: DFO
To: Deze Energy Corporation
Issue: Assessment methods, fisheries impact pathways validation

Preamble

The “rule of thumb” criteria that were used to evaluate flow management for the Taltson basin with regards to migration and/or access to habitats and to food supply was based on whether changes in the water level would be within the range of baseline variation for that month. Both pathways were ranked as either “Minor” if the anticipated average water level was found to be within the baseline range or “Valid” if the anticipated water level was found to be outside of that range.

In terms of ranking criteria, comparing average water depths to the baseline range may underestimate the impacts if the comparison reflects only minimum baseline water depths. Ranking criteria based on water depths above or below the average baseline value would provide a better understanding of the frequency of these pathways. Validation of the food supply pathway appeared to focus on water levels related to the reduction of fish access to shoreline riparian vegetation and limitation of food supply introduced via seed/detritus and insect drop. It is unclear whether food supply based on items transported along the water course via flowing water was also considered in this pathway. Reduced flow rates may reduce or limit the food supply in some parts of the Taltson watershed where access to shoreline vegetation is limited.

Request:

1. Provide background information on the rule-of-thumb criteria used to assess significance of impacts for changes in water level, including examples of where it has been used previously and evidence of it being a valid method of assessment.
2. Indicate whether the food supply pathway included items being transported by flowing water to areas of the watercourse where there is no access or limited access to shoreline vegetation. If this was not done, please provide a rationale.

IR Number: 57

Source: MVEIRB

To: Deze Energy Corporation

Subject: Aquatic Baseline

Preamble:

The information presented on natural and existing conditions for the aquatic environment in the Taltson Project Area is very limited. More detail is required, especially if impacts are to be assessed based on operational data. The data is very basic and consists primarily of species presence and relative abundance for specific areas for each zone (e.g. Section 13.9.2). There appears to be little thought given re: experimental design and hypothesis testing. Fish Population is identified as the valued component, yet information on populations is limited. The design does not seem to consider replication for effects assessment and no indication of a power analysis was conducted to determine sample size. Few sites were sampled more than twice, sample sizes were often small or not well defined and sampling methods were not always consistent.

There is also no basic information on fish migration (home range). This is critical especially if one is to determine what impact the hydroelectric development will have on fish movement. Fish movement is also related to fish habitat and spawning activities.

Request:

1. If the aquatic baseline data is limited, is it statistically robust enough to determine the significance of an impact, where one is expected to occur?
2. What is the size and age structure of the populations identified as valued components?
3. Are there any estimates of population sizes?
4. Please provide more information on sampling methodology, especially on sampling relying on gill net sets.
5. If there is a lack of baseline data, can potential cumulative impacts be assessed to a reasonable level of certainty?
6. Are there baseline spawning studies for valued component species?

7. Have polygons of detailed habitat been identified for valued component species?
8. Have migratory (home range) studies been completed for valued component species?
Radiotelemetry or acoustic tagging should be done to determine migratory patterns of selected valued component indicator species.

IR Number: 58

Source: MVEIRB

To: Deze Energy Corporation Corporation

Subject: Inconnu

Preamble:

Historical accounts describe inconnu (*Stenodus leucichthys*) as plentiful during their fall migration into the Taltson River (i.e., "Rocher River") in Sept and early Oct (Melvill 1914; Dymond 1943; Fuller 1955). Inconnu were also reported in a commercial harvest from Taltson Lake in 1970 (Yaremchuk et al.1989, pg. 54), but not since. This suggests that the lower Taltson River may be important to inconnu and that the species may have been affected by dam construction.

Request:

1. Do these fish still use the lower Taltson for spawning and, if so, does spawning occur in areas that may be affected by the Project?

IR Number: 59

Source: MVEIRB

To: Deze Energy Corporation

Subject: Effects on Northern Leopard Frogs (Section 13.10.7.1.4.1)

Preamble:

In Table 13.10.12 it is stated that the Project effects on Northern Leopard Frogs will be low. In Section 13.10.6.1.4.2 it is stated that the pathway from lowering the water level is to mortality is invalid. We agree with the logic that hibernating frogs would not be directly affected if the lowering of water levels occurs before frogs initiate their hibernation, but the question is about frogs losing wintering habitat. In order to understand whether or not winter survival of frogs can be affected we need to understand whether the wintering habitat will change as result of the Project and for how long. The pathway is not invalid; it is simply not yet understood. Moreover, the assessment of low uncertainty for impact predictions on frogs (Section 13.10.9.1.2) needs to be justified with sufficient rationale in light of poor baseline data and poor knowledge about the mortality effect of low water levels during the winter.

Request

Please explain:

1. The nature and the elements of wintering habitat that are required by Northern Leopard Frogs.
2. How these elements will change as a result of the project and for how long.

IR Number: 60
Source: DFO
To: Deze Energy Corporation
Issue: Ecological changes in Trudel Creek, WUA Analysis

Preamble

In order to assess the potential impacts to the fish habitat in Trudel Creek a weighted useable area analysis was used to compare available habitat for the baseline condition (existing flow) and for the 36 and 56 MW expansion options for the three valued ecosystem components of fish species: northern pike, lake whitefish and walleye. On Page 10 of the Trudel Creek Fish and Fish Habitat Effects Assessment and page 2 of the Trudel Creek Minimum Flow Interim Report it states that the methods used for the assessment follow those recommended in the British Columbia Instream Flow Methodology (Lewis et al, 2004). It should be noted that the procedures presented in these documents do not follows those outlined in Lewis et al. (2004), specifically the critical stages of approach provided on pages 36 through 44 and notably Points 1 through 7 on page 37. If the assessment of flow-related impacts did not follow the rationale and approach of Lewis et al. (2004), the actual rationale and supporting information should be presented.

The assessment does not include linear distances or area-based assessment of riverine habitats or a rationale specific to habitat utilization and critical life histories of the species in these reaches. The sections modeled may not be representative of flow sensitive habitats or critical habitats.

Request:

1. Provide the rationale and approach used to develop the methods for conducting the assessment of flow-related impacts in Trudel Creek.
 - a. As part of the assessment, identify flow-sensitive habitats in Trudel Creek and conduct an assessment of flow-related impacts to these specific areas.

This assessment should be expanded to other waterbodies where there are anticipated impacts to fish habitat from construction or operation activities, such as Nonacho Lake.

- b. If a rationale for the current assessment is not available, then a draft Terms of Reference for an in-stream flow assessment should be drafted for DFO review. The terms of reference should address these key items:
 - i. Watersheds and reaches that will have flows modified by the proposed project and the degree of modification of flows in terms of: magnitude, frequency and duration of flows; timing of key hydrologic events; and, duration and frequency of biologically significant flows such as temperature-based or open water flows.
 - ii. A rationale for selection of key systems, reaches and habitats used in the in-stream flow assessment.
 - iii. Identification and periodicity of key fish species.
 - iv. Metrics and variables that will be used to assess impacts to quantity and quality of fish habitat (See IR DFO_10 for additional details).
- c. The terms of reference (TOR) for the in-stream flow assessment should explicitly address procedures presented in Lewis et al. (2004), specifically the critical stages of approach provided on pages 36 through 44, notably Points 1 through 7 on page 37.

IR Number: 61

Source: MVEIRB

To: Deze Energy Corporation

Subject: Assessment methods, aquatic habitat

Preamble:

There appears to be a lack of field data specific to habitat and spawning areas for fish. The weighted usable area (WUA) was used to determine the habitat usability of different life history stages of the indicator species for both river and lake environments. The WUA is the portion of river channel or lake where habitat conditions (i.e. depth, velocity, cover and substrate) can be defined. Substrate is a critical component of this analysis, yet is not available as measured quantities for the Trudel Creek lake systems (see Section 14.8.6.2.1). Similarly, for the Trudel Creek riverine habitats, “substrate information observed where possible”.

Yet, the WUA model was used to determine the changes in preferred habitat conditions within the Trudel Creek system for the Valued Components: northern pike, lake whitefish and walleye. The life stages evaluated included:

- Northern Pike spawning
- Northern pike juvenile rearing
- Lake whitefish juvenile rearing
- Lake whitefish adult spawning
- Walleye spawning

Request:

1. Were fish spawning studies conducted to verify the model?
2. Were larval fish studies conducted to verify the model?
3. Was quality of fish habitat assessed for critical areas?
4. How was minimum flow criteria defined, if habitat is not well defined? Is habitat limiting?
5. Why were other models not considered such as DFO’s HAAT model?

IR Number: 62
Source: DFO
To: Deze Energy Corporation
Issue: Ecological changes in Trudel Creek, WUA Analysis

Preamble

Section 14.8.6.2.1.1 of the DAR states:

The mean monthly flows were used in conjunction with the WUA curves to determine the habitat availability for northern pike, lake whitefish and walleye during the life-stage period. As many of the life-stage periods extend for more than one month and the mean monthly flows vary, minimum and maximum values of habitat availability were determined as summarized in Table 14.8.5, Table 14.8.6 and Table 14.8.7 respectively.

The use of mean flow values in the WUA calculations does not provide information on the variation in magnitude and frequency of the WUA. Mean flow values may be misleading in terms of the WUA that will be available during low flow years. A preferred approach would be to generate habitat exceedance curves relating weighted usable area to percent exceedance for various species and life stages of concern (examples can be provided). These curves could then be used to determine habitat limiting flows.

Request:

1. With regards to the referenced statement from section 14.8.6.2.1.1, that the Deze Energy Corporation indicate whether the minimum and maximum habitat availability values were based on the minimum and maximum of the mean monthly flows, or the absolute minimum and maximum monthly flow values during the given life-stage period.
2. To better quantify the potential impact of the proposed 4 m³/s minimum flow release on fish habitat in Trudel Creek, DFO requests that the proponent develop habitat exceedance curves for the various valued components species and life-stages. As part

of this analysis, a summary of the equivalent percent habitat exceedance values corresponding to the 4 m³/s minimum flow release should be provided.

IR Number: 63
Source: DFO, MVEIRB
To: Deze Energy Corporation
Issue: Trudel Creek and the Taltson watershed, impacts to littoral vegetation

Preamble

The importance of wetlands and littoral vegetation to the functioning of the aquatic ecosystem is well documented in the DAR. Many impacts associated with the loss of littoral vegetation caused by reduced flows in Trudel Creek and lowered water levels in Nonacho Lake are predicted to be reversible due to the assumption that submergent and emergent vegetation, equivalent in quality and quantity to what was lost, will reestablish within a few growing seasons. This assumption was deemed realistic based on field observations and aerial data.

Studies on re-vegetation rates of littoral zones in northern climates are limited at best. The referenced study site in Odland and Moral (2002), was not subject to the freeze-up conditions found in the Northwest Territories, had a rich seed bank, and may not have experienced the same extreme variations in flows that are expected in the Trudel system due to scheduled and unscheduled ramping events.

Given the uncertainty surrounding the time required for the successful re-establishment of submergent and emergent vegetation in the Taltson basin and the dependence of aquatic and fisheries resources on these littoral zones, further analysis is needed of potential impacts should the period of re-establishment extend beyond one to three years. Additional measures may be needed to reduce impacts to the littoral areas.

A pilot study on the re-vegetation of the littoral zone within the Trudel system, following the reduced flow regime, may prove useful to validate the assumptions of this assessment and further refine predictions for future environmental assessments.

Request:

1. How and when will baseline data be provided that would show the extent of each category of wetlands existing at baseline and subsequently being gained or lost during the life of the project?
2. What does the loss or gain of wetlands mean for the assessment of impacts on the wildlife that inhabit the wetlands?
3. How long will it take for wetlands to be re-established?
4. Are there any reclamation programs planned that would assist wetland re-establishment?
5. Provide an assessment of the potential impacts to fish and benthic invertebrates should re-establishment of littoral zones not occur in the best case scenario of one to three years.
6. For Nonacho Lake, it states in 13.9.11.2.1 that “the re-establishment of the new water level regime depends on the currently submerged substrate and the inundation characteristics of the proposed water management scheme.” DFO requests that the Dezé Energy Corporation indicate whether it is possible to adjust the water management scheme to reduce the amount of littoral vegetation lost and assist in re-establishing vegetation.
7. Does the developer anticipate that the loss of littoral vegetation may lead to increased erosion at locations where vegetation loss is anticipated?

IR Number: 64
Source: Indian and Northern Affairs Canada
To: Deze Energy Corporation
Issue: Erosion

Preamble

The Kohn Crippen Berger Ltd 2009 report, titled Trudel Creek Erosion Assessment, recommends erosion sites 1, 2 and 3 be monitored several times per year, especially before low and high flow periods and that turbidity measurements be taken to provide a more complete baseline record. INAC understands that erosion along Trudel Creek will generally decrease if the expansion project goes ahead; however this reduction could also lead to changes in water quality and possible reduction of fish habitat. In addition, unplanned ramping events will likely still cause erosional events.

INAC is pleased that the developer intends to use the recommendations of INAC's draft Aquatic Effects Monitoring Program (AEMP) guidelines to engage interested parties in developing a monitoring program. However, we (INAC? The Board?) would like to point out that an AEMP would not be fully implemented until the Water Licensing phase is complete, and therefore we (who?) encourage the developer to begin any necessary baseline monitoring as soon as possible.

Request:

1. Will Deze Energy Corporation use the recommendations from the Kohn Crippen Berger Ltd. 2009 report when developing a monitoring program for erosion potential along Trudel Creek, both pre and post construction? The purpose of this monitoring would be to ensure that there is sufficient base line data available.

IR Number: 65
Source: DFO; INAC
To: Deze Energy Corporation
Issue: Ice structure and under-ice-dissolved-O2 Levels

Preamble

The qualitative assessment of potential changes in ice structure was based on three ice field studies within the Taltson River watershed and on predictive hydrologic modeling.

Given that flow levels through Tronka Chua Gap and over the South Valley Spillway will decrease under both the 36 MW and 56 MW expansion options, it is important to understand the predicted ice conditions in these two areas. Reduced flows could result in build up of ice downstream of the Gap and less oxygen to overwintering habitat in the downstream lakes, which may lead to adverse impacts to fish and fish habitat. In section 13.6.7, the Deze Energy Corporation acknowledges that more studies are required in Zone 2 to fully characterize ice freeze-up and mid-winter conditions.

Sections 14.4.3.3.6 and 14.4.3.4.6 compare predicted dissolved oxygen (DO) to the CCME guidelines of 6.0 mg/O₂/L for sensitive early life stages and 5.5 mg/O₂/L for all other life stages of fish. These thresholds were intended for warm water waterbodies. The analysis should be based on the cold water values of 9.5 and 6.5 mg/O₂/L provided in the CCME guidelines. A review of the predicted DO values for Gertrude, Trudel and Unnamed Lakes under both options indicate that DO levels would be below the recommended values for sensitive early stages for all lakes as well as below the recommended values for all other life stages in Unnamed Lake.

Using the warm water values, it was acknowledged in the DAR that the minimum value for sensitive early stages would not be met under either option in Unnamed Lake but it was concluded that uncompromised connectivity along Trudel Creek throughout the winter would allow for sufficient inflow of oxygenated water thus increasing DO concentrations to

levels above the CCME guidelines. Should connectivity throughout the Trudel Lake system not be achieved during ice conditions, winter fish kills may be induced.

Request:

1. Provide a detailed quantitative assessment of changes in flow condition on ice structure based on local river hydraulics and stream morphology for Zones 2 and 5, and assess the potential impacts to fish and fish habitat. As part of this assessment, the impacts of lower flows on water depths and oxygen levels in downstream overwintering habitat should also be included.
2. For the 56MW option, provide an assessment of impacts to overwintering fish in Tronka Chua Lake due to reduced dissolved oxygen levels as a result of flow not being maintained through Tronka Chua Gap over the winter season.
3. Re-assess the potential impacts to aquatic life using the cold water DO values presented in the CCME guidelines (1999).
4. Provide any data collected on dissolved oxygen (DO) during the ice observation field visits along the Taltson River and Trudel Creek. If this information was not collected, the Dezé Energy Corporation should commit to conducting baseline DO sampling during the winter season in Zones 2 and 5, at a minimum, to verify the conclusion reached by the model. Year round sampling of DO for Zones 2 and 5 should form part of the Project's DO monitoring program.
5. Provide supporting evidence to the conclusion that the reduced flow expected during the winter season will be sufficient to uphold the concentration of DO as prescribed in the CCME guidelines for cold water.

IR Number: 66
Source: DFO, MVEIRB
To: Deze Energy Corporation
Issue: Taltson River watershed, wetlands

Preamble

Dezé concluded in their report that wetland extent did not need to be quantified for Zones 2, 3 and 4 as it was predicted that Nonacho Lake and Zone 1 would have the greatest potential for effects. However as stated in section 13.7.9.1.2:

Water levels in Tronka Chua Lake (Zone 2) are expected to drop an average of 26 cm over the year but would be down approximately 50 cm during the growing season. This would change the hydrology of riparian marshes and would lead to an alteration of extent and function in this part of the zone

[...] Water levels in Tsu Lake (Zone 4) are expected to drop an average of 33 cm in the growing season. This would elicit a low to moderate reduction in riparian marsh extent and function.

The decision to not include Zones 2, 3 or 4 in the wetland baseline study was rendered when only the 36 MW option was being considered and it was determined that potential effects to wetlands in these zones would be minimal. However, in considering the 56 MW option, and the substantial water level differences likely to occur in Zone 2, additional wetland surveys in Zones 2, 3 and 4 are warranted.

Request:

1. Will Deze Energy Corporation complete additional wetland surveys in Zones 2, 3 and, if so, what would be the timelines for the completion of these studies?
2. For the wetlands that are currently mapped, please provide an accuracy analysis for the mapping.

3. For the wetlands that are currently mapped, is it possible to provide data on the density of individuals and residences of the wildlife VCs that inhabit them?
4. Are hydrological Zones 2, 3 and 4 assumed to have similar wetland composition as that of Zone 1?
5. Why was no baseline wetland information obtained for Zone 3, which contains the Twin Gorges Dam site?
6. Why were more wetland communities surveyed in the Trudel Creek area as compared to the larger Zone 1?
 - a. Does Zone 5 contain a greater variety of wetland communities than the other Zones?

IR Number: 67
Source: DFO
To: Deze Energy Corporation
Issue: Impacts on fish and fish habitat – reduced flows

Preamble

In Table 14.3.4, the model's results indicate that the annual freshet, under the 36MW and 56MW options, would be delayed by one month, from April/May to June in Trudel Creek. As per 14.7.7.15, low flow years resulting in freshet flows not exceeding the minimum 4 m³/s would occur in Trudel Creek every two years under the 36 MW option and once every ten to fifteen years under the 56 MW expansion.

The year-round reduced flows into Trudel Creek were predicted to increase water temperature by 2 to 3 C° degrees. This increase in water temperature was assessed as being not sufficient to trigger a shift in timing of certain stages of life history that may be initiated by thermal cues (section 14.8.5.1.3.6). However, given that the deeper and cooler habitat within Trudel Creek will be significantly reduced, it is possible that species that prefer these types of habitat may retreat from the creek to the lakes, potentially causing a change in species composition throughout the system.

Request:

1. Address the potential impacts to fish that spawn in the spring due to:
 - a. the one month delay in the freshet; and,
 - b. low flow years when no freshet would occur in Trudel Creek.
2. Assess the potential for a change in fish species composition within the Trudel system due to the rise in temperature in Trudel Creek resulting from lowered water levels.
3. Clarify whether it is expected that areas of sufficient depth will remain to provide overwintering habitat.

IR Number: 68
Source: DFO
To: Deze Energy Corporation
Issue: Ecological changes in Trudel Creek, impacts to fish and fish habitat – white suckers

Preamble

In section 14.8.6.2.2 it states that two side channels adjacent the South Valley Spillway currently drain into a large pool before continuing into Trudel Creek. Large numbers of young-of-year white sucker were found in the pool habitat indicating that the side channel and pool are important habitat for white sucker spawning and rearing. Under the expansion project it is proposed that these side channels be dewatered. The possibility of using one of these side channels for the minimum flow release should be considered to preserve this habitat.

Request:

1. That the Deze Energy Corporation indicate whether it would be feasible to utilize one of the side channels adjacent to the South Valley Spillway as the outlet for the minimum flow release into Trudel Creek in order to preserve the white sucker habitat currently found in this area.

IR Number: 69
Source: DFO, MVEIRB
To: Deze Energy Corporation
Issue: Turbine and conveyance canal operation, fish mortality from entrainment

Preamble

As per 5.2.2 of the Terms of Reference, the Deze Energy Corporation is required to provide:

- ...b) An assessment of the impact on fish and fish passage through the conveyance canal and turbines; and
- c) Identification of mitigation measures to minimize impacts to fish and fish passage through conveyance canal and turbines.

DFO notes the following regarding the assessment of effects of entrainment of fish:

- While the rationale for the assessment of effects of entrainment of fish, including mortality and injury is valid, the potential effects on fish populations upstream of the barriers proposed at Nonacho Lake Control Structure and Twin Gorges facilities has not been undertaken.
- The effects assessment provides a literature review and survival rate calculations based on the general habitat utilization and species composition of fish within proximity of the proposed barriers in order to produce mortality estimates. While species composition and habitat utilization may be important factors, movement characteristics and timing of movement by life history stages may be more important with respect to incidental entrainment. As life history movement and habitat utilization (e.g. depths and zones within the reservoir) may vary by species, assuming that fish with the highest relative densities are at greatest risk to entrainment may not be valid. As such, entrainment probability should not be assessed based on general habitat utilization alone.

- The assessment considers entrainment due to the service turbine operation at Nonacho Lake Control Structure, but does not include the potential for entrainment in the Control Structure itself.
- The presence of Lake Trout immediately below the Nonacho Lake Control Structure suggests that there is either: displacement of adult Lake Trout from Nonacho Lake and/or downstream populations of Lake Trout exhibit upstream movements related to life history needs. These needs could be extended to other fish species.

Also, the Review Board notes that mortality rates from passing through turbines have only been predicted for fish less than 15 cm total in length (Section 15.3.2.8.1.2 and Section 15.3.3.9.1.1). It was assumed by the developer that fewer larger fish would be entrained, in part because their burst swimming speed would exceed the predicted velocity of 1 m/s in the channel (Section 15.3.2.8.1.5) and adjacent to the inlet canal of the Nonacho Control Structure (Section 15.3.3.9.1.3). No mention was made of using screens or other measures to prevent or discourage fish entrainment. The removal of large reproducing fish typically has a greater impact on a population than the removal of juvenile fish.

Request:

1. Please identify common mitigation techniques available to prevent the entrainment and mortality of fish at hydroelectric facilities;
2. Provide examples of hydro projects where intake canals were designed to be unsuitable as fish habitat, and not screened, as a measure to prevent fish from entering hydro turbine and assess if these were successful in preventing fish entrainment.
3. Provide an assessment of population-level effects on fish stocks in the Forebay due to entrainment or displacement of fish downstream of the Twin Gorges facilities. These population-level effects should be included in the analysis of the magnitude of effect.
4. Provide a rationale and additional information on the specific life history movement characteristics of the fish species that may utilize the canal, to support the three assumptions presented in section 15.3.2.8.1.5.
5. Revise the proposed mortality estimates provided in section 15.3.2.8.1.5 based on the age and size compositions of fish populations known to utilize the Forebay around

- the North Gorge Canal and South Gorge Spillway areas. What are the mortality rates for larger fish that pass through turbines and at what length is there 100% mortality?
6. Provide an assessment of the potential for downstream displacement or entrainment of fish during the operation of the Nonacho Lake Control Structure as well as the requirement for fish passage for lake trout and/or other species.
 7. Provide an assessment of potential population-level impacts and fish movement characteristics for lake trout, northern pike and lake whitefish in Nonacho Lake. Data or studies should be provided to justify that only a small proportion of fish populations may be entrained as stated in section 15.3.3.8.1. These population-level effects should be included in the analysis of the magnitude of effect.
 8. Provide information on whether mortality estimates include both direct/immediate mortality and indirect/delayed mortality from injury.
 9. How will the channel velocities change on an hourly, weekly or seasonal basis in response to changes in the operating regime?

IR Number: 70
Source: MVEIRB
To: Deze Energy Corporation
Subject: Habitat Mapping

Preamble

Habitat mapping has been conducted at the regional level. The models included the typical baseline and future effects scenarios, but also included a “pristine” conditions scenario. This is a very useful effort that allows one to understand the estimated amount of change to date. It appears that the mapping only occurred at the regional level and only at a coarse scale. The methods of Johnson et al. (2005) are referenced. In that study, however, the authors suggested that their analysis “serves as the coarsest framework for understanding the impacts” (Johnson et al. (2005), p. 2).

Request

1. Is it possible to provide more detailed mapping at a finer scale of resolution and finer “framework for understanding the impacts”? Such mapping would be needed for the evaluation of impacts, particularly on a Project-specific basis, where the effects of changing habitat could be measured in the hundreds of meters or up to a few kilometres from the Project footprint. Such mapping should exhibit habitat for all VCs for which the effects predictions need to be evaluated. If such mapping cannot be provided at this time, please provide a plan as to how this can be done before the start of construction so that this mapping could serve as a baseline for monitoring purposes.

IR Number: 71
Source: Environment Canada
To: Deze Energy Corporation.
Issue: Species at Risk, key bird species, Horned Grebe

Preamble

The Terms of Reference (Section 5.2.3, page 26) state:

For Species at Risk, the analysis provided in the DAR must be of sufficient detail to allow the Review Board, as well as relevant other parties, to discharge its responsibilities under the Species at Risk Act, which includes:

- a) Determining whether the proposed development is likely to affect a listed species or its critical habitat;
- b) Identifying the adverse effects on the species and its critical habitat;
- c) Ensuring that measures are taken to avoid or lessen those effects, consistent with any applicable recovery strategy and action plan; and
- d) Monitoring the effects.

For the purpose of this environmental assessment, the term “species at risk” includes all species listed under any applicable schedule of the Species at Risk Act, as well as any species listed by the Committee on the Status of Endangered Wildlife in Canada.

In April 2009, Horned Grebe (western population) was newly assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as being a species of Special Concern. As such, it is now under consideration for listing on Schedule 1 of the Species of Risk Act (SARA). Horned Grebes are found in the project study area (DAR, Tables 13.10.3 – page 13.10.12 and Table 14.9.3 – page 14.9.11) and should be assessed as outlined in the Terms of Reference.

Note that a Management Plan for Horned Grebe will only be developed when the species is listed on Schedule 1 of SARA. Critical habitat (as defined in SARA) is only established for species listed as endangered or threatened on Schedule 1 of SARA. Thus, critical habitat will not be established for Horned Grebe given its current status of Special Concern.

Request

1. For the proponent to determine whether the proposed development is likely to affect Horned Grebe or its habitat, identify any adverse effects on the species and its habitat, suggest mitigation to avoid or lessen any adverse effects and suggest whether any monitoring is required.

IR Number: 75
Source: Environment Canada
To: Deze Energy Corporation.
Issue: Key bird species, predation

Preamble

Predation of eggs and chicks is a key factor that limits the productivity of many species of birds. Although predation is a natural process, artificial increases in predator abundance caused by human activities can readily alter any existing balance between predators and nesting birds. This can lead to population declines and conservation problems. Ravens are predators of eggs and chicks and increases in raven populations in development areas elsewhere in the north have resulted in declines in local bird populations (e.g., Alaskan North Slope).

In the Terms of Reference (Section 5.2.3, page 27), the proponent was asked for:

Characterization of the transmission towers for their suitability as nesting and roosting sites for predators and the potential for increased predation facilitated by the development as well as potential mitigation measures to be considered, such as tower design

As well, the Terms of Reference also identified raptor and raven nesting habitat along the transmission line as one of the issues to analyze from the EA scoping exercises (Table 7-1, page 36).

The DAR did assess the potential impacts of the transmission towers providing hunting perches and nest sites for raptors (Section 15.4.5.2.2.8, page 15.4.34). However, the DAR did not address the issue of ravens nesting and roosting on towers or other project infrastructure.

Request

1. For the proponent to:
 - a. Evaluate the degree to which ravens will use the towers and other project infrastructure for nesting
 - b. Assess the probability of increased predation of migratory birds because of increased nesting and roosting sites in the area for ravens and evaluate how this might impact local bird populations
 - c. Suggest potential mitigation measures to be considered

IR Number: 73

Source: Environment Canada, MVEIRB

To: Deze Energy Corporation.

Issue: Species at risk and key bird species, Yellow Rail and Northern Leopard Frog surveys

Preamble

Section 79(2) of the Species at Risk Act (SARA) states that during an assessment of effects of a project, the adverse effects of the project on listed wildlife species must be identified, that measures are taken to avoid or lessen those effects and that the effects need to be monitored. This requirement is also reflected in the Terms of Reference for the project (Section 5.2.3, page 26). Yellow Rail and Northern Leopard Frogs are listed as species of Special Concern in SARA and, as such, these requirements apply to these species.

As a first step in determining whether there could be potential adverse effects, it needs to be determined if Yellow Rail and Northern Leopard Frogs occur in the project area. The proponent had a wildlife consultant undertake surveys for Yellow Rail in 2008 (Appendix 13.10A of the DAR, 2008 Taltson Basin Wildlife Baseline Study). No Yellow Rails were detected during the surveys. EC is assessing the survey undertaken in 2008 to determine whether the survey timing and methodology were adequate to detect Yellow Rails or whether additional surveys might need to be conducted.

Yellow Rails have been found to move to other locations to breed from one year to the next if water levels are not sufficient for breeding (i.e., water levels too high or wetlands completely dry). If 2008 was an unusually wet or dry year, this might have affected the ability for the surveys to adequately detect Yellow Rail. This could indicate the need for additional surveys.

Also, there have been concerns raised about the completeness of surveys used to determine the presence of the Northern Leopard Frogs. This information request addresses questions related to the population surveys related to this species as well.

Request

1. For the proponent to provide information as to whether 2008 was a normal, wet or dry year for water levels in the areas assessed for Yellow Rails.
2. Why was call playback for the Yellow Rail only conducted at a subset of sites?
3. Why were not all sites included to remain consistent in survey protocol?
4. Was a “quiet time” utilized to account for the disturbance effect of helicopter drop-off at survey sites?
5. Was detailed habitat information collected for each Yellow Rail (call playback) survey site?
6. Figure 4.1.1 does not show 4 daytime habitat evaluation locations as stated in the text. Alternatively, is a “daytime habitat evaluation location” different from the daytime reconnaissance period? Please clarify. Same comment for Figures 4.2.1 and 4.3-1.
7. On page 5-1 it is stated that: “...the observation may also indicate that the yellow rail surveys were conducted slightly too early as the sora is known to breed earlier in the season than the yellow rail...”. Are further Yellow Rail surveys warranted, given the potentially early timing of the Yellow Rail surveys described in this report?
8. Is it more likely that Yellow Rails are absent or were they simply not detected?
9. Is there the possibility that basking Northern Leopard Frogs were disturbed by the arrival of the surveyors by helicopter?
10. Were breeding sites distinguished between Wood Frog and Northern Leopard Frog breeding sites (i.e., were tadpoles identified to species)?
11. As Northern Leopard Frog summer and breeding sites were identified in Taltson River Zones 1 & 3, is it possible to use the habitat information collected to predict other potential Northern Leopard Frog summer or breeding sites occurring within the local study area (i.e., habitat suitability model)? This would provide further information on potentially important Northern Leopard Frog habitat not identified during the field program.

IR Number: 74
Source: MVEIRB
To: Deze Energy Corporation
Subject: Zones of Influence (Section 15.4.9)

Preamble

As part of the impact predictions, there are many assumptions used regarding the zone of influence (ZOI), which denotes a distance from disturbance within which animals avoid using their preferred habitat. Although the factors that shape the ZOI are numerous and often complex, the assumptions made in the DAR are reasonable. However, these assumptions are not evaluated as there do not appear to be empirical data from the project site for any of the VCs assessed.

Request

1. If it is currently not feasible to provide the data on ZOIs from the project site for any of the VCs assessed, please provide a plan of how that can be done in time to be used for a potential baseline of a future monitoring program and to test ZOI predictions.
2. Discuss the parameters that need to be measured so as to evaluate the predictions and alleviate the uncertainty.

IR Number: 75

Source: MVEIRB

To: Deze Energy Corporation

Subject: Fragmentation Analysis and Mapping Methods (Section 15.4.7.1.2.1)

Preamble

“To estimate the effects of habitat fragmentation, grizzly bear and tundra wolverine habitat were classified using a remote sensing Land Cover of Canada data (1985 to 2000) provided by the Government of Canada in a GIS platform; land cover classes were developed similar to Johnson et al. (2004, 2005). The land cover dataset was modified from 1,000 m cell sizes to a 25 m resolution, and then joined with esker habitat in 1:50,000 scale national topographic database (NTDB) layers. The merged database was similar to the SGP dataset used in Johnson et al. (2004, 2005). However, upon joining layers, the dataset was re-sampled to 200-m cell sizes using a nearest neighbour algorithm (versus 100 m in Johnson et al. [2004, 2005]) because of computational constraints with generating habitat rasters over the study area.” (page 15.4.63)

It is evident and understandable that the analysis at the Slave Geological Province (SGP) level has been done at a very coarse scale. However, the consequence is that the resolution is only a rough 200 m. There are several biological limitations in interpreting the results at such a resolution if the Board considers that some forms of habitat patch utilization by wildlife occur at a much finer scale.

Request

Please clarify:

1. What is the benefit of resampling 1,000m cell size to 25 m and after 25m to 200m?
Would it be easier to go directly from 1,000m to 200m?
2. Why was a 1,000m resolution land cover data set used for data processing when the 25 m resolution data set appears to be available and is more accurate?

3. Please justify the fragmentation analysis given that patch selection by wildlife can occur at a much finer scale than 200 m.
4. It may be argued that the point c) above is an academic exercise for which much more research needs to be done (however, even if that is the case then the conclusions provided in DAR would need to be presented with a great deal more caution). From a practical point of view of a large mammal, however, using the SGP is increasingly more compromised because of industrial features. Please provide a patch analysis that shows how the total natural landcover, irrespective of habitat type, has changed over time. How large were the land patches under pristine conditions, how many patches were there and what was the nearest neighbour distance (or any metric of patch isolation). Subsequently, given the assumptions for industrial disturbance and ZOIs, please demonstrate the changes that occurred to date, and the changes that will likely occur in the future.
5. Please provide the yearly rate of change in the measured parameters, which should assist in estimating a change into the future, if the rate of change remains the same (constant) in the foreseeable future.

IR Number: 76

Source: MVEIRB

To: **Deze Energy Corporation**

Subject: Effects on furbearers and ungulates (Section 15.7.6.2.2)

Preamble

Section 15.7.6.2.2 presents the effects assessment of the hydrological changes. However, it is unclear how these effects (which were already qualitatively stated under the KLOIs) add to the effects of the Project footprint (vegetation clearing), ZOIs, and increased access.

Request

1. Please provide an effects assessment for furbearers and ungulate furbearers that includes the combined effects of the Project footprint (vegetation clearing), ZOIs, and increased access.

IR Number: 77
Source: Deninu Kue First Nation
To: Deze Energy Corporation
Issue: Employment and training

Preamble

Deninu Kue First Nation had an obligation to its membership to ensure the respect for its culture and the environment on which its culture has relied on since time immemorial are conserved for generations to come, “as long as the sun shines, grass grows and rivers flow”.

Deninu Kue First Nation requests further information on how Deze Energy Corporation current business structure and how it will accommodate the First Nation and its membership.

Request:

1. Will there be employment for Deninu Kue First Nation members?
2. What type of benefit package is proposed to Deninu Kue First Nation due the infringements that will occur from this proposed development?

IR Number: 78
Source: North Slave Metis Alliance
To: Deze Energy Corporation, GNWT
Issue: Socio-economic impacts, economic opportunities

Preamble

The TOR for the DAR required Deze Energy Corporation to describe current and trend patterns in socio-economic conditions of potentially affected communities. The table of concordance identifies section 15.9 as the location of the information, but there is no information there on the indigenous North Slave Métis. Only the South Slave communities of Hay River, Fort Smith, Fort Resolution and Lutselk'e' are mentioned. The MVEIRB Guidelines for conducting Socio-Economic Assessment state, on page 19, section 3, that the Developer should explain why potentially affected communities that have expressed an interest in engagement have been left out.

During the environmental assessment of the Ekati, Diavik and Snap Lake diamond mining projects, the employment and business benefits of the projects for the North Slave Region Aboriginal Groups and other NWT residents were weighed against the environmental costs – including cultural changes, depletion of non-renewable resources, wildlife disturbance and habitat loss, to name a few. As a result of those environmental assessments, Impact Benefit and Participation Agreements were negotiated between the Tlicho, Akaitcho, and North Slave Métis People and the mining companies to ensure that socio-economic mitigation occurred. Subsequently, the Tlicho, Akaitcho and North Slave Métis have all invested heavily in business and human resource development in order to take advantage of the business and employment opportunities associated with the winter road transportation of diesel fuel.

Although the NSMA does not normally receive many fuel haul orders, the NSMA is certain that any reduction in truck traffic which reduces the fuel hauls of the other two aboriginal groups will have a trickledown effect on the NSMA, as non-fuel truck loads are re-allocated away from the NSMA to satisfy conditions of the IBA's of the other two preferentially treated First Nations.

This will reduce the transportation related employment and business opportunities for NSMA members.

The current proposed project intends to create a transmission line across the North Slave Region, and to “steal” the energy transportation business opportunities (104 million litres of diesel fuel) already allocated to the North Slave Region aboriginal groups, and re-distribute those benefits to South Slave Region aboriginal groups. However, the project has made no effort to assess the socio-economic impacts on the North Slave Region aboriginal groups. The project descriptions for those three mines included the use of the Tibbitt to Contwoyto winter road as their transportation method, and diesel fuel as the energy source. Any change in transportation route or energy source is considered by the North Slave Métis as a significant change in the project, which will require an environmental assessment.

The majority of the impacts of the currently proposed project will result from the transmission lines and winter roads, which pass through the North Slave Region, and overlap the NSMA traditional territory, as well as the electrical substations, which will all be within the NSMA territory.

To re-allocate benefits from the North to South while allocating costs from South to North is fundamentally unfair, and contrary to the distributive justice principles underlying sustainable development, as well as our Canadian legal and political systems. Paradoxically, in table 18.1 the developer explicitly adopts the Bellagio sustainability principles, which are supposed to consider equity and disparity within current populations and future generations.

Request

1. Please provide an assessment of the socio-economic impacts of this proposed project on the North Slave Métis People, including the impact of reduced trucking jobs on the NSMA.
2. Please indicate whether socio-economic impact mitigation will occur by adding the NSMA to the ownership structure of the project or through the creation of an Impact Benefit Agreement.

IR Number: 79
Source: GNWT
To: Deze Energy Corporation
Issue: Regional economic development, NWT contracting and procurement opportunities

Preamble

The Terms of Reference requires socio-economic matters be addressed in the Deze Energy Corporation Taltson Hydroelectric Expansion Project environmental assessment. Matters related to employment and regional economic development (TOR 5.3.1 and 5.3.2) are important regarding opportunities for NWT businesses and individuals.

Our experience indicates that explicit predictions regarding local and Northwest Territories (NWT) employment, northern contracting and procurement are necessary to understand the extent to which the Proponent's mitigation measures will benefit communities and residents and to protect them from adverse effects to the social, economic or cultural environment over the life of the project.

In particular, we have found that NWT businesses that are informed about available contracts and provided with information sessions on business and procurement opportunities are more likely to participate in contract opportunities and thus it is more likely that the benefits of the project will be realized within the NWT. Advanced communication of business opportunities is critical for northern businesses to compete to the best of their abilities.

Section 15.8.5.1.2 of the Developer's Assessment Report (DAR) states "The Proponent's intentions with respect to contracting policies, processes, and procedures are discussed elsewhere in this document." However, although this summary is repeated in Section 15.9.4.5, it is not clear where in the DAR the proponent's intentions are discussed in detail.

Request:

1. Please provide an analysis on NWT businesses that have the capacity to successfully compete for opportunities related to the Taltson Hydroelectric Expansion Project.
2. What percentage of procurement may be sourced from NWT businesses? Please explain how this percentage was calculated and how much of the total cost of contracts will be made available to NWT businesses.
3. Please provide additional information on the efforts Dezé Energy Corporation will make to ensure NWT businesses are aware of business and procurement opportunities?

IR Number: 80
Source: GNWT
To: Deze Energy Corporation
Issue: Regional economic development, NWT business policy

Preamble

Contracting and procurement from NWT owned businesses provides secondary employment opportunities for NWT residents and contributes to the NWT's economy. The cost of doing business in the NWT can be higher because of the lack of economies of scale and the distance goods must travel to market. As a result, competitive pricing by NWT companies can be difficult when competing with Southern companies. It is important that NWT businesses have the opportunity to compete competitively on contracts and procurement opportunities. For these reasons it is important Deze Energy Corporation have a NWT business policy that outlines the developer's intentions toward contracting and procurement with NWT businesses.

The DAR mentions that business opportunities will be addressed in section 15.9.4.5, section 15.8.5.1.2, section 15.8 and Chapter 20, however there is little detail provided in these sections as to what is included in the NWT business policy and how it will be implemented.

Request:

1. Please provide details on Deze Energy Corporation's NWT Business Policy and how it will be implemented.

IR Number: 81

Source: MVEIRB

To: Deze Energy Corporation

Subject: Greenhouse Gas reduction calculations

Preamble:

The reduction of Greenhouse Gases (GHGs) is an important environmental consideration of the project. A key aspect is the reduction of the use of diesel generators and their resulting emissions. In Section 15.9.6.3.3, a calculation is provided showing the estimated GHG reductions for each development scenario. The calculation for the reduction of GHGs includes the replacement of fuel transported to the mine sites by the proposed hydroelectric power generation.

Request:

1. Does the GHG calculation include the reduction of truck traffic as a result of less diesel being transported to the mine sites? What is the amount of this reduction?
2. Does the GHG calculation include the emissions produced by the construction and operation of the proposed development? What is the amount of this production?

The emission reduction calculation assumes a diesel generator efficiency of 84%. Are there other assumptions in the calculation?

IR Number: 82
Source: Deninu Kue First Nation
To: Deze Energy Corporation
Issue: Impacts on harvesting and land use

Preamble

Deninu Kue First Nation has an obligation to its membership to ensure the respect for its culture and the environment which its culture has relied on since time immemorial are conserved for generations to come, “as long as the sun shines, grass grows and rivers flow”.

Deninu Kue First Nation needs further information on how the potential infringement of the accessibility to more hunters and trappers from the south and elsewhere through the Akaitcho Territory will impact the lifestyle and culture of the Akaitcho Dene of Deninu Kue First Nation.

Request:

1. How do you propose to mitigate any infringement or impact?
2. Will the Akaitcho Dene of Deninu Kue First Nation get compensated for this infringement and impact?
3. What mechanism is in place to assist Deze Energy Corporation in determining an infringement?
4. What level of impact might this have on the Deninu Kue First Nation culture and lifestyle? Who will determine this and how will this be determined?

IR Number: 83

Source: MVEIRB

To: Deze Energy Corporation

Subject: Lightning and Precipitation

Preamble:

In section 16.4, it is stated that, “lightning is common in the area from June to August associated with frontal systems.” Typically - but not always - where there is lightning there is intense precipitation associated with convectional cells that build along the frontal system. These storms can be significant, highly localized rain events that may not be recorded by scattered rain gauges. Although the few regional weather stations may not detect the precipitation, the lightning would be registered by the lightning detection systems monitored by Environment Canada. Such information may be valuable to quantify the intensity, duration and frequency of these events to assess risk to the transmission line and the potential precipitation in the study area.

Request:

1. Was lightning data acquired from Environment Canada to assess risks and potential precipitation patterns? If not then why?

IR Number: 84
Source: MVEIRB
To: Dezé Energy Corporation
Subject: South Valley Gorge Increased Discharge

Preamble

The proposed expansion plan calls for substantial water spillage through Trudel Creek in the event of a shut down of the new powerhouse facilities. Trudel Creek is a relatively long water course which would be likely adversely impacted by the periodic large water flow increases. This large increase in flow along Trudel Creek could potentially be substantially reduced by directing more of the water through the South Valley Gorge of the Twin Gorges site. Substantial quantities of water previously discharged along this alignment prior to construction to the Twin Gorges Dam.

Request

1. What measures would be required to be taken to facilitate increased discharge of water along the South Valley Gorge?
2. What is the maximum volume of water that could be safely discharged through the South Valley Gorge?
3. Are there any significant technical reasons why a substantial increase in periodic discharges along the South Valley Gorge can not be accommodated?
5. Will the anticipated rapid rise and fall of water levels along Trudel Creek induce any slope instabilities or similar concerns?

IR Number: 85
Source: DFO
To: Deze Energy Corporation
Issue: Fish stranding due to unscheduled ramping

Preamble

Ramping events in Trudel Creek from scheduled outages are predicted to occur 6 out of 13 years for the 36 MW option and 1 out of 13 years for the 56 MW option. This would see an increase in flow in Trudel Creek of 4 m³/s to 82 m³/s over 10 to 18 hours, under the 56 MW option, remaining at elevated levels until the subsequent reduction in flow back to 4 m³/s at the end of the three week maintenance period. Unscheduled outages, predicted to occur once every five years, could potentially result in 150 m³/s to 210 m³/s of flow being directed into Trudel Creek, with 30 m³/s being directed into the South Gorge Spillway, with a staggered restarting of the turbines designed to reduce the impacts from the sudden reduction in flow back to pre-outage levels. The proponent has indicated that the staggered start-up will be one mitigation measure identified in the operational plan for controlled and emergency shutdowns. DFO would be interested in reviewing this draft plan, once it has been developed.

In both scheduled and unscheduled events, fish may become stranded as the flow recedes back to pre-outage levels. The proponent must have an effective plan in place in order to identify and recover fish stranded due to these scheduled and unscheduled events.

Request:

1. Identify the mitigation measures that will be implemented to prevent fish from being stranded in Trudel Creek and the South Gorge Spillway as a result of scheduled and unscheduled ramping events.
2. Confirm that the South Gorge Spillway will be designed with manual or secondary operating mechanisms to ensure that it may be operated during complete power outages.

IR Number: 86
Source: MVEIRB
To: Deze Energy Corporation
Issue: Barren-ground caribou

Preamble

“The DAR must explain how it has incorporated lessons learned from other developments within the Slave Geological Province if they are applicable. Lessons learned from similar developments in other circumpolar regions where caribou or reindeer are present should also be considered”. The DAR (section **9.5.4.5**) included a few observations (but no study or historic observations or analyses such as for satellite-collared caribou) for Snare Hydro roads. Reference was included for transmission lines elsewhere but, surprisingly, not from Quebec Hydro. Quebec Hydro has an extensive history of operations on caribou ranges including events at Limestone Falls in 1984 (10, 000 caribou drowned and in 2007, 300 caribou drowned despite the use of fencing as a mitigative measure). A Quebec government report was critical of Hydro Quebec’s water management.

Chapter 17 describes as High Risk, accidents such as power outage and subsequent increased flow (ramping) for Trudel Creek which could rise by as much as almost 3 m within 10 h. Water levels in the lower Talston River would initially decline then recover. How ramping could affect ice formation and breakup is addressed in Chapter 13 (Talston River) although not specifically in the context of caribou. Although Section 13.6.1. “ provides a qualitative discussion of potential changes to ice structure within the Taltson River Basin. To make quantitative estimates of changes to ice structure at critical sites (i.e. important winter crossing points) more extensive, site specific work would be required.” This should be considered if areas are found with strong probability of caribou encountering water bodies at risk for ramping and changes to ice conditions.

Section 16.1.3.1 predicts that changes in snow cover during fall and spring are likely with increases in high flow events, although changes to the severity of river-ice events and related downstream effects, such as ice-jam flooding, or a change in the frequency of ice storms and power outages are unknown. However these possible trends have to be related to the probability of accidents to migrating caribou.

Request:

1. Please provide information on the likelihood and consequences to caribou of accidents resulting from a range of and combination of environmental effects, such as a 1 in 55 year rain event coupled with an outage. The analysis should include:
 - a. Risk to caribou encountering waterways and waterbodies affected by ramping, both during migration and through use of snow- and ice-covered waterbodies,
 - b. Changes to water levels and ice conditions relative to environmental changes, such as a heavy rainfall.
2. How will the Nonacho control structure be used to potentially mitigate fluctuations in water levels and the resulting impacts to caribou?
3. Please provide information on any research or case studies from Quebec and report on the experience in that jurisdiction on hydro developments and their impacts to caribou.

IR Number: 87

Source: MVEIRB

To: Deze Energy Corporation

Subject: Power outage frequency and ramping in Trudel Creek

Preamble:

The frequency of unscheduled power outages lasting long enough to cause full ramping in Trudel Creek has been estimated at 5 years on average (Section 17.4.1). Such events could increase creek flow by up to 210 m³/s (Table 17.6), and raise the water level by 1.6 to 2.7 m (Figure 17.4). These changes are greater than those that occur under the existing operating regime, where much of the flow is already routed through Trudel Creek (Cambria Gordon 2008--Trudel Creek fish and fish habitat effects assessment Section 3.1.1.1). Ramping may also occur annually for scheduled maintenance. The Proponent has rated the residual effect of long-term ramping on Trudel Creek as low, on the basis that the wetland extent and function is expected to recover in 1 to 3 years (Section 17.4.5.5.1—pg. 17.34), but has indicated that the quality and quantity of the resulting primary production is uncertain (Table 17.4). Community response to these ramping events would likely be related to their duration and frequency. A full outage would also cause a transitory 2.5 m decrease in the water level of the Taltson River, downstream of the Twin Gorges power plant (Section 17.5.4.4).

Request:

1. Is the 5-yr frequency of occurrence an estimate or is it based on experience operating the existing facility?
2. If it is an estimate what is it based on, and if based on experience, what are the frequencies and causes of the outages?
3. Given that the frequency of these events and the ability of the system to recover are both uncertain, does rating these effects as low represent a precautionary approach to impact prediction?
4. Have alternatives that would eliminate ramping in Trudel Creek been considered, such as enlarging the South Valley Spillway or converting the existing power station into a control structure and increasing the capacity of the Proposed generating facility to take advantage of the increased head?

IR Number: 88

Source: MVEIRB

To: Deze Energy Corporation

Subject: Ramping Events

Preamble:

Ramping events during annual scheduled maintenance in April or May would partially overlap with the spawning period for northern pike and walleye. During these periods, water levels in the Taltson River may decrease for a period of 6 to 10 hours, which could leave incubating eggs above the water line.

Request:

1. Are the spawning studies specific to this project other than general literature reviews?
2. How can one determine minimal flow requirements when habitat has not been quantified?
3. How can you assure that operations will not occur during specific periods of fish spawning activities, and if so, what mitigative measures would be in place?
4. Is spawning habitat limited for the different species?