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**To:** Troy Larden, Senior Ecosystem Biologist, Ministry of Environment - Smithers

**From:** Jason Harris, Environment and Community Partnerships, Northern Gateway Pipelines

**cc:** Paul Anderson, Environment Land Manager, Northern Gateway Pipelines  
Ray Doering, Manager Engineering, Northern Gateway Pipelines

**Date:** April 3, 2009

**Re:** Initial Pipeline Corridor Selection Morice River Valley - Coastal Mountain Area

### **Initial Pipeline Corridor Selection**

Various pipeline corridor alternatives were considered by Enbridge Northern Gateway Pipelines (ENGP) and are illustrated in Figure C-3. Each one-kilometre wide alternative was reviewed by a team of engineering, geotechnical, construction and environmental specialists using available mapping and published information, visual inspections of the various potential routes coupled with previous construction experience in many of the areas.

Primary objectives in establishing the pipeline corridor were as follows:

- Avoid, where possible, terrain subject to geotechnical hazards such as unstable slopes
- Minimize potential adverse effects on communities, land owners, land users, environmental and culturally sensitive areas
- Provide a safe and reliable route for pipeline construction and operations
- Provide suitable locations and construction methodology for watercourse, highway, road, rail and utility crossings
- Provide common locations for the oil and condensate pump stations and valve sites cost effectiveness.

For convenience the Initial Pipeline Corridor selected at this early stage is shown as the red line on Figure C-3 and is referred to in this memo as the preferred corridor. Five alternative corridor segments (labeled A through E) that were considered during this early stage are also shown on the figure. The primary reasons why the preferred corridor was selected over the alternative corridor segments for the western corridor alternatives are described below.

### **Western Corridor Alternatives**

As shown on Figure C-3, the preferred corridor runs west of Fort St. James, through Burns Lake, west along the Morice River Valley to the upper Clore River Valley (on the east site of Nimbus Mountain in the Coastal Mountain Range). The preferred corridor then crosses into the upper Kitimat River Valley and then follows the Kitimat River Valley, first west and then south, along the west side of the Kitimat River valley to the marine terminal near Kitimat.

As shown on the figure, 4 alternative pipeline corridor segments (and various combinations of these 4 segments) were considered before the preferred corridor between Fort St. James and Kitimat was selected. Each of the alternative corridor segments (and combinations thereof) have advantages and disadvantages with respect to the preferred corridor, however, the corridor, as shown on the figure, is preferred, primarily for the following reasons:

- The preferred corridor avoids crossing a recently designated park (Sutherland River Provincial Park) which is located west of Fort St. James at the south end of Babine Lake
- The preferred corridor avoids a crossing of the lower Clore River at a location where the only possible crossing options were either a long aerial crossing or a trenched crossing constructed in the wet
- The preferred corridor is significantly shorter than any of the more northerly alternative corridor segments B, C or D
- The preferred corridor, which runs along the west side of the lower Kitimat River valley, as shown on the figure, avoids extensive areas on the east side of the valley that are underlain by sensitive marine clays which are prone to slope failure
- The preferred corridor avoids a crossing of the lower Kitimat River

### **Pipeline Corridor Refinements**

Further refinements to the preferred corridor were developed at specific locations as engineering evaluations and environmental studies progressed. These refinements had the following objectives:

- Minimize the length of the pipelines
- Minimize tree clearing by following existing linear disturbed areas where practical
- Where practical, avoid parks, protected areas, wildlife areas, archaeological or heritage sites and other environmentally sensitive areas
- Minimize potential adverse environmental effects on fish, wildlife, and other environmentally sensitive areas
- Minimize potential adverse effects on communities and land and resource users
- Minimize the potential for land and resource use conflicts
- Where practical, accommodate suggestions and concerns raised by landowners, the public and the regulatory agencies
- Ensure that a viable alternative crossing method is available in the immediate vicinity for watercourse crossings where a trenchless crossing is the primary crossing method
- Avoid or minimize exposure of the pipeline and associated facilities to geotechnical hazards such as unstable slopes, rock falls and avalanches
- Minimize the volume of earthworks construction required for preparation of the right-of-way for pipeline construction.

### **Morice River Valley (KP 990 to 1040)**

As shown on Figure C-11, the initial selected corridor was located on the north side of the Morice River. This route crossed the Morice River near KP 1000 at a location where landslides were present on both sides of the river. The initially selected corridor route also crossed the Thautil River near its confluence with the Morice River, near KP 1035. The Morice and Thautil River channels at this location are very unstable and unsuitable for a pipeline crossing.

The preferred corridor is located on the south side of the Morice River valley as shown on the figure. The preferred corridor crosses the Morice River at a suitable location near KP 1035, and avoids a crossing of the Thautil River.

### **Coastal Mountain Area (KP 1065 to 1090)**

The Coastal Mountain Range presents some of the most extreme topography along the entire pipeline route. As indicated on Figure C-12, the preferred corridor includes two tunnels - a 6.5 km long east tunnel (the Clore Tunnel) under North Hope Peak and a 6.6 km long west tunnel (the Hoult Tunnel), through Nimbus Mountain. The project determined going up and over North Hope Peak and the shoulder of Nimbus Mountain presented far too many risks for the pipeline corridor. It was determined that the tunnels mitigated a number of risks associated with crossing the coastal mountains.

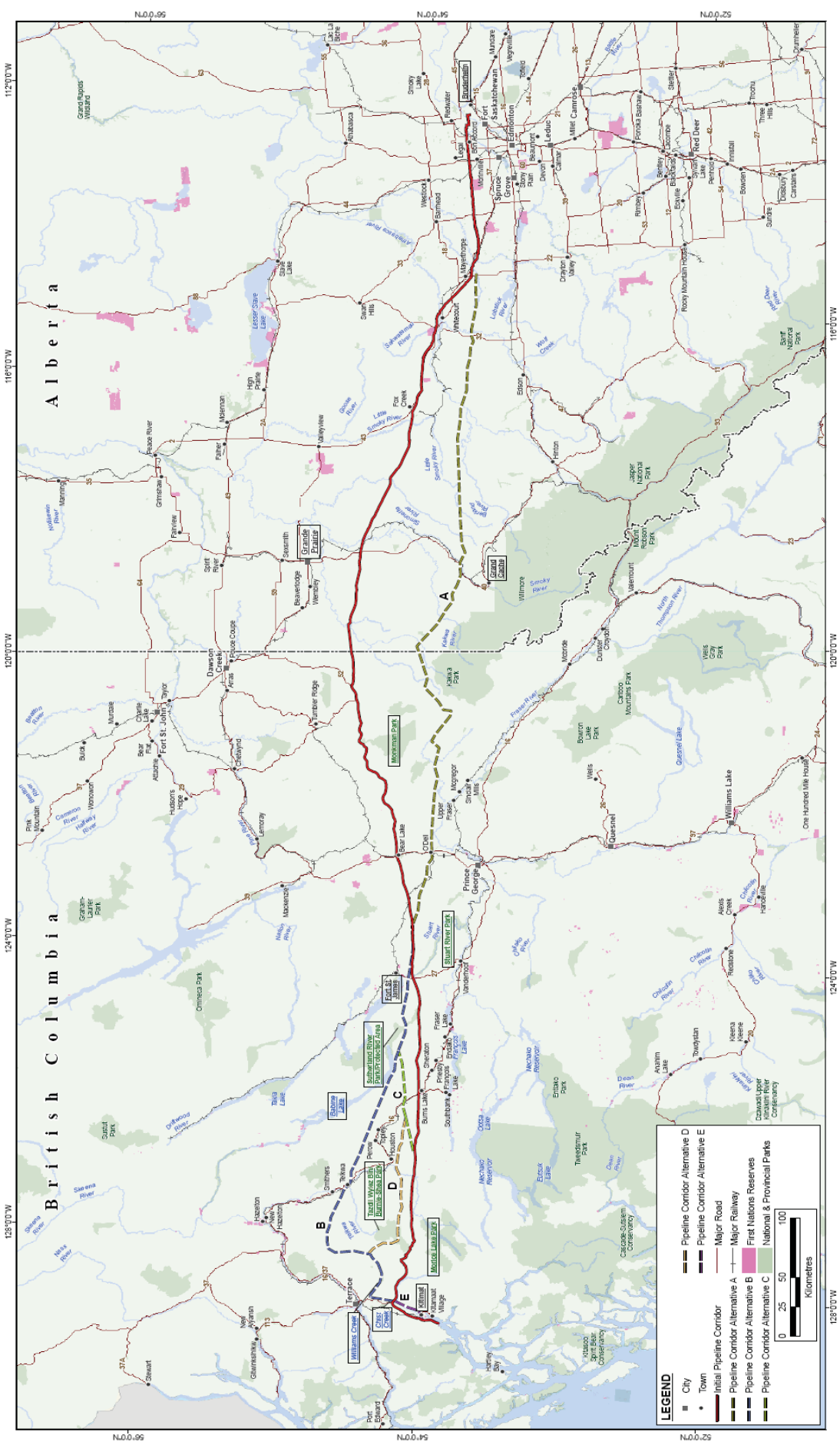
The tunnels carry the pipelines from the Clore River valley on the east side of Nimbus Mountain to the Hoult Creek valley on the west side of the mountain. From the Hoult Creek Valley, the preferred corridor runs west, along the north side of the upper Kitimat River valley to a crossing of Chist Creek, located near KP 1123.

The tunnel alignments and the locations of the tunnel portals have been selected based on an evaluation of anticipated tunneling conditions and the requirement to minimize exposure to geotechnical hazards at the portals. Selection of the preferred corridor for the approach segments of the pipeline to the tunnel portals considered constructability, exposure to geotechnical hazards and environmental sensitivities. Further investigations are planned during detailed engineering.

Five alternative corridor segments through the Coastal Mountains were evaluated as alternatives to the currently preferred corridor. These alternative corridor segments are shown on Figure C-12 and have been labeled Alternative Segments A through E. The preferred corridor though this area presents the following major advantages over the various alternative routes:

- Alternative corridor Segment A assumed that the pipelines would be constructed over the mountain pass between the Clore River and Hoult Creek Valleys. Construction of the Clore and Hoult tunnels along the preferred alignment provides a significant advantage over Alternative A, because they reduce the maximum pipeline elevation which permits the use of significantly lower pump and line operating pressures through this area. Construction of the tunnels also provides a significant safety advantage since it avoids construction and operation of two major pipelines at a high elevation (1650 metres) through this area. These risks are exacerbated by very poor weather conditions throughout most of the year (including fog and avalanches) that are generally highly unpredictable.
- Alternative Segment B was also considered, since it would require construction of only one tunnel 8.9 km long, rather than the two tunnels (6.5 and 6.6 km long) required along the preferred corridor. However, construction of a single 8.9 km long tunnel will take considerably longer than construction of the two shorter tunnels, because the construction of the longer tunnel can only proceed from two tunnel portals, rather than from the 4 tunnel portals that are available for construction of the Clore and Hoult Tunnels. In addition, Alternative corridor Segment B is considerably longer than the preferred corridor.
- The more southerly corridors (Alternative Segments C and D) through the Hirsh Creek Valley are both shorter than the preferred corridor; however they both require a crossing of the lower Kitimat River. In addition, both routes must cross areas in the lower Kitimat River Valley that are known to contain deposits of sensitive marine clays which are susceptible to slope instability.
- A more northerly corridor (Alternative Segment E) through the Williams Creek Valley, as shown on Figure C-12, has an advantage in that it would eliminate the need for the Hoult and possibly the Clore Tunnel. However, this alternative significantly increases the length of the pipeline and exposes the route to additional geotechnical hazards in the Clore River and Williams Creek valleys. This corridor would also result in greater environmental disturbance to both valleys.

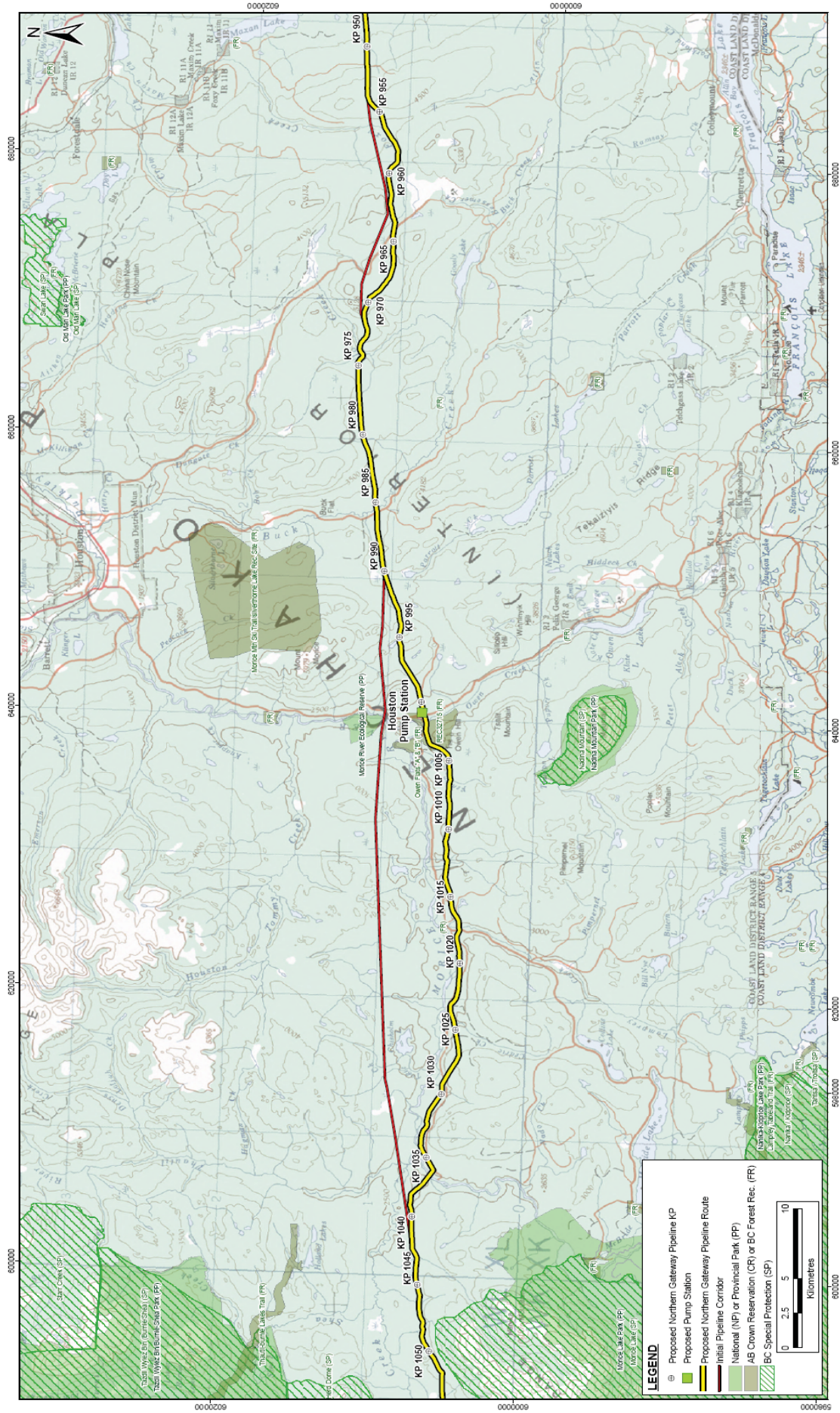
April 3, 2009 - Initial Pipeline Corridor Selection Morice River Valley - Coastal Mountain Area - Figures





|  |  |             |
|--|--|-------------|
| <br>PREPARED FOR<br> | ENBRIDGE NORTHERN GATEWAY PROJECT                                |             |
|  | Proposed Northern Gateway Pipeline Initial Corridor Alternatives |             |
|  | FIGURE ID  | 11-019-003  |
|  | REVISION   | B           |
| FIGURE NO.   |  | C-3         |
| SCALE  |  | 1:3,000,000 |
| DATE   |  | 06 Feb 2009 |



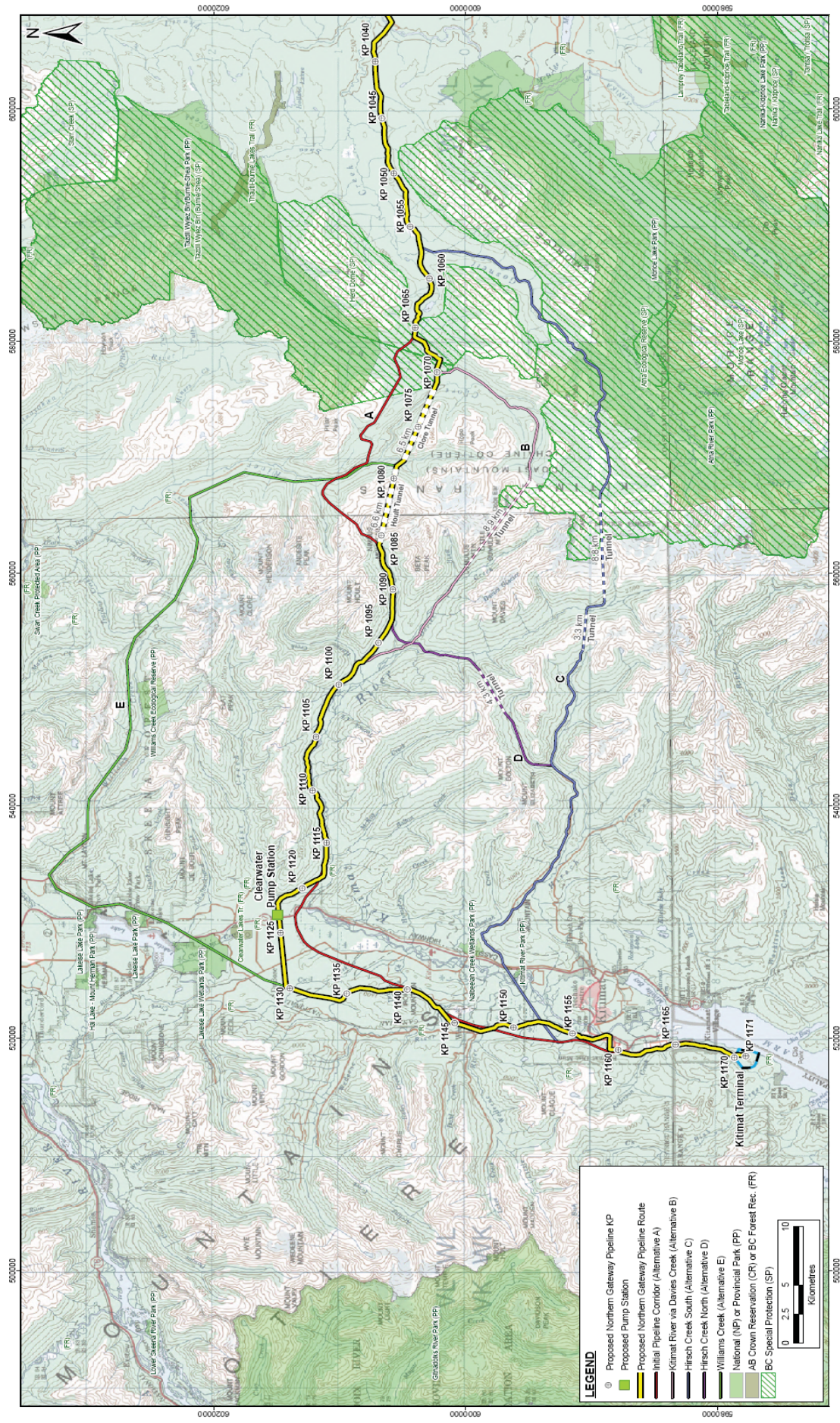
April 3, 2009 - Initial Pipeline Corridor Selection Morice River Valley - Coastal Mountain Area - Figures



|   |                                   |                     |
|---|-----------------------------------|---------------------|
| <br>PREPARED FOR<br><br>ENBRIDGE<br>NORTHERN<br>GATEWAY PROJECT | ENBRIDGE NORTHERN GATEWAY PROJECT |                     |
|   | SCALE<br>1:250,000                | DATE<br>06 Feb 2009 |
| FIGURE D<br>11-019-011  |                                   | REVISION<br>B       |
| FIGURE NO.<br>C-11  |                                   |                     |



April 3, 2009 - Initial Pipeline Corridor Selection Morice River Valley - Coastal Mountain Area - Figures





|                                   |  |  |
|-----------------------------------|--|--|
| <p>WorleyParsons<br/>NORWORTH</p> | <p>ENBRIDGE<br/>NORTHERN<br/>GATEWAY PROJECT</p> | <p>SCALE 1:300,000<br/>DATE 06 Feb 2009<br/>FIGURE D 11-019-012<br/>REVISION B<br/>FIGURE NO. C-12</p> |
|                                   |  |  |

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# Enbridge Northern Gateway Pipeline Project

Meeting with BC Ministry of Environment  
Ft.St.John, BC  
April 29, 2009



## Agenda

- Introduction
  - Project Overview
  - Approach
- Baseline Studies
  - Geotechnical
  - Hydrology
  - Fisheries
  - SWAT
- Risk Management Framework
- Consultation
  - First Nations
  - Communities




2



## Project Overview - Enbridge

- A Canadian company that employs over 5000 people across North America
- Owns and operates 13,500 km of pipelines
- A global leader in pipeline construction and operation with a 55 year record of safety
- Recognized as one of the worlds top 100 most sustainable companies by World Economic Forum
- Strong record of corporate social responsibility and community support

3





## Project Overview - History

- ENGP was previously referred to as the “Enbridge Gateway Project”
- A Preliminary Information Package (PIP) was filed with the National Energy Board (NEB) in 2005
- ENGP project ESA re-initiated in 2008 following confirmation of commercial support
- ENGP formed as separate entity from Enbridge
- New focus of company on developing community and Aboriginal partnerships in project

4







## Project Overview - Scope

Twin pipelines:

- 1171 km petroleum export pipeline from Edmonton to Kitimat (525,000 bpd)
- 1171 km condensate import pipeline from Kitimat to Edmonton (193,000 bpd)
- World-class marine terminal in Kitimat including minimum of 14 tanks and 2 berths
- 2 Initiating Stations plus Pump stations at 8 other locations along the pipeline route


5




## Project Overview - Footprint

- General project study corridor width is 1000 m
- Temporary and permanent construction and operations access will be identified
- Construction camps, marshalling sites and pipe stockpile sites to be identified where possible
- Powerline routes to supply pump stations will be identified where possible
- Micro-routing within 1000 m study corridor is expected as a result of consultation activities and detailed Engineering/Constructability review phase

6





## Project Overview

- Pipelines will typically be constructed with 5 m separation
- Typical construction footprint is 45 m wide
- Generally the permanent Right of Way (ROW) width will be 25 m
- Route parallels existing pipelines, roads powerlines etc. where possible (e.g. Alliance Pipeline ROW)
- Minimum 0.9 m depth of cover
- Substantially greater cover at watercourse crossings

7





## Project Approach

- ENGP has commercial support to move forward with NEB filing
- Continuing environmental, engineering and land field work, including traditional knowledge, to support the proposed project
- Establishing relationships with Regulatory Agencies in respect of Consultation

9



## Regulatory Approach

- Early decision that this project will be referred to a Joint Review Panel (JRP)
- A Draft JRP Agreement was issued for public comment in 2006
- Recent decisions in the Federal Court of Canada require the Federal Government to consult with Aboriginal Groups on the regulatory process
- CEAA will be the lead agency in developing the Aboriginal consultation on process and the public consultation around the JRP agreement

10



## Regulatory Approach

- MPMO to make the regulatory process for the Project as efficient as possible
- Responsible Federal Departments must have sufficient resources
- A proposal will be presented to the October meeting of the Deputy Ministers' Committee overseeing the MPMO to address resource requirements
- TERMPOL process is expected to be initiated in late 2008 or early 2009 and will run concurrently with the NEB/JRP process.

11



## Regulatory Approach

- CEAA has developed and approved a consultation plan
- Letters have been sent to potentially impacted groups
- Consultation around process continuing
- A draft JRP Agreement will then be released for public comment
- Final JRP Agreement expected to be released in Q2 2009

12




## Approach - Timeline

- Final JRP Agreement – Q2 2009
- Application Ready to file – Q2 2009
- JRP Community Sessions – 2009
- NEB Hearing Order - Summer 2009
- NEB IR Process – Q3/Q4 2009
- Supplemental Information Filing – Fall 2009
- IRs on Supplemental Filing – Q4 2009
- JRP Hearing - 2010
- Decision with GIC Approval – Summer 2011

13




## Approach – DFO relationship

- ENGP hopes to work with DFO in all phases of the project. In the pre-application phase we hope:
  - to assist each other in discharging our respective consultation obligations;
  - to clarify key points, respond to DFO concerns, and to ensure
    - EA and NEB application meet DFO requirements
    - Clear basis for Authorization
- ENGP welcomes MOE to participate in the process.

14







**Baseline**

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Baseline investigations include:

- Geotechnical assessment of possible crossing techniques.
- Hydrologic assessment of flows and channel processes for use in design and construction planning
- Fish populations and biophysical conditions
  - Field surveys
  - Literature reviews
- Sensitive Watercourse Assessment Team (SWAT)




16



## Baseline - Geotechnical

- Geotechnical Assessments of Stream Crossings
  - Emphasis on crossings that may require trenchless crossings or where there may be stability issues on approach slopes.
  - Considers lateral and downcutting erosion as well as scour in conjunction with hydrotechnical personnel
- All major crossings have been evaluated on a preliminary basis with more detailed work ongoing.
- Investigation methods as required for stability assessments include airphoto interpretation, LiDAR, aerial reconnaissance, ground reconnaissance, boreholes and geophysics.
- Crossing methods, including trenchless methods, are assessed from a geotechnical point of view.
  - Geometry is assessed using available topographical data and LiDAR.
  - Subsurface information is generated from similar investigation methods to those above.

17



## Hydrology

## Baseline - Hydrology

- Regional hydrological assessments along the route have identified four distinct hydrologic zones: Plains, Eastern Slopes, Central Mountains and Coastal Mountains.
- Regional hydrological assessments have been used to estimate peak design discharges for crossing burial designs and construction period discharges for assessing water management techniques at each crossing.
- Survey program to verify and augment calculations.
- Detailed crossing burial designs will be prepared for crossings with specific design considerations (e.g. lateral channel and bank migration, alluvial fans, degrading or aggrading channels, manmade structures).



19

## Hydrologic Inputs to Design

- Regional correlations used to estimate:
  - Peak 1:100 year return period discharge (burial depth design)
  - Mean monthly discharges (construction scheduling and crossing method selection)
- Data transfer used for crossings on watercourses with WSC streamflow monitoring stations
- Limitations of the data:
  - Hydrologic characteristics will vary between watersheds
  - Estimated flows are precipitation-dependent
  - Streamflow estimates are based on historical data



20



## Hydrotechnical Design

- Detailed crossing burial designs will consider:
  - Bed scour (burial depth)
  - Lateral channel movement (sagbend locations)
  - Future channel changes (e.g., headcutting, geomorphological responses to altered hydrology)
  - Crossing construction method
  - Site-specific opportunities (pipe on bridge)
- Will be prepared for crossings with specific design considerations (e.g. lateral channel migration, alluvial fans, degrading or aggrading channels, manmade structures)

21

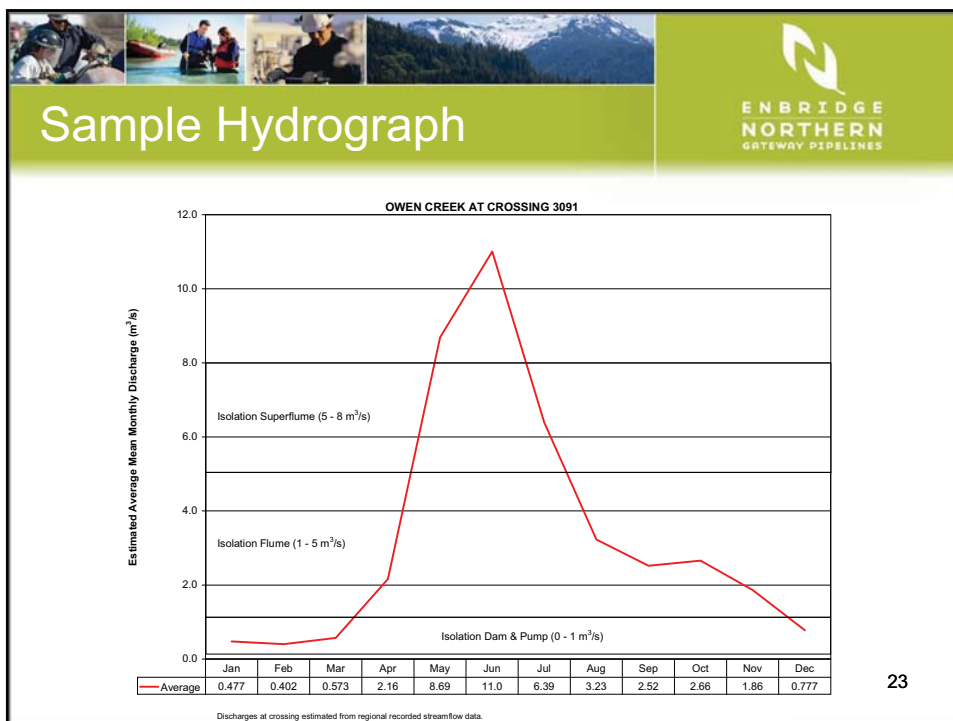


## Construction Methods

- Flow thresholds used in construction method selections:

s.21
- Crossing construction method selection also considers bed material (feasibility of isolation)

22





23

**Fisheries Baseline**

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GATEWAY PIPELINES



## Baseline - Fisheries

- **Baseline surveys of 1,250 potential watercourse crossings completed in 2005**
  - Survey design included parameters from both the Guide to the Alberta Code of Practice, and the BC 1:20,000 standards.
  - Additional sites were covered in 2006.
  - 2008 survey focused on new sites resulting from route refinement, previously inaccessible sites, and 'Individual review' crossings.
- **Prepared a stream catalogue to provide convenient access to fisheries site data.**
- **Prepared a draft technical data report and fisheries environmental assessment.**



25




## Baseline - Fisheries

- **2005-2006**
  - Environmental Protection and Environmental Monitoring Plan developed with standard suite of mitigation strategies for all crossings.
  - Interdisciplinary SWAT team refined habitat protection and construction strategies for 224 crossings.
  - Meetings with DFO discussed:
    - Baseline data program
    - Crossing technique selection process
    - Assessment matrix

26


## Fisheries Baseline

**258 Mapped watercourse crossings in AB**



- 6 Class B (High Sensitivity)
- 190 Class C (Moderate Sensitivity)
- 0 Class D (Low Sensitivity; non fish-bearing)
- 62 No visible channel / non classified drainage

**1034 Mapped watercourse crossings in BC**


- 19 S1 (>20 m width)
- 51 S2 (>5-20 m width)
- 126 S3 (1.5-5 m width)
- 138 S4 (<1.5 m width)
- 19 S5 (no fish, >3 m width)
- 129 S6 (no fish, ≤3 m width)
- 15 fisheries sensitive zones / wetlands
- 444 No visible channel / non classified drainage
- 93 Unknown



27

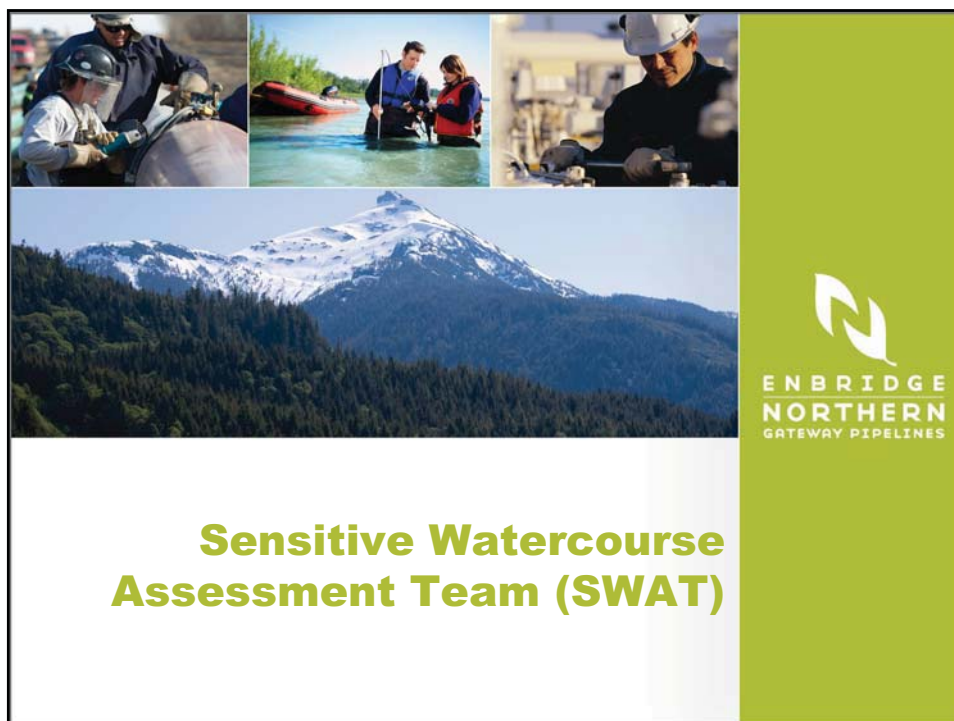



## Baseline - Fisheries



| Construction period flow (cms) | Fish bearing Stream Count |     | Subtotals |
|--------------------------------|---------------------------|-----|-----------|
|                                | AB                        | BC  |           |
| >5                             | 7                         | 16  | 23        |
| >1                             | 5                         | 30  | 35        |
| 0.01-1.0                       | 44                        | 349 | 393       |
| <.01                           | 140                       | 140 | 280       |
| Totals                         | 196                       | 535 | 731       |

28

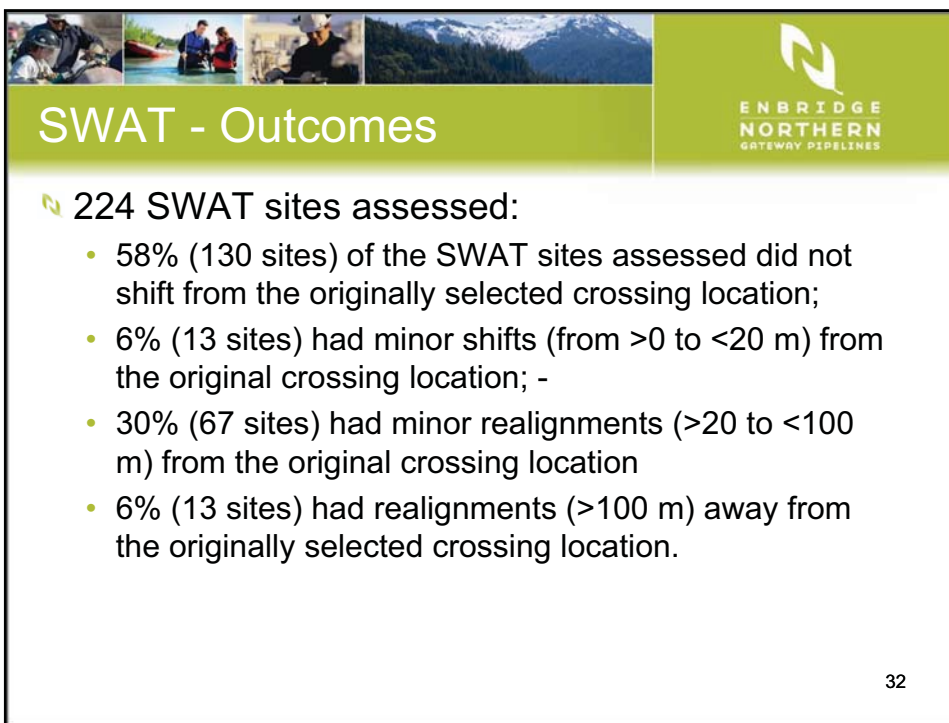
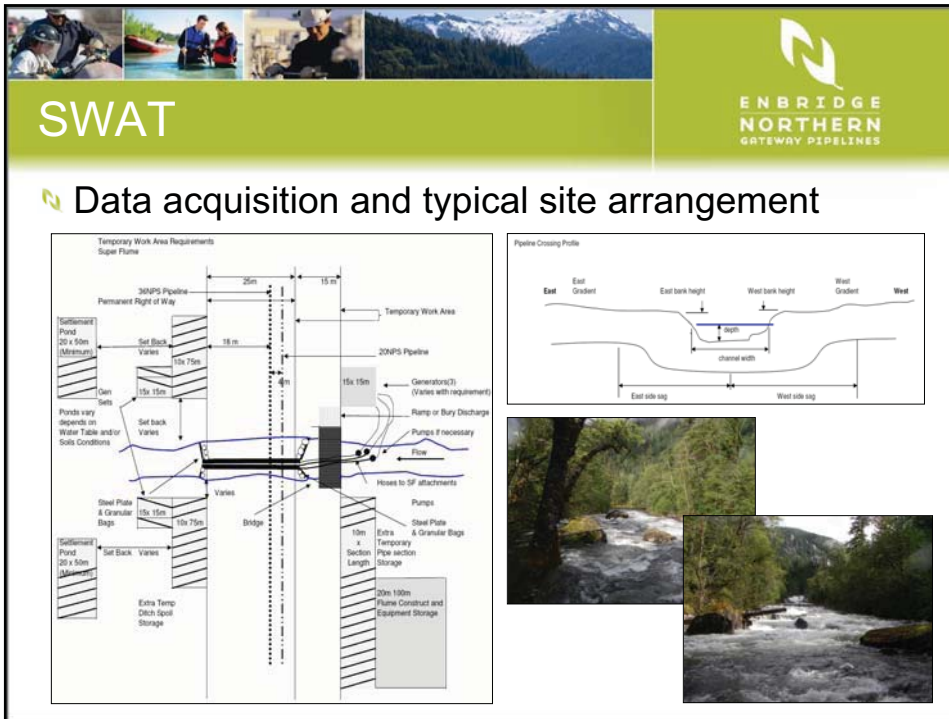




**SWAT**

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- Sensitive Watercourse Assessment Team
- Interdisciplinary analysis: fisheries biologist, design engineer, construction specialist, and geotechnical engineer.
- For 'Individual Review' or potentially trenchless crossing sites:
  - Develop site specific, technically and financially feasible mitigation measures.
  - Evaluate any residual risk in the context of stock and watershed resource values.

30








## SWAT - Outcomes

SWAT shifts/relocations were typically associated with the following:

- To improve constructability (less cross-cutting of approach, perpendicular crossing alignment, to reduced approach slope gradient, to avoid bedrock areas, and incorporate narrower crossing locations)
- To avoid flooded/ponded areas
- To avoid sidehill and approach slope drainages
- To avoid identified fisheries values (such as spawning locations, deep run habitat, deep pools, large woody debris features, etc.)
- To re-locate the crossing to a non-fish bearing section of stream
- To avoid areas of bank erosion, slumping and slope failures
- To avoid disturbing existing Forest Service Road crossings (i.e. bridges and culverts)
- To incorporate already disturbed areas (i.e. cutblocks, access trails, roads, etc.)
- To avoid confluences of water course crossings and avoid crossing multiple streams
- To minimize riparian loss.

33

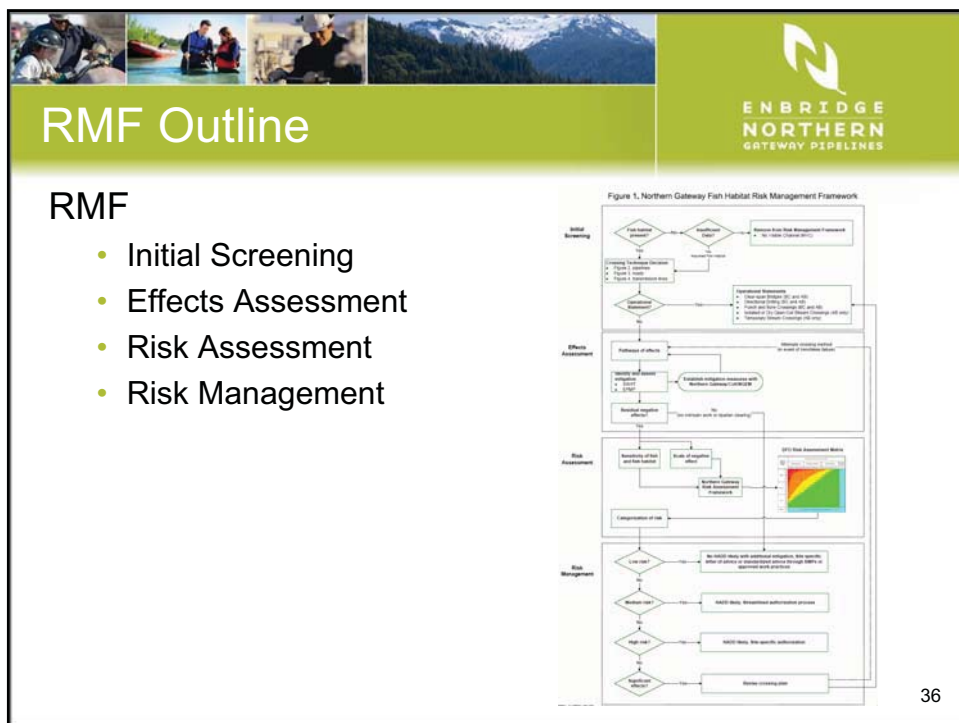
## Baseline - Current activities


### Current activities


- Geotechnical and engineering program
  - Ongoing assessment of conditions and construction options at crossing sites and approaches.
- Hydrology
  - Ongoing assessment of flows, scour, and construction options at crossing sites
- Fisheries
  - Baseline surveys of ~150 revised crossings
  - More detailed assessment of 'Individual Review' sites.
- SWAT
  - Further assessment of 'Individual Review' sites

34



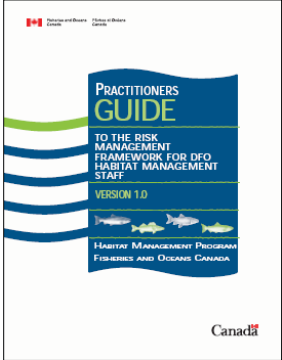
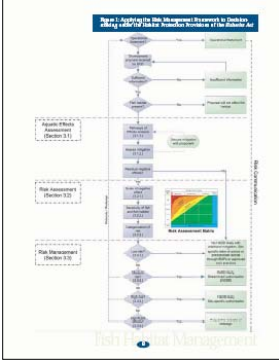






## Risk Management Framework

Based on DFO Practitioners Guide.


37









## Initial Screening







## Fish Habitat Presence

- Field data
  - Surveys 2005, 2006, and 2008
- Historical data
  - Alliance Pipeline 1997
  - Pacific Trails 2003
  - FISS
  - Available literature.
- Non-fish streams
  - No fish present or recorded.
  - No fish within zone of influence.



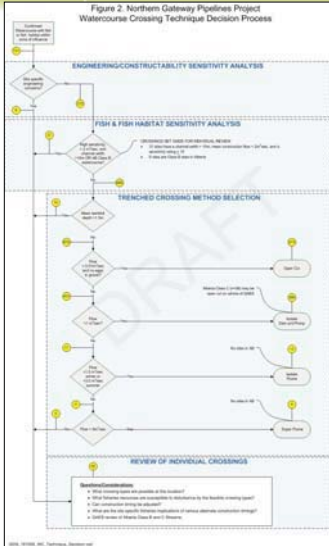
39







## Crossing Techniques Decision 1

- Planning level guide to likely crossing types.
  - Actual crossing techniques will be determined in the field and will vary with conditions.
- Site Specific Engineering Concerns
  - Geotechnical and construction limitations
  - Cost analysis
  - Long term integrity
  - Health and Safety
  - Life cycle issues
  - Stakeholder/landowner issues.



40



## Fish & Fish Habitat Sensitivity Rating

- Sensitivity rating at right developed in accordance with DFO RMF (guide table 5).
- Key inputs
  - Species sensitivity
  - Species habitat dependency
  - Species rarity
  - Habitat resiliency
- Assumed very small sensitive streams could be protected while crossing with standard methods and EPMP.

**Table 10-1 Biophysical Parameters used to Calculate Watercourse Sensitivity Rating**

| DFO ATTRIBUTE                                  | PROPOSED ATTRIBUTE MEASURE   | SCORE   |   |
|--|--|---|---|
| Fish Sensitivity                               | Sensitivity of species to change or perturbation of conditions (e.g. TSS, temp, salinity)                                | 0   |   |
|  | Cyprinids (not finless)  | 0   |   |
|  | Fish: whitefish, lake, yellow perch, black charr, brook trout, splined (spotted)   | 2   |   |
|  | Salmonids, burbot, sturgeon  | 4   |   |
| Fish Habitat Dependency                        | All habitat poor or nil  | 0   |   |
|  | Poor spawning, overwinter, or rearing habitat OR moderate migration or dispersal habitat                                 | 1   |   |
|  | Poor spawning or overwintering habitat/moderate to good rearing habitat/poor to excellent migration or dispersal habitat | 2   |   |
|  | Moderate to good spawning or overwintering habitat/excellent rearing habitat   | 3   |   |
| Rarity   | Excellent spawning or overwintering habitat  | 4   |   |
|  | Secure species / abundant habitat  | 0   |   |
|  | Threatened species (SC blue list) / limited habitat  | 3   |   |
|  | Endangered species (listed on SARA schedule, SC red list, All fish tracking) / rare habitat                              | 4   |   |
| Habitat Resiliency                             | Physical Characteristics   | Bank Shape - Steep                                  | 1 |
|  |  | Bank Shape - Steep                                  | 3 |
|  |  | Bank Shape - Undercut                               | 4 |
|  |  | Bank Material - Bedrock                             | 1 |
|  |  | Bank Material - Boulder                             | 2 |
|  |  | Bank Material - Cobbles or Gravel                   | 3 |
|  |  | Bank Material - Sand or clay                        | 4 |
|  |  | Bed Material - Bedrock                              | 1 |
|  |  | Bed Material - Boulder                              | 2 |
|  |  | Bed Material - Cobbles or Gravel                    | 3 |
|  | Flow Regime  | Habitat Type - Run                                  | 1 |
|  |  | Habitat Type - Riffle                               | 3 |
|  |  | Habitat Type - Pool                                 | 4 |
|  |  | Cover - 0 to 5%                                     | 1 |
|  |  | Cover - 5 to 20%                                    | 3 |
|  |  | Cover - > 20%                                       | 4 |
|  |  | Epifaunal abundance                                 | 0 |
|  |  | Mean monthly flows are > 8 m <sup>3</sup> /sec      | 1 |
|  |  | Mean monthly flows are > 3 to 8 m <sup>3</sup> /sec | 2 |
|  |  | Mean monthly flows are 1 to 3 m <sup>3</sup> /sec   | 3 |
| Mean monthly flows are < 1 m <sup>3</sup> /sec | 4  |   |   |

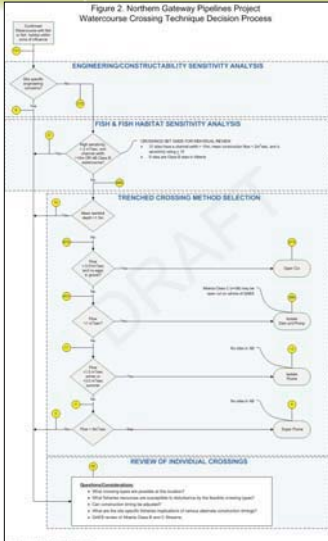
41


## Crossing Techniques Decision 2

- Trenched crossing methods
  - Industry standard crossing methods (CAPP 2005)
  - Adapted by engineering design and construction personnel
  - Based on mean flow during planned construction season.
  - Conservative sizing to ensure protection of fisheries resources and other environmental values.
  - Capacity to 5 m<sup>3</sup>/s covers all non-'Individual Review' watercourses on route.


**Figure 2: Northern Gateway Pipelines Project Watercourse Crossing Technique Decision Process**



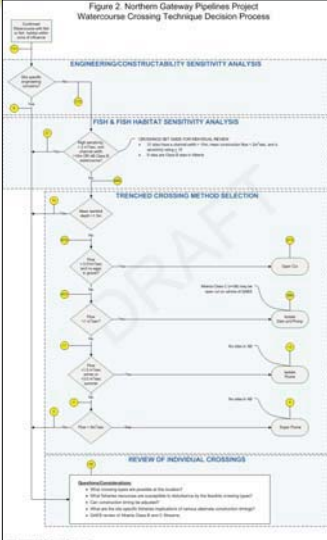
42




## Crossing Techniques Decision 3




- Individual Review Crossings**
  - Includes sites that require special attention due to engineering, construction, or environmental issues
  - Design and evaluation ongoing
  - Later DFO/ENGP meetings on this topic.




3 43



## DFO Operational Statements



- Where appropriate, design and construction will follow Operational Statements for:
  - Pipeline
  - Access roads
  - Powerlines
- ENGP recognizes changing nature of OS's and BC/AB differences.



44





## Pathways of Effects

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- Pathways developed for
  - Land-based activities within riparian zone
  - In-water activities
- Based on DFO pathways of effects
- Removed non-applicable activities/pathways
- Mitigation measures on all pathways.



Pathway of Effects Summary

```

graph TD
    LBA[Land-based activities] --> LO[Vegetation Clearing]
    LBA --> LE[Use of Industrial Equipment]
    LBA --> EX[Excavation]
    LBA --> SD[Grading]
    LBA --> UE[Use of Explosives]
    
    IWA[In-water Activities] --> PIS[Placement of Temporary Structures in Water]
    IWA --> CTS[Change in Towing Direction and Frequency of Tows]
    IWA --> FP[Fish Penetration]
    IWA --> WC[Water Connection]
    IWA --> OSM[Operational Safety Management]
      
```

ENBRIDGE  
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## Mitigation – SWAT and EPMP

- SWAT
  - Sensitive Watercourse Assessment Team
  - Mitigate impacts by adjusting:
    - crossing location
    - design
    - construction techniques
    - construction timing
- EPMP
  - Comprehensive suite of protection measures
  - Includes restoration and monitoring programs

47





## Residual Effects

- Not likely at most crossings.
- Could include:
  - riparian vegetation
    - canopy
  - instream habitat
    - complexity
  - water quality
    - water withdrawal and return
    - sedimentation
- Direct mortality not anticipated

48








## Sensitivity of Fish and Fish Habitat


- Used sensitivity analysis as described previously in watercourse crossing technique decision process.
- Corresponds to DFO RMF table 5 shown at right.

Table 5: Sensitivity of Fish and Fish Habitat

| Attribute                        | Description   | Scale for qualifying the attributes in freshwater ecosystems. These are ordered from low sensitivity to high sensitivity for each attribute.  |
|----------------------------------|---|---|
| 1. Species Sensitivity           | Sensitivity of species to changes in environmental conditions, such as suspended sediment, water temperature or salinity.   | Species present are resilient to change and perturbations (e.g. many cyprinid species)<br>Species present are moderately resilient to change and perturbation (e.g. pike, walleye and some cyprinids)<br>Species present are highly sensitive to perturbations (e.g. many salmonids)  |
| 2. Species Dependence on Habitat | Use of habitat by fish species. Some species may be able to species in a wide range of habitats, while others may have very specific habitat requirements.  | No use by fish<br>Used as migratory corridor only: feeding, rearing<br>Spawning habitat; habitat critical to survival of species  |
| 3. Rarity                        | The relative strength of a fish population or prevalence of a particular type of habitat.   | Habitat/species is prevalent<br>Habitat/species is low limited distribution confined to small areas<br>Habitat/species is rare e.g. listed species under SARA   |
| 4. Habitat Resiliency            | Habitat resiliency refers to the ability of an aquatic ecosystem to recover from changes in environmental conditions. The flow and thermal regime of the system as well as its physical characteristics are important considerations in describing freshwater ecosystems. | Thermal regime<br>Thermal regime unsuitable for any fish species.<br>Warm water thermal regime suitable for cyprinids.<br>Cool water systems: cold-water systems that can buffer temperature changes<br>Cold water systems that cannot only buffer temperature changes.<br><br>Physical characteristics<br>System is stable and resilient to change and perturbations<br>System is unstable and resilient to change and perturbations<br>Flow regime<br>Ephemeral - system contains water only for short period after rain event<br>Intermittent - system contains water periodically<br>Perennial - system contains water year round |

50






## Scale of Negative Effects


- Based on Table 4 of DFO Practitioners Guide.
- Key inputs
  - Extent
  - Duration
  - Intensity
- Interpreted as:
  - Zone of influence
  - Duration of residual effect of construction
  - Timing of instream work
  - Type of instream work

**Table 10-2 Project Specific Data used to Calculate Scale of Negative Effects**

| DFO ATTRIBUTE |  | PROPOSED ATTRIBUTE MEASURES   | SCORE |
|---------------|--|---|-------|
| Extent        | The direct footprint and areas indirectly affected | Dry or construction flows < 0.01 m³/sec                                 | 0     |
|               |  | Zone of influence < 300 metres downstream                               | 1     |
|               |  | Zone of influence ≥ 300 metres and < 1000 metres downstream             | 3     |
|               |  | Zone of influence ≥ 1000 metres downstream                              | 4     |
| Duration      | Period that residual effects persist               | Instream construction and habitat restoration period is < 3 months      | 0     |
|               |  | Instream construction and habitat restoration period is 3 to 6 months   | 1     |
|               |  | Instream construction and habitat restoration period is 7 to 18 months  | 2     |
|               |  | Instream construction and habitat restoration period is 19 to 24 months | 3     |
|               |  | Permanent (habitat loss)  | 4     |
| Intensity     | Timing   | No instream works occur   | 0     |
|               |  | Instream work occurs within the least risk window                       | 1     |
|               | Habitat Impacts                                    | Instream work occurs outside of the least risk window                   | 4     |
|               |  | Isolated work on small watercourse (flows ≤ 1 m³/sec)                   | 0     |
|               |  | Isolated work on medium watercourse (flows > 1 m³/s and ≤ 3 m³/s)       | 1     |
|               |  | Isolated work on large watercourse (flows > 3 m³/sec)                   | 2     |
|               |  | Direct instream works with no isolation/diversion of flows              | 3     |
|               |  | Habitat loss  | 4     |

51





## ENGP Risk Assessment

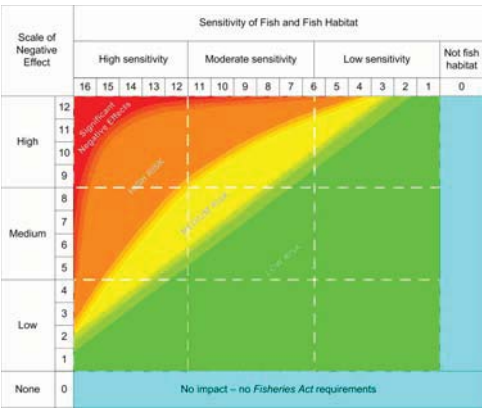
- Axes on DFO risk determination matrix scaled to fit sensitivity and effects tables.
- Plot sensitivity and negative effect scores for individual watercourses
- Risk categorized as
  - Low
  - Medium
  - High
  - Significant negative effects

**Scale of Negative Effect**

|        |    |    |    |   |   |   |   |   |   |   |   |   |   |
|--------|----|----|----|---|---|---|---|---|---|---|---|---|---|
| High   | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| Medium | 8  | 7  | 6  | 5 | 4 | 3 | 2 | 1 | 0 | 0 | 0 | 0 | 0 |
| Low    | 4  | 3  | 2  | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| None   | 0  | 0  | 0  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Sensitivity of Fish and Fish Habitat**

|    | Sensitivity of Fish and Fish Habitat |                      |                 | Not fish habitat |    |    |   |   |   |   |   |   |   |   |   |   |
|----|--------------------------------------|----------------------|-----------------|------------------|----|----|---|---|---|---|---|---|---|---|---|---|
|    | High sensitivity                     | Moderate sensitivity | Low sensitivity |                  |    |    |   |   |   |   |   |   |   |   |   |   |
| 16 | 15                                   | 14                   | 13              | 12               | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |



52



## Risk Management

Four risk levels identified as per Practitioners guide:

- Low - No HADD likely
- Medium - HADD likely but Authorization could be streamlined.
- High - HADD likely.
  - Site specific Authorization needed.
  - Crossing method will be re-assessed.
- Significant negative effects
  - Site specific Authorization needed.
  - Crossing method will be re-assessed.

54





## Compensation

- Provided as necessary.
- Compensation plan in progress.
- Subject of a future discussions.



55







## Risk Management Results



## RMF assessment - Overall

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Summary of stream analysis and risk management assessment process

57

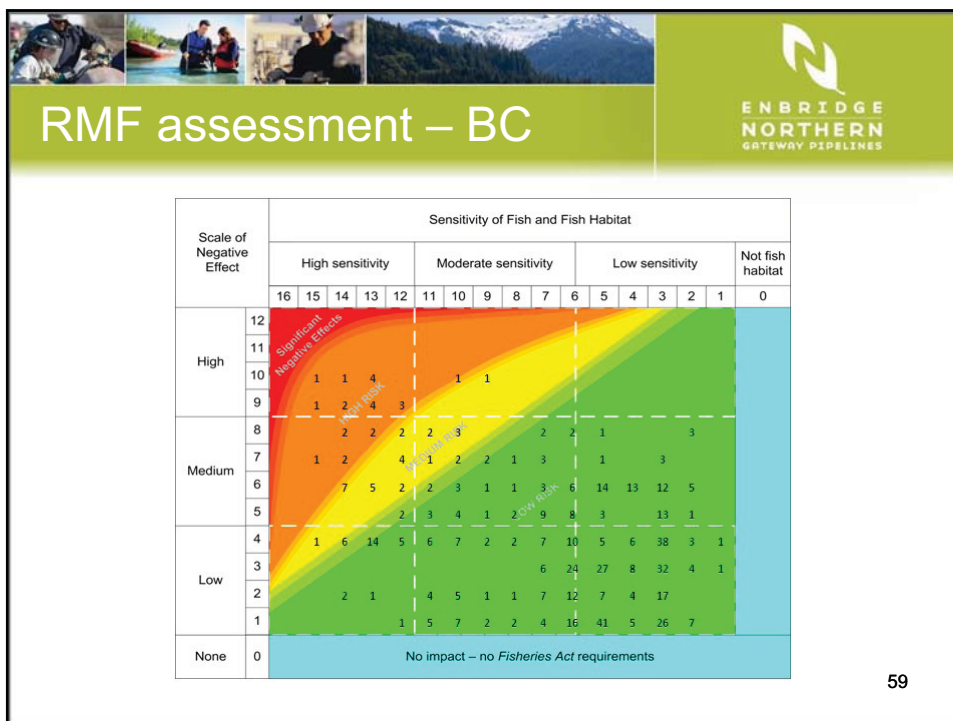
## RMF assessment - Alberta

ENBRIDGE  
NORTHERN  
GATEWAY PIPELINES

| Scale of Negative Effect |    | Sensitivity of Fish and Fish Habitat |   |    |    |    |                      |    |   |   |   |                 |   |   |   |   |                  |   |   |
|--------------------------|----|--------------------------------------|---|----|----|----|----------------------|----|---|---|---|-----------------|---|---|---|---|------------------|---|---|
|                          |    | High sensitivity                     |   |    |    |    | Moderate sensitivity |    |   |   |   | Low sensitivity |   |   |   |   | Not fish habitat |   |   |
|                          |    | 16                                   | 15  | 14 | 13 | 12 | 11                   | 10 | 9 | 8 | 7 | 6               | 5 | 4 | 3 | 2 |                  | 1 | 0 |
| High                     | 12 |                                      |   |    |    |    |                      |    |   |   |   |                 |   |   |   |   |                  |   |   |
|                          | 11 |                                      |   |    |    |    |                      |    |   |   |   |                 |   |   |   |   |                  |   |   |
|                          | 10 |                                      |   |    |    |    |                      |    |   |   |   |                 |   |   |   |   |                  |   |   |
| Medium                   | 9  |                                      |   |    |    |    |                      |    |   |   |   |                 |   |   |   |   |                  |   |   |
|                          | 8  |                                      |   |    |    |    |                      |    |   |   |   |                 |   |   |   |   |                  |   |   |
|                          | 7  |                                      |   |    |    |    |                      |    |   |   |   |                 |   |   |   |   |                  |   |   |
| Low                      | 6  |                                      |   |    |    |    |                      |    |   |   |   |                 |   |   |   |   |                  |   |   |
|                          | 5  |                                      |   |    |    |    |                      |    |   |   |   |                 |   |   |   |   |                  |   |   |
|                          | 4  |                                      |   |    |    |    |                      |    |   |   |   |                 |   |   |   |   |                  |   |   |
| None                     | 3  |                                      |   |    |    |    |                      |    |   |   |   |                 |   |   |   |   |                  |   |   |
|                          | 2  |                                      |   |    |    |    |                      |    |   |   |   |                 |   |   |   |   |                  |   |   |
|                          | 1  |                                      |   |    |    |    |                      |    |   |   |   |                 |   |   |   |   |                  |   |   |
|                          |    | 0                                    | No impact – no Fisheries Act requirements |    |    |    |                      |    |   |   |   |                 |   |   |   |   |                  |   |   |


58







## CONSULTATION









A header for the 'Background' slide. It features a collage of four images: two workers in safety gear, two people in a kayak, a worker in a hard hat, and a large snow-capped mountain. Below the collage, the word 'Background' is written in a bold, green, sans-serif font. To the right of the text is a green vertical bar containing the Enbridge Northern Gateway Pipelines logo, which consists of a stylized 'N' and the text 'ENBRIDGE NORTHERN GATEWAY PIPELINES'.

## Background


- Open Houses allowed a wide spectrum of interested parties and stakeholders to receive information on the ENGP Project and to provide comments or insights into the proposed development.
- Open Houses reach out and engage stakeholders in a meaningful and transparent manner.
- Open Houses in combination with other consultation and community relations tactics ensure that there have been multiple points of access for interested parties and stakeholders, facilitating their active participation and input in decisions concerning the proposed project.

62







## Open House Summary


- In 2008, Open Houses went from October 20<sup>th</sup> to December 5<sup>th</sup>.
- In 2008, a total of 18 Open Houses were completed with 871 attendees (compared to 790 attendees during 2005 Open Houses).
- Open Houses were 4 hours in length.
- Various forms of advertising were used for the open houses (newspaper, radio and mailouts).
- Open House surveys were given to all attendees to complete before leaving (a total of 410 surveys were completed).



63

## Gathering Aboriginal Technical Input on Watercourse Crossings

## A Proposed Approach

- Adequate Consultation and Opportunity for Input
- Watercourse Crossings
  - Have the potential to affect culturally important and/or significant areas.
- Opportunity to:
  - Identify areas that are significant/important, and
  - Work with the project to determine how potential effects can be mitigated and values respected.
- Recommendations Incorporated
  - Recommendations from discussions must be considered, and to the extent practicable, incorporated into all Project phases (e.g. planning, design, construction, mitigation, operations, compensation).

65






## Engagement with Aboriginal Groups

- Engagement with Aboriginal Groups is a key component of ENGP Project success.
- A range of forums for information sharing are available:
  - Presentations to Chief and Council,
  - Community-based Open Houses,
  - Information displays at community events,
  - Participation in the ENGP Community Advisory Boards, and
  - Community technical forums.




66



## Proposed Approach

- The proposed approach will:
  - Identify Aboriginal Groups engaged by the Project,
  - Establish open lines of communication and information flow (share baseline information and local knowledge),
  - Provide information on proposed watercourse crossing location, rationale for chosen crossing method, suggested mitigation measures and proposed compensation options,
  - Provide avenues for information sharing and mutual learning,
  - Establish a feedback loop based on policy, guidelines and Aboriginal group willingness to participate in consultation, and
  - Engage federal agencies to ensure the process is adequate and meets expectations.



67




## Community Technical Forum Format

- Community Technical Forum steps:
  - Planning Meeting – identify watercourse crossing topics to be discussed, participants, resourcing, information needs, format, timelines, forums, etc.,
  - Community Technical Forum – depending on the community preference, it may include a field and meeting room-based session over a couple of days,
  - Documentation – records of discussions, recommendations, rationale and outcomes will be kept,
  - Draft Summary – share the draft with community representatives to ensure that it correctly captures the intent of the community comments (revise as needed), and
  - Outcome Meeting – explain how recommendations and feedback were considered, incorporated in the Project, document feedback and potentially revisit how initial feedback was incorporated.

68



## Decision-Making

- Community Technical Forum participants will try to reach consensus on recommendations.
- If consensus is not reached, the options discussed and rationale will be documented. The next steps in this process to reach consensus are:
  - Participants will rank recommendations or options in order of preference.
  - Recommendations or options may have to be reviewed by Aboriginal leadership for consultation prior to engaging in a final discussion to reach consensus.
  - ENGP representative would then forward outcomes to the CAB Chairs for consideration in their decision-making process.

69



## Non Aboriginal Stakeholders




## A Proposed Approach

- Consultation for Non-Aboriginal stakeholders will be similar to the approach for Aboriginal stakeholders.
- Non-Aboriginal stakeholders will be identified through:
  - Open Houses,
  - Presentations and discussions with local community leaders,
  - Discussions with regulatory agencies, environmental groups and other non-government organizations,
  - Project website,
  - Toll-free line, and
  - Project newsletters and brochures.

71

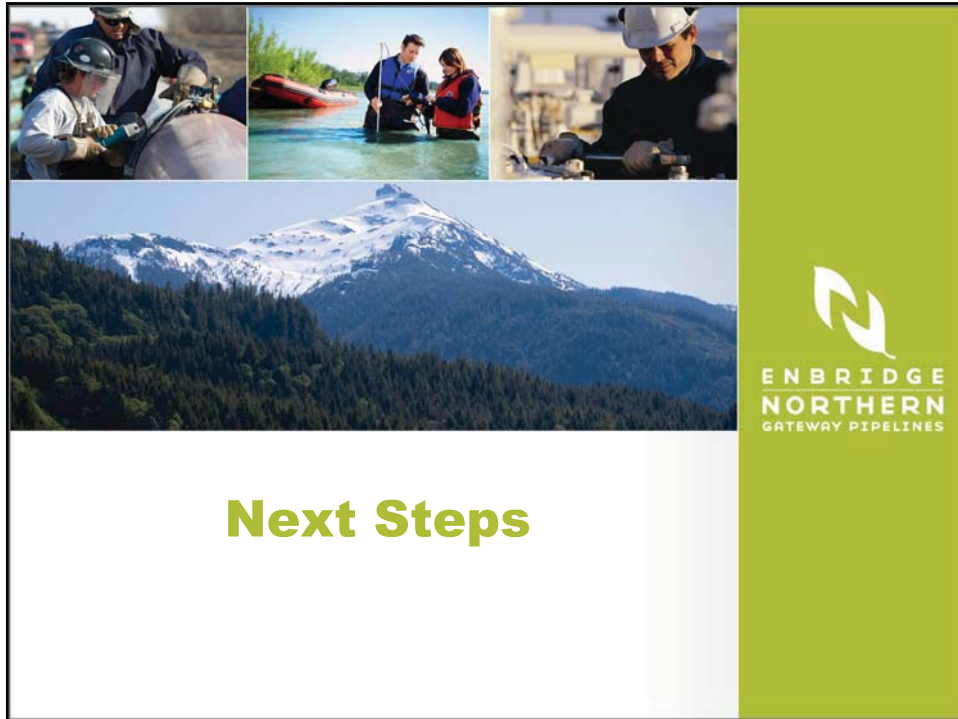



## A Proposed Approach

- There will be opportunities to:
  - Identify areas that are significant, and
  - Work with the project to determine how potential effects can be mitigated.
- Recommendations Incorporated
  - Recommendations from discussions will be considered.



72



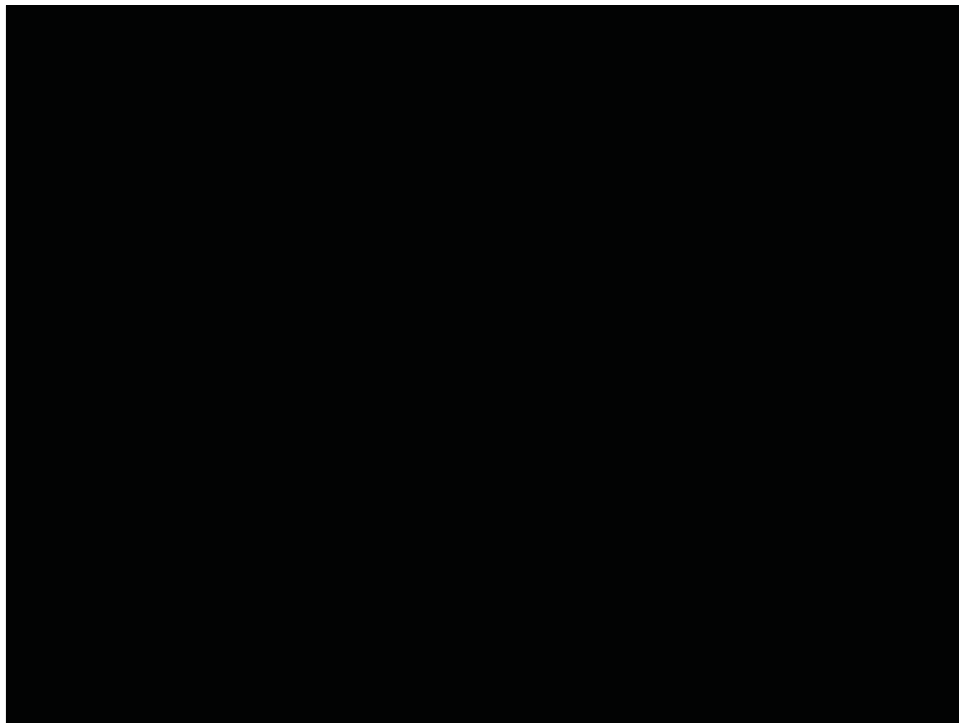
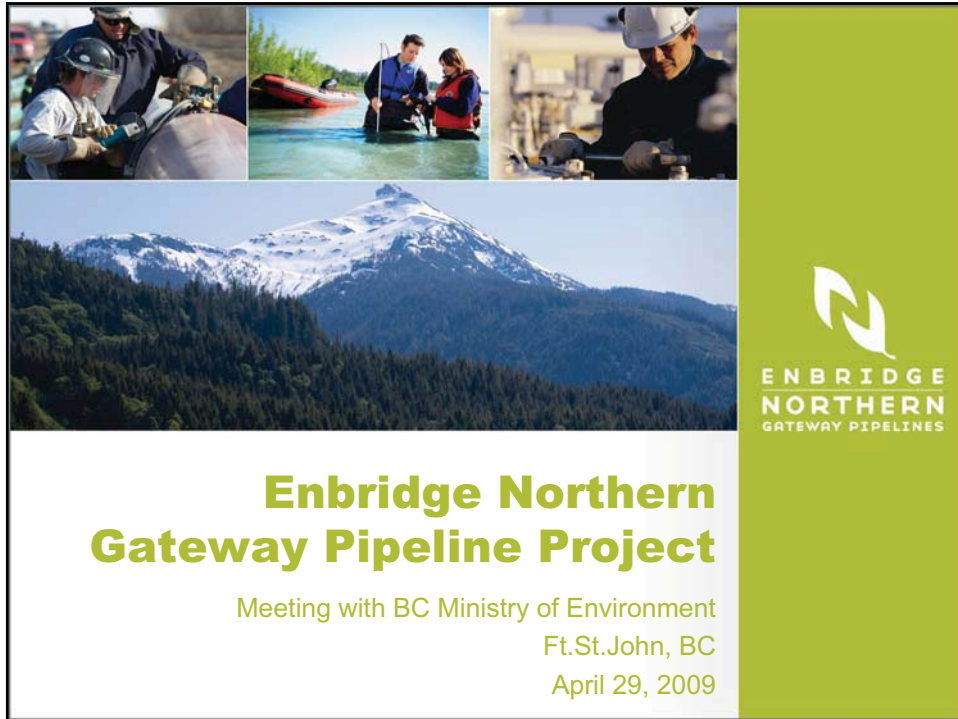
**Next Steps**

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- MOE to participate in future ENGP discussion with DFO?
- Specific MOE interests?

74





**From:** Larden, Troy ENV:EX

**Sent:** Wednesday, September 10, 2008 12:52 PM

**To:** 'Mason, Doug'

**Cc:** Scheck, Joelle ENV:EX; Peterson, Mike ENV:EX

**Subject:** FW: Additional Information on the Northern Gateway Pipeline Project

Good morning Doug. Below are comments from Dave Clark, Wildlife Habitat Ecologist in Victoria. I have not edited them as I think it is all valuable information for you to consider. Feel free to contact Dave directly if further discussion or clarity is needed.

Thanks.

Troy

---

**From:** Clark, Dave ENV:EX

**Sent:** Wednesday, September 10, 2008 11:37 AM

**To:** Larden, Troy ENV:EX

**Cc:** Guy, Stewart E ENV:EX; Diemert, Karen ENV:EX

**Subject:** RE: Additional Information on the Northern Gateway Pipeline Project

Troy - here are my comments on the proposed Wildlife (and habitat) Assessment methods. Consider them and pass any that you feel are relevant on to the other regions and the proponent. I know very little about the Environmental Assessment process, so my narrow focus is on inventory, monitoring and modeling - information development to assess potential impacts.

A general comment - we would welcome any reports and inventories for inclusion our corporate information systems. Wildlife inventories can go to [SPI\\_Mail@gov.bc.ca](mailto:SPI_Mail@gov.bc.ca) , TEM and coarser-scale site groups mapping can go to [eco\\_mail@Victoria1.gov.bc.ca](mailto:eco_mail@Victoria1.gov.bc.ca) , and Habitat interpretations and modeling go to [whr\\_mail@Victoria1.gov.bc.ca](mailto:whr_mail@Victoria1.gov.bc.ca) . Details for submissions are found at <http://www.env.gov.bc.ca/wildlife/wsi/contributions.htm> .

1. Terrestrial Ecosystem Mapping and associated Wildlife Habitat Ratings. It appears that the 1 km. wide corridor has been mapped and habitat interpretations for 9 (or 10) Key indicator species. For each, it may be that only the limiting life requisite is rated (that could be a concern). I wonder about the content of the species accounts, documenting the relationship between the life requisite and the mapped ecosystem. Do they deal exclusively with the short-term impacts on limiting life requisites?
  - For Woodland Caribou, is it necessary to also model predators (wolves) and their alternate prey (moose)?
2. DEM-models just to determine escape terrain for Mountain goats and sheep? Limited value if these are not done in conjunction with TEM-WHR?
3. HSI for Wolverine. Wolverine models generally centre around models for their prey species.
4. General habitat ranking: In BC this is equivalent to WHR on site groups (groups of site series) like Broad Ecosystem Inventory. This is proposed for most birds, weasel, and amphibians. What is the nature of the Species Accounts for these wildlife?

The overall approach is one of accessing and developing information, including expert opinion, on the changes to the biophysical habitat, and the subsequent impact on Key Indicators. Is there any requirement in the EA process (or other regulation) to follow up with a monitoring component to validate or verify the forecasts?

If so, should the scope of this work anticipate the eventual use of the developed information (including cumulative values, impacts, thresholds, uncertainty, etc.) in the design of a monitoring program?

Existing information sources:

1. Consider the current work being done by the Nature Conservancy of Canada on the Central Interior Ecoregion Assessment, including species distribution, habitat suitability, Mountain Pine Beetle (MPB) impacts, connectivity, etc. They also have a parallel initiative to develop an information atlas that should be widely available soon.
2. Eric Lofroth has habitat models for wolverine that cover the area of interest.
3. MoFR and MoE are working cooperatively on Habitat Supply modeling for a pilot group of 13 species - winners and losers given MPB. Output is habitat suitability at 1 hectare resolution for the complete MPB impact zone, and includes fisher,

wolverine, grizzly and caribou.

4. Broad Ecosystem Inventory (@ 1:250,000) has recently had an update to the seral stages, and there are 25 species modeled province-wide (also about 25 grassland birds, some of which may be of interest).

Give me a call if you would like to discuss any of this. Thanks for the opportunity to review the proposal.

at your service,

**Dave Clark**, P.Ag, RPF, RPBio

Wildlife Habitat Ecologist,  
Habitat Management Section  
Ecosystems Branch,  
Ministry of Environment

☎: (250) 387-9785, Fax: (250) 356-5104

✉: PO Box 9338 Stn Prov Govt, Victoria, British Columbia, V8W 9M1

💻: [Dave.Clark@gov.bc.ca](mailto:Dave.Clark@gov.bc.ca)

<http://www.env.gov.bc.ca/wildlife/index.html>

---

**From:** Guy, Stewart E ENV:EX  
**Sent:** Monday, September 8, 2008 4:18 PM  
**To:** Diemert, Karen ENV:EX; Clark, Dave ENV:EX; Larden, Troy ENV:EX  
**Subject:** RE: Additional Information on the Northern Gateway Pipeline Project

Karen,

Doug Mason had asked Dave Clark directly for feedback on a wildlife assessment methodology (see below) which is Dave's expertise.

I asked Dave to send his work to you so the three sections heads involved could coordinate among regions.

Thanks  
Stewart

---

**From:** Mason, Doug [<mailto:Doug.Mason@JacquesWhitford.com>]  
**Sent:** Wednesday, August 20, 2008 3:53 PM  
**To:** Clark, Dave ENV:EX  
**Subject:** Northern Gateway Pipeline Environmental Assessment

Dear Mr. Clark:

The Gateway Environmental Management Team has been retained by the Northern Gateway Pipeline Project to conduct baseline field studies and prepare the Environmental and Socio-economic Assessment for the proposed Northern Gateway Pipeline.

We have developed a work plan for the wildlife assessment and would welcome your feedback on the methodology. While you will receive a letter providing some additional information through the mail, I am attaching an electronic copy to facilitate our dialog.

Best regards,

Doug

Douglas Mason, M.Sc., Ph.D.  
Practice Director, Wildlife

**Jacques Whitford AXYS Ltd.**

5th Floor, 4370 Dominion Street, Burnaby, BC Canada V5G 4L7

| Direct: 604 678 3081 | Office: 604 436 3014 | Cell: 778 233 9106 | Fax: 604 436 3752 | [www.jacqueswhitford.com](http://www.jacqueswhitford.com)  
[doug.mason@jacqueswhitford.com](mailto:doug.mason@jacqueswhitford.com)

cid:3276596003\_67048611



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---

**From:** Diemert, Karen ENV:EX  
**Sent:** Monday, September 8, 2008 4:05 PM  
**To:** Clark, Dave ENV:EX; Guy, Stewart E ENV:EX  
**Subject:** RE: Additional Information on the Northern Gateway Pipeline Project

Dave and Stewart:

s.13

Thanks/karen

---

**From:** Larden, Troy ENV:EX  
**Sent:** Monday, September 8, 2008 3:50 PM  
**To:** Diemert, Karen ENV:EX  
**Subject:** RE: Additional Information on the Northern Gateway Pipeline Project

Thanks Karen, I have been working all day on a response to this as I received it last week. I had only planned on a copy to Mike and Joelle. Do I need to send to Vic. as well?

---

**From:** Diemert, Karen ENV:EX  
**Sent:** Monday, September 8, 2008 3:47 PM  
**To:** Clark, Dave ENV:EX  
**Cc:** Peterson, Mike ENV:EX; Scheck, Joelle ENV:EX; Witt, Andy ENV:EX; Guy, Stewart E ENV:EX; Larden, Troy ENV:EX  
**Subject:** RE: Additional Information on the Northern Gateway Pipeline Project

Dave:

Thanks for passing along this information. Troy Larden is the Skeena ESD rep for the Gateway project. Please send anything additional that you may get along to Troy for his attention.

Thanks in advance.

Karen A Diemert BSc RPBio  
Head, Ecosystems Section  
Environmental Stewardship Division  
Ministry of Environment  
Skeena Region

Phone: 250 847 7300

Fax: 250 847 7728

e-mail: karen.diemert@gov.bc.ca

Mailing address: 3726 Alfred Avenue PO Bag 5000 Smithers BC V0J 2N0

---

**From:** Clark, Dave ENV:EX  
**Sent:** Monday, September 8, 2008 3:38 PM  
**To:** Guy, Stewart E ENV:EX  
**Cc:** Diemert, Karen ENV:EX; Peterson, Mike ENV:EX; Scheck, Joelle ENV:EX; Witt, Andy ENV:EX  
**Subject:** FW: Additional Information on the Northern Gateway Pipeline Project

Stewart - to follow up on my emails of August 20th and September 2nd, attached is additional information on the proposed wildlife assessment methods for the Gateway Pipelines project.

To date I have not responded to the consultants, assuming you would like to coordinate a response.

at your service,

**Dave Clark**, P.Ag, RPF, RPBio

Wildlife Habitat Ecologist,  
Habitat Management Section  
Ecosystems Branch,  
Ministry of Environment

☎: (250) 387-9785, Fax: (250) 356-5104

✉: PO Box 9338 Stn Prov Govt, Victoria, British Columbia, V8W 9M1

📧: Dave.Clark@gov.bc.ca

<http://www.env.gov.bc.ca/wildlife/index.html>

---

**From:** Mason, Doug [mailto:Doug.Mason@JacquesWhitford.com]  
**Sent:** Sunday, September 7, 2008 6:14 PM  
**Cc:** Sargent, Paul; Bryden, Colleen; Wiacek, Richard; Bryden, Colleen  
**Subject:** FW: Additional Information on the Northern Gateway Pipeline Project

Colleagues,

As promised, attached is a map to facilitate our discussions of the proposed Northern Gateway Project. It includes the route and some environmental constraints. We have had one request for shapefiles which we are also working to accommodate.

I am also including a .pdf version of the wildlife assessment methodology.



Best regards,

Doug

---

**From:** Mason, Doug

**Sent:** Friday, August 29, 2008 5:17 PM

**Cc:** Wiacek, Richard; Sargent, Paul; dEntremont, Marc; Bryden, Colleen

**Subject:** Additional Information on the Northern Gateway Pipeline Project

Colleagues,

I would like to share some additional information to facilitate our discussion of the proposed Northern Gateway Pipeline Project. Attached is a short summary of our methodology for assessing effects on wildlife. Northern Gateway is also developing an updated Project Description and route map. I will send you both as soon as they are available.

In addition, I would be happy to share with you immediately the 2005 Enbridge Gateway Project Preliminary Information Package. It contains a project description and route map, although some details have changed based on further analysis. Since the document is fairly large (8MB), I will only send it to those who request it.

I would also like to mention several of my colleagues who will be participating in some of the discussions closest to their offices: Richard Wiacek (Edmonton), Paul Sargent (Calgary), Marc d'Entremont (Burnaby), and Colleen Bryden (Sidney).

We look forward to talking soon.

Best regards,

Doug

Douglas Mason, M.Sc., Ph.D.

Practice Director, Wildlife

**Jacques Whitford AXYS Ltd.**

5th Floor, 4370 Dominion Street, Burnaby, BC Canada V5G 4L7

| Direct: 604 678 3081 | Office: 604 436 3014 | Cell: 778 233 9106 | Fax: 604 436 3752 |

[www.jacqueswhitford.com](http://www.jacqueswhitford.com)

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cid:3276596003\_67048611



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\*\*\*\*\*

**From:** Larden, Troy ENV:EX

**Sent:** Monday, September 8, 2008 4:19 PM

**To:** 'Mason, Doug'

**Cc:** Peterson, Mike ENV:EX; Scheck, Joelle ENV:EX; Diemert, Karen ENV:EX

**Subject:** RE: Additional Information on the Northern Gateway Pipeline Project

First off, thanks for the opportunity. As a pre-cursor, these comments reflect the MoE Skeena Region and although may have overlap with the other two MoE regions (Peace, represented by Joelle Scheck and Omneeca, represented by Mike Peterson) crossed by the project, are not inclusive of their review. I am going to make an assumption that the assessment investments made to date have not been lost. In '05 I spent several days corresponding with Megan Watters (and a few others), Wildlife Biologist Westworth Associates Environmental Ltd. and discussed species to focus on as well as provided several contacts for existing data. She was initially looking at birds only as I understand and then incorporated small mammals. Some of the notes I have about the wildlife plan may have already been answered with previous assessments but because there is no Terms of Reference to support a certificate application, it is my intention to be as inclusive as possible given the cursory review provided.

Key Wildlife Issues - you have indicated a variety of mechanisms to affect wildlife. You have not indicated how this will be quantified or measured during your assessments.

Commonly included in the wildlife assessments are plant and plant communities at risk. No need to incorporate it here if it will be covered off somewhere else, just didn't want it missed.

Selection of Key Indicators - you have listed several wildlife species (KIs) which will form the basis of species for providing the detailed habitat assessments. I would like the following species added to the list as they are part of a list of regionally important species and/or provincially/federally listed and habitat elements will not be covered by the species currently found in table 1.

Northern Goshawk - both the mainland and QCI subspecies - not clear which one is included here but clearly there is consideration for only one.

Marbled Murrelet - listed

Great Blue Heron - listed

Black Bear (to include Kermode as it is listed in the Kalum Land Use Plan)

Grey Wolf - important commercial species

Lynx - important commercial species

Cougar - important commercial species

Bats - Northern long-eared myotis and silver-haired

Assessment of Potential Project Effects - you have noted that the effects assessment will be built on 20k maps. It is standard for MoE to request mapping up to 5K resolution when dealing with effects on listed and/or regionally important species, especially around areas of identified critical habitat or rare plants or plant communities.

General Habitat Ranking - courser?? coarser

Although stated that the analysis of potential project effects on wildlife mortality will be mostly qualitative, it will be necessary for the proponent to keep records and report any mortality of wildlife as a result of the project from the assessment to the conclusion and decommissioning of the project. An example of this could be vehicle collisions with wildlife during assessment, construction, operations phases of the project.

Project Effects Assessment Area - it is standard for MoE to request that the PEAA be 2 km wide corridor centered on the right-of-way. This is due to the potential effect the corridor can have on both plants (more local and smaller <100m) and animals (more broad >800m) in the case of disturbance, avoidance, migration, territory and critical habitats.

Again, Thanks for the opportunity for input. I hope these comments serve to strengthen the plan and provide for a more comprehensive application. I look forward to meeting with you and in the meantime, if you have any questions, feel free to contact me at your convenience.

Troy Larden

**Troy Larden BSc.**

Senior Ecosystem Biologist

Environmental Stewardship Division  
Ministry of Environment Skeena Region  
Phone: (250) 847-7203  
Fax: (250) 847-7728  
EMAIL TROY.LARDEN@gov.bc.ca  
Mailing Address: PO Bag 5000, Smithers BC, V0J 2N0

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**From:** Mason, Doug [mailto:Doug.Mason@JacquesWhitford.com]  
**Sent:** Friday, September 5, 2008 3:28 PM  
**To:** Larden, Troy ENV:EX  
**Subject:** RE: Additional Information on the Northern Gateway Pipeline Project

Troy,

Thanks for taking the time to review our plan. We look forward to talking about opportunities to strengthen the methodology and the project itself. I hope we can do that very soon. In the interim, if you would be willing to send some comments by email, they would certainly be welcome and would give us more time to think about them before we talk. Whichever you prefer would be fine with us.

We are also working to get you better cartography so that you can see the propose route. We are very interested in hearing your ideas about potential effects and what we can do to avoid, mitigate, or compensate for them. I should be able to get you a .jpeg version today or at the latest early next week, and we are also making arrangements so the shape files can be available for anyone that wants to download them.

Best regards,

Doug

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**From:** Larden, Troy ENV:EX [mailto:Troy.Larden@gov.bc.ca]  
**Sent:** Thursday, September 04, 2008 4:12 PM  
**To:** Mason, Doug  
**Subject:** RE: Additional Information on the Northern Gateway Pipeline Project

Thanks for forwarding the draft wildlife plan. I have reviewed the plan and would like to know the best way of providing comments for incorporation and revisions. I understand that there is going to be a meeting scheduled in the near future and comments can certainly wait until then. Let me know your preferred method.

***Troy Larden BSc.***

Senior Ecosystem Biologist  
Environmental Stewardship Division  
Ministry of Environment Skeena Region  
Phone: (250) 847-7203  
Fax: (250) 847-7728  
EMAIL TROY.LARDEN@gov.bc.ca  
Mailing Address: PO Bag 5000, Smithers BC, V0J 2N0

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**From:** Mason, Doug [mailto:Doug.Mason@JacquesWhitford.com]  
**Sent:** Friday, August 29, 2008 5:17 PM  
**Cc:** Wiacek, Richard; Sargent, Paul; dEntremont, Marc; Bryden, Colleen  
**Subject:** Additional Information on the Northern Gateway Pipeline Project

Colleagues,

I would like to share some additional information to facilitate our discussion of the proposed Northern Gateway Pipeline Project. Attached is a short summary of our methodology for assessing effects on wildlife. Northern Gateway is also developing an updated Project Description and route map. I will send you both as soon as they are available.

In addition, I would be happy to share with you immediately the 2005 Enbridge Gateway Project Preliminary Information Package. It contains a project description and route map, although some details have changed based on further analysis. Since the document is fairly large (8MB), I will only send it to those who request it.

I would also like to mention several of my colleagues who will be participating in some of the discussions closest to their offices: Richard Wiacek (Edmonton), Paul Sargent (Calgary), Marc d'Entremont (Burnaby), and Colleen Bryden (Sidney).

We look forward to talking soon.

Best regards,

Doug

Douglas Mason, M.Sc., Ph.D.  
Practice Director, Wildlife

**Jacques Whitford AXYS Ltd.**

5th Floor, 4370 Dominion Street, Burnaby, BC Canada V5G 4L7  
| Direct: 604 678 3081 | Office: 604 436 3014 | Cell: 778 233 9106 | Fax: 604 436 3752 | [www.jacqueswhitford.com](http://www.jacqueswhitford.com)  
[doug.mason@jacqueswhitford.com](mailto:doug.mason@jacqueswhitford.com)

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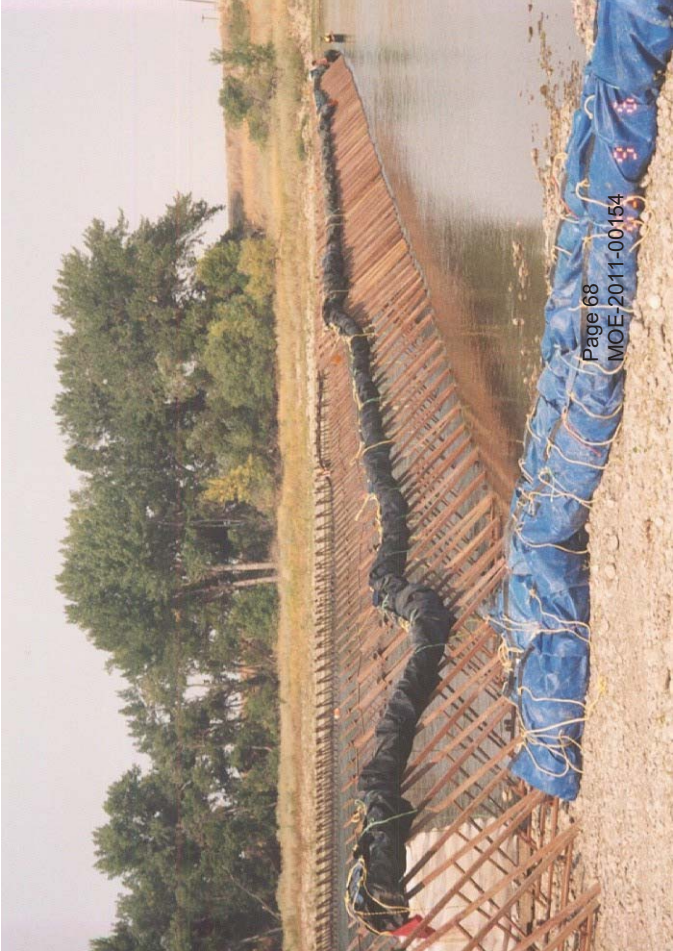
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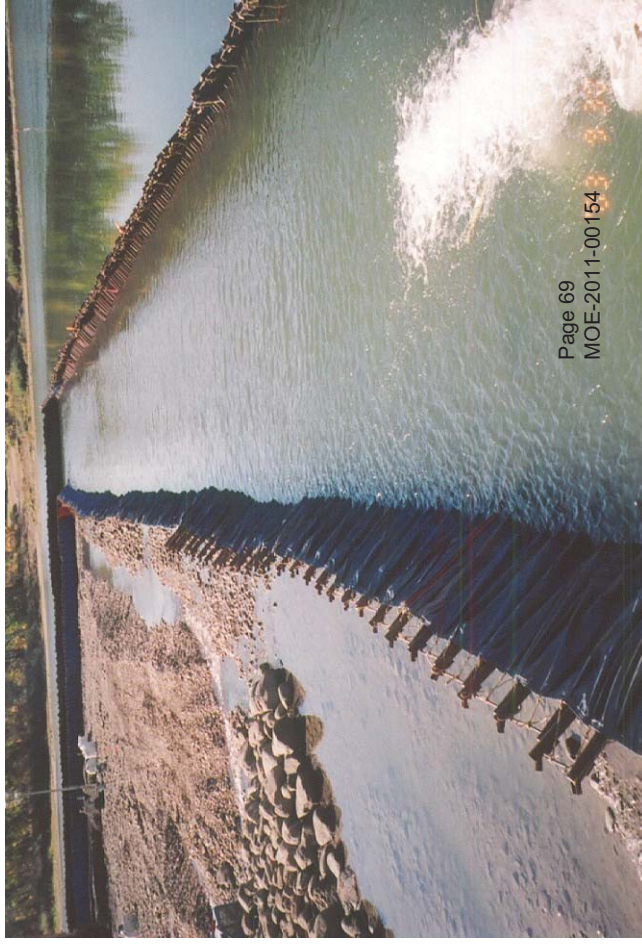
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## **DFO Meeting Notes**

**Date / Time:** February 24, 2009 (10:00 AM)

**Attendees:** DFO: Alasdair Beattie and John Summers.  
MOE: Troy Larden (Smithers, by phone).  
ENGP: Jason Harris, Steve Jasper, and Tim Slaney.

**Subject:** Northern Gateway Project (the Project) meeting with Fisheries & Oceans Canada (DFO) and BC Ministry of Environment (MOE)

### **Presentation on Compensation (See attached powerpoint).**

Alasdair noted that ENGP should have received DFO interim guidelines on habitat compensation. Tim will check for them.

Troy noted that HADD's could include short term disturbances, and that HADD's are not just those disturbances with residual effects.

Discussion of provincial referrals and HADD process. Alasdair reported that changes were in the works for small projects, but that ENGP would be a DFO responsibility throughout, although they welcome MOE participation and expertise through a referral process and will look to MOE for judgment as to HADD on non-anadromous streams.

Troy asked how the impacts of access and infrastructure were being addressed. ENGP does not have details on these aspects of the project yet. However, DFO agreed that the principles of the pipeline assessment would apply to roads and other construction.

Parallel streams and meanders were discussed. Tim noted that we have a GIS estimate of the length of streams that would fall within the lateral buffers. However, this number would be subject to change during detailed design. DFO requested the subject be reported in the ESA as it would be necessary in their assessment.

s.13, s.16

Troy would like to see information for upstream and downstream of the sites so that a better assessment of their contribution to overall productivity could be assessed.

s.13, s.16

Troy noted that KSL had revised their route to avoid the Gosnell. Wanted to know if ENGP could do likewise. ENGP will provide a summary of the route alternatives explored in that area and the reasons for various changes.

Presentation on Individual Review Streams (see powerpoint attached).

Discussion of commercial confidence. Alasdair reported that all documents they handle, including emails are subject to Access to Information requests. Materials supplied to date, including the powerpoint, should be considered as 'public domain'. He will check with their legal to see how they can handle ENGP material without releasing it as we move into discussion of the IR streams, decision process, and various crossing alternatives.

DFO noted that they will require an explanation for all fisheries sensitive streams not crossed with their preferred methods. This is particularly true for streams >20m wide where they prefer a trenchless method, as well as for any other high risk streams. DFO may accept cost as a rationale for choosing a crossing method however, for every fish sensitive stream they will need a summary of the issues investigated and what went into the cost-benefit calculation before they will consider authorization.

Troy noted that HDD may be the only option for works outside the instream work windows.

- ENGP noted that not all streams can be drilled.
- Steve Jasper noted that a report on HDD risk and cost was coming and could be shared with DFO. Similar reports on aerial and micro-tunnel methods will be considered.

Possibility of site visits including DFO, MOE, and FN's was discussed.

**Next meeting**

- To be confirmed, but probably first week of April.
- Agenda to include: Compensation, summer programs, joint field sessions.

**From:** Larden, Troy ENV:EX

**Sent:** Tuesday, March 31, 2009 10:46 AM

**To:** Suther, Graham ENV:EX; Scheck, Joelle ENV:EX; Peterson, Mike ENV:EX; Pillipow, Ray ENV:EX; Sary, Zsolt ENV:EX

**Subject:** FW: Enbridge Northern Gateway Information Package

[For those with a Gateway file.....](#)

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**From:** Slaney, Tim L [mailto:tim.slaney@amec.com]

**Sent:** Tuesday, March 31, 2009 9:55 AM

**To:** Larden, Troy ENV:EX

**Subject:** Enbridge Northern Gateway Information Package

Troy

In February, when we met in your office, I promised to send you a copy of the project's preliminary information package (PIP).

Turns out we don't have any printed copies available. However, the document is posted on the NEB website. Look in the project's public registry, then

- [Link to Regulatory Documents \[Folder 384008\]](#)

See "05-11-01 Gateway Pipeline Inc. - Preliminary Information Package for the Gateway Pipeline Project (A10717)".

Regards,

Tim Slaney, RPBio.

Principal Biologist

Amec Earth and Environmental

2227 Douglas Rd, Burnaby BC, V5C 5A9, Canada

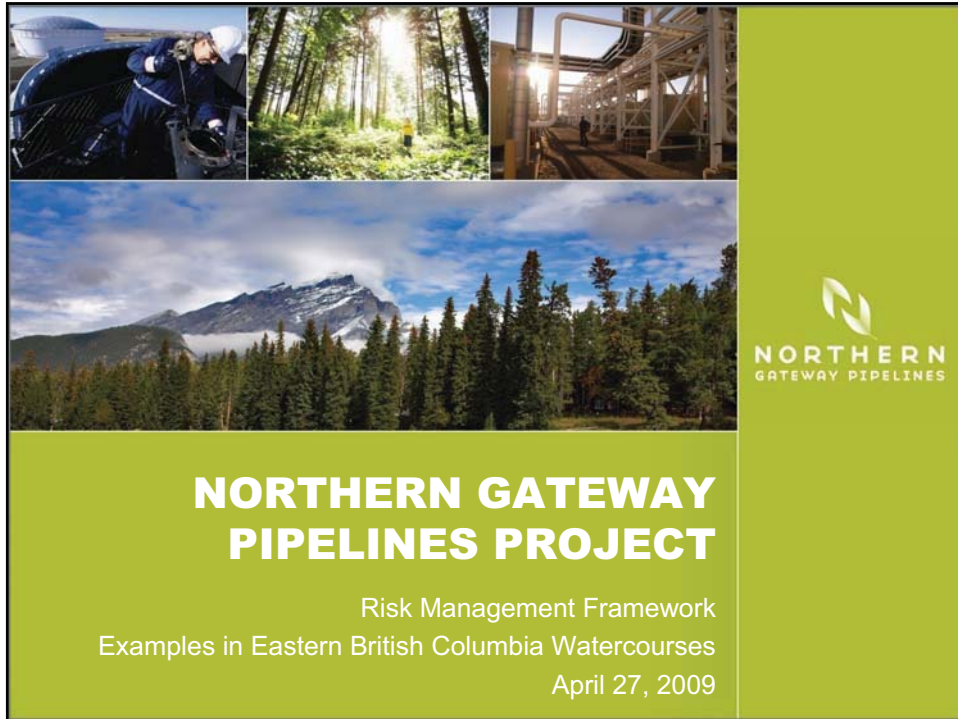
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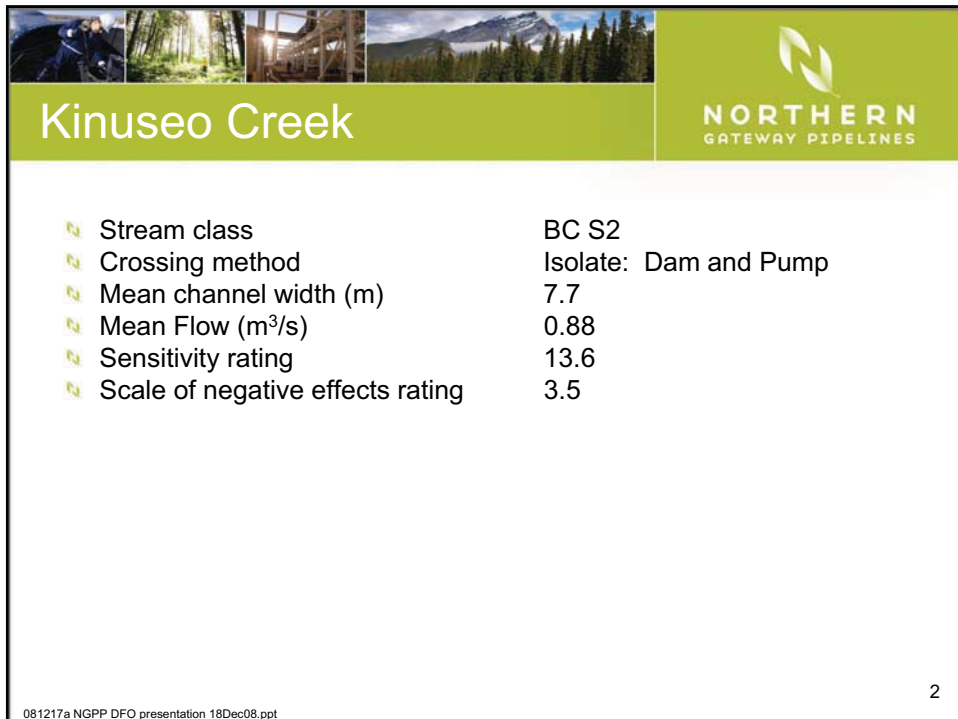
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The banner features a collage of four images at the top: a worker in a blue jacket and white helmet, a forest scene with sunlight filtering through trees, an industrial facility with large pipes and structures, and a large mountain peak behind a dense forest. Below the collage, the text 'NORTHERN GATEWAY PIPELINES' is displayed in white on a green background. The main title 'NORTHERN GATEWAY PIPELINES PROJECT' is in large white letters, followed by 'Risk Management Framework', 'Examples in Eastern British Columbia Watercourses', and the date 'April 27, 2009'.

# NORTHERN GATEWAY PIPELINES PROJECT

Risk Management Framework  
Examples in Eastern British Columbia Watercourses  
April 27, 2009




The slide features a banner at the top with the same collage of four images as the first slide. Below the banner, the title 'Kinuseo Creek' is displayed in white on a green background. The Northern Gateway Pipelines logo is on the right. The main content area lists six items, each with a small green icon and a value.


|                                  |                       |
|----------------------------------|-----------------------|
| Stream class                     | BC S2                 |
| Crossing method                  | Isolate: Dam and Pump |
| Mean channel width (m)           | 7.7                   |
| Mean Flow (m <sup>3</sup> /s)    | 0.88                  |
| Sensitivity rating               | 13.6                  |
| Scale of negative effects rating | 3.5                   |

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2







**NORTHERN**  
GATEWAY PIPELINES

## Kinuseo Creek

Sensitivity Rating = 13.6


| Sensitivity Analysis   |       |  |
|------------------------|-------|--|
| Parameter              | Score | Key Factors for Score                          |
| Spp. Sensitivity       | 4     | Salmonids and burbot present                   |
| Habitat Dependency     | 3     | Good spawning and overwintering habitat        |
| Species Rarity         | 3     | Bull trout present                             |
| Bank Shape             | 4     | Undercut banks                                 |
| Dominant Bank Material | 4     | Dominant bank material is fines                |
| Substrate              | 3     | Dominant substrate type is gravel              |
| Cover                  | 4     | Fish cover is approximately 40%                |
| Dominant Habitat       | 1     | Dominant habitat type is run                   |
| Flow                   | 4     | Mean monthly flows are < 1 m <sup>3</sup> /sec |


Scale of Negative Effects Rating = 3.5

| Scale of Negative Effects |       |  |
|---------------------------|-------|--|
| Parameter                 | Score | Key Factors for Score  |
| Extent                    | 1     | Zone of influence ≤ 300 metres downstream                            |
| Duration                  | 2     | Crossing method = Dam and Pump; higher flows; construction in winter |
| Timing                    | 1     | Construction in least risk period                                    |
| Habitat Impacts           | 0     | Isolated work on small watercourse (flows <= 1 m <sup>3</sup> /sec)  |

3

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**NORTHERN**  
GATEWAY PIPELINES

## Kinuseo Creek

| SENSITIVITY RATING   |                     |                    |                |                   |                           |                  |              |                     |             |
|--|---------------------|--------------------|----------------|-------------------|---------------------------|------------------|--------------|---------------------|-------------|
| Species Sensitivity + Habitat Dependency + Spp. Rarity + ((Average(Physical Characteristics)+Flow Rating)/2) |                     |                    |                |                   |                           |                  |              |                     |             |
|  |                     |                    |                |                   | PHYSICAL CHARACTERISTICS  |                  |              |                     |             |
| Sensitivity Rating   | Species Sensitivity | Habitat Dependency | Species Rarity | Bank Shape Rating | Dom. Bank Material Rating | Substrate Rating | Cover Rating | Dom. Habitat Rating | Flow Rating |
| 13.6   | 4                   | 3                  | 3              | 4                 | 4                         | 3                | 4            | 1                   | 4           |

SR = 4 + 3 + 3 + (((4 + 4 + 3 + 4 + 1) / 5) + 4) / 2

SR = 13.6

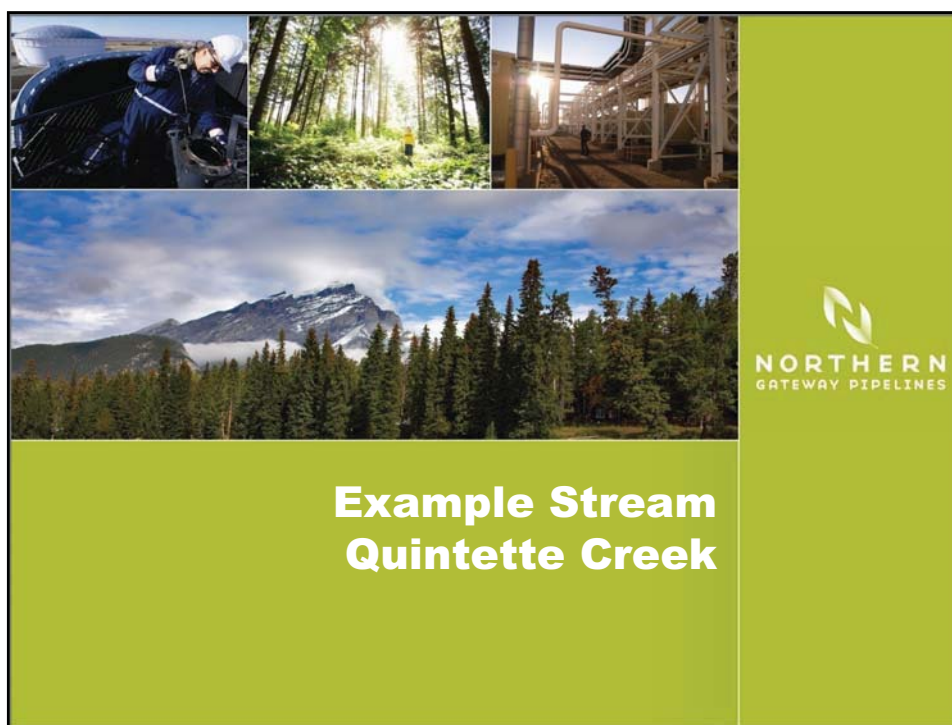
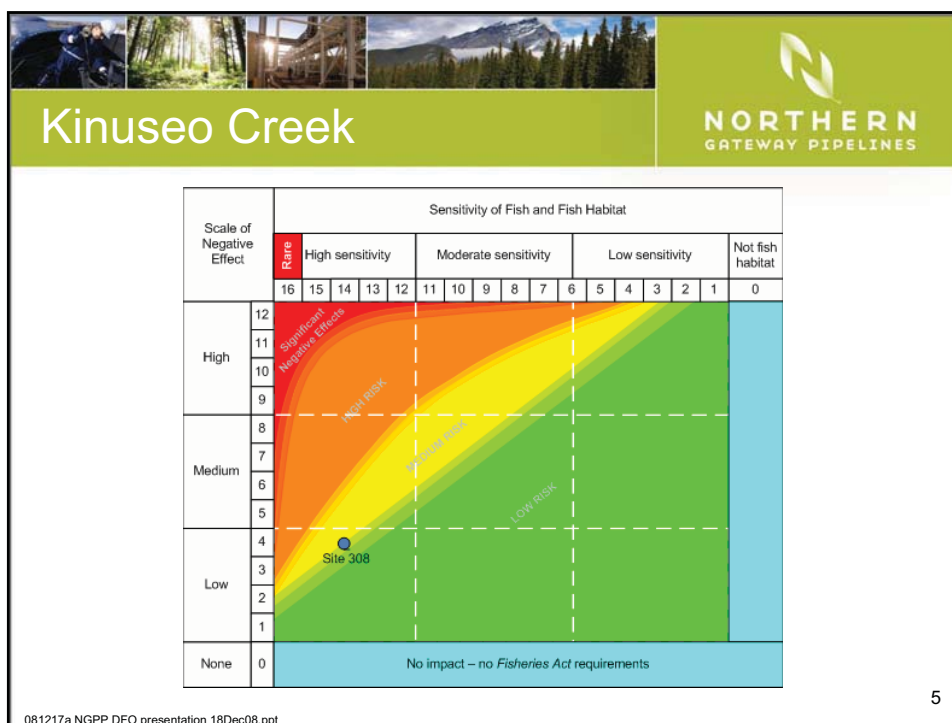
| SCALE OF NEGATIVE EFFECTS                    |               |                 |               |                |
|--|---------------|-----------------|---------------|----------------|
| (Extent + Duration) + (Timing + Impacts) / 2 |               |                 |               |                |
| Scale of Neg. Effects                        | Extent Rating | Duration Rating | Timing Rating | Impacts Rating |
| 2.5  | 1             | 2               | 0             | 1              |


SNE = (1 + 2) + ((1 + 0) / 2)


SNE = 3.5

4

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GATEWAY PIPELINES

## Quintette Creek

|   |                       |
|---|-----------------------|
|  Stream class                  | BC S2                 |
|  Crossing Method               | Isolate: Dam and Pump |
|  Mean channel width (m)        | 7.5                   |
|  Mean Flow (m <sup>3</sup> /s) | 0.34                  |
|  Sensitivity rating            | 13.4                  |
|  Scale of negative effects     | 3.5                   |

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7





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## Quintette Creek

Sensitivity Rating = 13.4

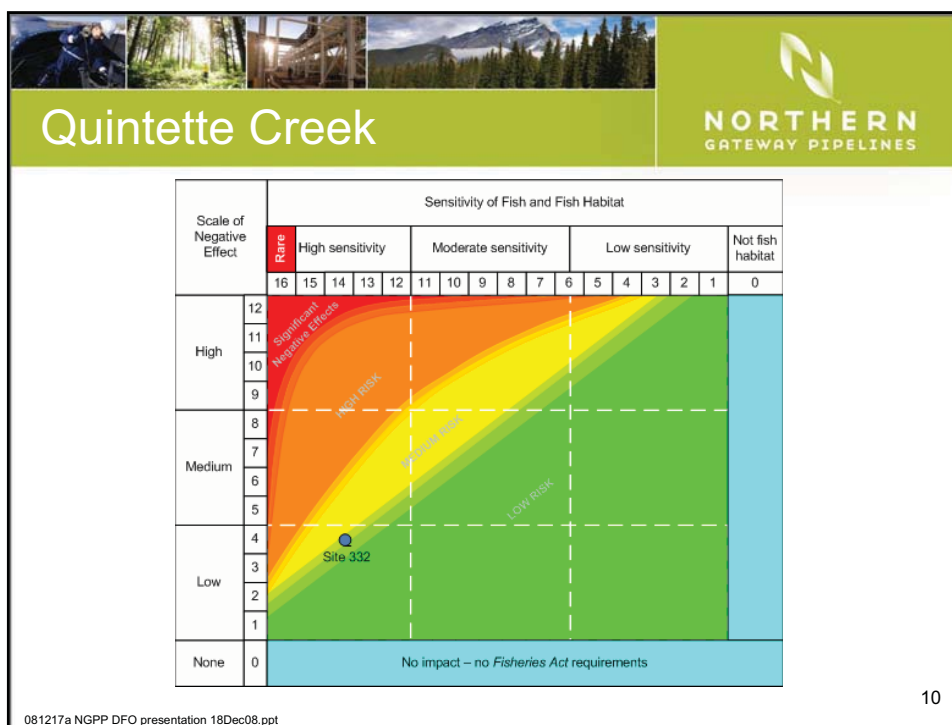
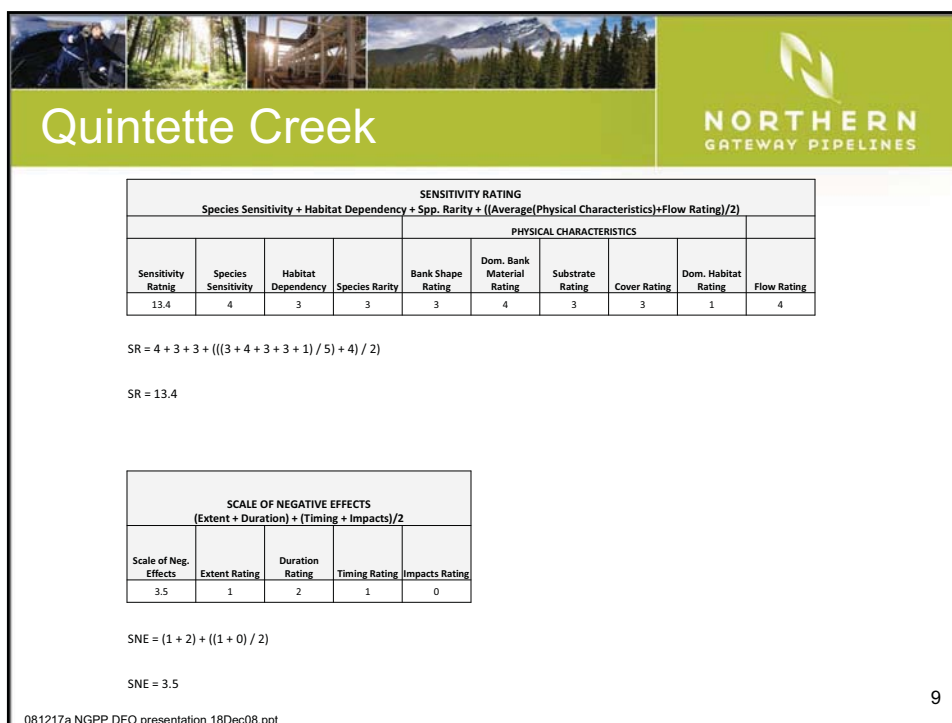
| Sensitivity Analysis   |       |  |
|------------------------|-------|--|
| Parameter              | Score | Key Factors for Score                          |
| Spp. Sensitivity       | 4     | Salmonids present                              |
| Habitat Dependency     | 3     | Good spawning habitat                          |
| Species Rarity         | 3     | Bull trout present                             |
| Bank Shape             | 3     | Steep banks                                    |
| Dominant Bank Material | 4     | Dominant bank material is fines                |
| Substrate              | 3     | Dominant substrate type is gravel              |
| Cover                  | 4     | Fish cover is approximately 20%                |
| Dominant Habitat       | 3     | Dominant habitat type is run                   |
| Flow                   | 2     | Mean monthly flows are < 1 m <sup>3</sup> /sec |


Scale of Negative Effects Rating = 3.5


| Scale of Negative Effects |       |  |
|---------------------------|-------|--|
| Parameter                 | Score | Key Factors for Score  |
| Extent                    | 1     | Zone of influence < 300 metres downstream                            |
| Duration                  | 2     | Crossing method = Dam and Pump; higher flows; construction in winter |
| Timing                    | 1     | Construction in least risk period                                    |
| Habitat Impacts           | 0     | Isolated work on small watercourse (flows <= 1 m <sup>3</sup> /sec)  |

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8












  
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## Example Stream Five Cabin Creek



  
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## Tributary to Five Cabin Creek


|   |          |
|---|----------|
|  Stream class                  | BC S1    |
|  Crossing Method               | Open cut |
|  Mean channel width (m)        | 72.0     |
|  Mean Flow (m <sup>3</sup> /s) | 0.53     |
|  Sensitivity rating            | 13.7     |
|  Scale of negative effects     | 7.0      |

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12







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## Five Cabin Creek

Sensitivity Rating = 13.7


| Sensitivity Analysis   |       |                                   |
|------------------------|-------|-----------------------------------|
| Parameter              | Score | Key Factors for Score             |
| Spp. Sensitivity       | 4     | Salmonids present                 |
| Habitat Dependency     | 3     | Good spawning habitat             |
| Species Rarity         | 3     | Bull trout present                |
| Bank Shape             | 3     | Steep banks                       |
| Dominant Bank Material | 4     | Dominant bank material is fines   |
| Substrate              | 3     | Dominant substrate type is gravel |
| Cover                  | 4     | Fish cover is approximately 20%   |
| Dominant Habitat       | 3     | Dominant habitat type is run      |
| Flow                   | 4     | Mean monthly flows are < 1 m³/sec |


Scale of Negative Effects Rating = 7.0

| Scale of Negative Effects |       |  |
|---------------------------|-------|--|
| Parameter                 | Score | Key Factors for Score                                      |
| Extent                    | 3     | Zone of influence ≥ 300 m and < 1000 m downstream          |
| Duration                  | 2     | Crossing method = Open Cut; Low flows (< 1.0m³/sec)        |
| Timing                    | 1     | Construction in least risk period                          |
| Habitat Impacts           | 3     | Direct instream works with no isolation/diversion of flows |

13

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## Five Cabin Creek

| SENSITIVITY RATING   |                     |                    |                |                          |                           |                  |              |                     |             |
|--|---------------------|--------------------|----------------|--------------------------|---------------------------|------------------|--------------|---------------------|-------------|
| Species Sensitivity + Habitat Dependency + Spp. Rarity + ((Average(Physical Characteristics)+Flow Rating)/2) |                     |                    |                |                          |                           |                  |              |                     |             |
|  |                     |                    |                | PHYSICAL CHARACTERISTICS |                           |                  |              |                     |             |
| Sensitivity Rating   | Species Sensitivity | Habitat Dependency | Species Rarity | Bank Shape Rating        | Dom. Bank Material Rating | Substrate Rating | Cover Rating | Dom. Habitat Rating | Flow Rating |
| 13.7   | 4                   | 3                  | 3              | 3                        | 4                         | 3                | 4            | 3                   | 4           |

$$SR = 4 + 3 + 3 + (((3 + 4 + 3 + 4 + 3) / 5) + 4) / 2$$

SR = 13.7

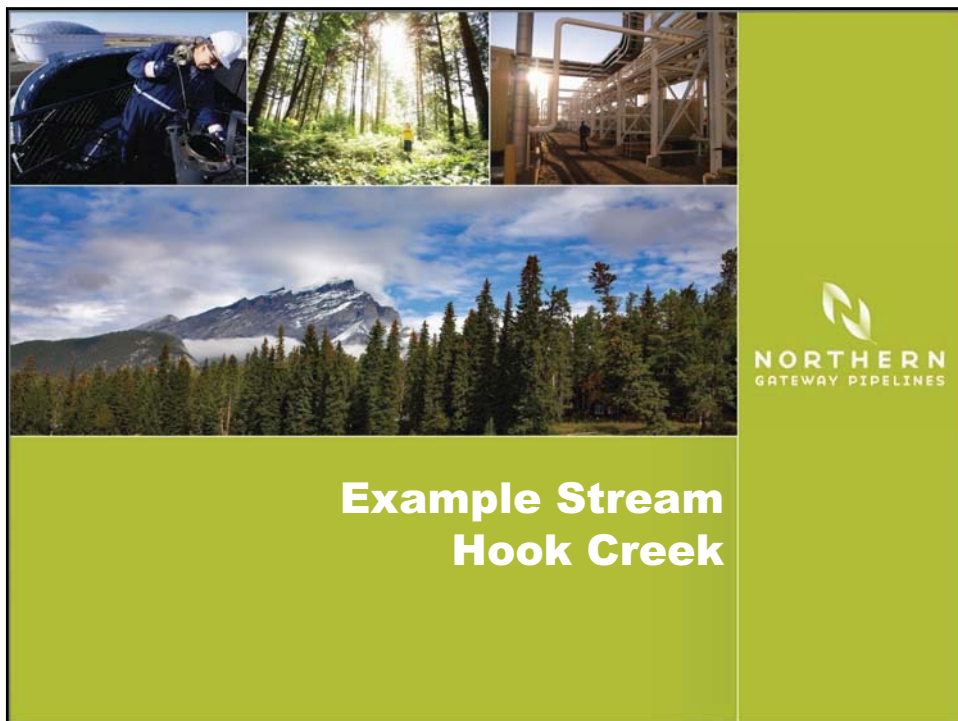
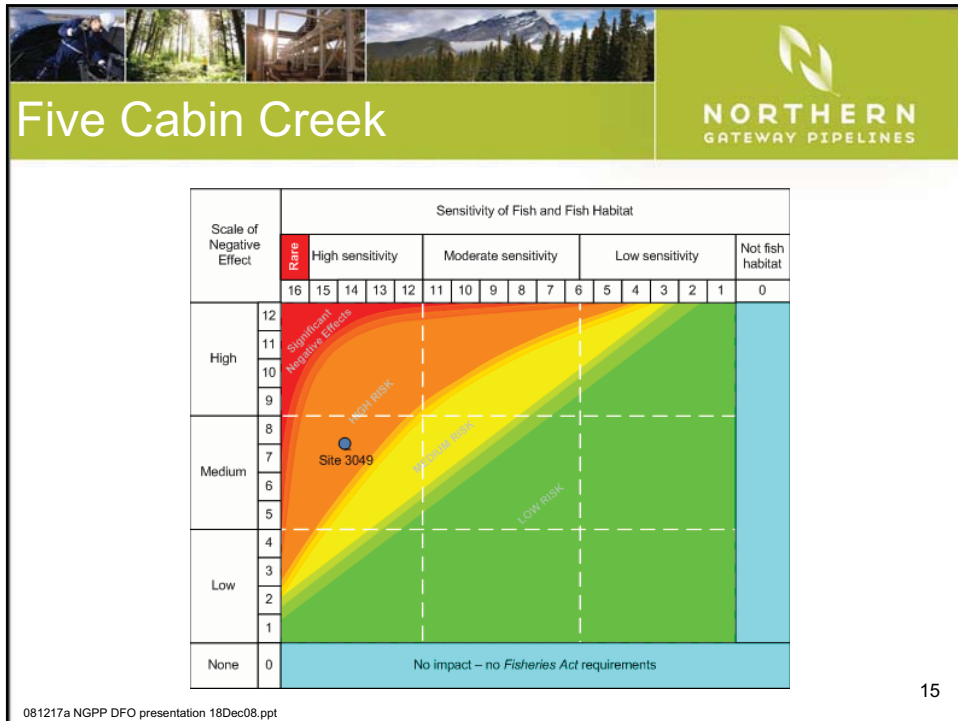
| SCALE OF NEGATIVE EFFECTS                    |               |                 |               |                |
|--|---------------|-----------------|---------------|----------------|
| (Extent + Duration) + (Timing + Impacts) / 2 |               |                 |               |                |
| Scale of Neg. Effects                        | Extent Rating | Duration Rating | Timing Rating | Impacts Rating |
| 7  | 3             | 2               | 1             | 3              |

$$SNE = (1 + 2) + ((1 + 0) / 2)$$

SNE = 7.0

14

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## Hook Creek

|                               |                       |
|-------------------------------|-----------------------|
| Stream class                  | BC S1                 |
| Crossing Method               | Isolate: Dam and Pump |
| Mean channel width (m)        | 20.3                  |
| Mean Flow (m <sup>3</sup> /s) | 3.05                  |
| Sensitivity rating            | 13.3                  |
| Scale of negative effects     | 6.5                   |

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17

## Hook Creek

Sensitivity Rating = 13.3

| Sensitivity Analysis   |       |   |
|------------------------|-------|---|
| Parameter              | Score | Key Factors for Score                               |
| Spp. Sensitivity       | 4     | Salmonids present                                   |
| Habitat Dependency     | 4     | Good spawning habitat                               |
| Species Rarity         | 3     | Bull trout present                                  |
| Bank Shape             | 1     | Sloping banks                                       |
| Dominant Bank Material | 4     | Dominant bank material is fines                     |
| Substrate              | 3     | Dominant substrate type is gravel                   |
| Cover                  | 4     | Fish cover is approximately 25%                     |
| Dominant Habitat       | 1     | Dominant habitat type is run                        |
| Flow                   | 2     | Mean monthly flows are > 3 to 8 m <sup>3</sup> /sec |

Scale of Negative Effects Rating = 6.5

| Scale of Negative Effects |       |  |
|---------------------------|-------|--|
| Parameter                 | Score | Key Factors for Score  |
| Extent                    | 3     | Zone of influence ≥ 300 m and < 1000 m downstream                    |
| Duration                  | 2     | Crossing method = Dam and Pump; higher flows; construction in winter |
| Timing                    | 1     | Construction in least risk period                                    |
| Habitat Impacts           | 2     | Isolated work on large watercourse (flows > 3 m <sup>3</sup> /sec)   |

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18

# Hook Creek

| SENSITIVITY RATING   |                     |                    |                |                          |                           |                  |              |                     |             |
|--|---------------------|--------------------|----------------|--------------------------|---------------------------|------------------|--------------|---------------------|-------------|
| Species Sensitivity + Habitat Dependency + Spp. Rarity + ((Average[Physical Characteristics]+Flow Rating)/2) |                     |                    |                |                          |                           |                  |              |                     |             |
|  |                     |                    |                | PHYSICAL CHARACTERISTICS |                           |                  |              |                     |             |
| Sensitivity Rating   | Species Sensitivity | Habitat Dependency | Species Rarity | Bank Shape Rating        | Dom. Bank Material Rating | Substrate Rating | Cover Rating | Dom. Habitat Rating | Flow Rating |
| 13.7   | 4                   | 3                  | 3              | 3                        | 4                         | 3                | 4            | 3                   | 4           |

$SR = 4 + 3 + 3 + (((3 + 4 + 3 + 4 + 3) / 5) + 4) / 2$   
 $SR = 13.7$

| SCALE OF NEGATIVE EFFECTS                    |               |                 |               |                |
|--|---------------|-----------------|---------------|----------------|
| (Extent + Duration) + (Timing + Impacts) / 2 |               |                 |               |                |
| Scale of Neg. Effects                        | Extent Rating | Duration Rating | Timing Rating | Impacts Rating |
| 7  | 3             | 2               | 1             | 3              |

$SNE = (1 + 2) + ((1 + 0) / 2)$   
 $SNE = 7.0$

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19

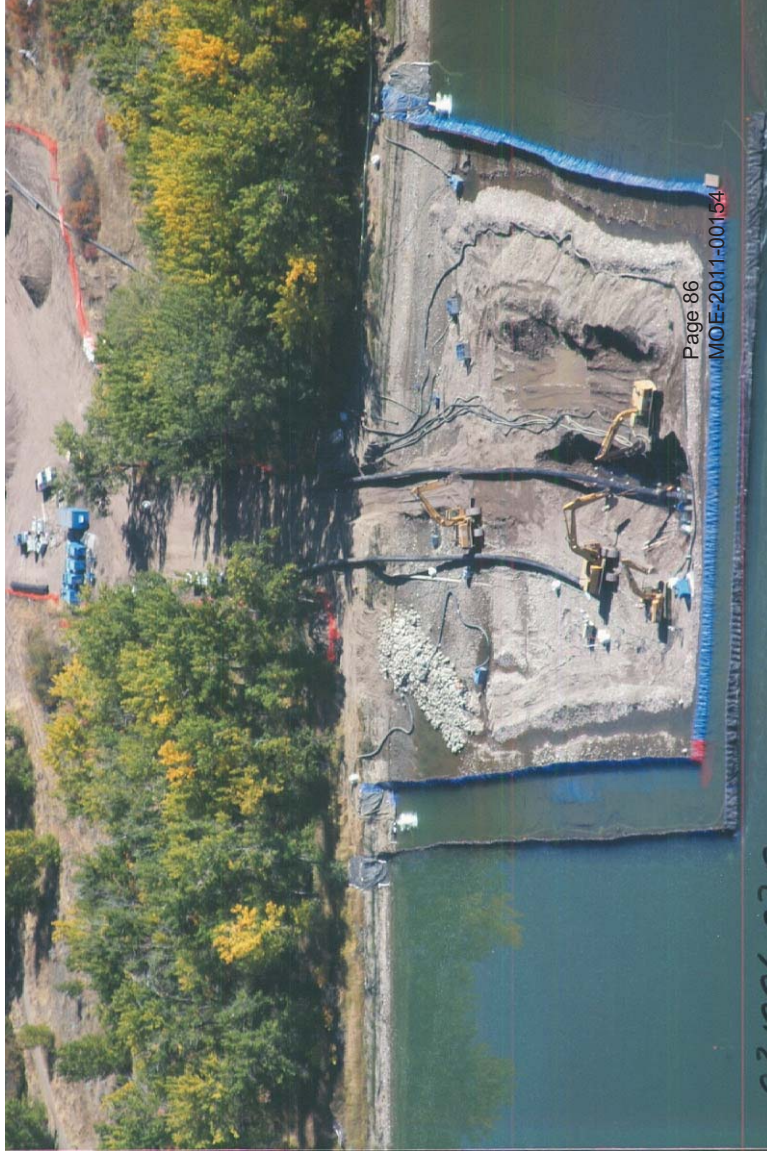
# Hook Creek

| Scale of Negative Effect | Sensitivity of Fish and Fish Habitat |   |           |    |    |                      |    |   |   |                 |   |   |   |                  |   |   |   |  |
|--------------------------|--------------------------------------|---|-----------|----|----|----------------------|----|---|---|-----------------|---|---|---|------------------|---|---|---|--|
|                          | Rare                                 | High sensitivity                          |           |    |    | Moderate sensitivity |    |   |   | Low sensitivity |   |   |   | Not fish habitat |   |   |   |  |
|                          | 16                                   | 15  | 14        | 13 | 12 | 11                   | 10 | 9 | 8 | 7               | 6 | 5 | 4 | 3                | 2 | 1 | 0 |  |
| High                     | 12                                   | Significant Negative Effects              | HIGH RISK |    |    |                      |    |   |   |                 |   |   |   |                  |   |   |   |  |
|                          | 11                                   |   |           |    |    |                      |    |   |   |                 |   |   |   |                  |   |   |   |  |
|                          | 10                                   |   |           |    |    |                      |    |   |   |                 |   |   |   |                  |   |   |   |  |
| Medium                   | 8                                    | MOD RISK                                  |           |    |    |                      |    |   |   |                 |   |   |   |                  |   |   |   |  |
|                          | 7                                    |   |           |    |    |                      |    |   |   |                 |   |   |   |                  |   |   |   |  |
|                          | 6                                    |   |           |    |    |                      |    |   |   |                 |   |   |   |                  |   |   |   |  |
| Low                      | 4                                    | LOW RISK                                  |           |    |    |                      |    |   |   |                 |   |   |   |                  |   |   |   |  |
|                          | 3                                    |   |           |    |    |                      |    |   |   |                 |   |   |   |                  |   |   |   |  |
|                          | 2                                    |   |           |    |    |                      |    |   |   |                 |   |   |   |                  |   |   |   |  |
| None                     | 0                                    | No impact – no Fisheries Act requirements |           |    |    |                      |    |   |   |                 |   |   |   |                  |   |   |   |  |

Site 390 is located in the High sensitivity area, corresponding to a Scale of Negative Effect of 7 and a Sensitivity of 13.

081217a NGPP DFO presentation 18Dec08.ppt

20





**From:** Larden, Troy ENV:EX  
**Sent:** Friday, March 27, 2009 10:47 AM  
**To:** Suther, Graham ENV:EX  
**Cc:** Scheck, Joelle ENV:EX  
**Subject:** RE: Enbridge Pipeline

I have been relatively diligent in forwarding all correspondence to Joelle so she is aware of events, meetings, conf. calls etc. In a nut shell, my participation has been fairly low because this is an NEB process, we have no formal involvement in the project and it comes generally at the request of the proponent. I have provided review of the wildlife program plan as well as participated in the fisheries meetings and conf. calls. There is a fisheries CC on April 8th at 10 that all three regions of MoE have been invited to attend. Details below. With respect to workload, It is and will be anything that you want it to be. We have no responsibility to participate but do so because of the values that we want to protect and the risk associated with the development so I can not speak for your commitment. I have been asked by my Regional Manager and supervisor to attend so by default, we are resourcing to a level over and above what is required. Partly because of the risk to the values but secondly because of the already approved pipeline in a parallel corridor.

Meeting 10 - 1PM Pacific  
Topics: Compensation, Summer field programs, Other?  
Agenda to follow.

Dial-in: s.17  
Connection problems? Call my cell s.17

Regards,  
Tim Slaney

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**From:** Suther, Graham ENV:EX  
**Sent:** Friday, March 27, 2009 10:21 AM  
**To:** Larden, Troy ENV:EX  
**Cc:** Scheck, Joelle ENV:EX; Thiessen, Conrad D ENV:EX  
**Subject:** Enbridge Pipeline

Hi Troy,

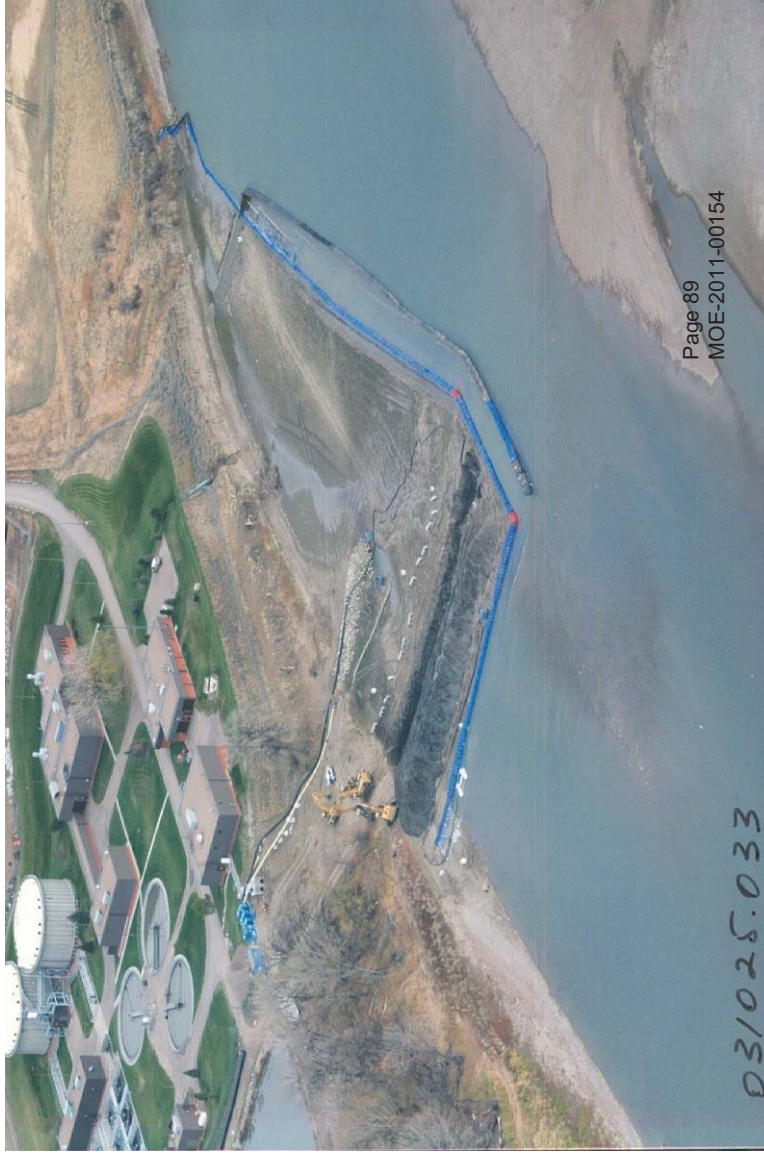
I understand in the last few months you've had some involvement with the Enbridge Pipeline proposal. As the proposed pipeline route traverses the southern portion of the Peace Region, we're interested in the project's status. We've had preliminary involvement in the past but none this calendar year.

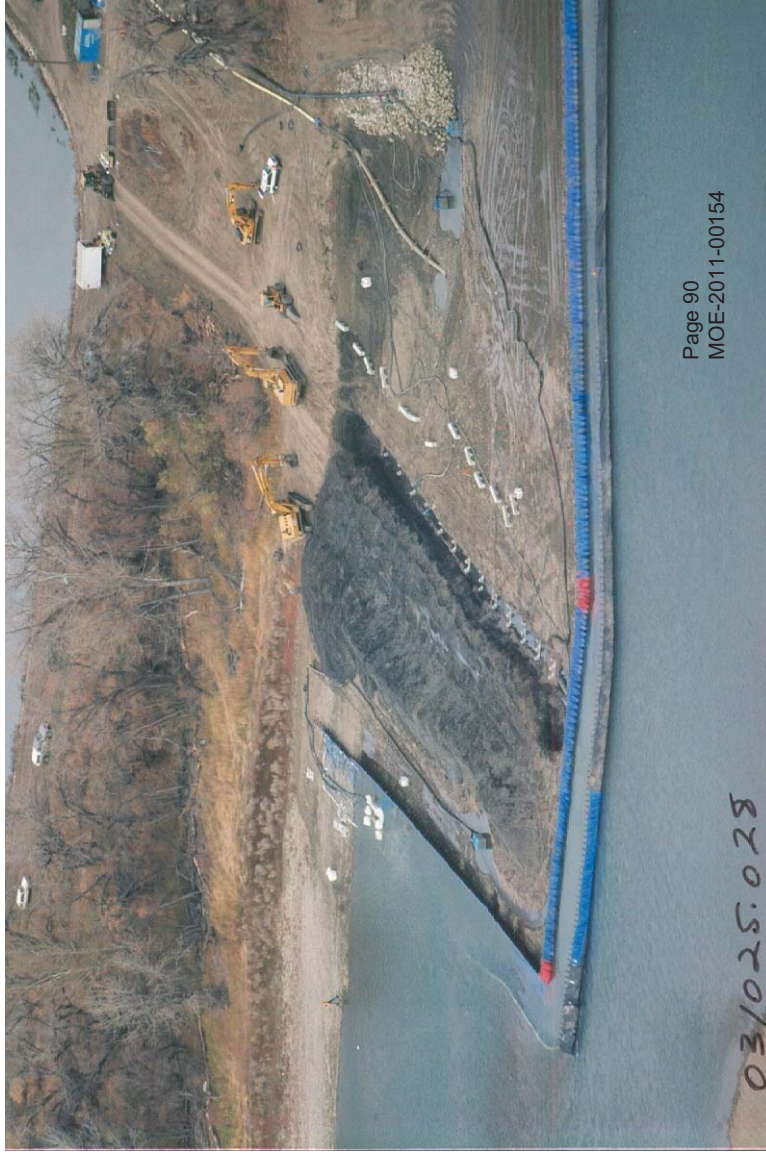
Could you please provide a brief update of recent initiatives regarding this project, what if any relevant material would be of benefit for our region to be cognisant of and generally what's on the planning/review "horizon".....we're attempting to scope out what level of Peace Region Ecosystems staff involvement may be necessary this coming fiscal regarding this project.

Thank you in advance.

Cheers  
Graham

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Page 90  
MOE-2011-00154

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