



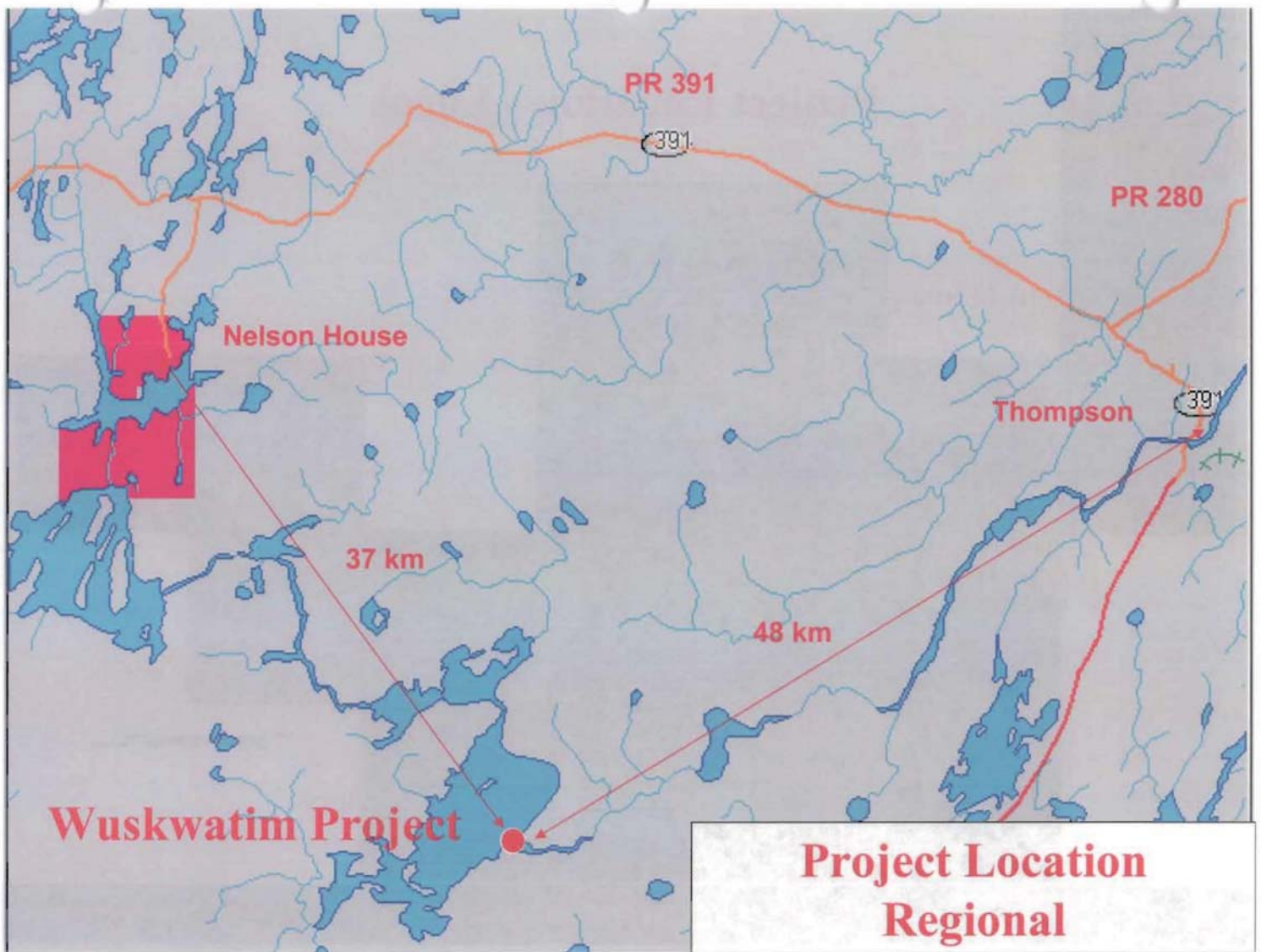
# Keeyask Generation Project

## Environmental Impact Statement

Supporting Volume  
Public Involvement

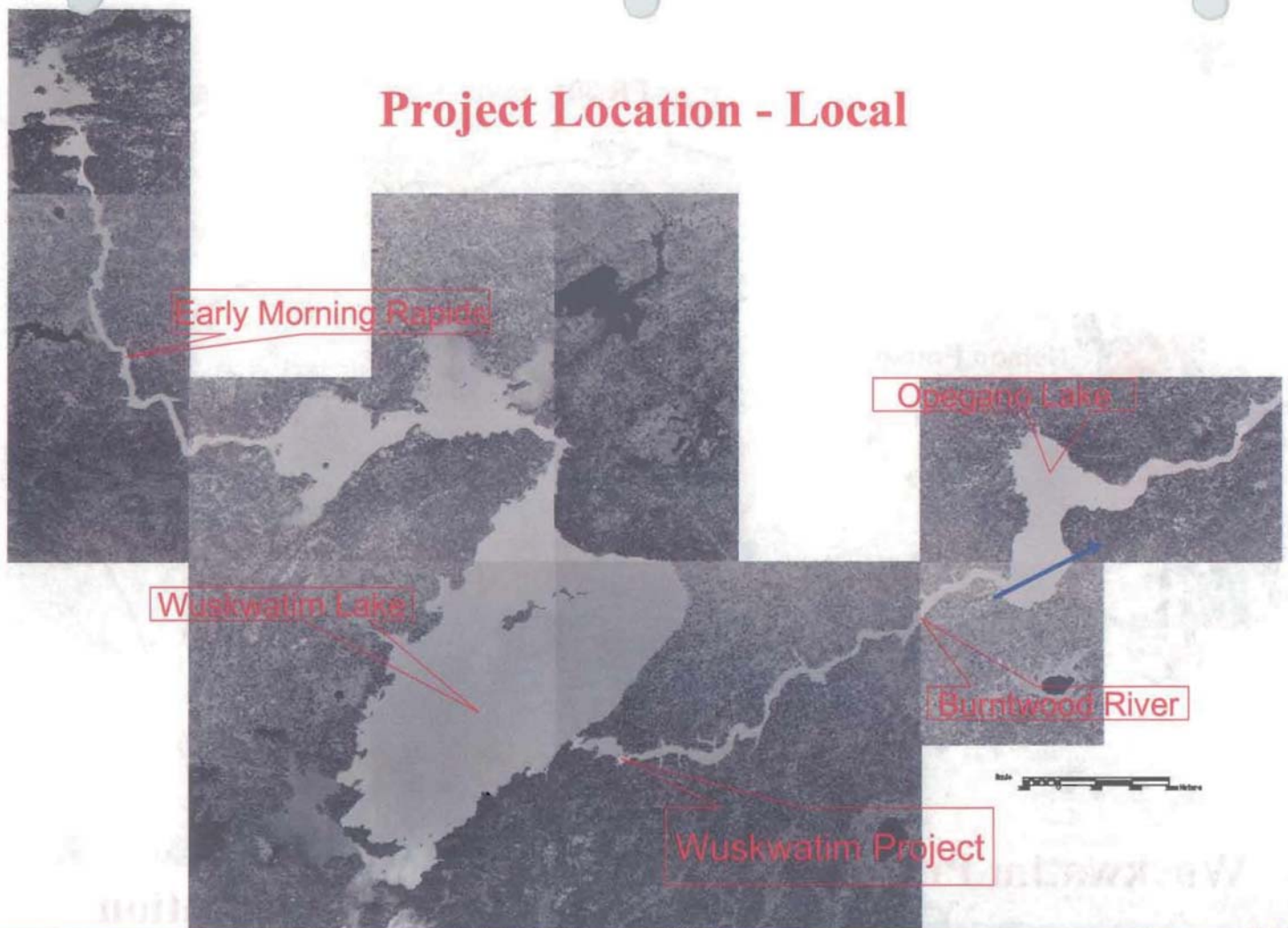


June 2012





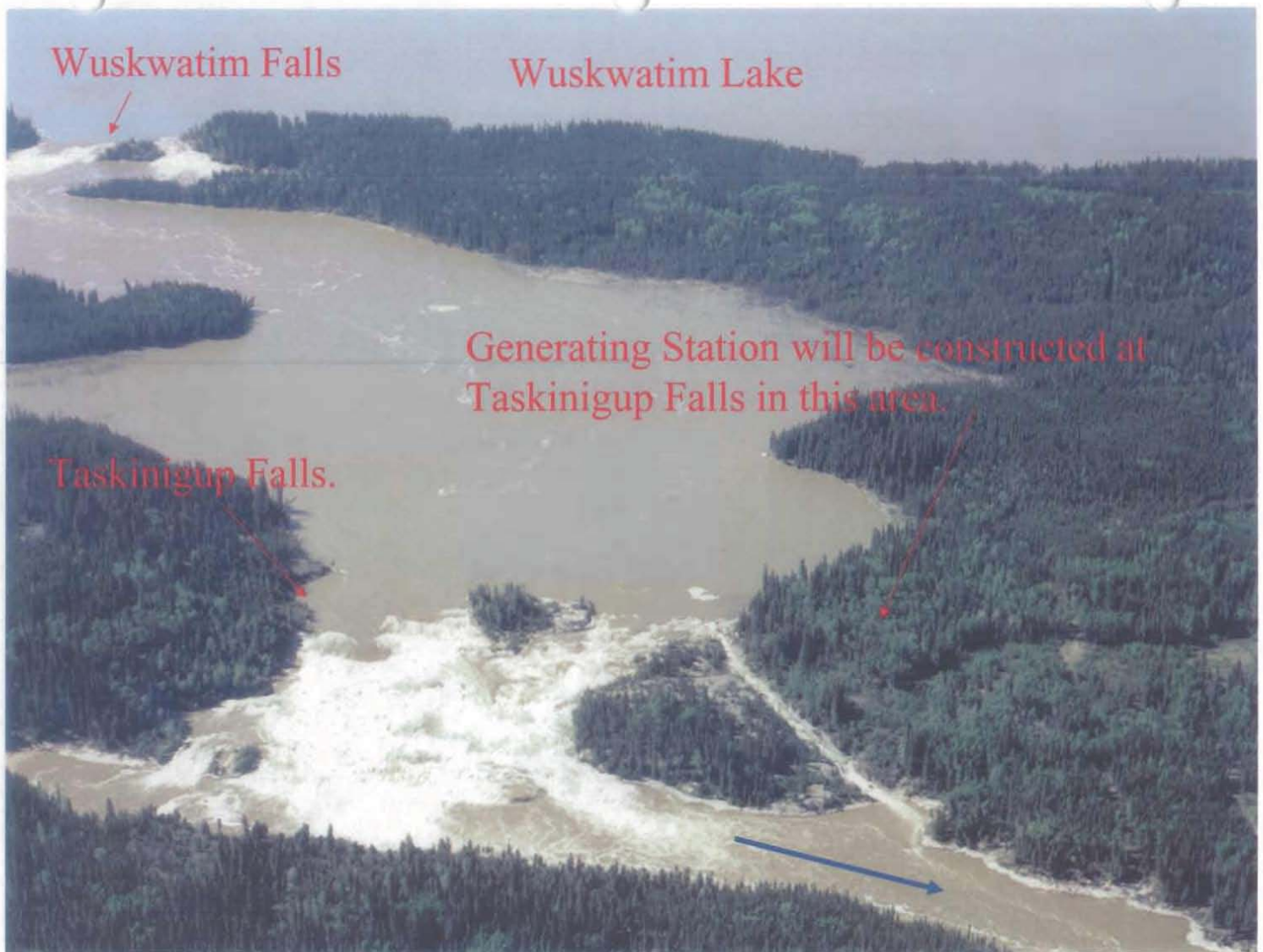
## Project Location - Local

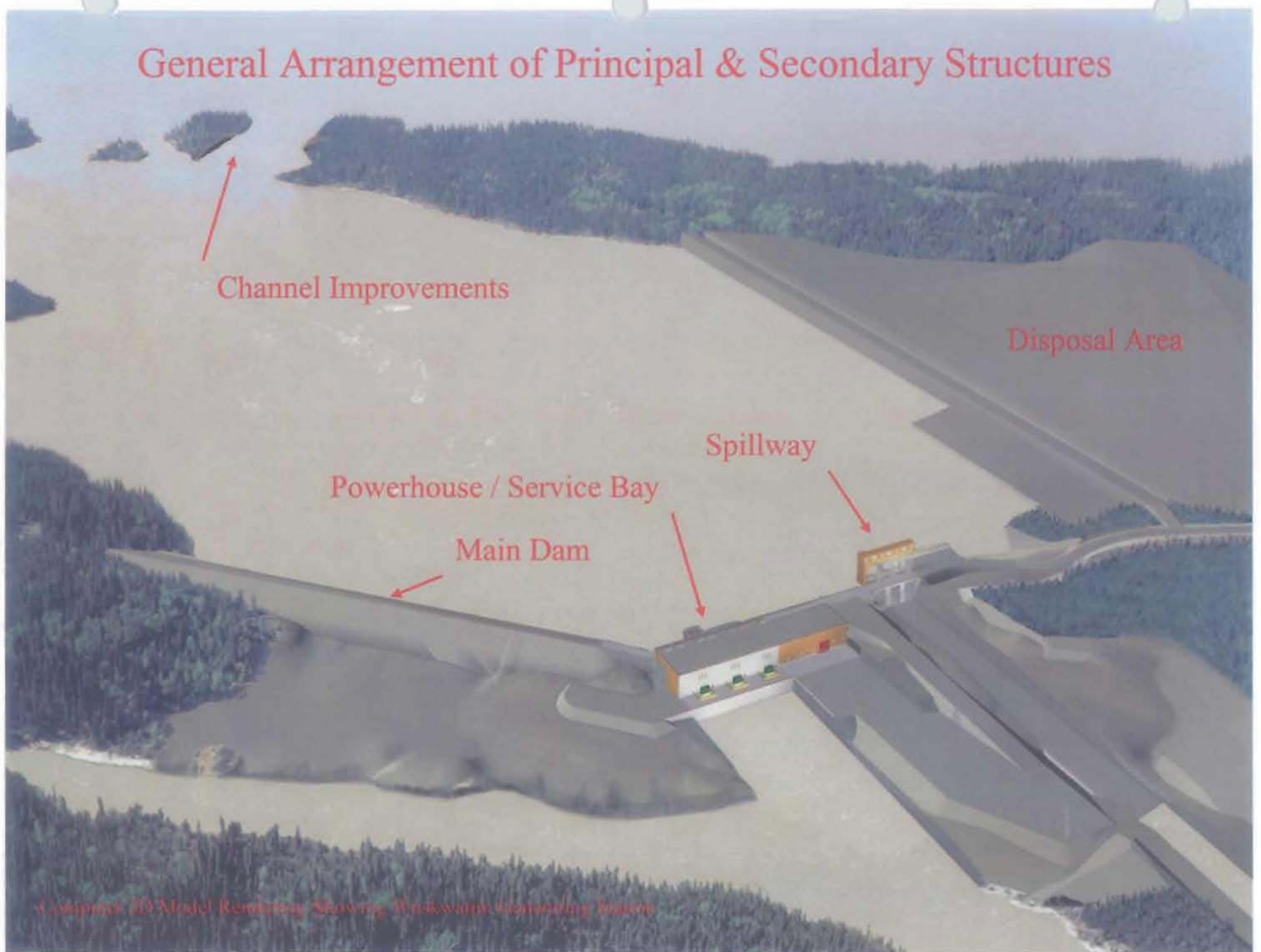


PCN Fresh (Aug 20, 02)

Project Overview

24



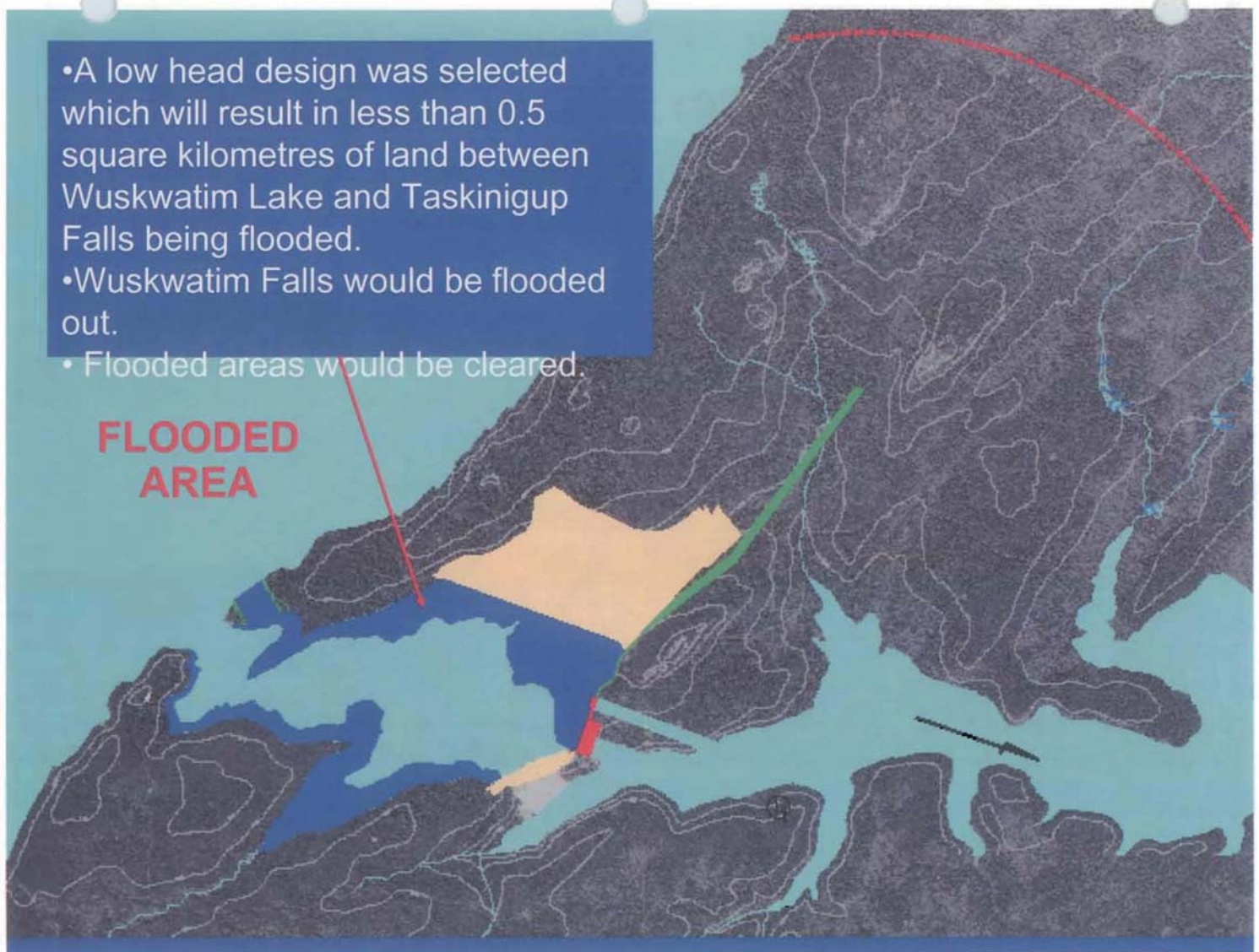




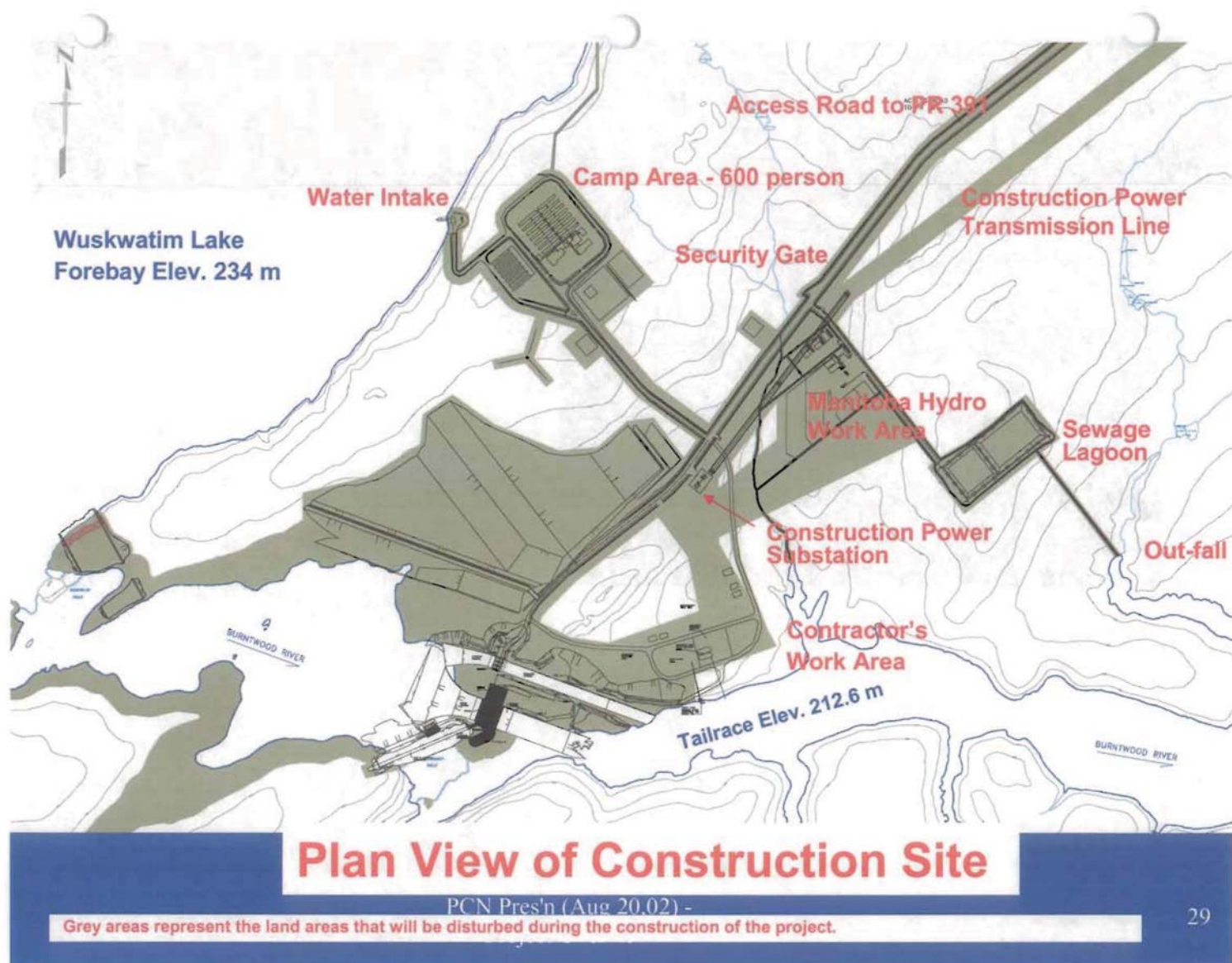
## Wuskwatim Project - Plant Parameters

• Forebay at elevation 234,0 m

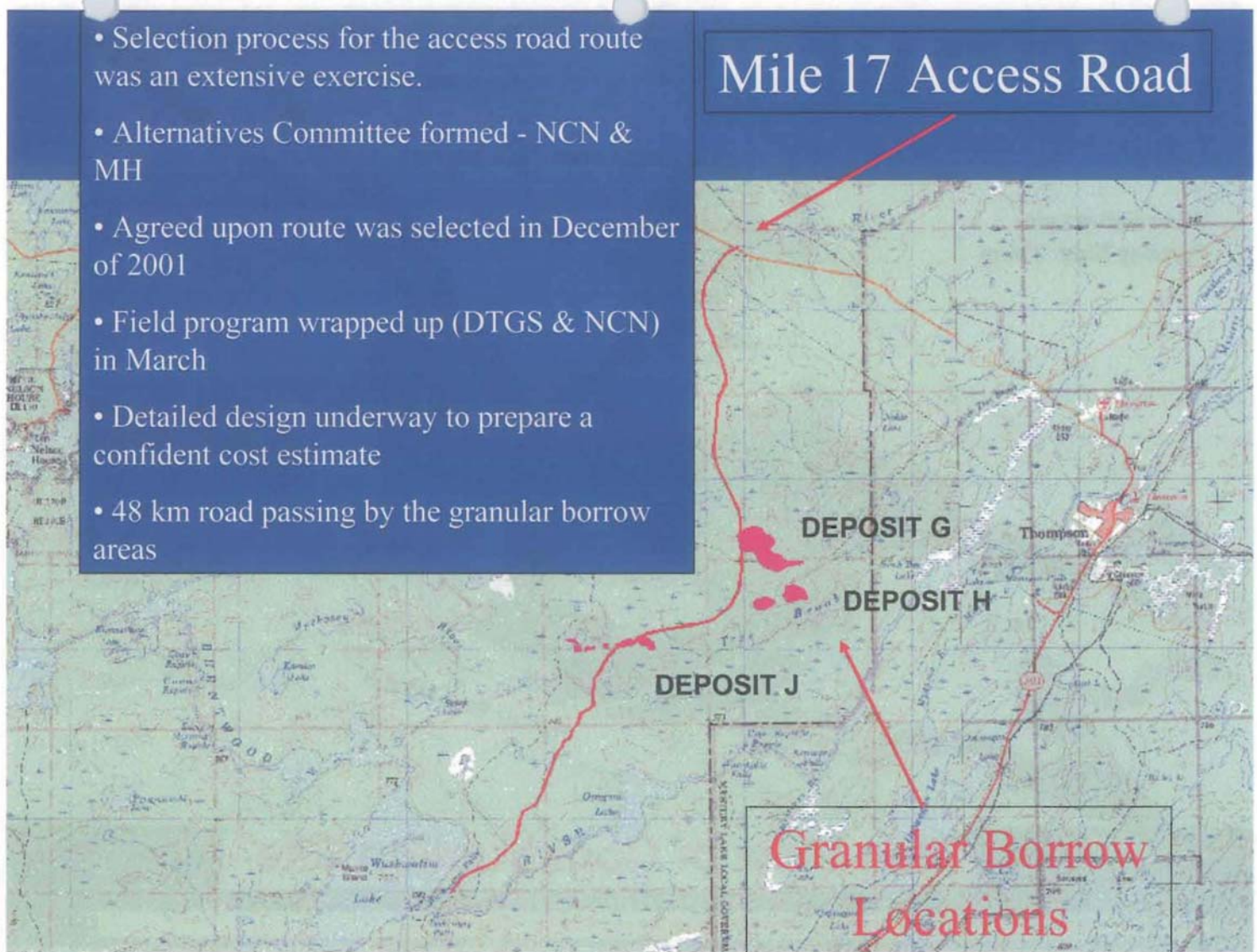
- Approximately 21-22 m of Hydraulic Head
- Rated Discharge of 1,100 cms (38, 850 cfs)
- Three Fixed Blade Vertical Shaft Turbines
- Produce about 200 MW of power (0.81 Capacity Factor)











## Part 2

- Wuskwatim Project Description
- **Construction Overview**
- How the Plant will be Operated

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Project Overview

31



## Construction Sequence

- Construction Summary Schedule
- span approximately 6 year period
- Announcement in December 2003
- First power in May 2009
- Last unit on line in late 2009

PCN Pres'n (Aug 20,02) -  
Project Overview

32

## Part 3

- Wuskwatim Project Description
- Construction Overview
- **How the Plant will be Operated**

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Project Overview

33



# How the Plant will be Operated

- Shaping Mode of Operation
  - Operating between the extremes of Base Loaded (Run-of-River) and Peaking
  - Generally Best Gate operation to efficiently pass flow while providing some capacity benefits
  - Daily balance of flow, F/B maximum at 234.0 m
  - Primarily an energy plant with some capacity benefits
  - Moderate downstream staging on a daily frequency
  - Capacity Factor (average/peak) = about 0.80

PCN Pres'n (Aug 20,02) -  
Project Overview

34

## Fundamental Design Assumption

- The design and planning for Wuskwatim assumes that the CRD will continue to operate as it is operated today.
- CRD will remain unchanged.
- Operation of CRD
  - “The primary purpose of the **CRD** is to divert water from the Churchill River to the Nelson River to supply the generating stations on the lower Nelson River. Natural inflows to the Rat, Footprint and Burntwood River system combine with the **CRD** regulated flows to move downstream along the Burntwood River towards Wuskwatim Lake and further downstream toward Split Lake. It is anticipated that the typical seasonal and monthly regulation pattern that has been experienced historically since the **CRD** was fully commissioned in September of 1977 will remain unaltered. Therefore, it is also anticipated by the **Parties** that the constraints imposed by the **CRD** 1973 Interim Water License, the Augmented Flow Program, the 1976 City of Thompson Agreement, the **NFA**, and the **1996 Implementation Agreement** will continue unaffected by the **Wuskwatim Project**.”

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Project Overview

35

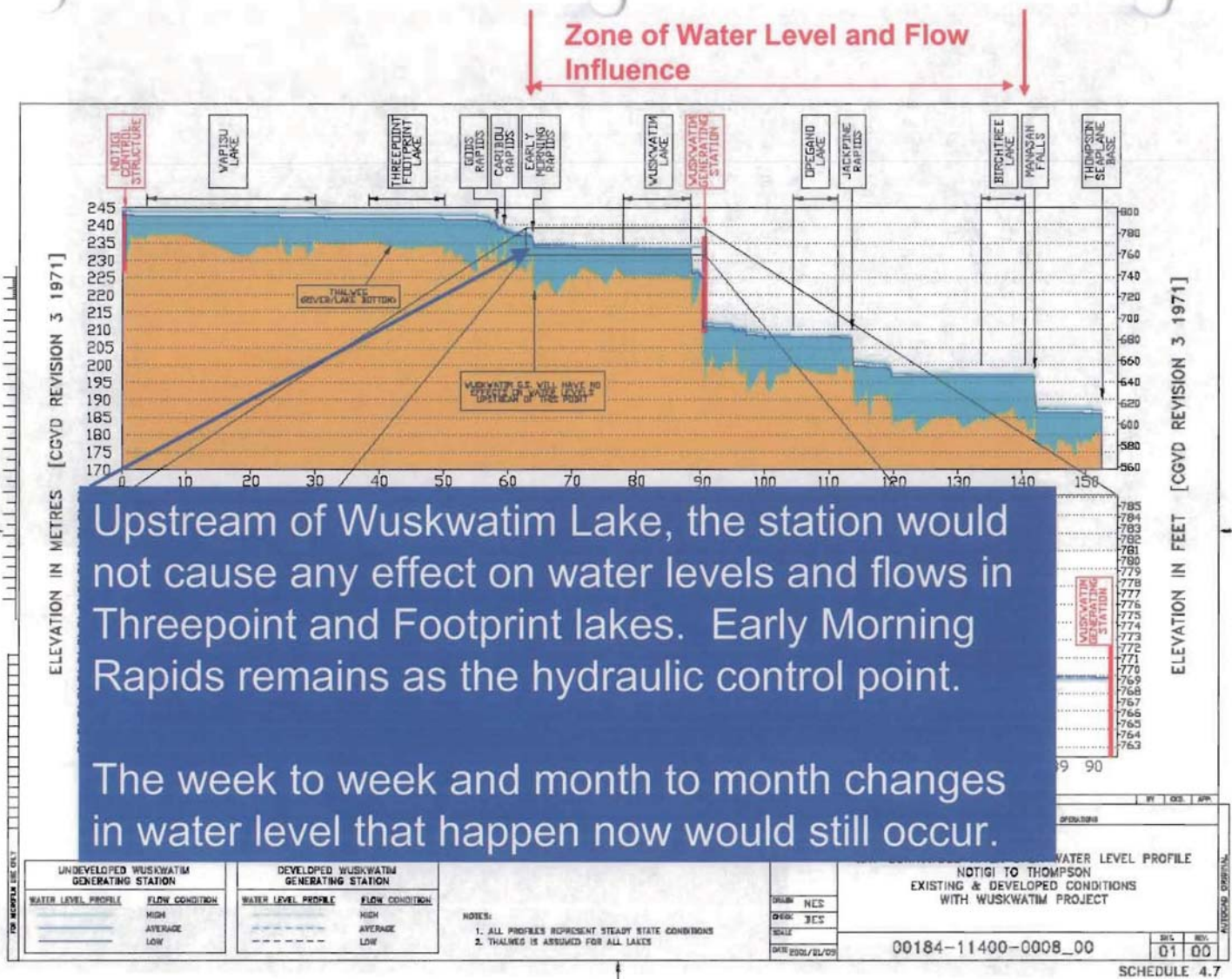


## Post Project Water Regime Estimates

- Preliminary estimates
  - Water levels and water level changes resulting from the operation of Wuskwatim GS were determined using a simple river routing model.
- Final estimates
  - Water levels and water level changes will be determined using a one dimensional hydro-dynamic backwater model (Hec Ras) that captures the attenuation & storage effects along the river not captured in the preliminary estimates.
  - A special ice process model (Ice Dyne) was used for winter conditions.
- Long term expected flows (85 years of monthly flows) were routed through the generating station using these models.
- A range of possible water levels and water level changes at various locations have been estimated for use in the environmental studies.
- The following slides summarize the preliminary results.
- The final estimates are currently under review.

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Project Overview

36



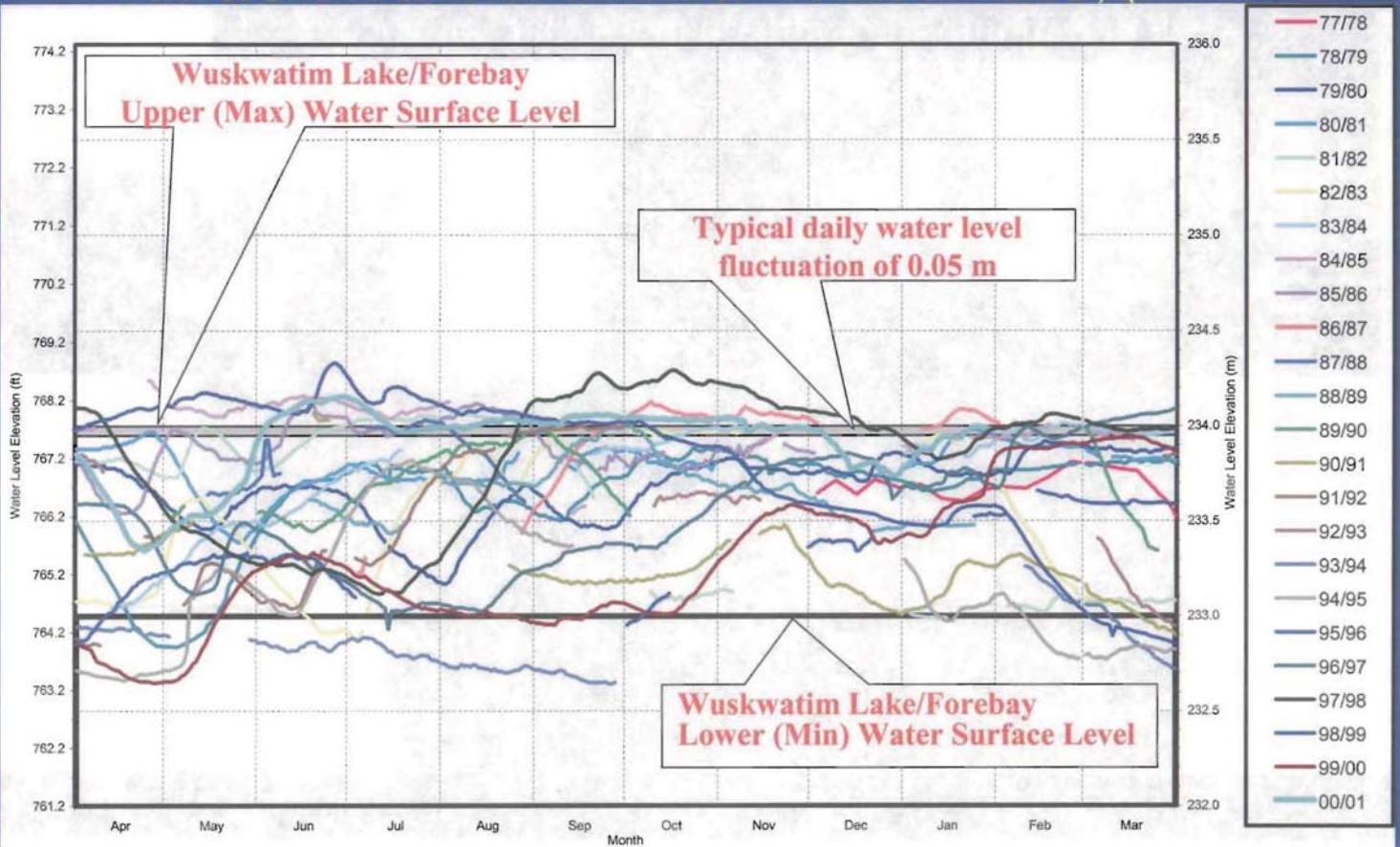


Water levels on Wuskwatim Lake would not go up and down like they have since CRD.

- The project will normally be operated such that the water level will be at or slightly below 234.0 m ASL
- The water level would remain near the upper end of the range seen in the last 25 years as shown in the following slide.
- The typical daily change in water level is about 0.05 m.
- For short term emergency purposes the water level may go down as low as 233.0 m . The “one” metre of storage would be drawn upon under emergency conditions most likely when water supplies are low in late winter.



# Wuskwatim Lake Water Regime





Downstream of the station, the planned plant operation would result in water level and flow changes within the day superimposed on the week to week and month to month changes that now occur.

Early Morning Rapids

Opeongo Lake

Wuskwatim Lake

Burntwood River

Wuskwatim Project

Scale 0 100 200 300 400 500 600 700 800 900 1000

PCN Fresh (Aug 20, 02)

Project Overview

40



The water levels immediately downstream of the station at the tailrace would go up and down within the day typically about 1.1 m (3.6 ft). The maximum change within the day would be 1.4 m (4.6 ft).

Early Morning Rapids

Opegnan Lake

Wuskwatim Lake

Burntwood River

Wuskwatim Project

Scale 0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400 2500 2600 2700 2800 2900 3000 3100 3200 3300 3400 3500 3600 3700 3800 3900 4000 4100 4200 4300 4400 4500 4600 4700 4800 4900 5000 5100 5200 5300 5400 5500 5600 5700 5800 5900 6000 6100 6200 6300 6400 6500 6600 6700 6800 6900 7000 7100 7200 7300 7400 7500 7600 7700 7800 7900 8000 8100 8200 8300 8400 8500 8600 8700 8800 8900 9000 9100 9200 9300 9400 9500 9600 9700 9800 9900 10000

PCN Presentation (Aug 20, 2012)

Project Overview

41

On Opegano Lake, the water level changes within the day would be less than at the tailrace. The average change would be around 0.1 m (4 inches), up to a maximum of 0.5 m (1.6 ft).

Early Morning Rapids

Opegano Lake

Wuskwatim Lake

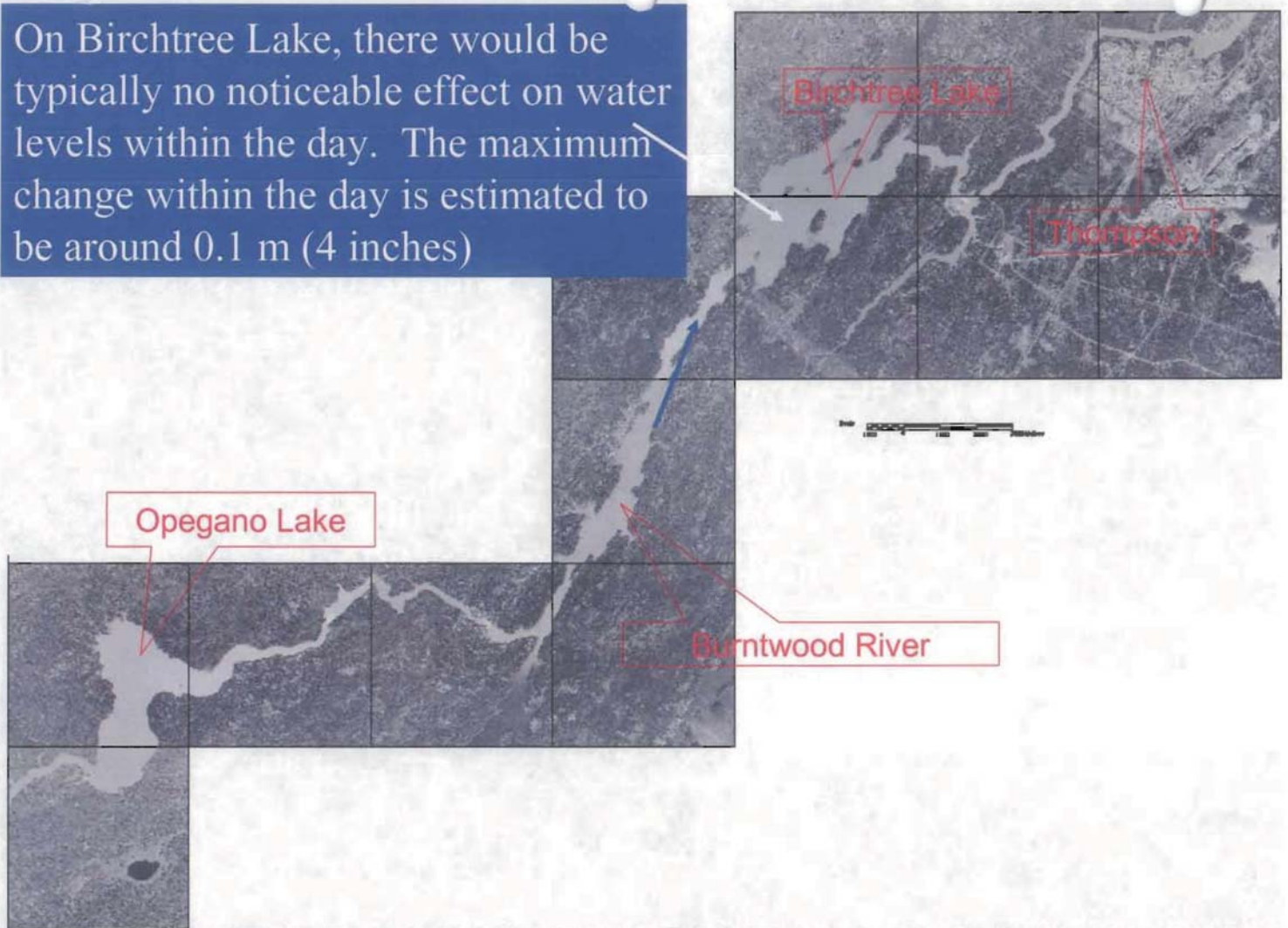
Burntwood River

Wuskwatim Project

Scale 0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400 2500 2600 2700 2800 2900 3000 3100 3200 3300 3400 3500 3600 3700 3800 3900 4000 4100 4200 4300 4400 4500 4600 4700 4800 4900 5000 5100 5200 5300 5400 5500 5600 5700 5800 5900 6000 6100 6200 6300 6400 6500 6600 6700 6800 6900 7000 7100 7200 7300 7400 7500 7600 7700 7800 7900 8000 8100 8200 8300 8400 8500 8600 8700 8800 8900 9000 9100 9200 9300 9400 9500 9600 9700 9800 9900 10000 10100 10200 10300 10400 10500 10600 10700 10800 10900 11000 11100 11200 11300 11400 11500 11600 11700 11800 11900 12000 12100 12200 12300 12400 12500 12600 12700 12800 12900 13000 13100 13200 13300 13400 13500 13600 13700 13800 13900 14000 14100 14200 14300 14400 14500 14600 14700 14800 14900 15000 15100 15200 15300 15400 15500 15600 15700 15800 15900 16000 16100 16200 16300 16400 16500 16600 16700 16800 16900 17000 17100 17200 17300 17400 17500 17600 17700 17800 17900 18000 18100 18200 18300 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On Birchtree Lake, there would be typically no noticeable effect on water levels within the day. The maximum change within the day is estimated to be around 0.1 m (4 inches)



Project Overview



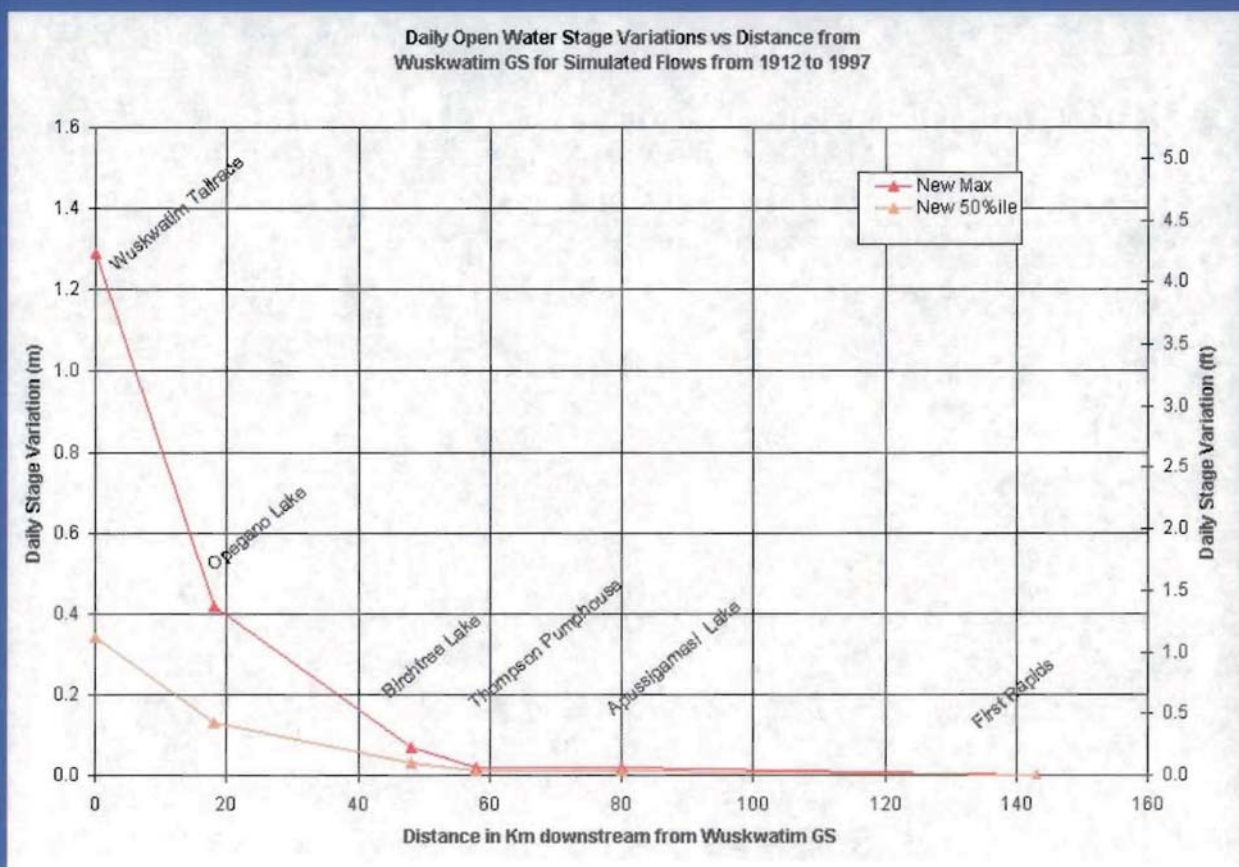
## Water Regime

- Downstream of the generating station, the week to week and month to month changes in water level that happen now would still occur.
- The operation of Wuskwatim will not change the way CRD is currently operated because the CRD is intended to feed the lower Nelson Plants.
- The water level and flow effects resulting from the daily operation at Wuskwatim G.S. are diminished as they reach Birchtree Lake.

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Project Overview

44

# Summary of Daily Stage Variations



## Wrap Up

- The normal operation of Wuskwatim projects will not affect any water levels or flows downstream of Birchtree Lake.
- The CRD will continue to operate as it is today.

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Project Overview

46

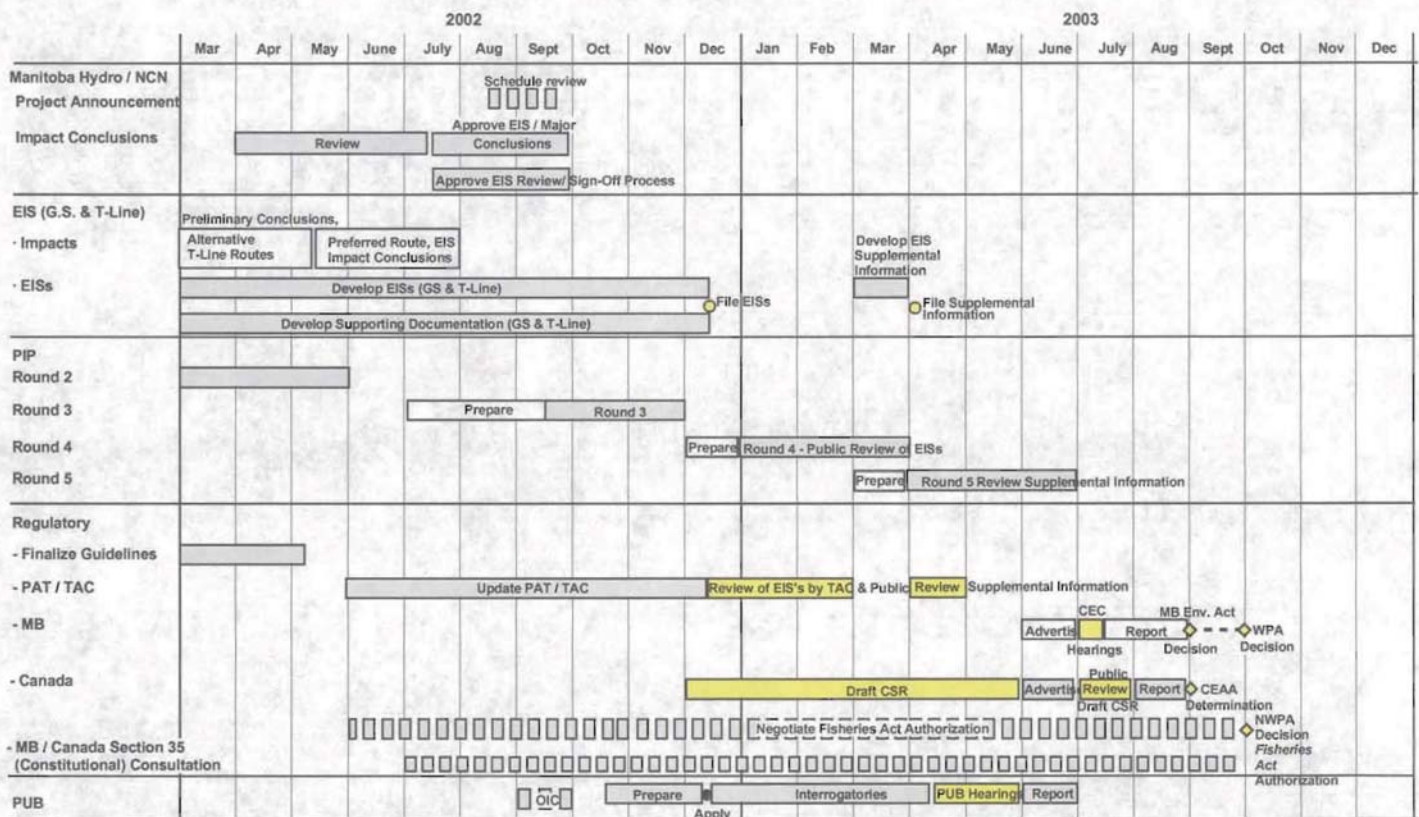


## Additional Presentations

- Status of biophysical studies
- Status of socio-economic studies
- Status of transmission line studies
- Status of Public Involvement Program (PIP)

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Project Overview

47



**DRAFT FOR DISCUSSION**

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Project Overview

**Timetable: Wuskwatim G.S. & T-Line EIS Process**

## Next Step re: Consultation

- Arrange for presentation to community of Cross Lake

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Project Overview

49



## ***Pre-Project Training Initiative***

# **Proposed Future Development Plans in Manitoba**

**Training and Employment Opportunities for PCN/CLFN**



December 15, 2003

Potential New  
Generation

Generating Stations:

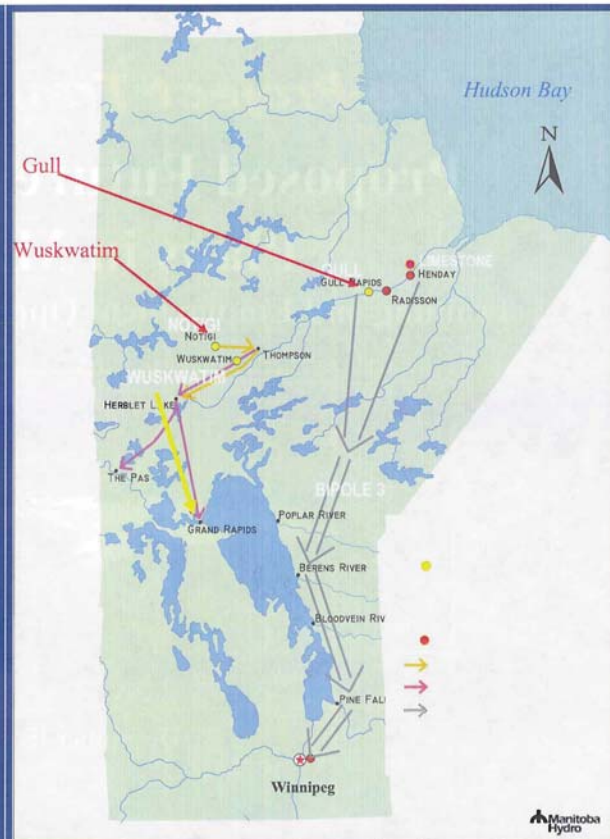
**WUSKWATIM**

**GULL (KEEYASK)**

Related Transmission

**AC**

**Bipole 3**





## Hydro Construction: Major Opportunities

- ⌘ \$4.0 billion in construction
- ⌘ \$2.0B contribution to national GDP
- ⌘ 700 jobs peak at Wuskwatim; 1,800 peak at Gull
- ⌘ Preferential employment provisions for Northern Aboriginal residents
- ⌘ Long-term capacity building:
  - ▢ Aboriginal community/economic development
  - ▢ Northern regional education/training delivery

## Pre-Project Training: Objectives

- ⌘ Ready Northern Aboriginal residents for employment on construction projects
- ⌘ Ensure residents are qualified to compete successfully for skilled construction jobs
- ⌘ Train and place up to 800 Northern Aboriginal residents in Hydro related jobs
- ⌘ Lever Hydro opportunities for long-term capacity building



## Pre-Project Training: Key Activities

### ⌘ Technical/Trades Training

#### ☒ Designated Trades

- ☒ carpenters,  
electricians, iron  
workers,  
plumbers/pipefitters,  
millwrights

#### ☒ Non-designated Trades

- ☒ heavy equipment  
operator, teamster

#### ☒ Construction Supports

- ☒ labourer, catering,  
security



## Pre-Project Training: Delivery Model

### ⌘ Training Preparation Model

- ☒ assessment/employment  
plan
- ☒ life skills; upgrading

### ⌘ Training Delivery Model

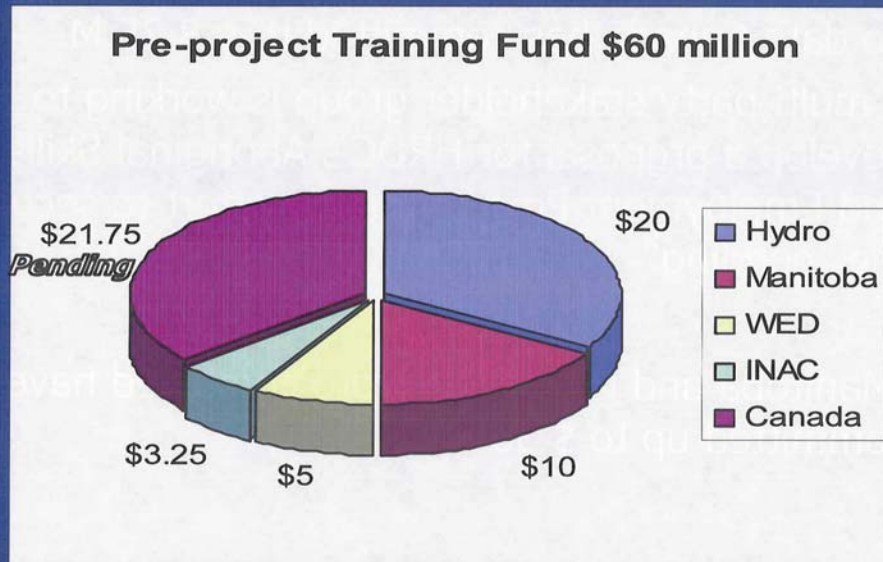
- ☒ tech/trades training; on  
the job training

### ⌘ Training Supports

- ☒ training allowances; child  
care; retention



## Pre-Project Training: Financial Contributions



## CANADA

- ⌘ To date Canada has committed to \$ 8.25 M
- ⌘ A multi-party stakeholder group is working to develop a proposal for HRDC's Aboriginal Skills and Employment Program in an effort to secure the "pending" \$ 21.75 M
- ⌘ Manitoba and Manitoba Hydro combined have committed up to \$ 30 M

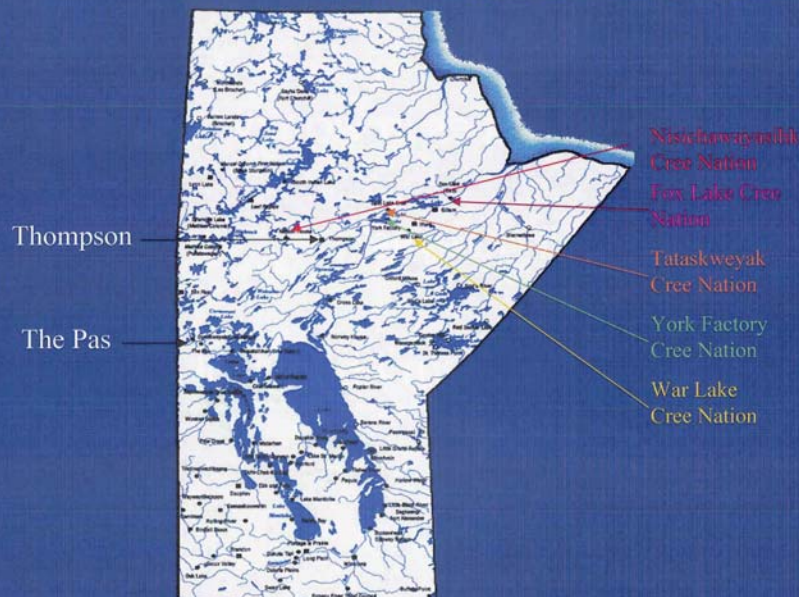


## Pre-Project Training: Notional Financial Allocations

⌘ \$45.0M - “communities in vicinity” \$11.25M for Wuskwatim  
\$33.75M for Gull (Keeyask)

⌘ \$15.0M - other Northern Aboriginal residents

## “Communities In-Vicinity”





## Northern Aboriginal Training: Overview

- ⌘ Other northern Aboriginal - \$15m fund
- ⌘ Third party delivery arrangements
- ⌘ Distributed/Community-based approach
- ⌘ Foundation skills in community
- ⌘ Skills training centrally
- ⌘ May be administered by MKO, MMF and/or MAET

## Northern Aboriginal Training: Proposed Program



- ⌘ Key Priority Areas
  - ☑ Northern Aboriginal Residents
  - ☑ Women in Trades
  - ☑ Youth
  - ☑ Apprenticeship TQ and Training



## Fostering Success:

### ⌘ Focus on “Communities In Vicinity”

- ☒ Increased recruitment and retention when employees reside in the vicinity
- ☒ Increased potential for success of residents
  - ☒ alleviate need to leave home community
  - ☒ decreased sense of isolation
  - ☒ increased availability of cultural and community supports

## Building Community Capacity:

### ⌘ Focus on “Community-based Training”

- ☒ Increased acceptance of training programs that are developed by the community
- ☒ Increased accessibility
- ☒ Opportunity to utilize/build community infrastructure
- ☒ Strong representation from Aboriginal communities that community-based training is the best approach



## Potential In-Service Dates



## Typical Generating Station Construction Employment

- ⌘ Lasts approximately 5 years
- ⌘ Seasonal activity, mainly summer from May to October
- ⌘ Job opportunities during construction
- ⌘ Jobs typically last 1 to 4 seasons
- ⌘ Level of employment highly variable

## **\*Designated Trades**

- ⌘ Carpenters
- ⌘ Electricians
- ⌘ Iron Workers
- ⌘ Millwrights
- ⌘ Plumbers/Pipefitters
- ⌘ Heavy Duty Mechanic

⌘

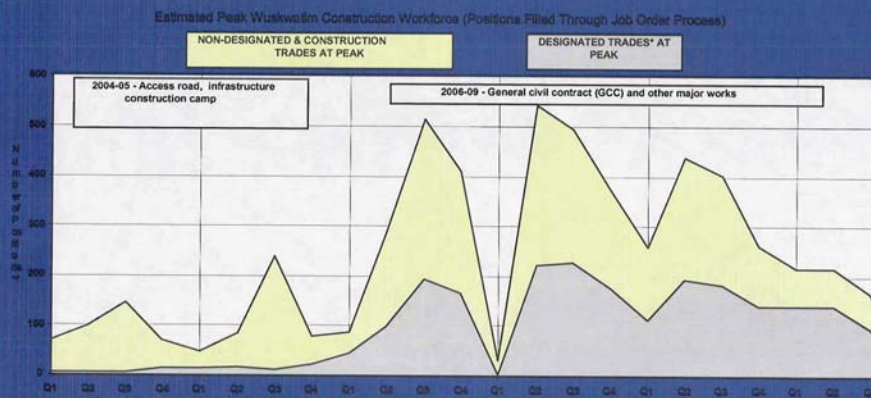
⌘ \*4- 6 years of training and on the job experience is required

## **\*Non-Designated Trades and Construction Support**

- ⌘ Clerical
  - ⌘ Catering
  - ⌘ Equipment Operator
  - ⌘ Labourer
  - ⌘ Security
  - ⌘ Servicemen
  - ⌘ Teamster
- ⌘ \* 0-2 years of training and on the job experience is required



## Timing of Demand for Non-indentured Trades/Construction Support and Indentured Trades - Wuskwatim Generating Station



## WUSKWATIM Preliminary Estimates Contractors Construction Workers Years 3-6 Peak Workforce Range

### ⌘ Designated Trades

☑ Mechanic	2-4
☑ Carpenter	75-160
☑ Millwright	15-30
☑ Iron Worker	25-45
☑ Sheet Metal Worker	0-4
☑ Pipe Fitter	10-28
☑ Plumber	0-1
☑ Electrician	35-85
☑ Glazier	0-1
☑ Painter	0-1
☑ Roofer	1-2
☑ Tile Layer	0-2
☑ Insulation Mechanic	1-2
☑ Grouter	1-2
☑ Tradesman	0-0



## WUSKWATIM Preliminary Estimates Contractors Construction Workers Year 3-6 Peak Workforce Range

### ⌘ Non-Designated Trades

☒ Labourer	50-100
☒ Driller/Blaster	2-15 (40 in year 2)
☒ Equipment Operator	15-30 (30 to 50 year 1 and 2)
☒ Teamster	15-25 (15 to 47 years 1 and 2)
☒ Servicemen	2-3
☒ Rebar Worker	20-45
☒ Cement Mason	20-30
☒ Utilityman/Groundman	0-0
☒ Lineman	0-0

## WUSKWATIM Preliminary Estimates Contractors Construction Workers Year 3-6 Peak Workforce Range

### ⌘ Construction Support

☒ Technical	8-16
☒ Clerical	10-15
☒ Catering	30-50
☒ Security	4-6

- ☒ Total Workforce Estimate (# of positions at peak) 341-703
- ☒ Positions will not occur simultaneously, actual workforce at any given time will lower.

## **GULL Estimates Contractors Construction Workers Years 5-9 Peak Workforce Range**

### ⌘ Designated Trades

☒ Mechanic	11-21
☒ Carpenter	80-450
☒ Millwright	6 - 37
☒ Iron Worker	25-45
☒ Sheet Metal Worker	0-5
☒ Pipe Fitter	1-21
☒ Plumber	0
☒ Electrician	50-60
☒ Glazier	1
☒ Painter	0
☒ Roofer	1
☒ Tile Layer	0
☒ Insulation Mechanic	0
☒ Grouter	1-3
☒ Tradesman	0

## **GULL Preliminary Estimates Contractors Construction Workers Years 5-9 Peak Workforce Range**

### ⌘ Non Designated Trades

☒ Labourer	60-230
☒ Driller/Blaster	4- 20
☒ Equipment Operator	50-80
☒ Teamster	30-50
☒ Serviceman	4- 6 (year 4 only)
☒ Rebar Worker	65-130
☒ Cement Mason	35-70
☒ Utilityman/Groundman	0
☒ Lineman	0



### **GULL Preliminary Estimates Contractors Construction Workers Years 5-9 Peak Workforce Range**

#### ⌘ Construction Support

⌘ Technical	25-55
⌘ Clerical	10-15
⌘ Catering	45-80
⌘ Security	6-12

⌘ Total Workforce Estimate (# of positions at peak) 508-1392

⌘ Positions will not occur simultaneously, actual workforce at any given time will be lower.

### **Many Challenges in Achieving High Participation Include:**

- ⌘ Clarifying pre-employment training needs
- ⌘ Developing effective pre-employment training programs
- ⌘ Communicating training and job opportunities to residents
- ⌘ Translating training into project employment
- ⌘ Gaining support for hiring preferences
- ⌘ Developing effective referral and job retention programs

## Pre-Project Training

