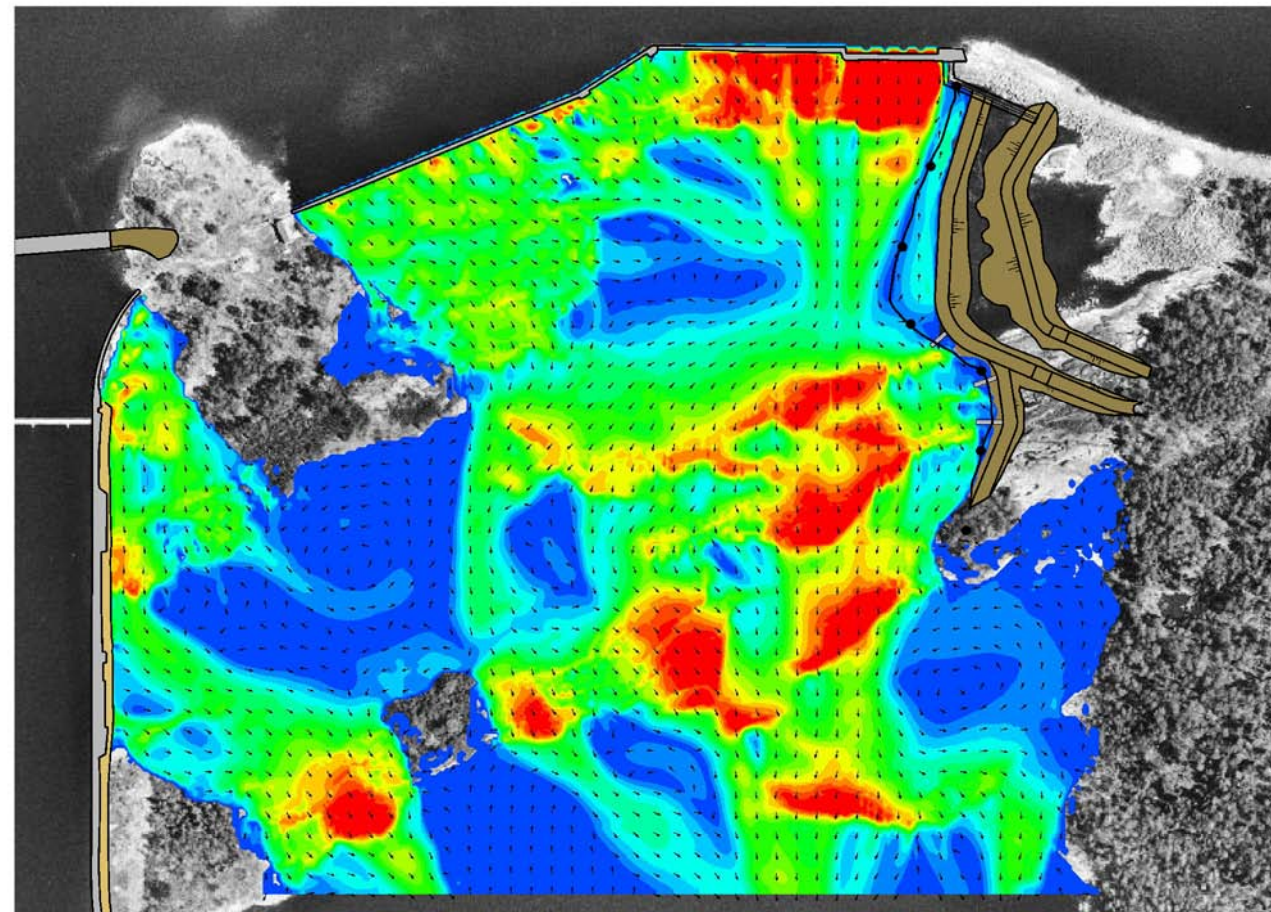


Depth Averaged Velocities  
Existing Environment  
50 Year Annual Peak Flow



Depth Averaged Velocities  
Downstream Cofferdam with Extension  
Under Construction Design Flood Conditions

Note:  
Figure represents Stage 1 - Phase 2 construction  
as described in Project Description Section 3.3.2



Coordinate System: UTM Zone 14N

N.T.S.

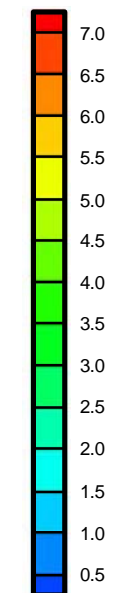
DATA SOURCE:  
Manitoba Hydro, KGS Acres

DATE CREATED: 30 MAY 2011  
CREATED BY: Water Resources Engineering

REVISION NO: VERSION 1.0  
REVISION DATE: 07 JUN 2011  
QA/QC: KMS / MWZ

**Legend**

Velocity [m/s]



Flow Conditions:

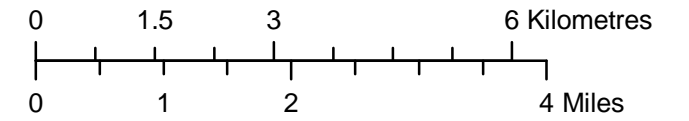
50 Year Annual Peak Flow  
Total Flow = 2610 m<sup>3</sup>/s  
Total Powerhouse Flow = 0 m<sup>3</sup>/s  
Total Spillway Flow = 2610 m<sup>3</sup>/s  
Forebay Water Level = 299.1 m  
Tailwater Level = 285.90 m  
Spillway Operation = Bays 121-133, 101-114, 1-65  
Sluiceway = 1-5

**Pointe du Bois  
Spillway Replacement Project**

Existing and Stage 1 Construction  
Water Velocities

Figure:  
8.1

Coordinate System: UTM Zone 14N



DATA SOURCE:  
Manitoba Hydro

DATE CREATED:  
24 DEC 2010

CREATED BY:  
Water Resources Engineering

REVISION NO:  
VERSION 1.0

REVISION DATE:  
06 JUN 2011

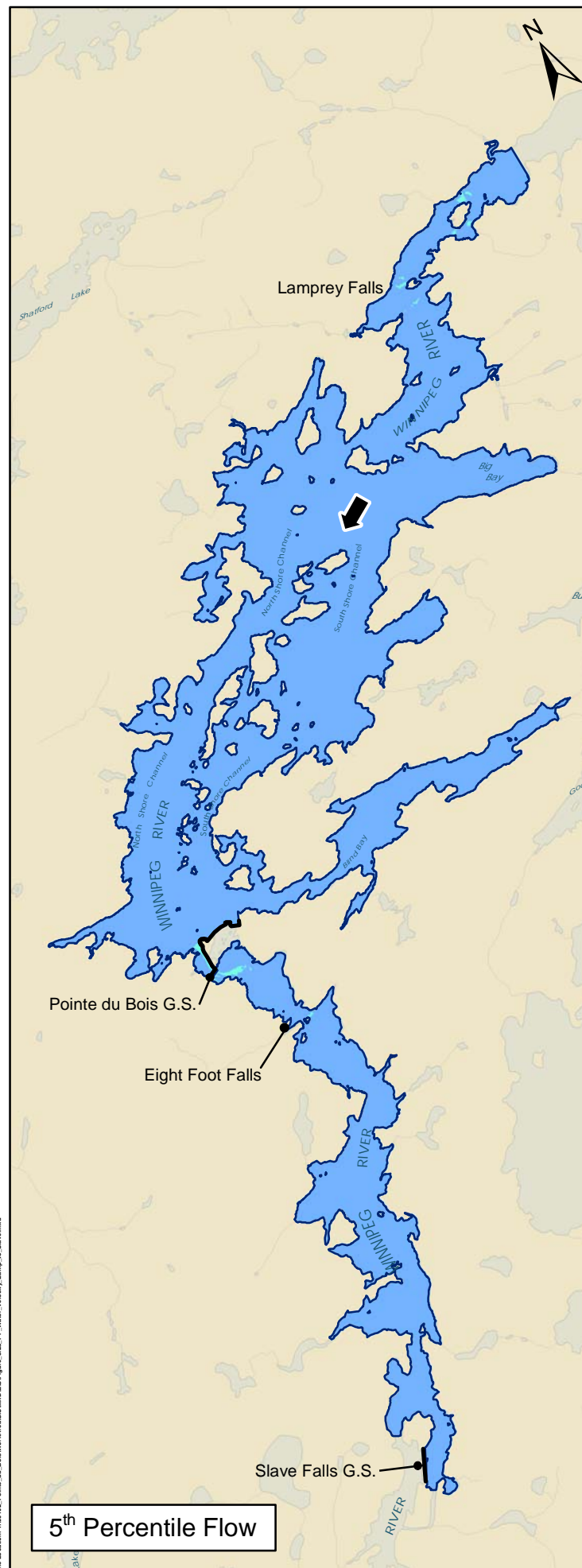
QA/QC:  
KMS / MWZ

### Legend

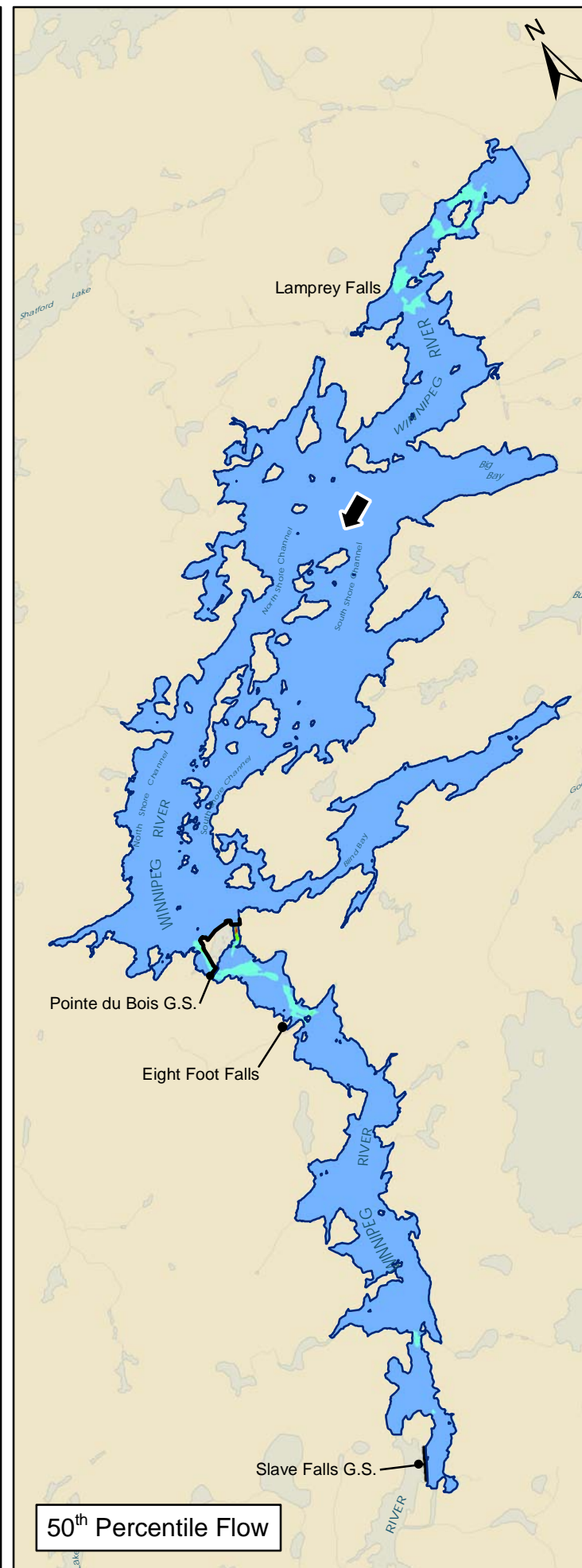
#### Velocity [m/s]

- 0 - 0.5
- 0.5 - 1.5
- 1.5 - 3
- 3 - 5
- Greater than 5

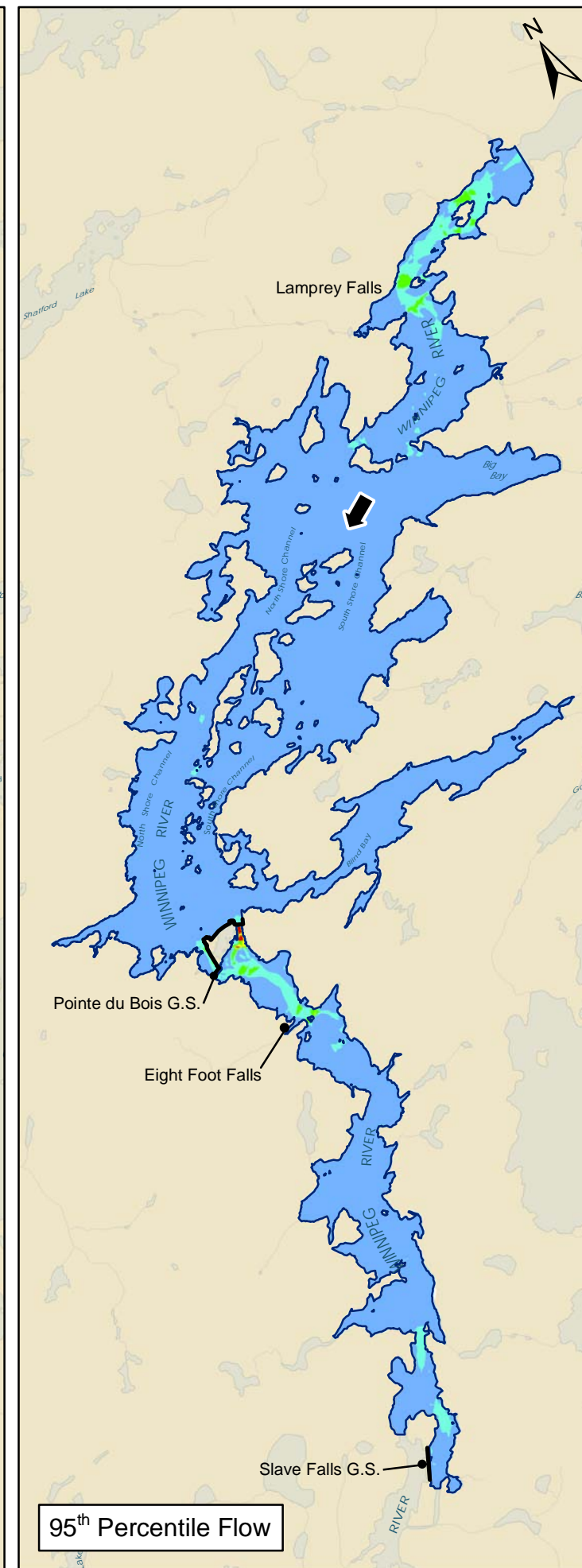
- Direction of Flow
- Generating Station (G.S.)



5<sup>th</sup> Percentile Flow



50<sup>th</sup> Percentile Flow



95<sup>th</sup> Percentile Flow

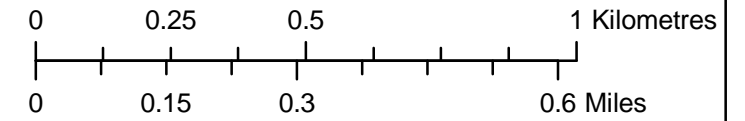
## Pointe du Bois Spillway Replacement Project

Stage 2 Diversion and Post Project  
Water Velocity Lamprey Falls to Slave Falls G.S.

Figure:  
8.2A

File Location: T:\0102\_Points du Bois\Water\Map\GIS\Map\Figure\_8.2A\_PP\_Water\_Velocity\_Lamprey\_to\_Slave.mxd

Coordinate System: UTM Zone 14N



DATA SOURCE:  
Manitoba Hydro

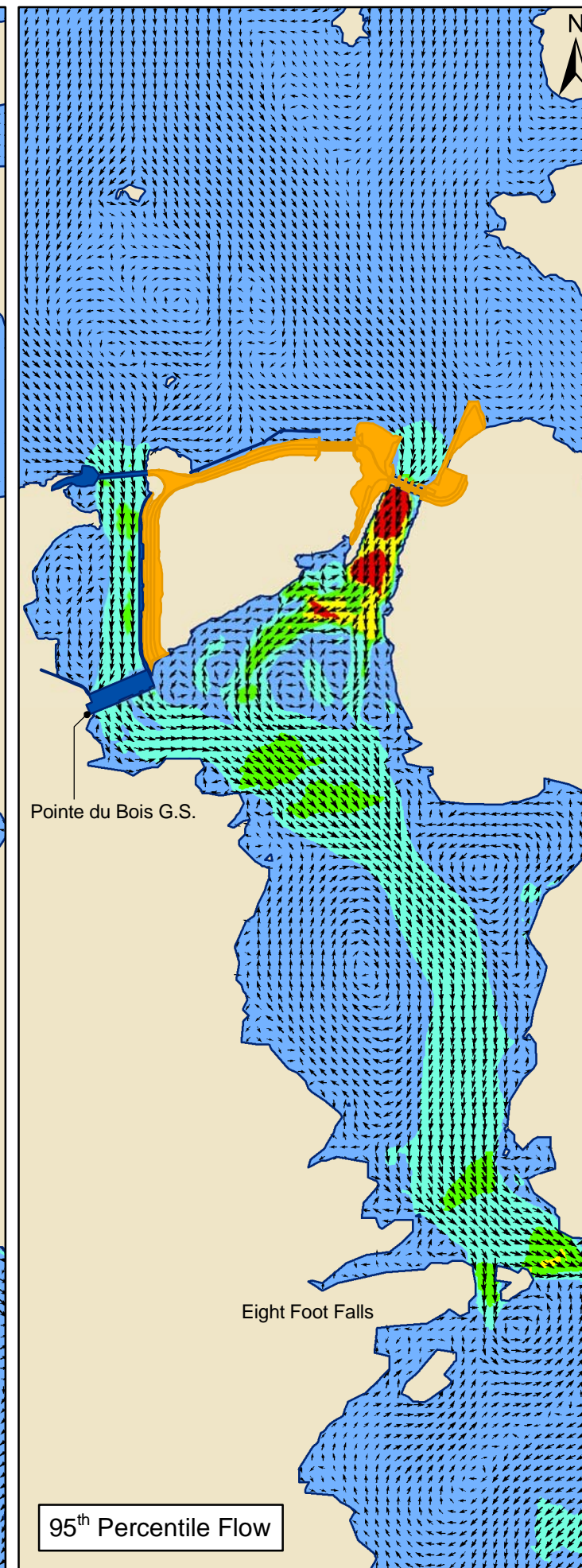
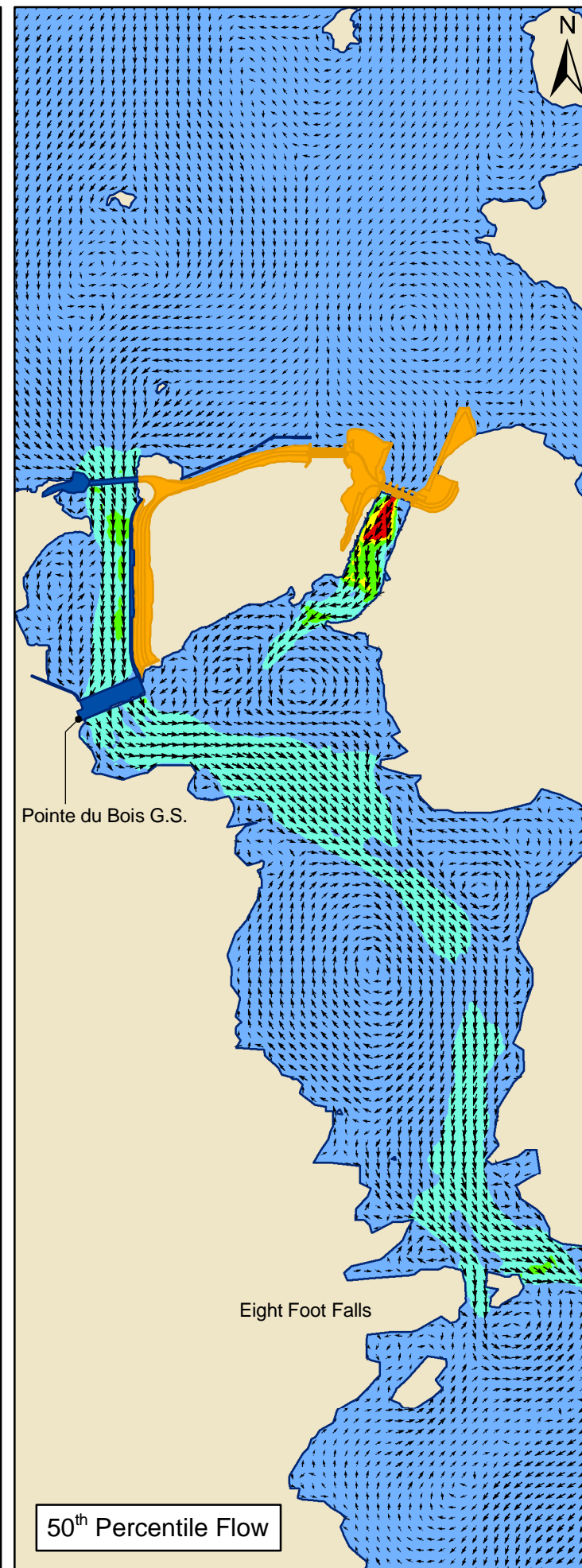
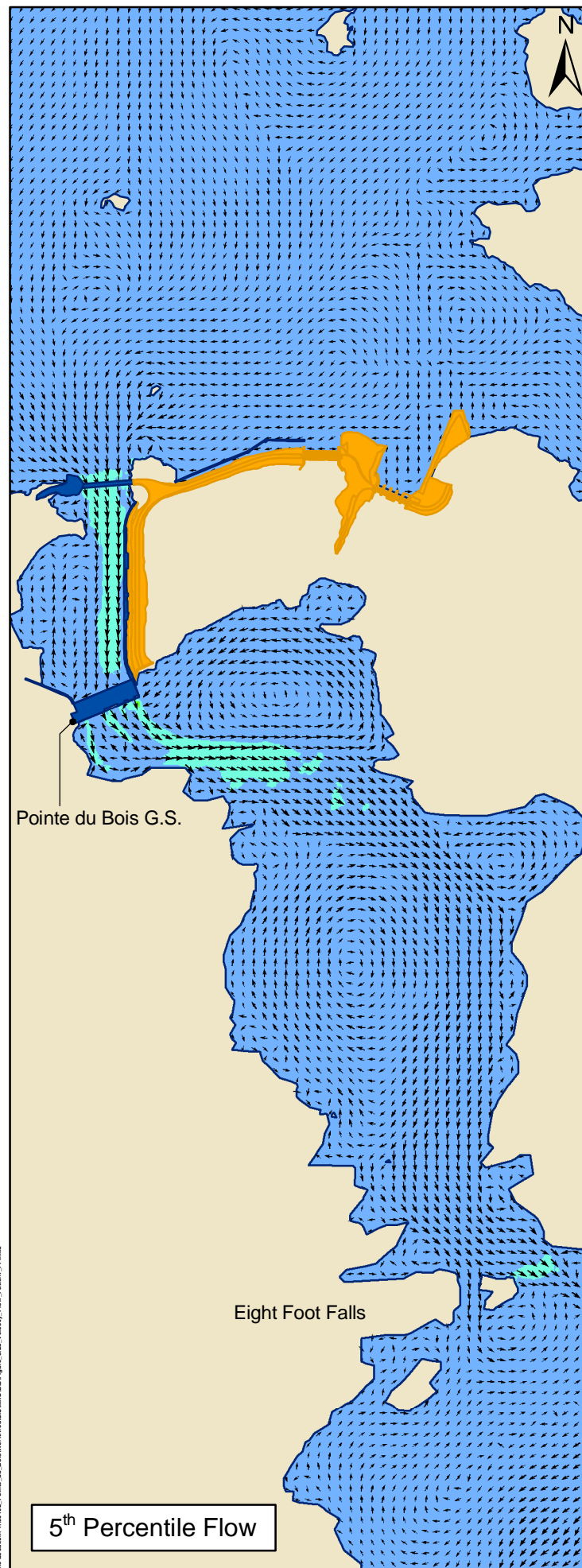
DATE CREATED: 24 DEC 2010	CREATED BY: Water Resources Engineering
REVISION NO: VERSION 1.0	QA/QC: KMS / MWZ

### Legend

#### Velocity [m/s]

- 0 - 0.5
- 0.5 - 1.5
- 1.5 - 3
- 3 - 5
- Greater than 5

Velocity Vectors NTS  
Generating Station (G.S.)

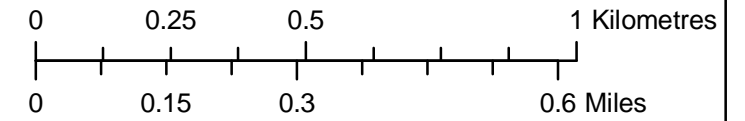


## Pointe du Bois Spillway Replacement Project

Stage 2 Diversion and Post Project  
Water Velocity and Flow Patterns

Figure:  
8.2B

Coordinate System: UTM Zone 14N



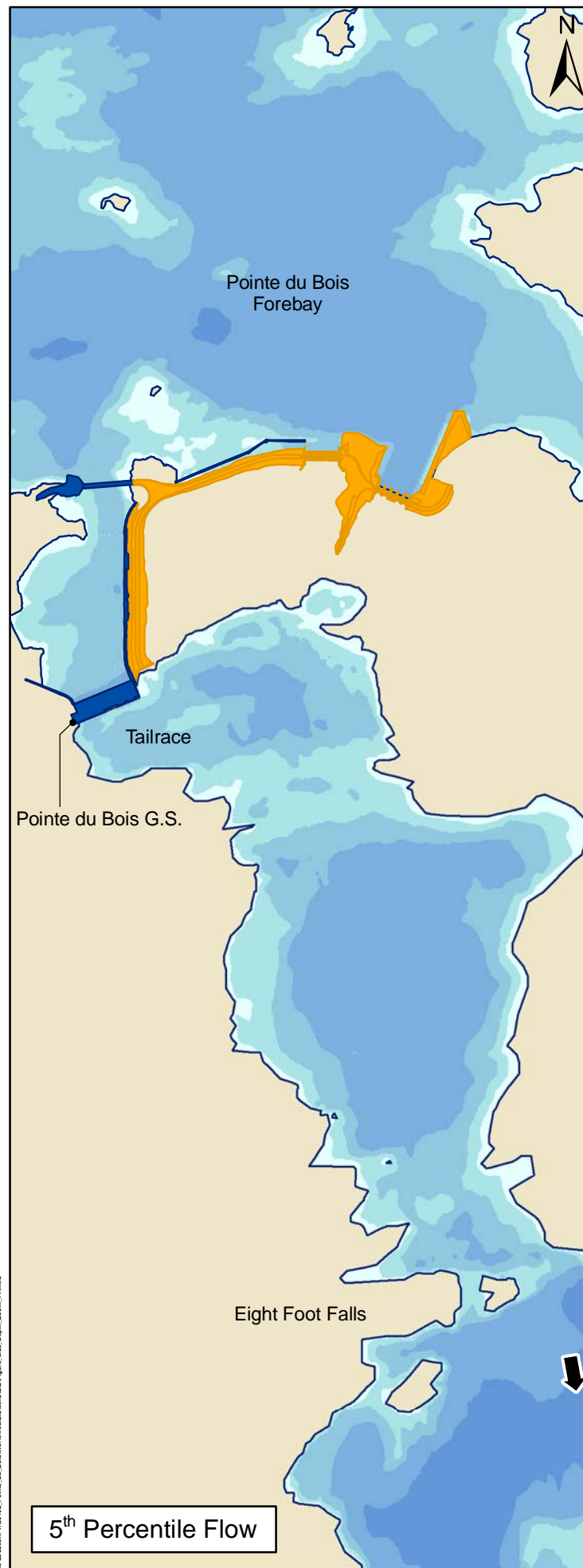
DATA SOURCE:  
Manitoba Hydro

DATE CREATED: 29 DEC 2010	CREATED BY: Water Resources Engineering
REVISION NO: VERSION 1.0	QA/QC: KMS / MWZ

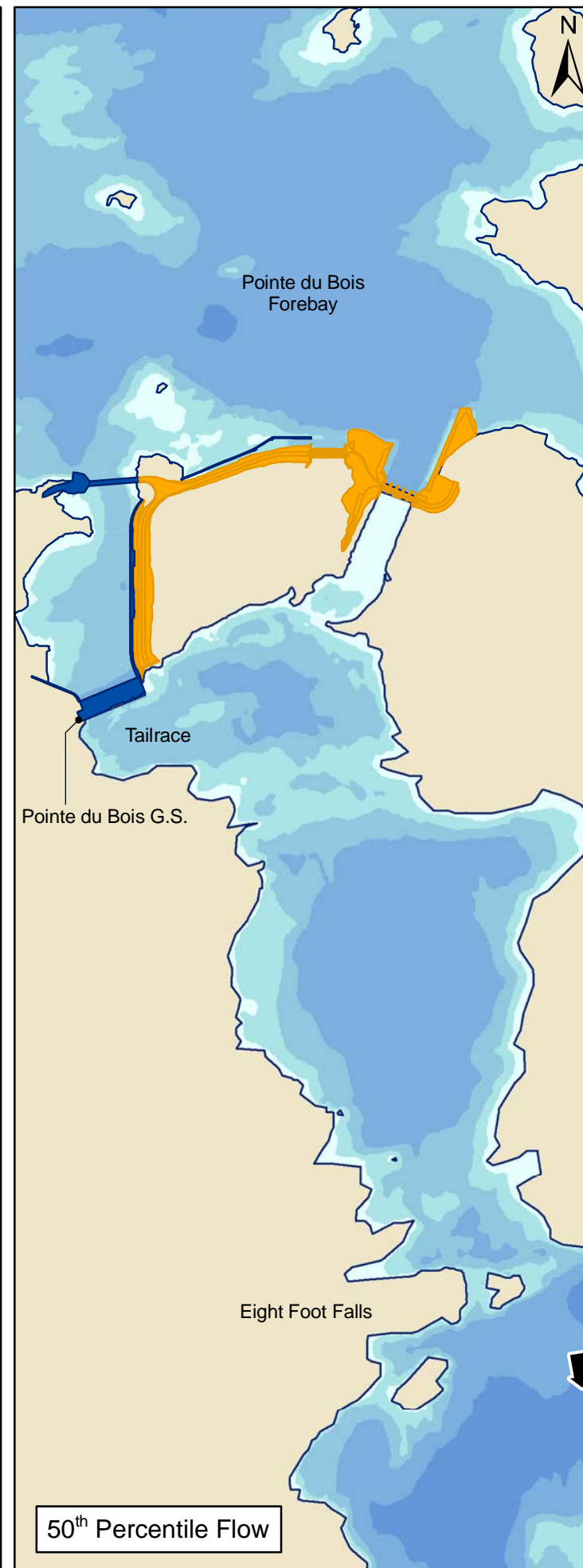
### Legend

#### Depth [m]

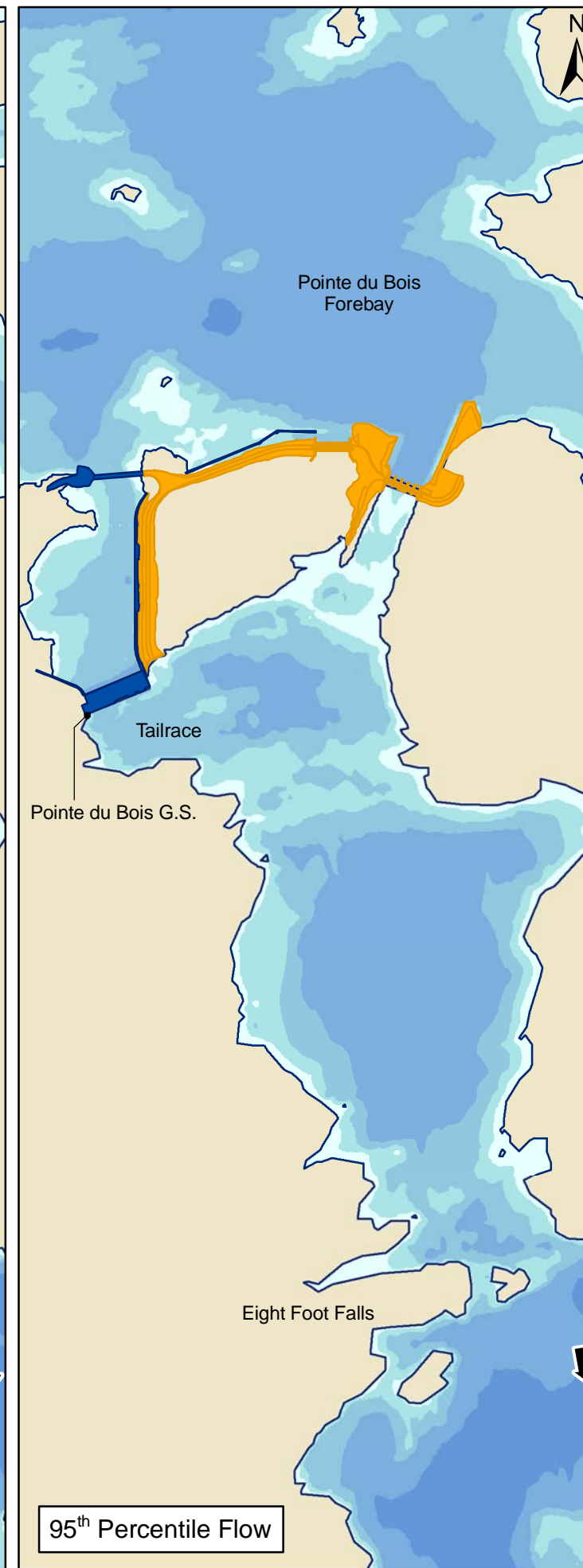
- 0 - 2
- 2 - 5
- 5 - 10
- 10 - 30
- Greater than 30
- Direction of Flow
- Generating Station (G.S.)



5<sup>th</sup> Percentile Flow



50<sup>th</sup> Percentile Flow



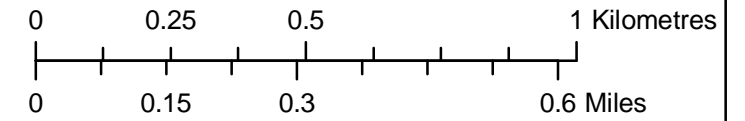
95<sup>th</sup> Percentile Flow

## Pointe du Bois Spillway Replacement Project

Stage 2 Diversion and Post Project  
Water Depth Near Pointe du Bois G.S.

Figure:  
8.2C

Coordinate System: UTM Zone 14N



DATA SOURCE:  
Manitoba Hydro

DATE CREATED:  
29 DEC 2010

CREATED BY:  
Water Resources Engineering

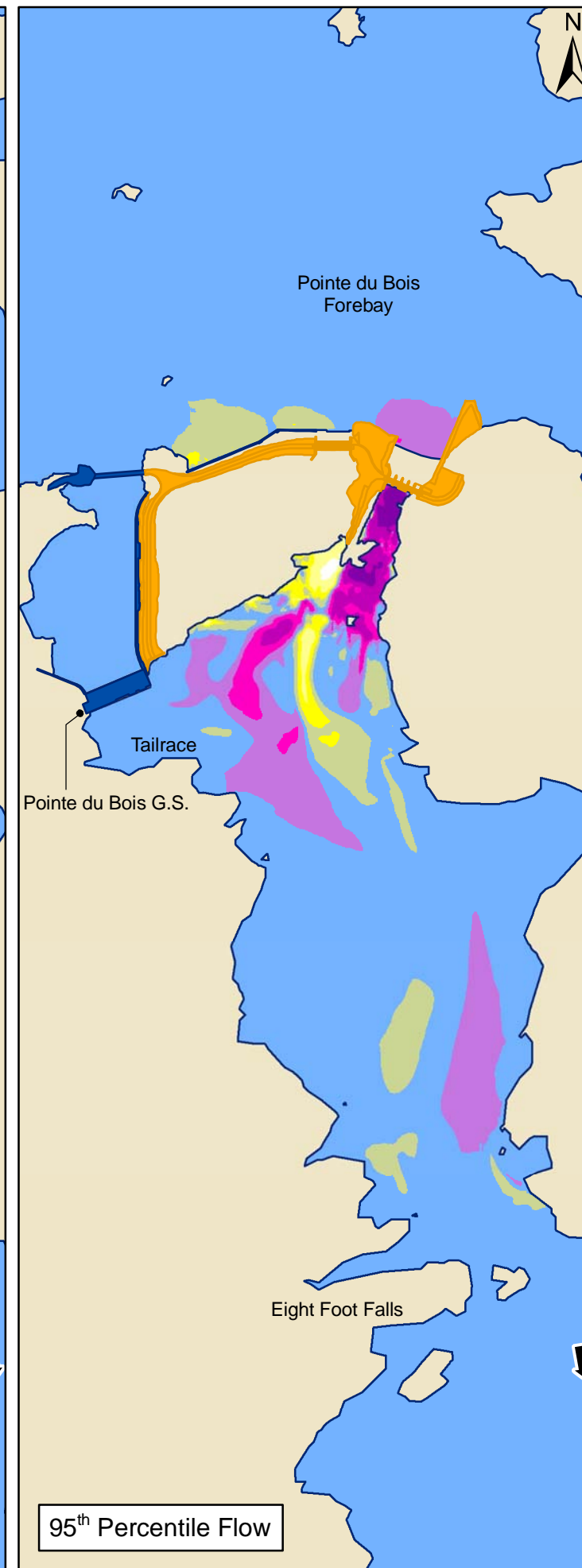
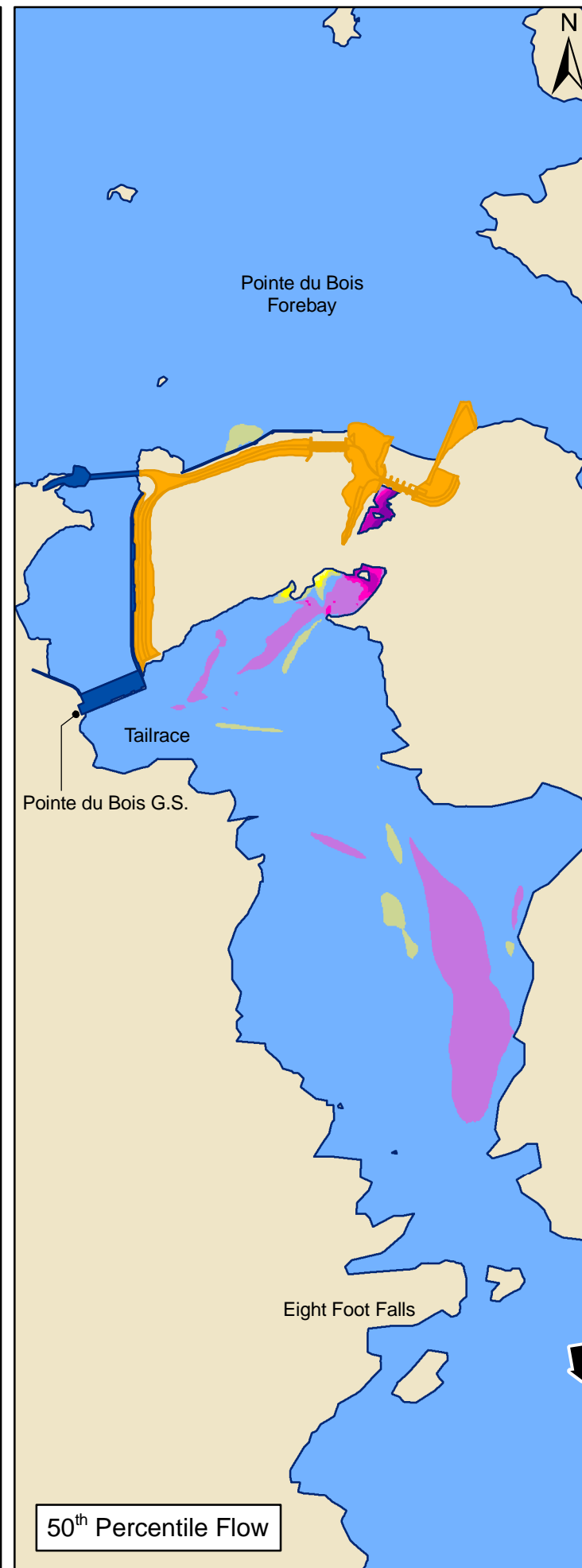
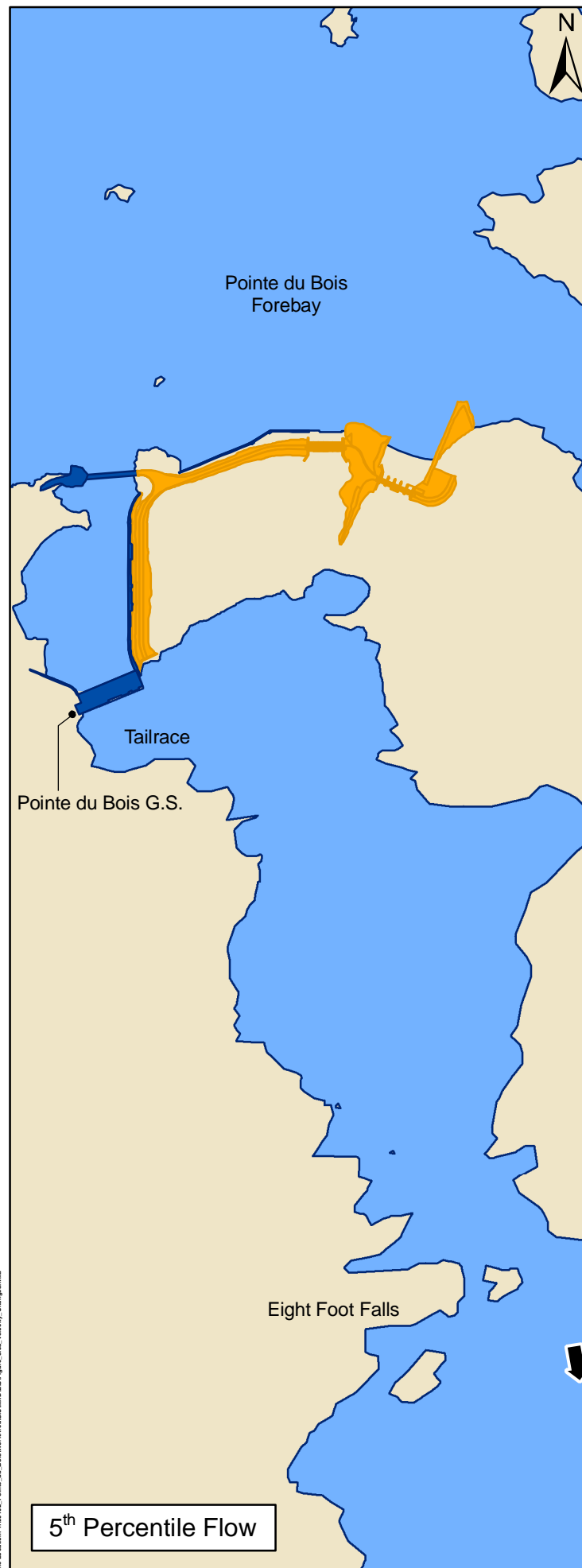
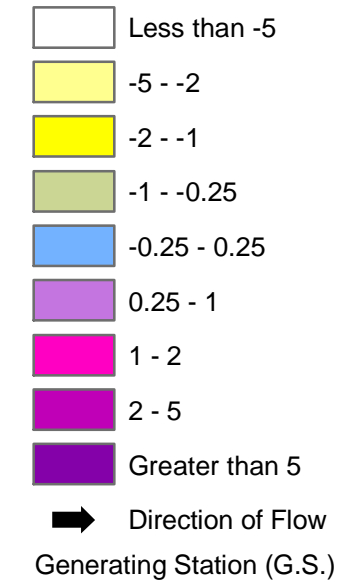
REVISION NO:  
VERSION 1.0

REVISION DATE:  
06 JUN 2011

QA/QC:  
KMS / MWZ

### Legend

#### Velocity Change [m/s]

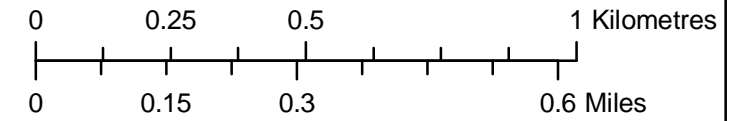


### Pointe du Bois Spillway Replacement Project

Estimated Velocity Changes  
Resulting from Spillway Replacement

Figure:  
8.3A

Coordinate System: UTM Zone 14N



DATA SOURCE:  
Manitoba Hydro

DATE CREATED:  
30 DEC 2010

CREATED BY:  
Water Resources Engineering

REVISION NO:  
VERSION 1.0

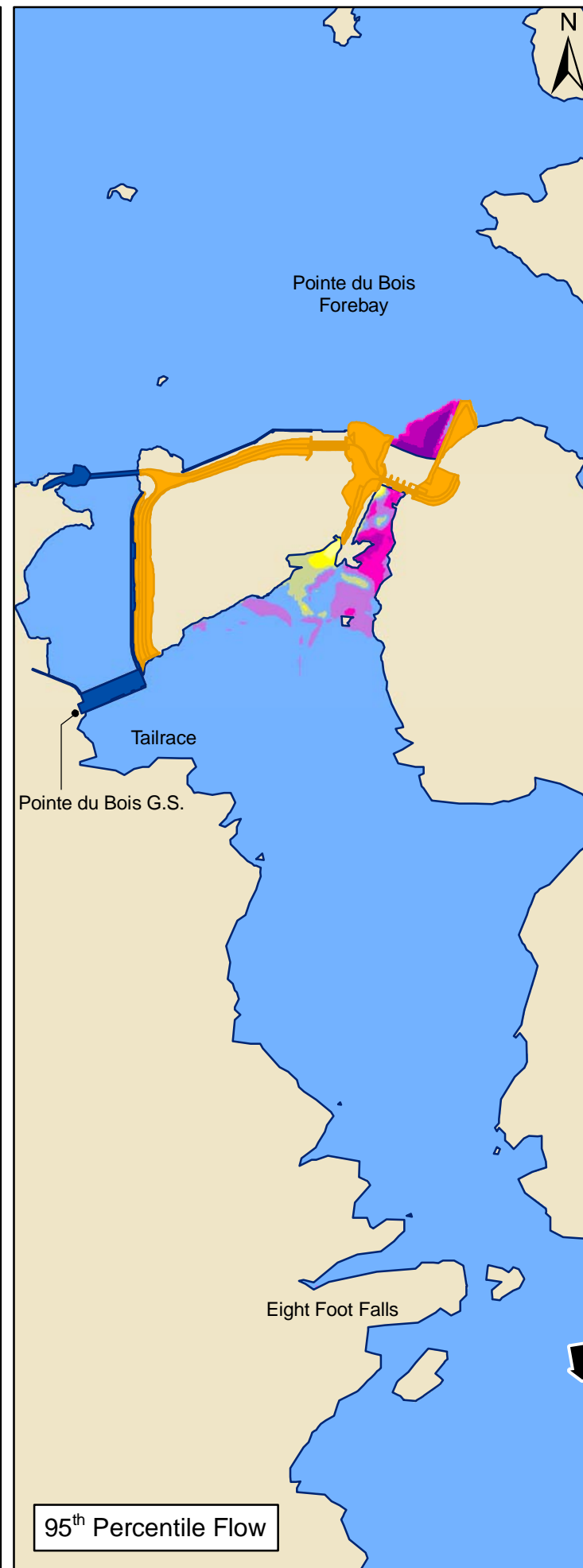
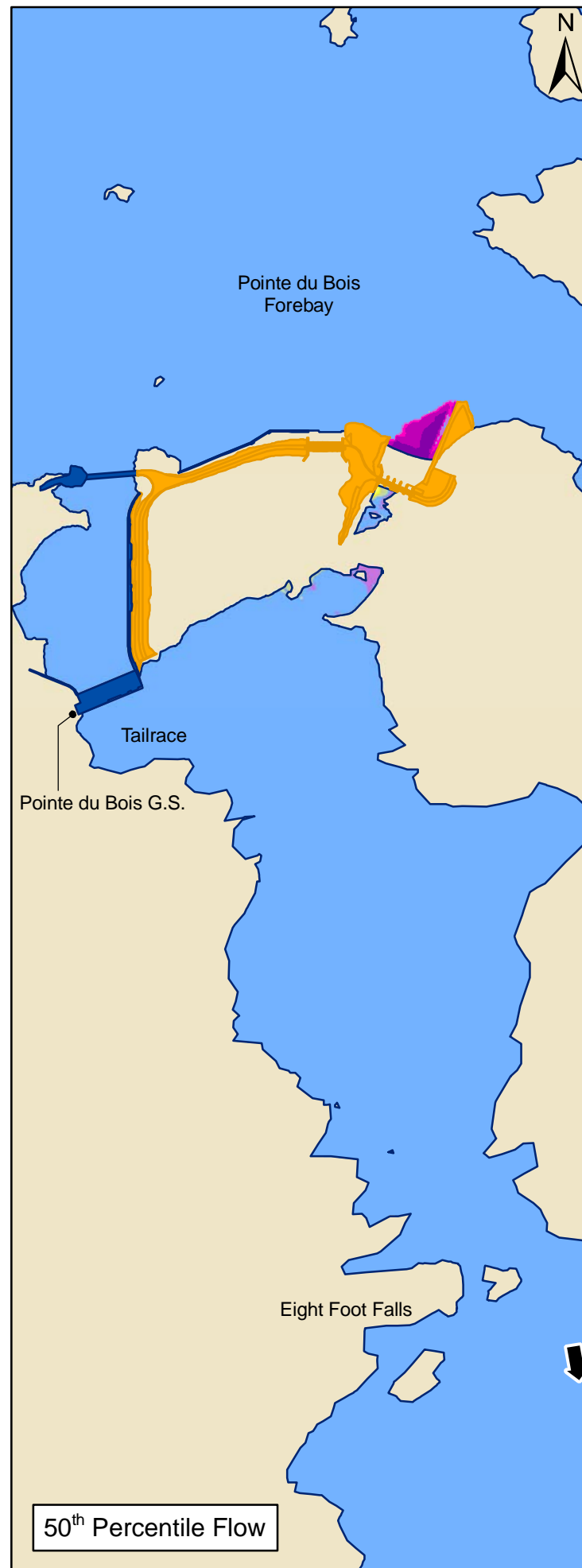
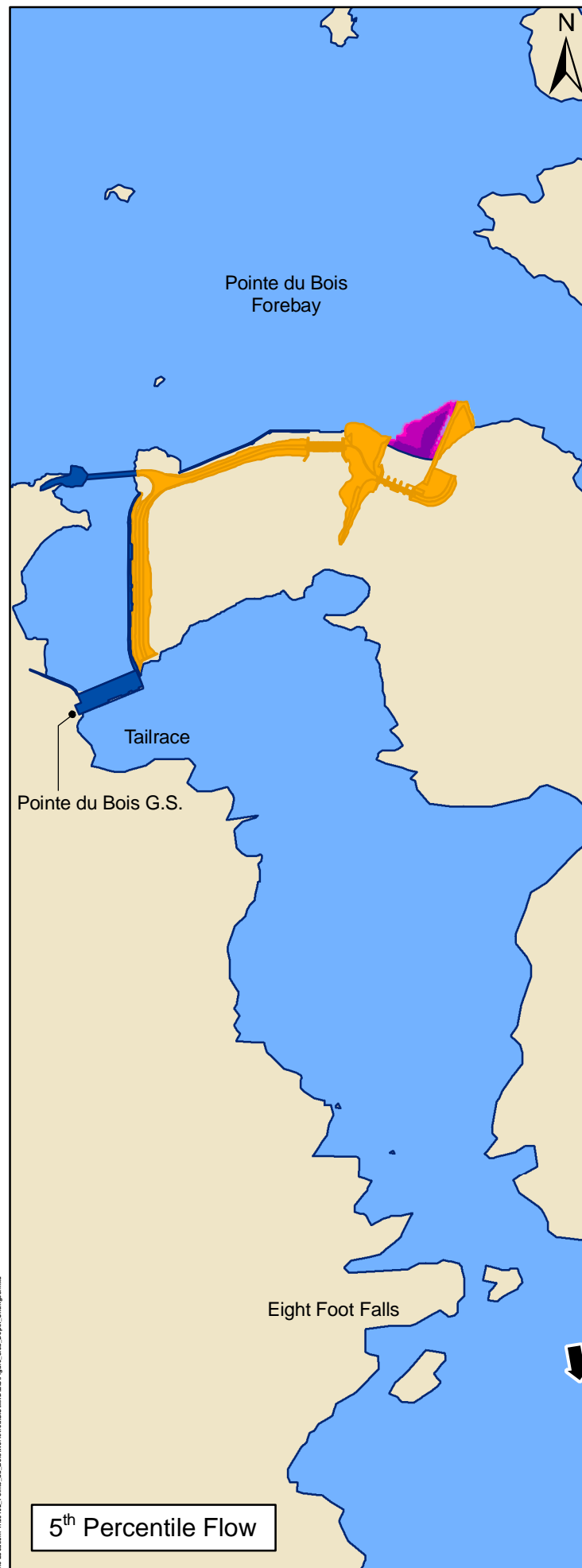
REVISION DATE:  
06 JUN 2011

QA/QC:  
KMS / MWZ

### Legend

#### Depth Change [m]

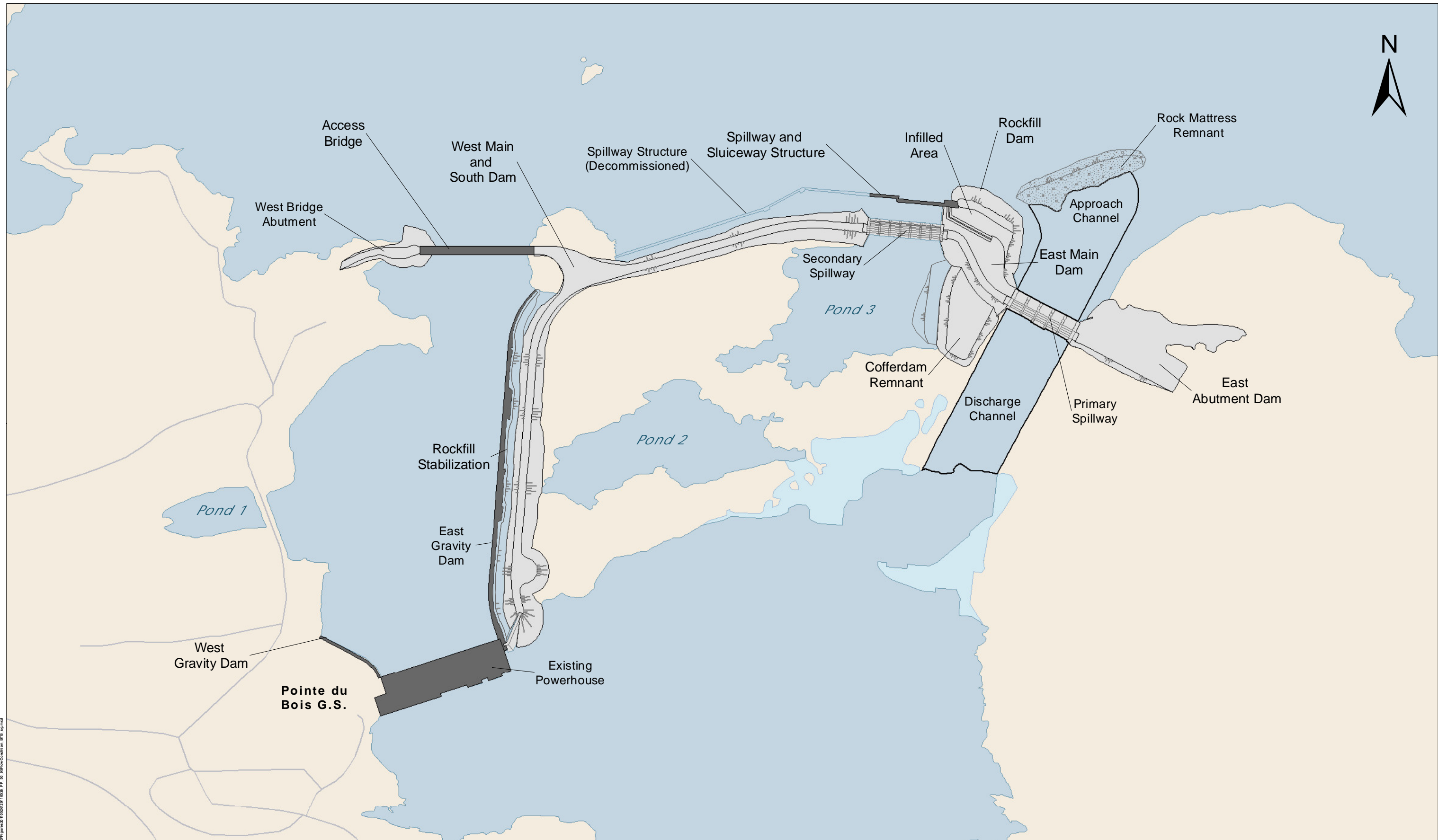
- Less than -5
- 5 - -2
- 2 - -1
- 1 - -0.25
- 0.25 - 0.25
- 0.25 - 1
- 1 - 2
- 2 - 5
- Greater than 5
- Direction of Flow
- Generating Station (G.S.)



### Pointe du Bois Spillway Replacement Project

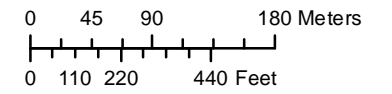
Estimated Depth Changes  
Resulting from Spillway Replacement

Figure:  
8.3B



File Location: G:\S\B\Pointe du Bois\Public\hdm\DF\game2\110203110251\_PP\_50\_95pcc\Condition\_BTB\_1g.mxd

	Coordinate System: UTM NAD 1983 Z15	DATA SOURCE: Manitoba Hydro, North/South Consultants	<b>Legend</b> <b>Post Project Flow Conditions</b> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="width: 15px; height: 15px; background-color: #ADD8E6; border: 1px solid black; margin-right: 5px;"></div> <span>50<sup>th</sup> Percentile</span> </div> <div style="display: flex; align-items: center;"> <div style="width: 15px; height: 15px; background-color: #ADD8E6; border: 1px solid black; margin-right: 5px;"></div> <span>95<sup>th</sup> Percentile</span> </div> </div> <div style="width: 45%;"> <div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="width: 15px; height: 15px; background-color: #666666; border: 1px solid black; margin-right: 5px;"></div> <span>Existing Infrastructure</span> </div> <div style="display: flex; align-items: center;"> <div style="width: 15px; height: 15px; background-color: #CCCCCC; border: 1px solid black; margin-right: 5px;"></div> <span>Proposed Infrastructure</span> </div> </div> </div>	<b>Pointe du Bois Spillway Replacement Project</b> 50 <sup>th</sup> and 95 <sup>th</sup> Percentile Flow Conditions Post Project Environment	Figure: 8.4
		DATE CREATED: 24 May 11		CREATED BY: North/South Consultants	REVISION NO: VERSION 1.0



DATA SOURCE:  
Manitoba Hydro, North/South Consultants

DATE CREATED: 07 Jun 2011  
CREATED BY: North/South Consultants

REVISION NO: VERSION 1.0  
REVISION DATE: 07 Jun 2011  
QA/QC: SB/MWZ

**Legend**

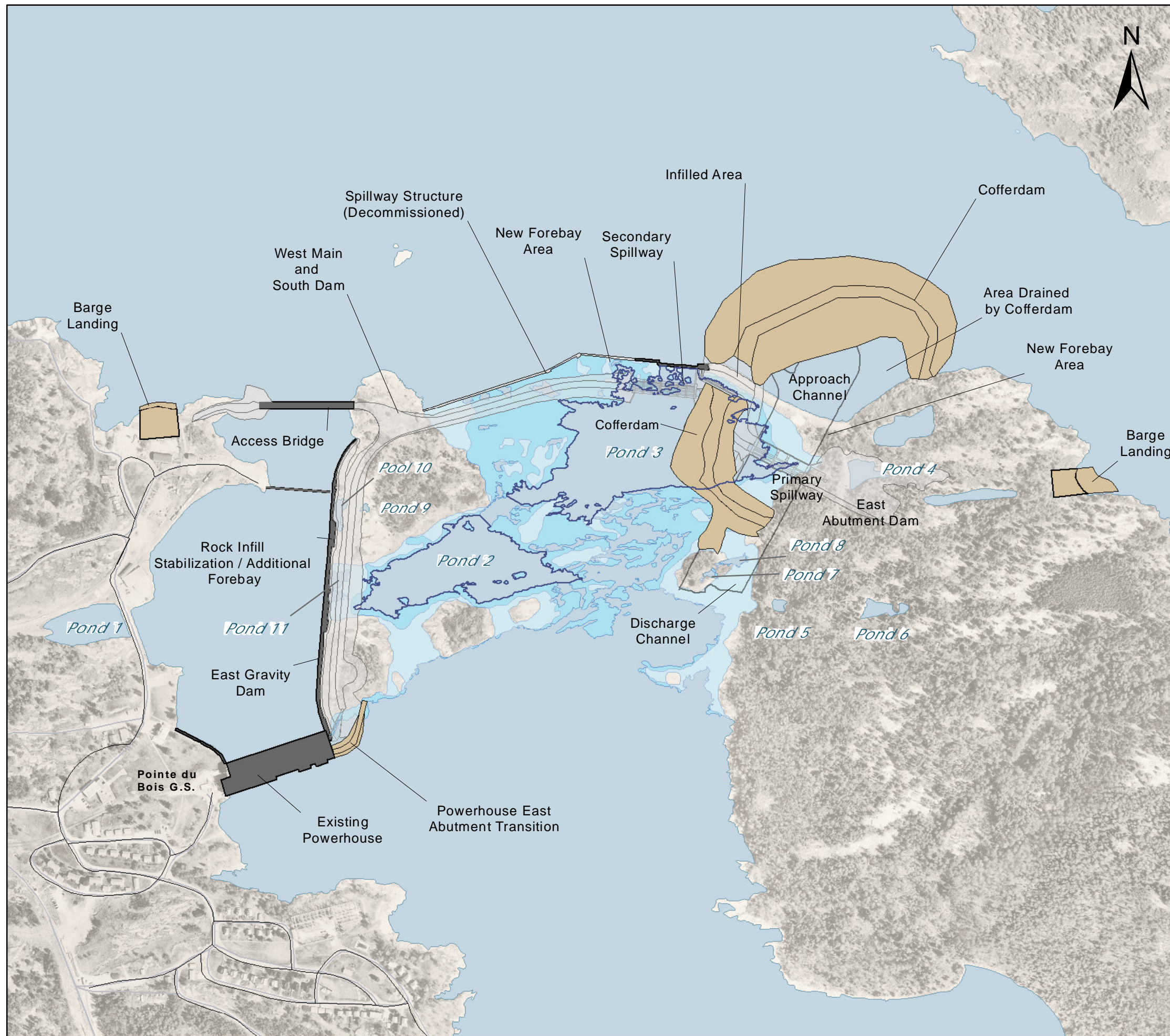
Construction Phase Infrastructure

**Existing Environment Flow Conditions**

No Spill

50<sup>th</sup> Percentile

95<sup>th</sup> Percentile

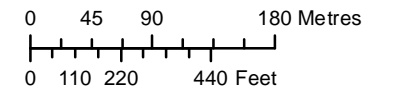


**Pointe du Bois Spillway Replacement Project**

Short-term Changes Specific to Construction Phase

Figure: 8.5





DATA SOURCE:  
Manitoba Hydro, North/South Consultants

DATE CREATED: 07 Jun 2011  
CREATED BY: North/South Consultants

REVISION NO: VERSION 1.0  
REVISION DATE: 07 Jun 2011  
QA/QC: SB/MWZ

**Legend**

**Post Project Flow Conditions**

- 50<sup>th</sup> Percentile
- 95<sup>th</sup> Percentile

**Loss of Wetted Habitat During Operation Phase**

- No Spill
- 50<sup>th</sup> Percentile
- 95<sup>th</sup> Percentile

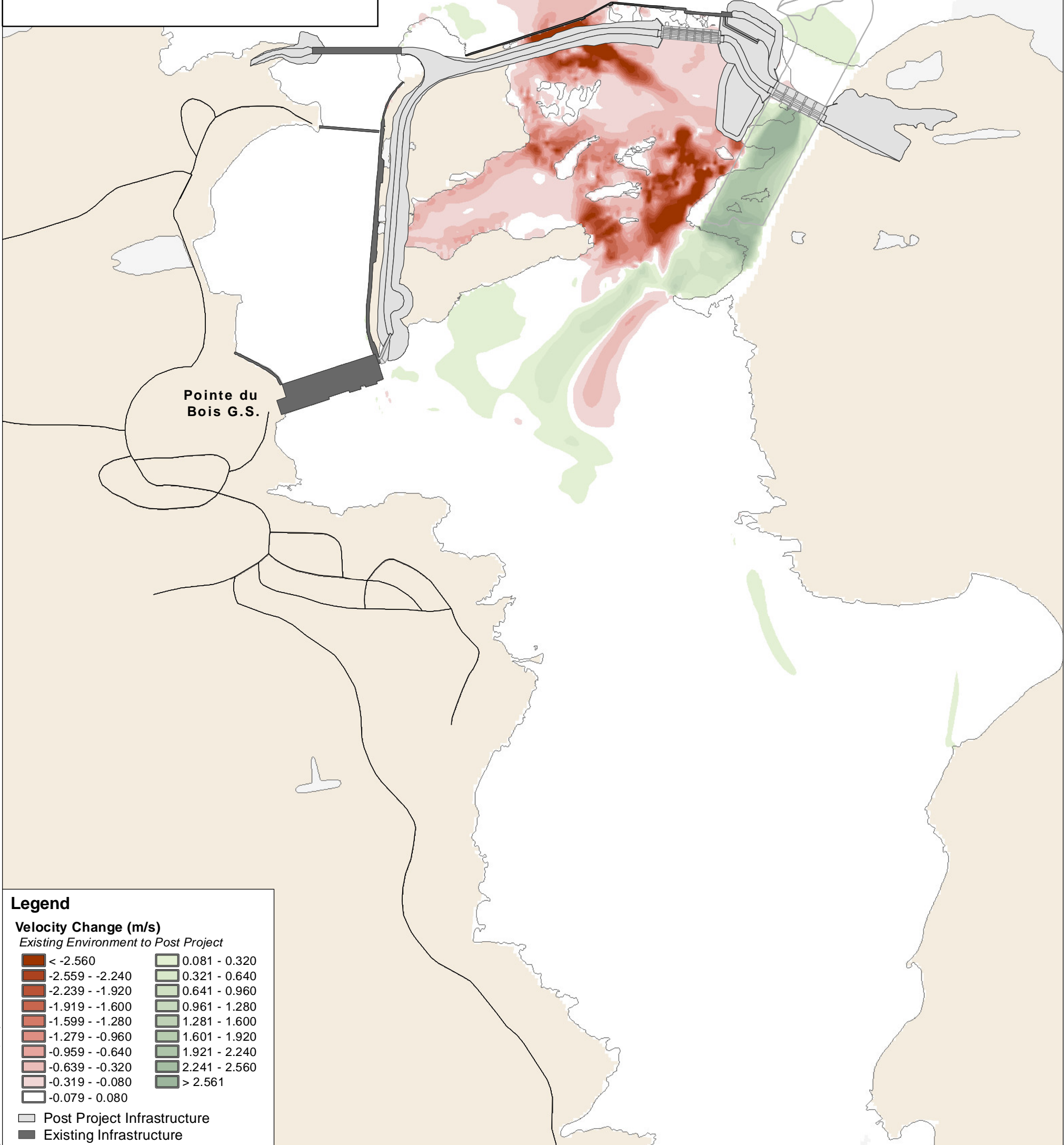
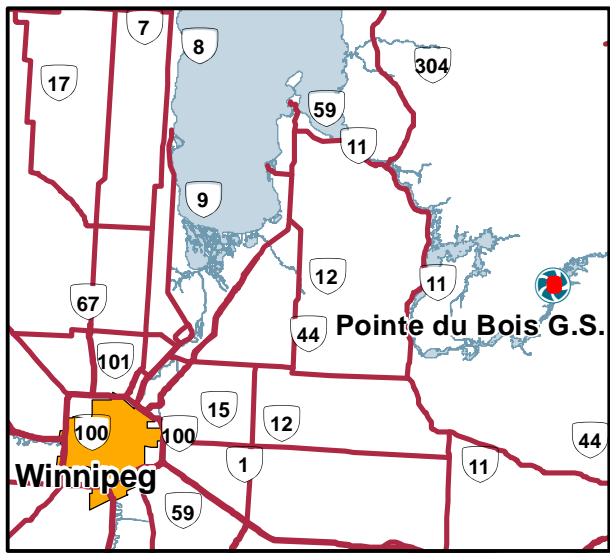
- Existing Infrastructure
- Proposed Infrastructure



**Pointe du Bois Spillway Replacement Project**

Long-term Changes Specific to Operation Phase




















Figure: 8.6





**Legend**

**Velocity Change (m/s)**

Existing Environment to Post Project

-  < -2.560
-  -2.559 - -2.240
-  -2.239 - -1.920
-  -1.919 - -1.600
-  -1.599 - -1.280
-  -1.279 - -0.960
-  -0.959 - -0.640
-  -0.639 - -0.320
-  -0.319 - -0.080
-  -0.079 - 0.080
-  0.081 - 0.320
-  0.321 - 0.640
-  0.641 - 0.960
-  0.961 - 1.280
-  1.281 - 1.600
-  1.601 - 1.920
-  1.921 - 2.240
-  2.241 - 2.560
-  > 2.561

-  Post Project Infrastructure
-  Existing Infrastructure

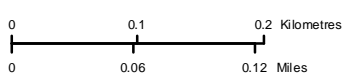
DATA SOURCE:  
Manitoba Hydro, North/South Consultants

DATE CREATED: 10 MAY 2011  
CREATED BY: North/South Consultants

REVISION NO: VERSION 1.0  
REVISION DATE: 26 May 2011  
QA/QC: SB/MWZ



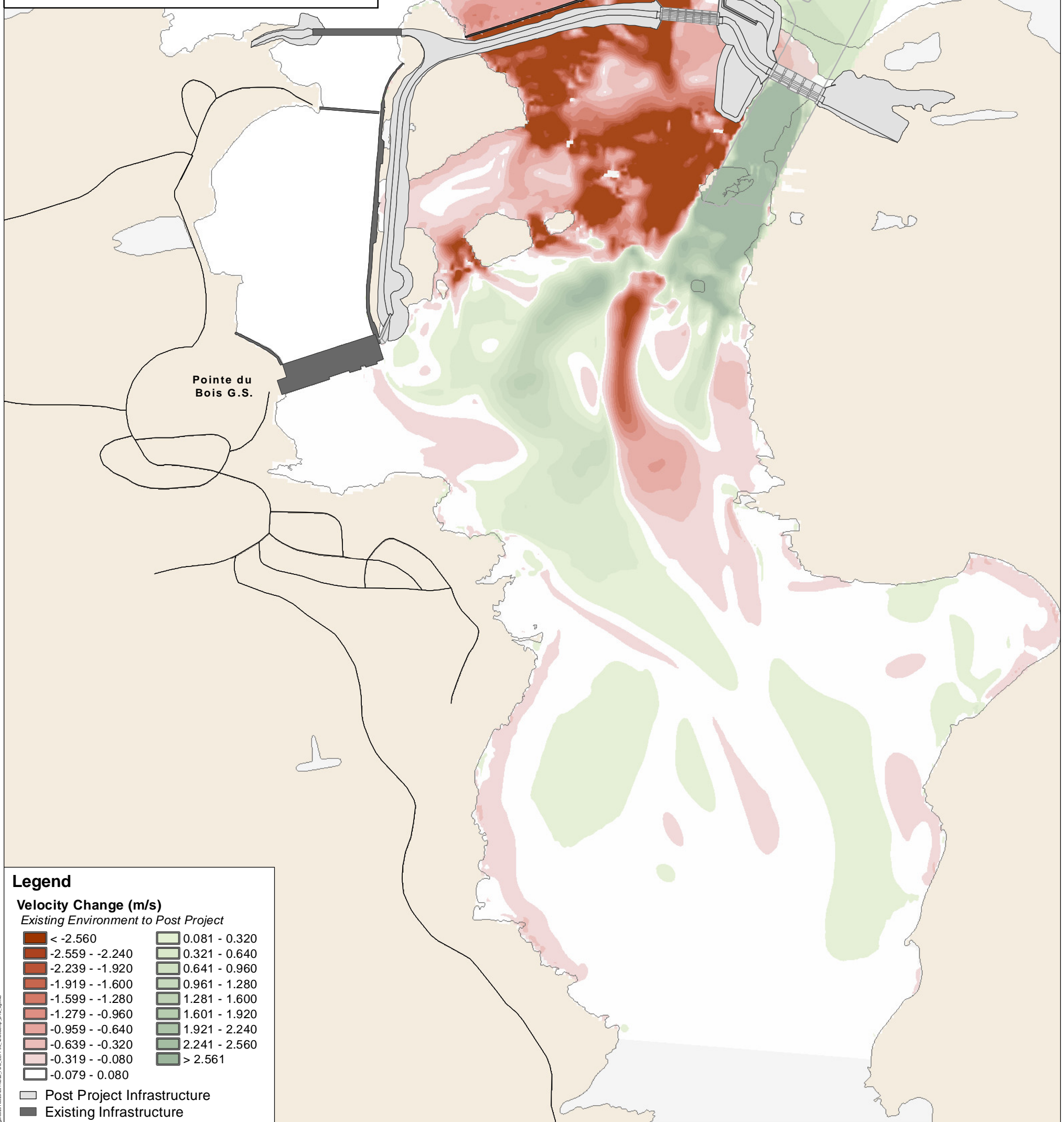
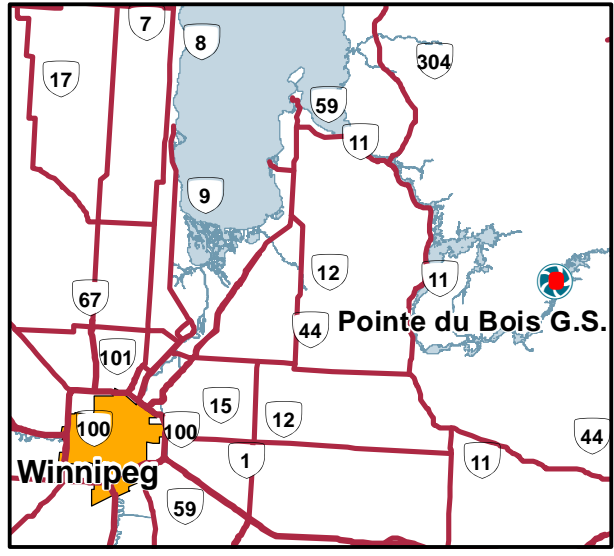
Coordinate System: UTM NAD 1983 Z15



**Pointe du Bois  
Spillway Replacement Project**

**50<sup>th</sup> Percentile Velocity Comparison  
Post Project subtracted from Existing Environment**

Figure:  
8.7A



**Legend**

**Velocity Change (m/s)**  
Existing Environment to Post Project

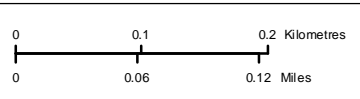
< -2.560	0.081 - 0.320
-2.559 - -2.240	0.321 - 0.640
-2.239 - -1.920	0.641 - 0.960
-1.919 - -1.600	0.961 - 1.280
-1.599 - -1.280	1.281 - 1.600
-1.279 - -0.960	1.601 - 1.920
-0.959 - -0.640	1.921 - 2.240
-0.639 - -0.320	2.241 - 2.560
-0.319 - -0.080	> 2.561
-0.079 - 0.080	

Post Project Infrastructure  
 Existing Infrastructure

File Location: C:\EIP\Projects\11\_11\MapFiles\MapDocs\Figure 8.7B\_95th\_Percentile\_Velocity\_Comparison\_BTL.sxd



Coordinate System: UTM NAD 1983 Z15

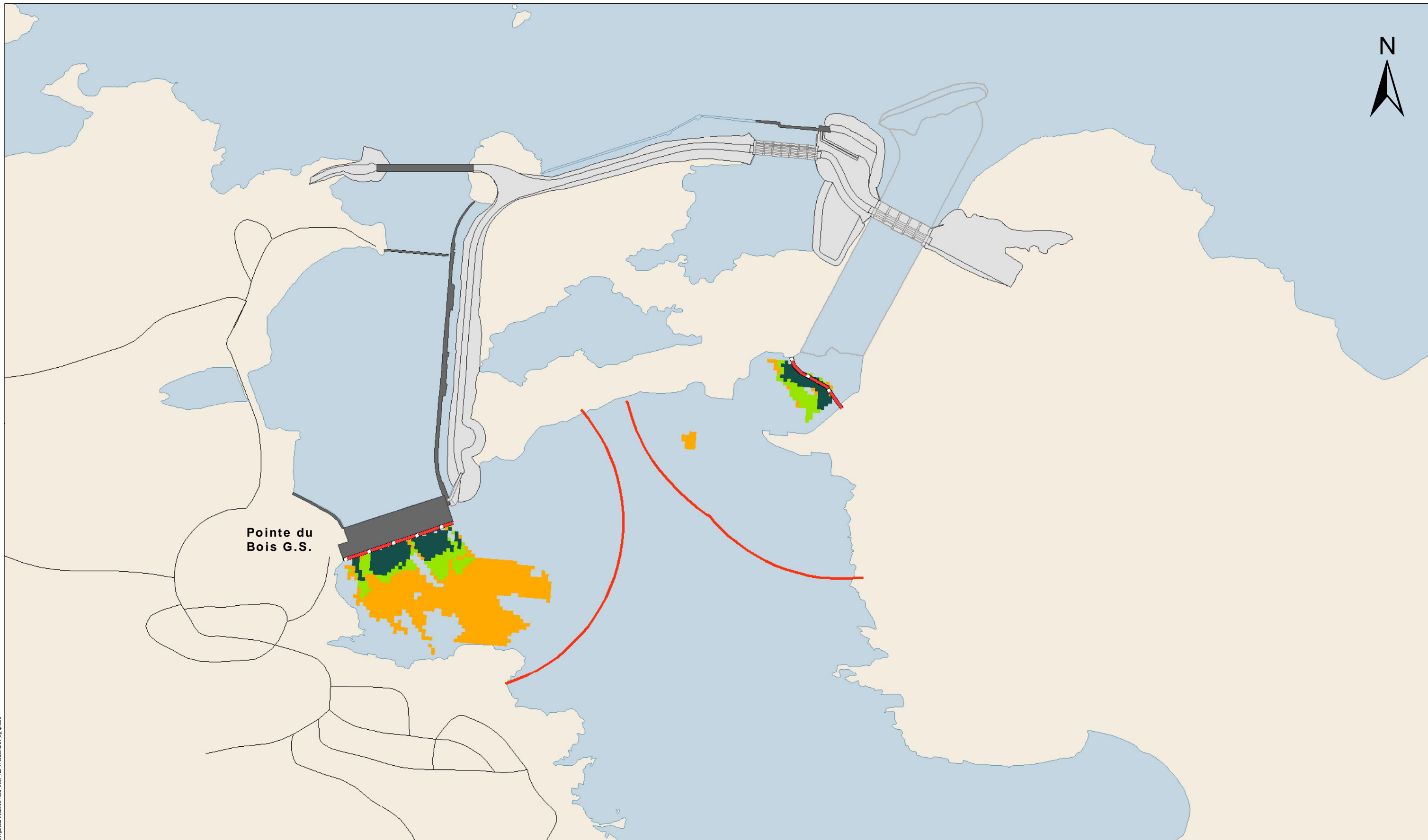


DATA SOURCE: Manitoba Hydro, North/South Consultants		
DATE CREATED: 10 MAY 2011	CREATED BY: North/South Consultants	
REVISION NO: VERSION 1.0	REVISION DATE: 26 May 2011	QA/QC: SB/MWZ

### Pointe du Bois Spillway Replacement Project

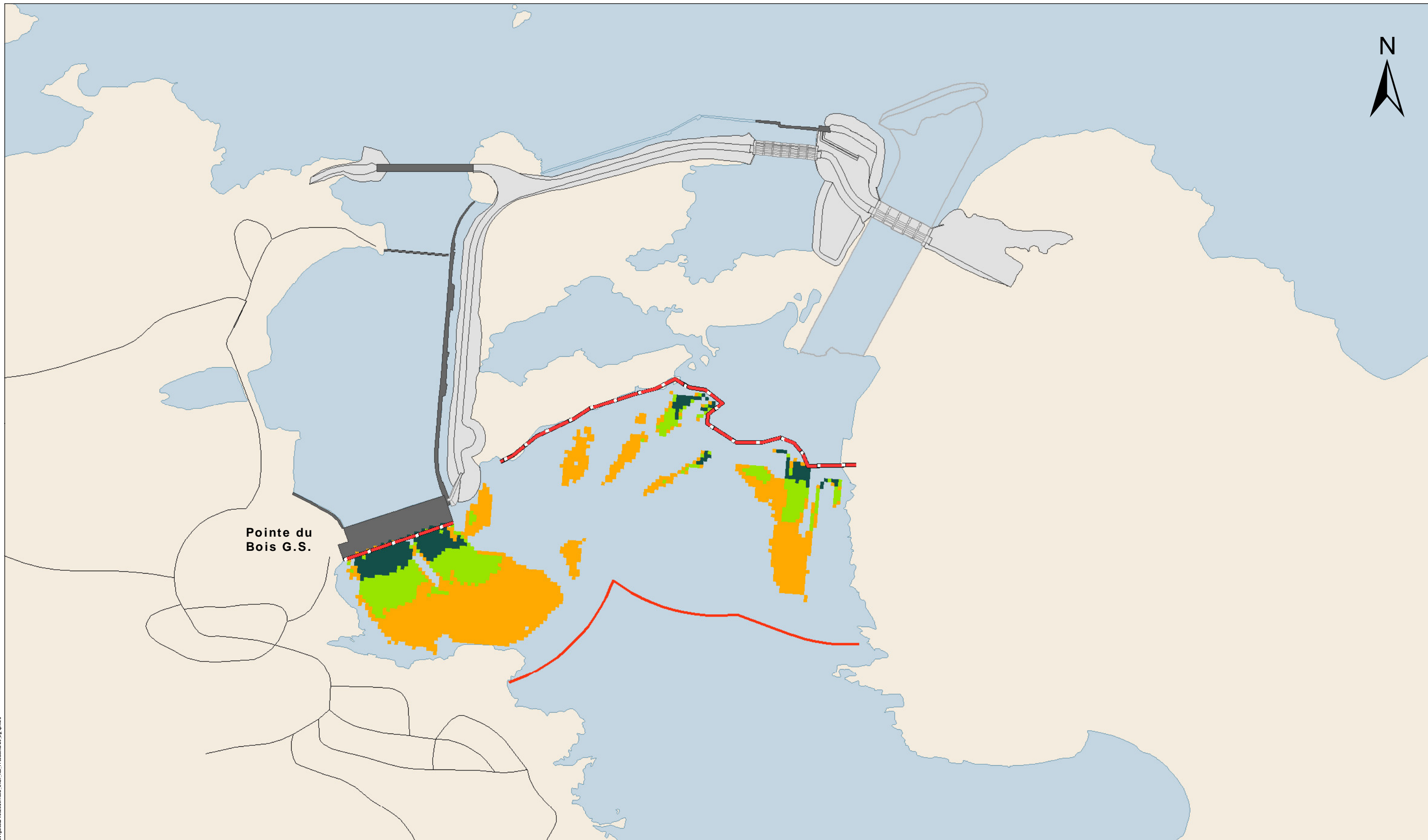
**95<sup>th</sup> Percentile Velocity Comparison**  
Post Project subtracted from Existing Environment

Figure:  
8.7B



File Location: G:\SE\Projects\04\_Bio\Public\Habitat\Map\Lake Sturgeon\11026311007\_LCST\_LB0\_P000\_Southern\_1\_S\_0.mxd

	Coordinate System: UTM NAD 1983 Z15	DATA SOURCE: Manitoba Hydro, North/South Consultants	<b>Legend</b> Spawning Barrier Critical Distance (238m) Post Project Infrastructure Existing Infrastructure	<b>Habitat Suitability Index (Egg Deposition)</b> 0.5 - 0.75 0.25 - 0.5 0.75 - 1	<b>Pointe du Bois Spillway Replacement Project</b>	
		DATE CREATED: 24 May 11 REVISION NO: VERSION 1.0			CREATED BY: North/South Consultants REVISION DATE: 07 Jun 11 QA/QC: SB/MWZ	<b>50<sup>th</sup> Percentile Flow Conditions (Scenario 1) Lake Sturgeon Habitat Suitability Index Post Project</b>



File Location: G:\SE\Projects\_04\_Bio\Public\hatched\DF\game2\11026311007\_LCST\_LB0\_P005\_Southern\_1\_0\_0.mxd

	Coordinate System: UTM NAD 1983 Z15	DATA SOURCE: Manitoba Hydro, North/South Consultants	<b>Legend</b> Spawning Barrier Critical Distance (238m) Post Project Infrastructure Existing Infrastructure	<b>Habitat Suitability Index (Egg Deposition)</b> 0.5 - 0.75 0.25 - 0.5 0.75 - 1	<b>Pointe du Bois Spillway Replacement Project</b> 95 <sup>th</sup> Percentile Flow Conditions (Scenario 6) Lake Sturgeon Habitat Suitability Index Post Project	Figure: 8.8B
		DATE CREATED: 24 May 11 REVISION NO: VERSION 1.0 CREATED BY: North/South Consultants REVISION DATE: 07 Jun 11 QA/QC: SB/MWZ				