Appendix I

Engagement Materials

Appendix I1 – Public Engagement Materials
Appendix I1 – A – Newspaper Advertisement of Open House Sessions
Appendix I1 – B – Project Launch Materials at Open Houses and Engagement Sessions
Appendix I2 – What We've Heard Summary
Appendix I3 – Record of Project Website
Appendix I4 – Stakeholder Meeting Minutes

Appendix I1

Public Engagement Materials

Project Initiation

Environmental Assessment for the Northern Pulp Nova Scotia Replacement Effluent Treatment Facility

The Northern Pulp Mill is located in Abercrombie Point, Pictou County. It is owned and operated by the Northern Pulp Nova Scotia Corporation, a Paper Excellence company.

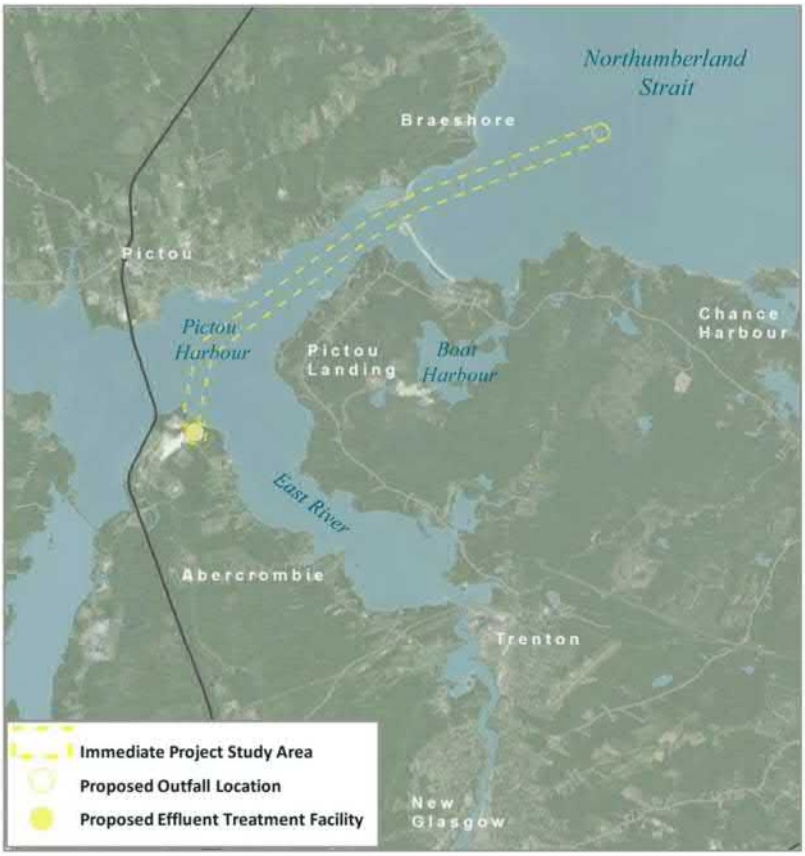
Dillon Consulting Limited has been hired to complete the Environmental Assessment for the replacement of the Effluent Treatment Facility.

PROJECT DESCRIPTION

The Northern Pulp Nova Scotia (NPNS) Pulp Mill manufactures northern bleached softwood kraft, more commonly known as pulp. The pulp is sold to manufacturers of household products (e.g. hygiene products, tissue, and paper towel). The NPNS Pulp Mill uses water as part of its processing to produce the pulp. After the water is used in production it is treated at the existing effluent treatment system at Boat Harbour. The NPNS Pulp Mill and effluent treatment system are operated under the most current March 2015 permit (Industrial Approval).

The existing treatment system needs to be replaced to meet the requirements of the *Boat Harbour Act*. In accordance with the *Environment Act*, the design and construction of a new treatment facility is a modification to the existing Industrial Approval and therefore will follow a Class 1 Environmental Assessment (EA). EA approval is required prior to construction and operation.

The proposed Effluent Treatment Facility (ETF) will be designed, built, and operated using current best practices. The main components of the new ETF will be located on Northern Pulp property, adjacent to the NPNS Pulp Mill. This means all treatment will occur on-site. The water, once treated and ready to discharge, will be released through a pipe to an 'outfall' in the Northumberland Strait.



STUDY PURPOSE

The detailed design of the ETF, including outfall design and location, has not been completed. The purpose of this study is to identify constraints and mitigation measures to protect the environment which will be incorporated into the final design and construction of the ETF.

Project Initiation

Environmental Assessment for the Northern Pulp Nova Scotia Replacement Effluent Treatment Facility

STUDY PROCESS The Environmental Assessment study will follow the process described below. We will engage with Indigenous Communities, the public, agencies, and stakeholders throughout. The project website (www.NorthernPulpEffluentTreatmentFacility.ca) has additional information on the study process and how you can be involved. It will be updated as the study progresses.

FALL 2017
Environmental Assessment Study Initiation

WINTER 2017
Consultation and Engagement: 'Project Launch'. Receive input on existing conditions. Understand community/stakeholder concerns

SPRING 2018
Consultation and Engagement: Receive feedback on proposed environmental planning.

SUMMER 2018
Register the Environmental Assessment

OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG

FALL/WINTER 2017
Environmental Sciences
Background research and field studies to document existing conditions

WINTER 2018
Environmental Sciences
Begin evaluating potential for impacts and appropriate environmental planning.

SPRING 2018
Environmental Sciences
Complete final field studies. Finalize environmental planning and project.

CONTACT US

You can contact us at any time with your feedback, ideas, and questions:

Annamarie Burgess, LPP, P.Eng
Project Coordinator
Dillon Consulting Limited
137 Chain Lake Drive, Suite 100
Halifax, NS B3S 1B3
1-877-635-8553 x5050
npns.effluenttreatmentfacility@dillon.ca

PLEASE JOIN US

Please join us at our first Open House. Our goal is to share information about the project, gather information on the existing conditions (natural and social), and identify key areas of consideration. The Open House will be a drop-in session format. It will be held at two locations, with the same information presented at each:

Tuesday December 5, 2017
Glasgow Square
155 Riverside Parkway
New Glasgow
5:00 pm – 7:30 pm

Wednesday December 6, 2017
Abercrombie Fire Hall
2030 Granton Abercrombie Road
Abercrombie
5:00 pm – 7:30 pm

Comments and information received will be considered, and kept on file for inclusion in the Environmental Assessment Registration. All personal information such as name, address, and telephone will be kept confidential, in accordance with the *Personal Information Protection and Electronic Documents Act*. Only comments will become part of the public record.

Appendix I1 – A

News Paper Advertisement of Open House Sessions

NORTHERN PULP NOVA SCOTIA

ENVIRONMENTAL ASSESSMENT REPLACEMENT OF EFFLUENT TREATMENT FACILITY

Northern Pulp Nova Scotia's existing effluent treatment system needs to be replaced, as required by the Nova Scotia Boat Harbour Act. The detailed design of the new effluent treatment facility, including outfall design and location, has yet to be finalized. This Environmental Assessment study will provide input to the design and construction of the facility, through identifying constraints and mitigation measures to achieve sound environmental planning. Dillon Consulting Limited has been contracted by Northern Pulp Nova Scotia to complete the Environmental Assessment.

Engagement is an important component of the study. There will be opportunities throughout the study to provide input and meet with the project team. You are invited to the first Open House. Our goal is share information on the project, gather information on the existing conditions (natural and socio-economic), and identify key areas of consideration. The Open House will be a drop-in session format. It will be held at two locations, with the same information presented at each:

Tuesday December 5, 2017
Glasgow Square
155 Riverside Parkway
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5:00 pm – 7:30 pm

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Abercrombie Fire Hall
2030 Granton Abercrombie Road
Abercrombie
5:00 pm – 7:30 pm

Additional information on the project is available at www.NorthernPulpEffluentTreatmentFacility.ca

If you would like to be notified directly of future project updates, please contact us to be added to the notification list.

CONTACT US
You can contact us at any time with your feedback, ideas, and questions using any of the options below:

Kathy Cloutier
Communications Director
Paper Excellence Canada
Northern Pulp Nova Scotia Corporation
P.O. Box 549, Station Main
New Glasgow, NS B2H 5E8
902-752-8461 ext.231
info@northernpulp.ca

Annamarie Burgess, LPP, P.Eng
Project Coordinator
Dillon Consulting Limited
137 Chain Lake Drive, Suite 100
Halifax, NS B3S 1B3
1-877-635-8553 x5050
npns.effluenttreatmentfacility@dillon.ca

NORTHERN PULP
NOVA SCOTIA CORPORATION
A PAPER EXCELLENCE COMPANY

DILLON
CONSULTING

Appendix I1 – B

Project Launch Materials Presented at Open Houses and Engagement Sessions

Replacement of the Effluent Treatment Facility

Northern Pulp Nova Scotia Mill

COMMUNITY OPEN HOUSES –
DECEMBER 2017 & JANUARY 2018

NORTHERN PULP
NOVA SCOTIA CORPORATION
A PAPER EXCELLENCE COMPANY

DILLON
CONSULTING

WELCOME. THANK YOU FOR ATTENDING.

GOALS FOR COMMUNITY OPEN HOUSES

We need your input and ideas to find a path forward.

We want to meet with the community and begin a dialogue that will continue over the study.

WHAT WORK HAS BEEN DONE?

The Project Team has been working hard to gather information and complete studies in order to meet with the community and start discussing the proposed effluent treatment facility replacement.

We are currently working on reports and will share the results and information with you when complete.

WHAT IS BEING PROPOSED?

Based on the studies done to date, there is a technically recommended approach. A treatment facility would be constructed adjacent to the Northern Pulp mill to treat the mill effluent. Federal and Provincial regulations would be met before leaving the site. A pipeline carries the treated effluent to an outfall. Studying flow dynamics, it was clear that the outfall needs to be in the Northumberland Strait. The existing facility and pipeline will then be closed.

WHAT'S NEXT?

We are completing an Environmental Assessment (EA) Study, which will take months to complete before it is submitted to Nova Scotia Environment. There is data to collect, studies to be done, and more conversations will be needed to find a path forward.

APPROACH TO ENGAGEMENT

Northern Pulp is part of the community.
We want to find a solution that works for all of us.
Our approach to engagement and consultation is based on five principles:

Inclusivity

Involve those to be affected in the decision-making process.

Responsiveness

Address input received in a timely fashion.

Accessibility

The complex should be made clear. Materials and processes made accessible to a diverse range of participants.

Transparency

Clearly communicate how information received was used in the decision making process.

Respect

A safe and comfortable environment is always maintained, where individuals can freely contribute their opinions and directions.

ENVIRONMENTAL ASSESSMENT STUDY

PANEL 2

FALL 2017
Environmental Assessment Study Initiation

WINTER 2017
Consultation and Engagement: 'Project Launch'. Receive input on existing conditions. Understand community/stakeholder concerns

SPRING 2018
Consultation and Engagement: Receive feedback on proposed environmental planning.

SUMMER 2018
Register the Environmental Assessment

October	November	December	January	February	March	April	May	June	July	August

FALL/WINTER 2017
Environmental Sciences
Background research and field studies to document existing conditions.

WINTER 2018
Environmental Sciences
Begin evaluating potential for impacts and appropriate environmental planning.

SPRING 2018
Environmental Sciences
Complete final field studies. Finalize environmental planning and project.

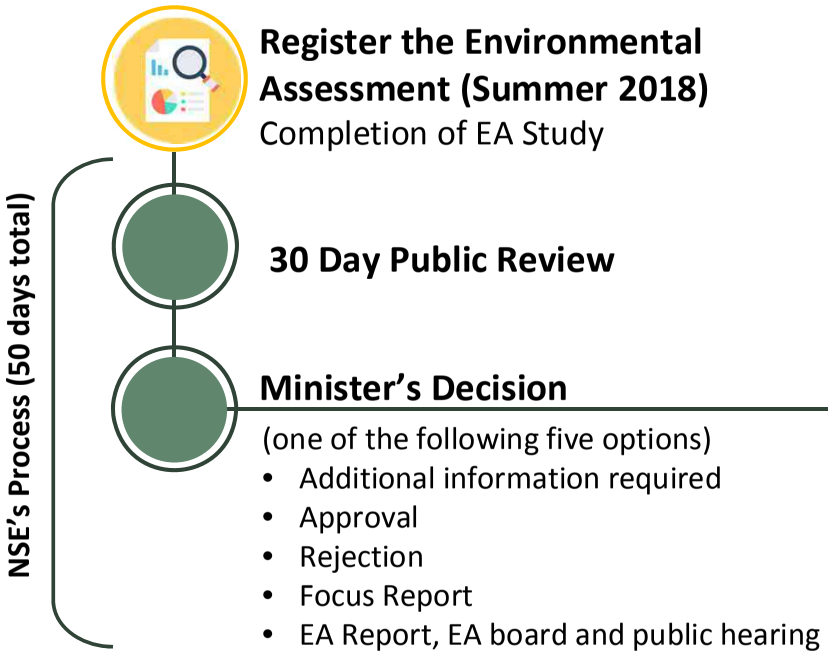
Engagement and consultation will occur during our study in order for the project team to understand community concerns and develop a more complete understanding of the area prior to Project Registration.

Environmental planning to protect or mitigate risks will be developed from this understanding.

ENVIRONMENTAL ASSESSMENT PROCESS

What's an Environmental Assessment (EA)?

- A decision-making tool used to promote sustainable development by evaluating the potential environmental effects of developments before they proceed.
- Public, Aboriginal Communities, stakeholders, along with government departments and agencies are engaged.
- Promotes better project planning by identifying and addressing environmental effects at the earliest stages of project development.



Government Agencies that have been engaged in the process:

Provincial:
Nova Scotia Environment (NSE)
Department of Natural Resources

Federal:
Fisheries and Oceans Canada
Environment & Climate Change Canada
Canadian Environmental Assessment Agency
Transport Canada

ORIGINS OF THE BOAT HARBOUR TREATMENT FACILITY

PANEL 4

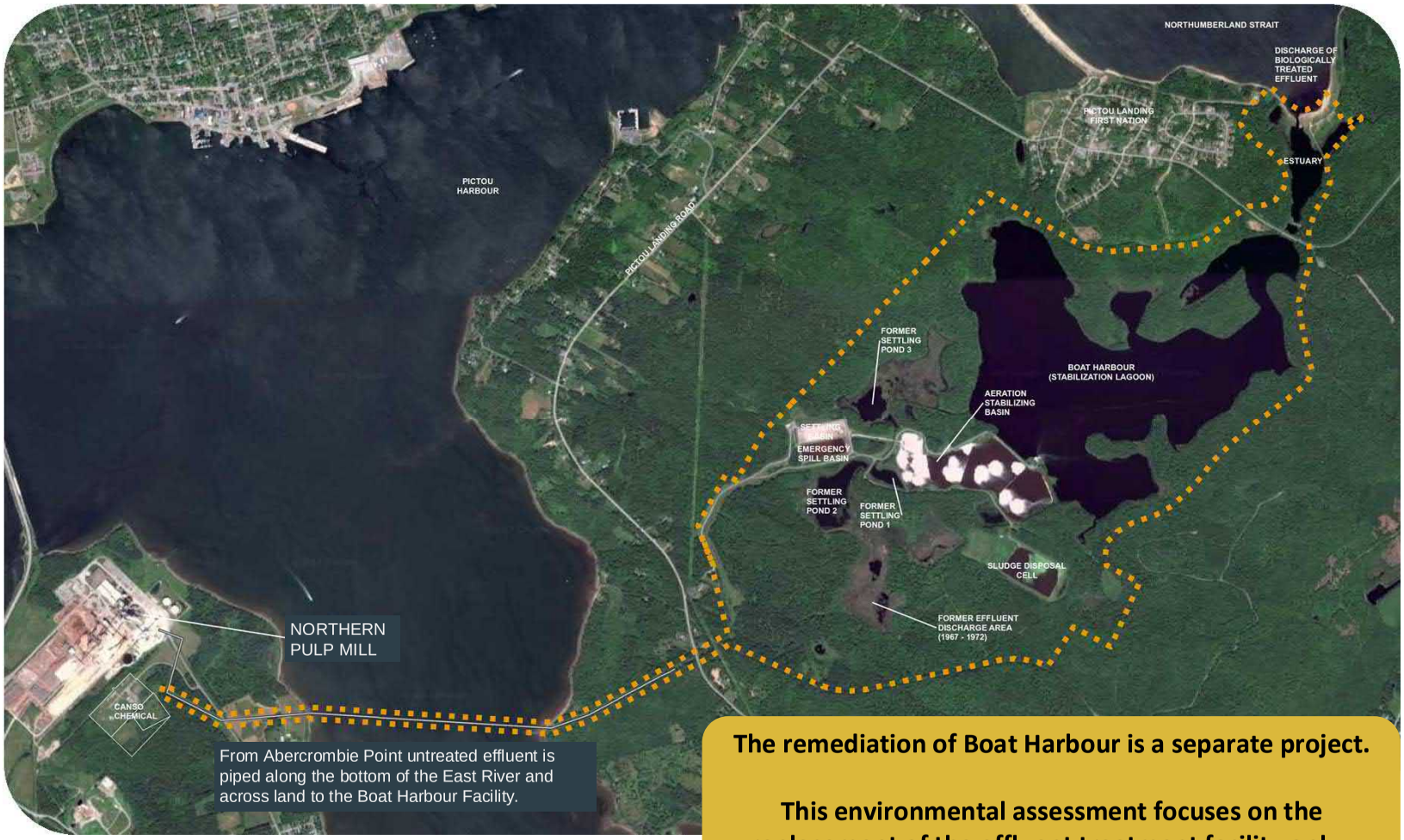
1965 As an incentive to attract industry to Pictou County, the provincial government offered raw water supply and effluent treatment to potential incoming industries.

3 companies were attracted to the County through these incentives (Michelin Tire, Northern Pulp's predecessor and Canso Chemicals).

Boat Harbour began operating as a treatment facility in 1967.

It is the wish of Pictou Landing First Nation that Boat Harbour be returned to tidal and be made a place that the community can once again enjoy.

Northern Pulp supports the government's actions to fulfill the promise made to Pictou Landing First Nation to close the existing facility.



The remediation of Boat Harbour is a separate project.

This environmental assessment focuses on the replacement of the effluent treatment facility only.

EXISTING BOAT HARBOUR TREATMENT FACILITY

PANEL 5

What is now operated as the Boat Harbour Effluent Treatment Facility (ETF) is very different than how it began.

In fact, originally there was no formal treatment process. It was believed that nature and time were enough to treat the effluent.

Shortly following operation, it was recognized that additional treatment was necessary.

In 1995 NPNS took over operations of the facility under a lease agreement originally for 10 years, extended until 2030.

1967 Treatment plant began operating

1972 Treatment process at Boat Harbour was improved to include settling ponds and an aerated basin.

1992 Canso chemical chlor-alkali facility closed, stopping production of sodium hydroxide using mercury as a catalyst.

1996 Beginning in 1992 and finishing in 1996, multiple upgrades were made to the EFT including: additional aeration, separation curtains in the aeration basin, and the addition of a nutrient feed system to optimize microbiological activity.

1997 The bleaching process was upgraded to meet new federal regulations for dioxins and furans by switching to chloride dioxide instead of elemental chlorine (Pulp and Paper Effluent Regulations (PPER)).

2015 Boat Harbour Act enacted in 2015, requiring the current Boat Harbour Treatment Facility to cease operations by January 31, 2020. A new effluent treatment facility is now required.

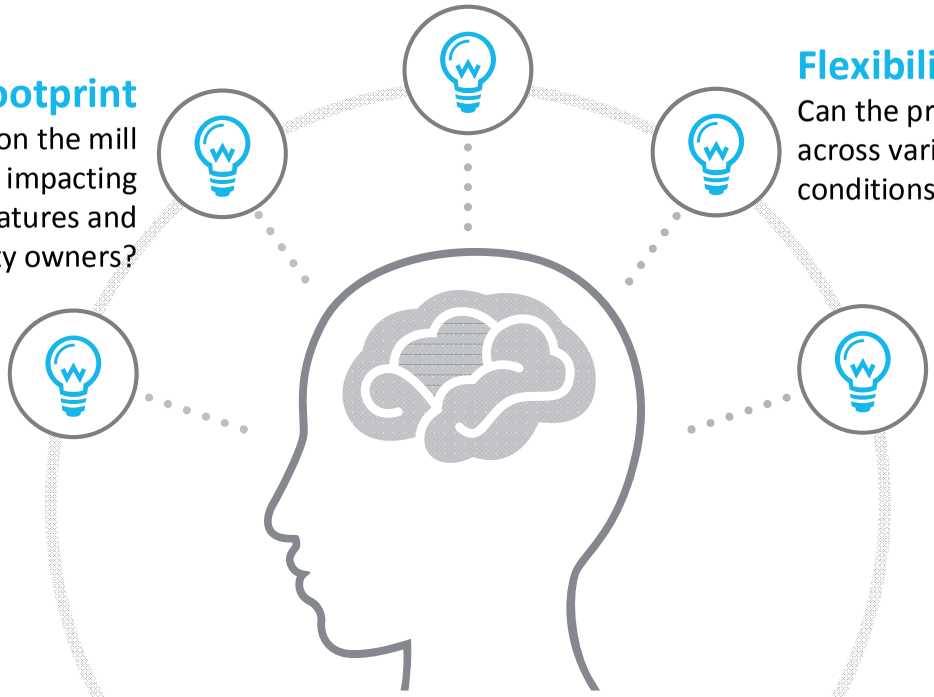
ALTERNATIVE TREATMENT PROCESSES CONSIDERED

The recommended process was determined considering:

Efficiency
Does the technology match the requirement?

Flexibility
Can the process function across various operating conditions?

Footprint
Can the process fit on the mill property, without impacting adjacent natural features and property owners?



Optimization
What process will reliably result in quality treatment, given the characteristics needing to be treated?

Economic Viability
Can the process allow for the continued viable operation of the mill?

An **Activated Sludge Treatment (AST)** process is recommended based on evaluation of these criteria and other alternatives.

Alternative technologies (processes) were identified based on their potential to meet Pulp and Paper Effluent Regulations, minimize environmental risks, and be economically viable.

Several treatment process alternatives and combinations were considered:

- **Sequencing Batch Reactors;**
- **Rotating Biological Contactors;**
- **Biological Aerated Filters;**
- **Moving Bed Bio-Reactors;**
- **Anaerobic Treatment;**
- **Tertiary Treatment; and**
- **Closed Loop (Zero Effluent).**

WHY NOT A CLOSED LOOP SYSTEM?
WHAT TYPE OF PULP MILLS CAN BE ZERO-EFFLUENT?

Zero-effluent mills do exist, but use different processes. Because they make different products, they can use different pulping processes:

MECHANICAL PULPING where "grinders" separate wood fibres to form pulp.

- Pulp used for newspaper, magazines and paperboards
- Process uses less water than kraft pulping.

UNBLEACHED KRAFT pulp is a different process to form pulp.

- Pulp used for shipping boxes and brown bags
- "Zero-effluent" operations are not all the time every day. It's intermittent.
- Some of these mills use the treated effluent for irrigation, making them "zero-effluent" for that period of time.

NORTHERN PULP IS A BLEACHED KRAFT MILL. WHY NOT A ZERO EFFLUENT BLEACHED KRAFT MILL?

BLEACHED KRAFT pulp is a chemical process to form pulp.
The bleaching process generates the majority of the effluent from a bleached kraft mill. The effluent contains chlorides that cause equipment corrosion.

! This is the same reason you use cathodic protection operating a boat in salt water.

11 bleached kraft pulp mills have attempted zero-effluent systems, but they weren't zero-effluent all the time.

- Some had full effluent closure for only short periods of time or partial closure only of the bleach plant effluent stream:
- Operating issues with the closure system occurred regardless of the bleaching process used.
- Of the 10 mills that remain in operation today, all have effluent treatment plants and discharge the treated effluent.

Full closure of a bleached kraft mill effluent cycle is not technically feasible on a sustainable basis

The bleaching process used at Northern Pulp (Elemental-Chlorine-Free, or ECF, bleaching) is considered "Best-Available-Technology" by every government in the world.

WHAT IS IN TYPICAL BLEACHED KRAFT PULP MILL EFFLUENT? HOW DOES IT CHANGE DURING TREATMENT?

Parameter Before Treatment	After Treatment
Fresh water	No change
Organics naturally present in wood – lignin, resins, fatty acids, sugars, alcohols, etc	85 to 95% removal through the biological activity in the treatment system
Metals naturally present in water and wood	Most metals leave with the biological sludge
Wood fibre	80 to 90% removal via settling (primary treatment)
Sand or dirt	80 to 90% removal via settling (primary treatment)
Lime	80 to 90% removal via settling (primary treatment)
Wood ash	80 to 90% removal via settling (primary treatment)
Black liquor (lignin, cellulose and sodium sulphide, sodium hydroxide)	85 to 95% removal through the biological activity in the treatment system
Chlorinated Compounds	45 to 65% removal through the biological activity in the treatment system

Lime can help in pH adjustment of effluent
Wood ash can provide some of the nutrients (nitrogen, phosphorus) required for effective treatment

FEDERAL PULP AND PAPER EFFLUENT REGULATIONS
WHY TREAT THE EFFLUENT?

Kraft pulp mill effluent must be treated to protect the receiving water and ensure fish are not harmed

Federal Pulp and Paper Effluent Regulations (PPER) developed in the mid 1990's to protect fish

- Prompted many mills in Canada to install Secondary Treatment Systems
- Prior to that, many mills had no treatment systems or primary treatment only

Primary Treatment	→	Removal of solids from the effluent
Secondary Treatment	→	Removal of biodegradable non-settlable organic pollutants using microorganisms

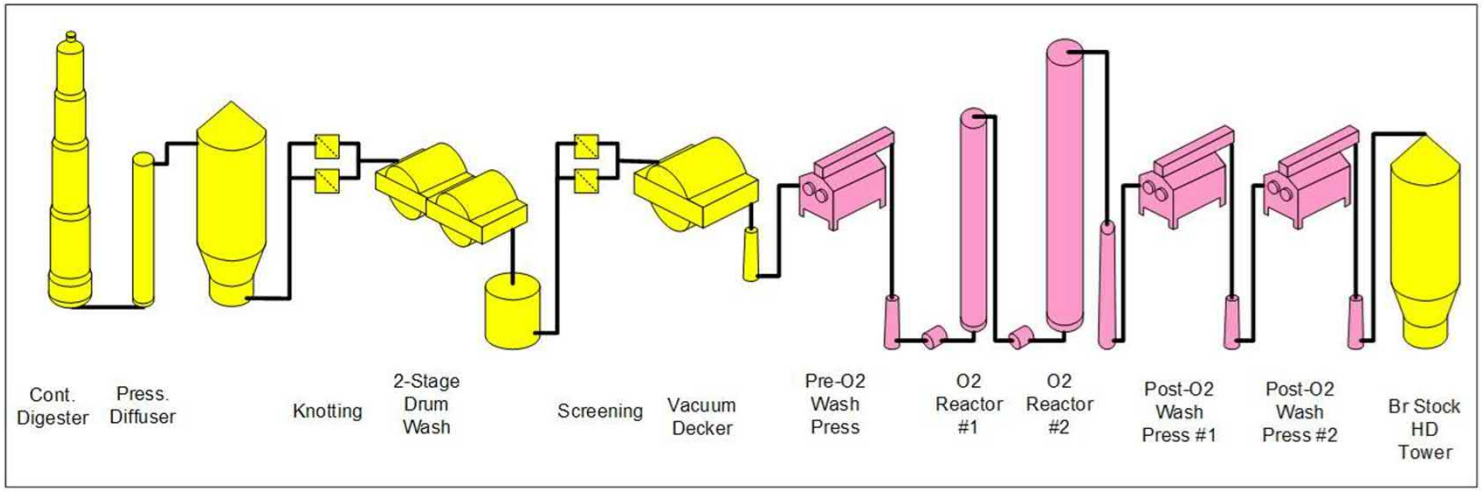
The process is very similar to the treatment provided for municipal effluent treatment systems

- These microorganisms occur naturally and consume organic food sources present in water.
- Secondary treatment uses this same process, but in an accelerated, controlled way.
- Microorganisms are concentrated and given the proper conditions (food, nutrients, oxygen) to degrade this organic pollution more quickly than what nature alone can achieve.

IN-MILL IMPROVEMENTS: OXYGEN DELIGNIFICATION

Two-stage Oxygen Delignification technology will be incorporated into the pulp making process.

The system, which consists of oxygen reactors and wash presses, will be installed after the brown stock washing stage and before the existing bleaching stages. The system uses oxygen gas to react with residual lignin that remains in the pulp after brown stock washing. The lignin removed in this new stage will result in the use of less bleaching chemicals to whiten the pulp in the existing bleach plant. It is a significant and well-proven process for ECF pulp and as such it is often referred to as the first stage of bleaching (oxygen bleaching).

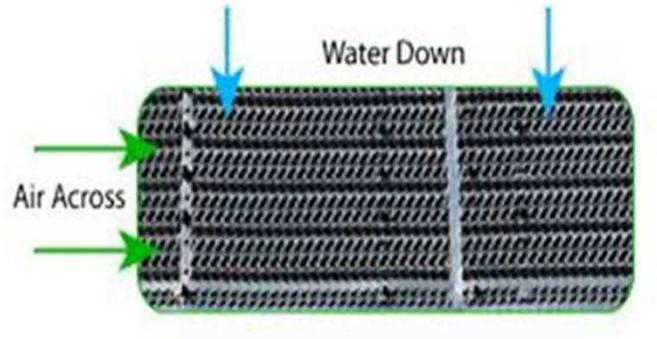


Yellow: Existing Equipment.
Pink: Future oxygen delignification equipment which will be installed in the mill.

The environmental benefits of Oxygen Delignification:

- Reduces Chlorine Dioxide bleaching chemicals by 30 – 40% - corresponding reduction in effluent organic loading and chlorinated compounds
- Reduces effluent color
- Reduces wood losses
- Increases recovery of lignin to the liquor cycle – reduction in carbon footprint
- Reduces energy consumption by reducing aeration requirements in the new ETF – reduction in carbon footprint
- Reduces nutrient addition in the new ETF

IN-MILL IMPROVEMENTS: EFFLUENT REDUCTION



Fresh water trickles down the medium, as air is blown across. Cooling occurs through evaporation.

Cooling towers are required to reduce high summer water flows. This will in turn reduce the total effluent flow.

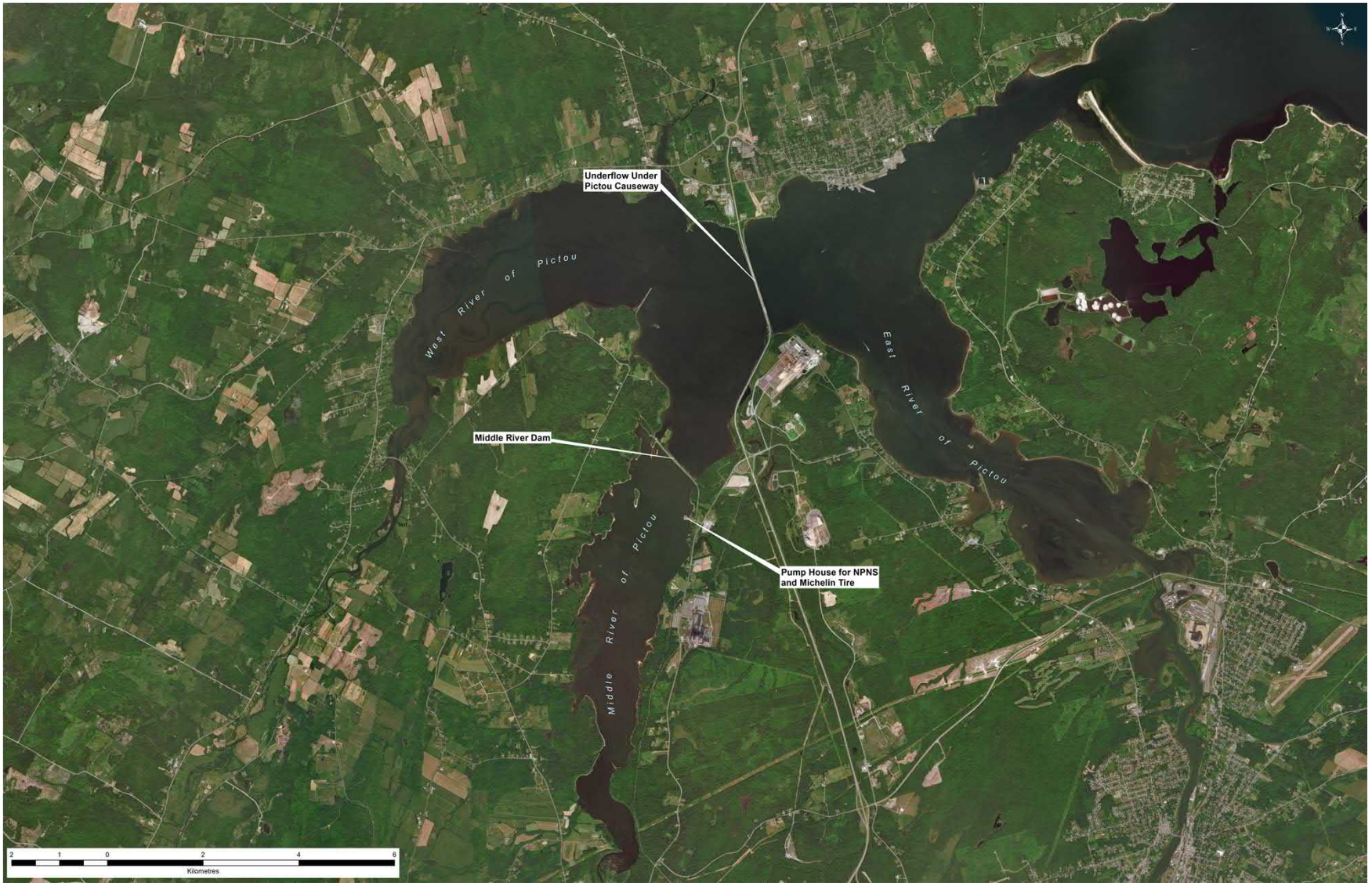
- New ETF is designed for 85,000 m^3/day peak effluent flow
- Current annual average < 70,000 m^3/day effluent flow
- Effluent flow varies by seasonal water temperature
- Non-contact cooling water makes up a considerable portion of the total effluent flow
- Summer effluent flows will be reduced as will annual average effluent flow

Colder incoming water → less cooling water needed

FRESHWATER RIVERS FEEDING INTO PICTOU HARBOUR

Three freshwater rivers flow into Pictou Harbour and the Northumberland Strait

RV Anderson Study (December 2015) was undertaken to determine the Middle River sustainable water withdrawal rate.



HISTORY OF EFFLUENT QUALITY

Effluent Quality Discharged to Strait	Date	Significant Events Affecting Effluent Quality
Apparent that additional modifications were required	1967	• NPNS start-up
	1971	• Canso Chemicals start-up
	1972	• Settling basins added; ASB constructed at Boat Harbour
Generation of mercury and dioxins & furans from chlor-alkali process ceases	1992	• Canso Chemicals closes
Significant improvement in all effluent parameters to meet Federal PPER	1995	• Closure of NPNS woodroom (wet debarking)
	1996	• Upgraded aeration system in ASB; curtains added in ASB
Generation of dioxins & furans from chlorine bleaching ceases to meet Federal PPER	1997	• Nutrient system added • NPNS switches from chlorine to chlorine dioxide bleaching
Improvement in all effluent parameters	2004	• Additional aeration installed in ASB
Boat Harbour basin still providing polishing effect on effluent (organics & solids)	2010	• Federal PPER regulatory point moved from outlet of Boat Harbour basin to inlet of Boat Harbour basin
Improvement in all effluent parameters	2011	• Closure of brown stock screen room
	2013	• Recycle of lime water in the lime kiln area

2020 Target

Reduced organic loading; reduced chlorinated compounds; small increase in solids loading

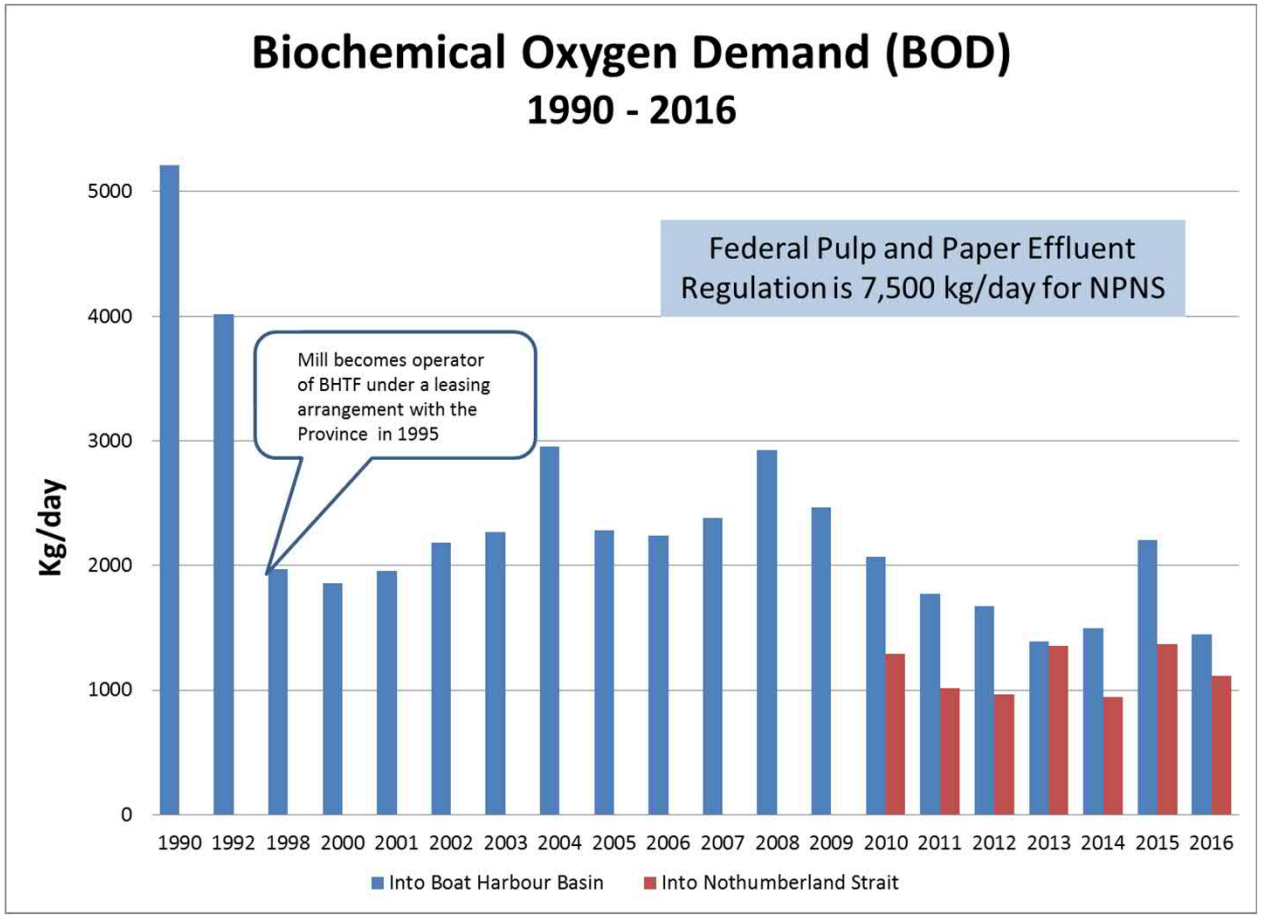
Replacement facility (AST) is in operation, and existing facility at Boat Harbour (ASB) ceases operation.

EFFLUENT QUALITY
BIOCHEMICAL OXYGEN DEMAND (BOD)

Historical improvements have been made with regards to organic loading in effluent.

Northern Pulp currently operates well under the PPER limit for BOD.

With the addition of the Oxygen Delignification process and switching to the AST process, Northern Pulp will see further reductions in organic loading



BOD - measure of organic pollutant in effluent
BOD is regulated by Environment Canada under PPER

EFFLUENT QUALITY
TOTAL SUSPENDED SOLIDS

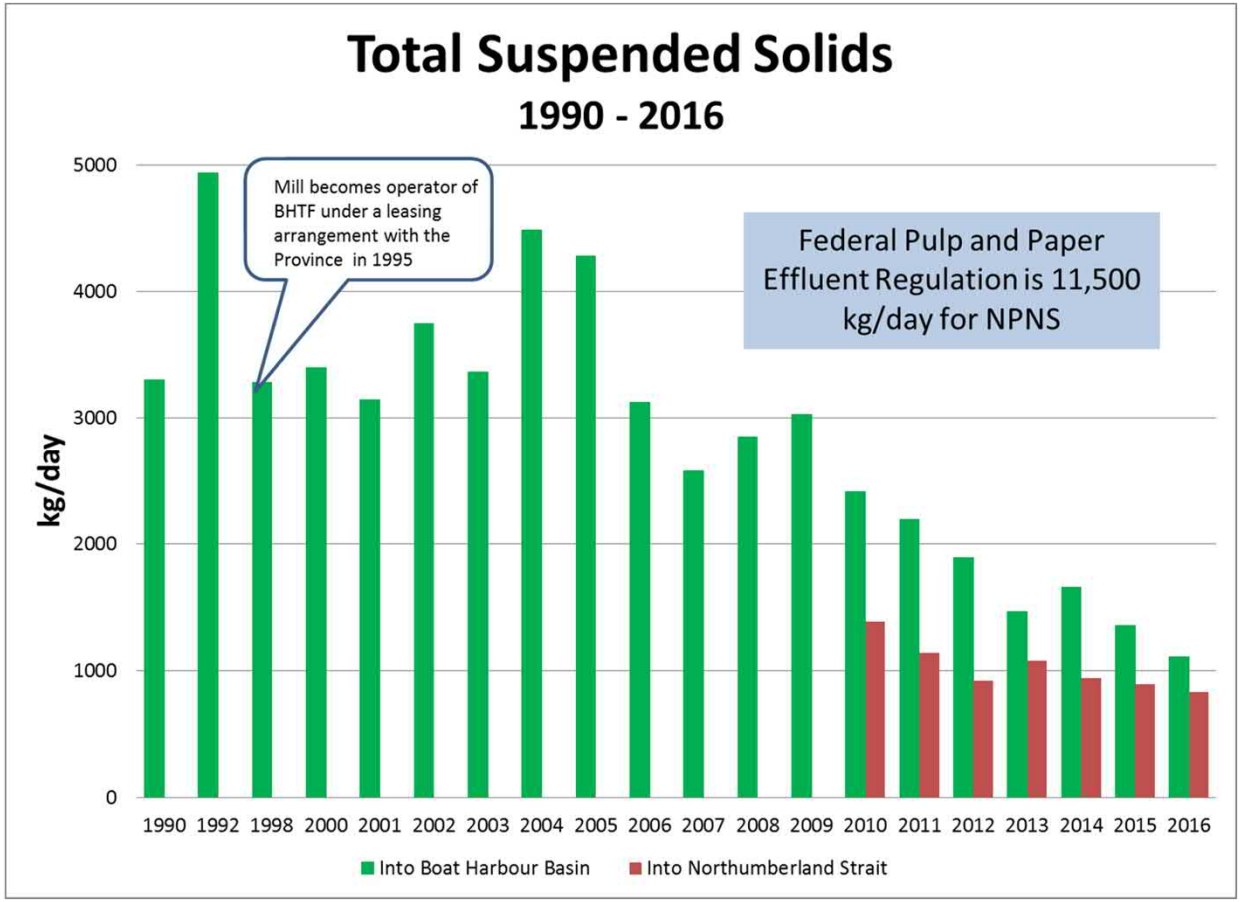
Historical improvements were made at NPNS regarding solids loading in effluent.

NPNS currently operates well under the PPER limit for TSS.

Switching to the AST Process will not have the polishing effect of the Boat Harbour Basin.

Solids loading will be similar to the current discharge of the ASB into the Boat Harbour basin and remain well below PPER limits.

TSS at the end of a biological treatment process is > 98% biodegradable organic material.



TSS - measure of solids in effluent
TSS is regulated by Environment Canada under PPER

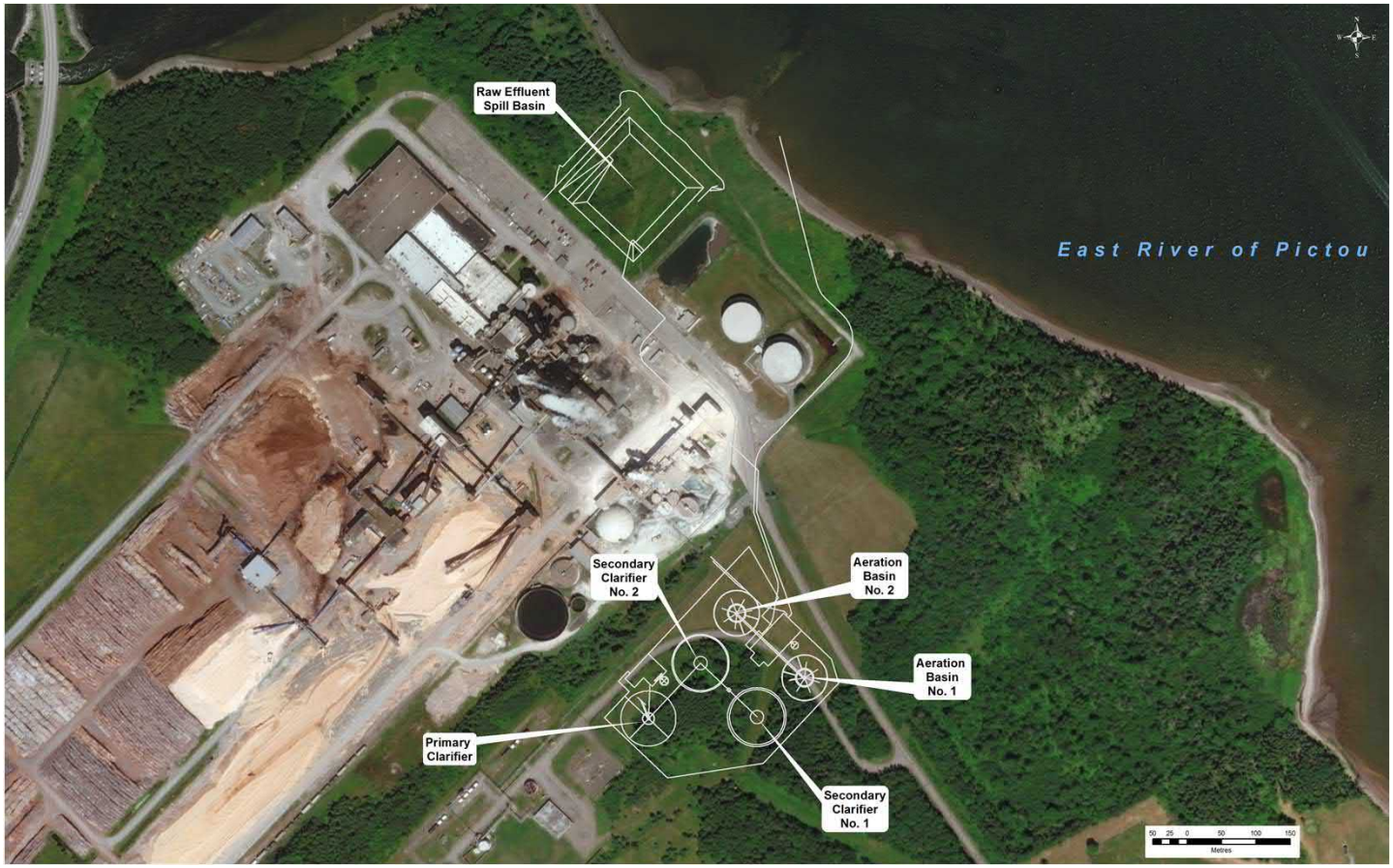
RECOMMENDED APPROACH
EFFLUENT TREATMENT FACILITY

Our proposal is to construct an ETF on land at the mill property, and lay a pipeline on the bottom of Pictou Harbour, avoiding constraints as much as possible.

The pipeline will carry treated effluent to an outfall and multi-port diffuser in the Pictou Road area of the Northumberland Strait. The proposed location of the diffuser is within the same body of water (Pictou Road) as the discharge point for the existing Boat Harbour facility.

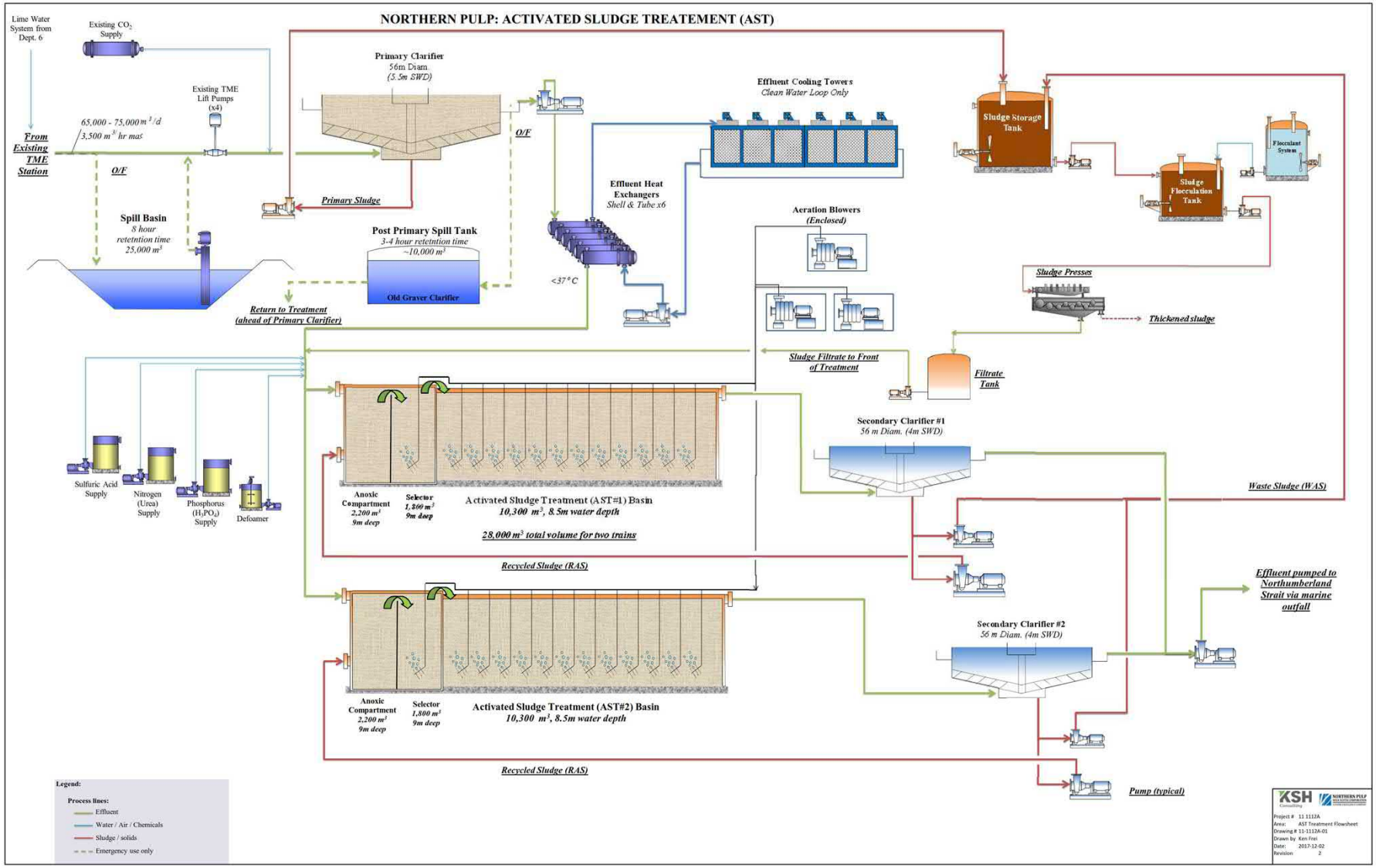
We are particularly looking for your input on the recommended route and outfall area.

We will be completing further studies to understand sensitivities in the proposed route. Right now, what we have identified is a 'corridor' rather than a specific path.



PROPOSED EFFLUENT TREATMENT FACILITY PROCESS STEPS DIAGRAM

PANEL 18



DESIGN CONSIDERATIONS IN NEW AST FACILITY: ODOUR CONTROL

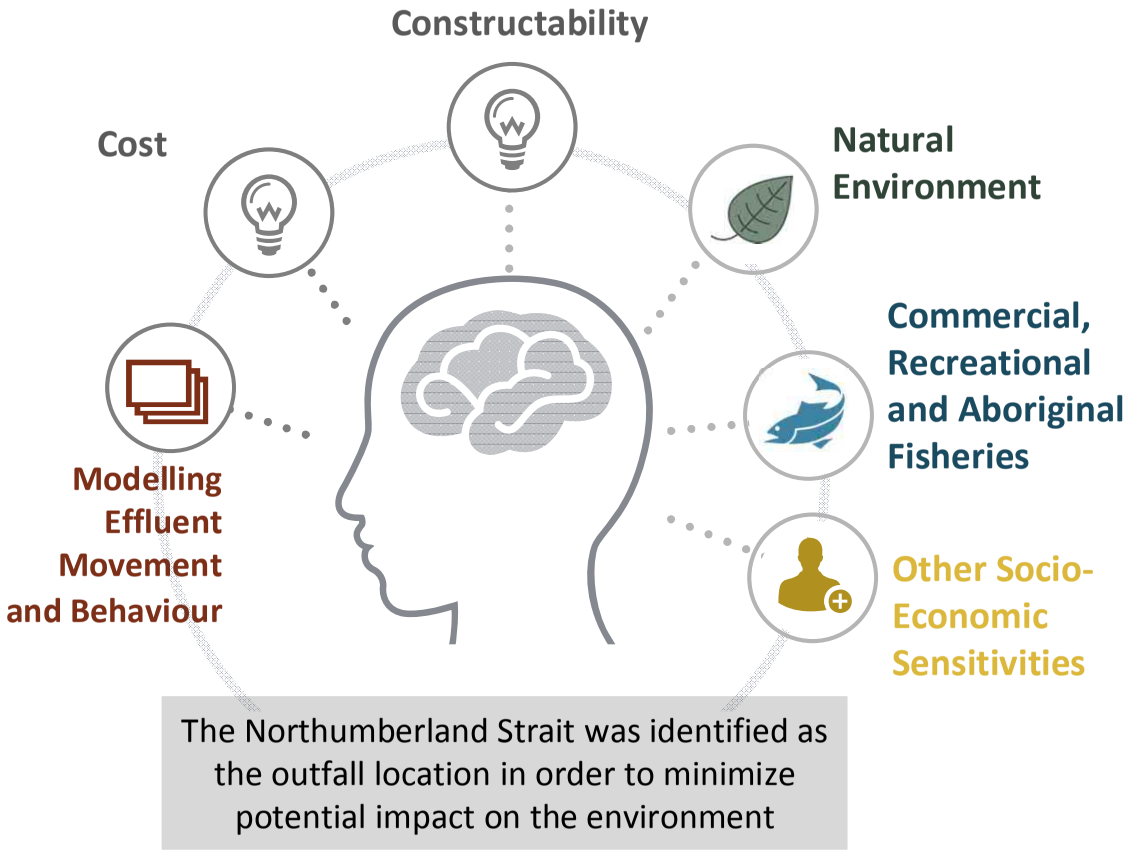
PANEL 19

TREATMENT PROCESS STAGE	CURRENT FACILITY	PROPOSED AST FACILITY
Primary Clarification	Large settling ponds, where solids settle over time and decompose under anaerobic conditions, generating hydrogen sulfide, hence creating odour similar to rotten eggs.	Solids removal is done on a continuous basis. Solids residence time is less than one day: this leaves little time for septic conditions to be created
Effluent Cooling	Effluent is cooled by the action of the surface aerators that throw the effluent into the air to allow it to absorb oxygen. This action also allows sulphur compounds to be released to the atmosphere by volatilization.	Uses indirect cooling (where cooling water is used to cool the effluent without coming into contact with it). Effluent cooling therefore occurs while the effluent is fully contained: no odours can be generated from this step of the process
Treatment Process	Solids decompose at the bottom of the ASB lagoon, which can create odours. Aeration is provided by surface aerators, which spray effluent in the air to bring it in contact with oxygen and, because of this, potentially release odorous compounds to the air through vapourization.	Solids are removed continuously and never allowed to settle within the basin. The aeration system selected is a combination of subsurface mixers and air injection (fine bubble diffuser). This system, combined with a sub-surface feed of the cooled effluent, minimizes the potential to volatilize odorous compounds
Sludge Handling	Sludge removal from the settling ponds and ASB lagoon occurs periodically as sludge inventories dictate.	The secondary clarifiers remove sludge continuously to prevent sludge accumulation that could lead to septic conditions. The dewatered solids will be collected and mixed in with existing biomass and burned in the Power Boiler.
		IMPROVED ODOUR CONTROL

CONSTRAINTS ANALYSIS: LOCATING THE OUTFALL

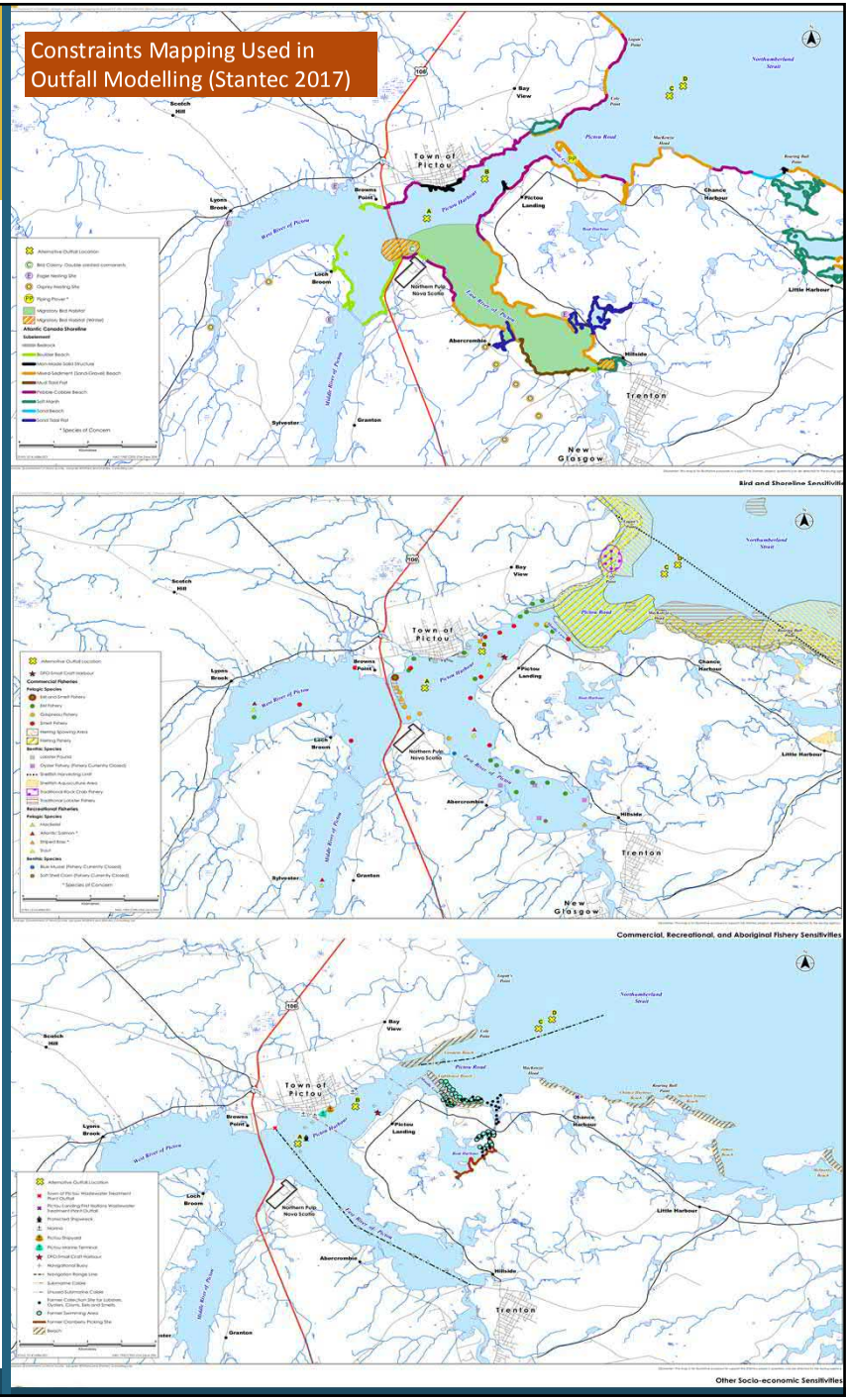
PANEL 20

Possible Locations for Outfall were Modeled and Evaluated on:



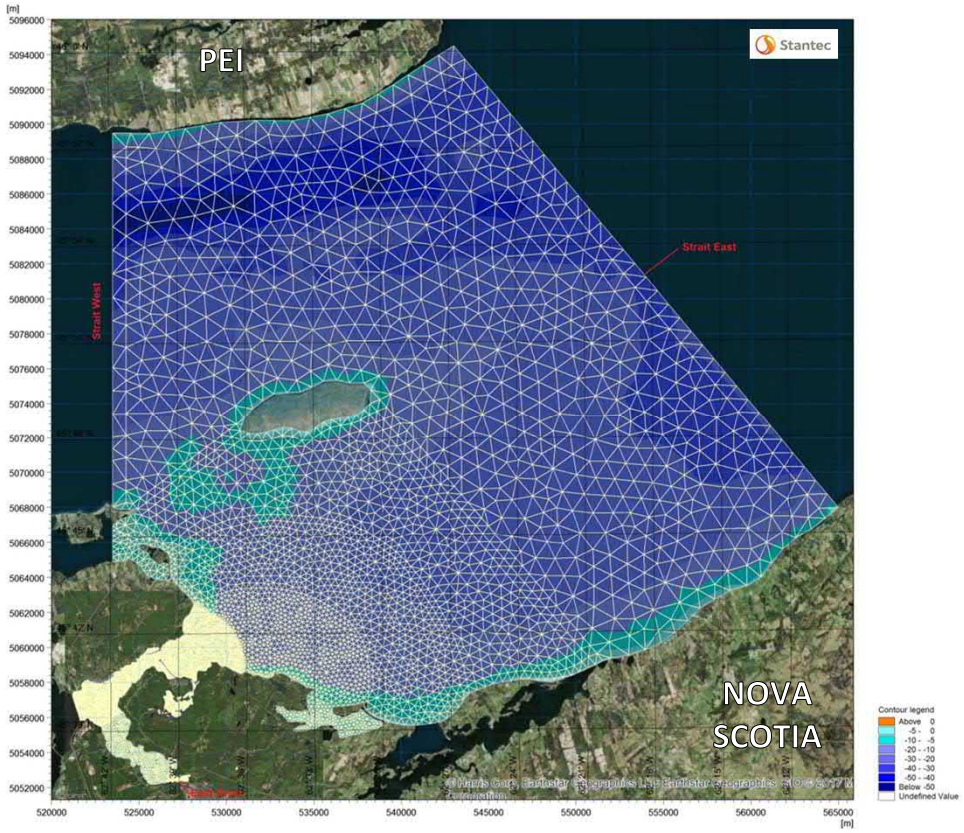
The Northumberland Strait was identified as the outfall location in order to minimize potential impact on the environment

Constraints Mapping Used in Outfall Modelling (Stantec 2017)



RECEIVING WATER STUDY
LOCATING THE MARINE OUTFALL

PANEL 21



A series of models were created to evaluate the flow dynamics, dispersal rates, settling rates, water chemistry and temperature profiles of the effluent discharge location options. The study area is shown above.

Modeling was completed to identify the potential area for the outfall, and the route the pipeline would take to get there.

There are a lot of constraints - things we need to avoid - including available commercial, recreational, and Aboriginal fisheries sensitivities, bird and shoreline sensitives, and other socio-economic sensitivities.

We've identified a solution we believe balances these constraints.

A key consideration, in consultation with Pictou Landing First Nation, was to develop a solution that does not impact Boat Harbour in the future tidal state.

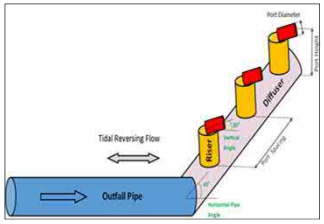
Studies have shown that if the outfall was inside Pictou Harbour the slow currents and other environmental factors inside the Harbour could result in eutrophication. Eutrophication is the creation of conditions that stimulate the growth of plants and algae that will consume oxygen in the water which will harm aquatic species.

The Northumberland Strait was identified as the outfall location. In this dynamic location, modelling predicts there will not be an accumulation of nutrients.

OUTFALL DESIGN : MULTI-PORT DIFFUSER

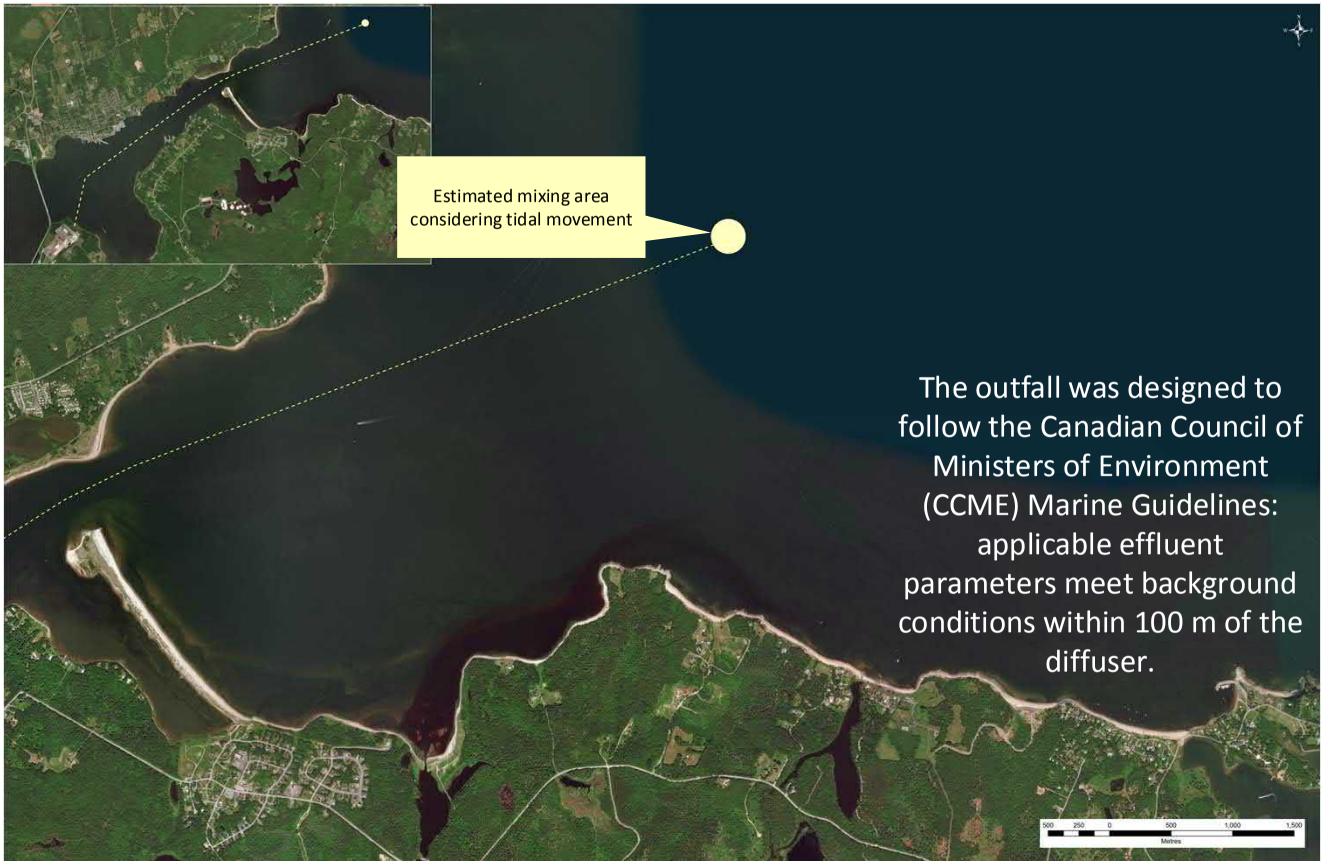
Once the effluent is treated on the mill site in the ETF, a pipeline will carry the treated effluent to the outfall location.

Example illustrations of a multi-port diffuser



Based on the design completed to date:

- The outfall will be a six-port diffuser
  - Selected for better mixing and therefore less potential for environmental impact.
- The pipeline will be approximately a 36" diameter pipe made out of high density poly-ethylene (HDPE) material.
  - HDPE is strong and has some flexibility to allow for the undulating ocean bottom profile.
- A rock mattress will be placed under the outfall pipeline on the bottom of Pictou Harbour, and then covered in armour-stone for protective cover.



PREDICTED CONCENTRATIONS OF EFFLUENT IN THE NORTHUMBERLAND STRAIT

PANEL 23

Parameter	What is it?	What types of effects could the parameter cause?	Predicted distance (Stantec 2017) from diffuser to meet water criteria:
Total Nitrogen (TN)	A nutrient.	Large concentrations in the nearshore can cause excessive algae growth (algae blooms), which can limit the amount of oxygen in the local area.	Within 2 metres - meets background (Pictou Road)
Total Phosphorus (TP)	A nutrient.	Large concentrations in the nearshore can cause excessive algae growth (algae blooms), which can limit the amount of oxygen in the local area.	Within 2 metres - meets background (Pictou Road)
Colour	Measures the colour of water.	Aesthetic consideration for humans. Potential visibility issue for fish if extensive.	Within 40 metres - meets background (Pictou Road)
Adsorbable Organic Halides (AOX)	AOX is a parameter group that encompasses organic halogen compounds from simple volatile substances such as chloroform, to complex organic molecules such as dioxins/furans (in trace amounts).	High AOX levels may have variable effects depending on the specific chemicals that comprise AOX and their levels in water.	Background data not available. Within 2 metres – well below World Bank guideline for pulp mills.
Total Suspended Solids (TSS)	TSS describes the amount of solids (clay, sand, silt, organic matter and particulates) that are suspended in water.	High TSS can affect dissolved oxygen (DO) levels or long term exposure to elevated levels may affect marine species.	Within 2 metres - meets CCME Marine Aquatic Life Guidelines (long term and short term exposure)
pH	pH indicates if a water body is acidic (low pH) or basic (high pH).	Although changes in pH can cause a variety of effects, the ocean will rapidly neutralize the effects of pH changes.	Within 5 metres – meets background (Pictou Road)
Biochemical Oxygen Demand (BOD5)	BOD measures the amount of oxygen used to decompose organic materials.	High BOD can reduce dissolved oxygen (DO) levels and may affect marine species.	Background data not available. Within 100 metres – meets levels typical of nearshore waters
Dissolved Oxygen (DO)	Amount of oxygen dissolved in the water.	Low levels of dissolved oxygen may mean there is less available oxygen for marine species to use.	Within 100 metres – meets background (Pictou Road)
Chemical Oxygen Demand (COD)	Amount of oxygen required or used by chemical reactions within the water. Required to breakdown organic and some inorganic material.	High COD may reduced dissolved oxygen (DO) and may affect marine species.	Background data not available. Within 100 metres – well below levels considered unpolluted by UNESCO
Water Temperature	How hot or cold the water is.	Marine life require a specific range of temperatures.	Within 8 m - meets CCME Marine Aquatic Life Guidelines of +/-1°C
Salinity	Salt content of the water.	Marine life require a specific range of salinity.	Within 100 m – meets background (Pictou Road)

Results from *Preliminary Receiving Water Study for Northern Pulp Effluent Treatment Plant Replacement, Pictou Harbour, Nova Scotia. 2017. Final Reports Stantec 2017.*

NEXT STEPS

Over the next few months we will complete additional studies, refine the engineering design, and continue evaluating for potential impacts and appropriate environmental planning.

We will share the results of our work.
We will summarize comments and ideas provided and make this document publicly available.

Engagement and consultation will continue.
Focused sessions with stakeholders and the community.

Thank you for engaging with us on the project.
Your comments and feedback are important.
Please complete a comment form.

NORTHERN PULP
NOVA SCOTIA CORPORATION
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DILLON
CONSULTING

Annamarie Burgess, LPP, P.Eng
Project Coordinator
Dillon Consulting Limited
137 Chain Lake Drive, Suite 100
Halifax, NS B3S 1B3
1-877-635-8553 x5050
npns.effluenttreatmentfacility@dillon.ca

Appendix I2

What We've Heard Summary Report

DILLON CONSULTING

NORTHERN PULP NOVA SCOTIA CORPORATION
REPLACEMENT EFFLUENT TREATMENT FACILITY
ENVIRONMENTAL ASSESSMENT

Project Launch: Summary of Engagement

What We Heard

March 2018

What We Heard

...during the PROJECT LAUNCH

November 5, 2017 – January 10, 2018

A 'What We Heard' document will be prepared for each project phase.

GOALS FOR THE PROJECT LAUNCH

- ü Educate about the requirement to replace the effluent treatment facility (ETF);
- ü Describe the proposed ETF Project approach
- ü Provide information on the environmental assessment (EA) process;
- ü Gather and document comments, questions, and suggestions.

KEY THEMES WE HEARD:

Potential for Environmental Impact - Respondents consistently stated the need to protect the environment.

Effluent Treatment Facility Design & Alternatives- Reasons for proposed location of the outfall, intended emergency spill procedures, and method of treatment.

Feedback on Attended Sessions- Feedback on the information sessions, and additional opportunities for public engagement.

Water Quality/Marine Protection- The environmental effects of the effluent on marine life, particularly commercial fisheries.

Socio-Economics- Need to respect the environment and the socio-economic importance of both forestry and commercial fisheries to the province.

EA and Project Process- Ability to meet *Boat Harbour Act* (January 2020) timeframe. Questions regarding the project timeline, and EA process.

DILLON CONSULTING

1.0 Project Introduction

1.1 A Replacement Treatment System to meet the *Boat Harbour Act*

Northern Pulp Nova Scotia Corporation's (NPNS) pulp mill in Abercrombie Point, Pictou County has operated since 1967. NPNS uses water during the process to produce the kraft pulp product that NPNS sells both domestically and internationally. After the water is used in production, it is currently treated at the existing effluent treatment system at Boat Harbour across the East River of Pictou. The Northern Pulp mill and effluent treatment system are operated under permit (Industrial Approval). This existing treatment system needs to be replaced to meet the requirements of the *Boat Harbour Act*.

> The *Boat Harbour Act* enshrines in law a government commitment to close the provincially-owned effluent treatment plant and build a new facility by 2020, allowing for the remediation of Boat Harbour.

A replacement Effluent Treatment Facility (ETF) is proposed to be designed, built, and operated using current best practices to allow the mill operation to continue. The main components of the proposed new ETF will be located on NPNS property, adjacent to the mill. This means all treatment will occur on-site. The water, once treated and ready for discharge, will be released through a pipe to an outfall location. The technically recommended location for the outfall is in the Northumberland Strait.

1.2 Project Team

The core Project Team for the Environmental Assessment includes:

- Northern Pulp Nova Scotia Corporation (NPNS), the proponent;
- Dillon Consulting Limited (Dillon), the Environmental Assessment consultant; and
- KSH Engineering, the overall designer and engineering consultant.

Nova Scotia Transportation and Infrastructure Renewal (NSTIR) represents the government of Nova Scotia, as owner of the existing Boat Harbour effluent treatment facility.

Unifor Local 440 represents the union employees at NPNS.

1.3 Environmental Assessment Process

In accordance with the *Nova Scotia Environment Act*, the design and construction of the treatment facility is a 'modification to an existing undertaking'. The design and construction of the new replacement facility will follow the process of a Class 1 Environmental Assessment (EA). EA approval from the provincial Minister of Environment is required prior to construction and operation of the ETF.

The detailed design of the ETF, including outfall design and location, has not been finalized.

The purpose of the EA study is to identify constraints, evaluate potential effects, and develop mitigation measures to protect the environment and associated socio-economic impacts, which will be incorporated into the final design and construction of the ETF.

Dillon Consulting Limited (Dillon) was contracted by NPNS to conduct the EA. We hope that you will engage with us on this important project.

Nova Scotia has a regulatory system in place to ensure that projects and activities proceed in an environmentally sustainable manner. We are committed to doing everything we can to fulfil and exceed the requirements for registration.

1.4 Engagement and Consultation

A key part of the EA is building a dialogue with the Pictou Landing First Nation, local communities, the public, key stakeholders, and government entities early in the EA process. Through this dialogue during meetings, discussions, and community sessions, we want to understand interests and concerns that will allow us to find a path forward that protects the environment and allows NPNS to continue to operate.

Our approach to engagement and consultation is informed by these 5 principles:

2.0 Connecting with the Community

To launch the project and begin these conversations we:

- Developed a project website to provide up to date information on the project and EA process;
- Mailed the Project Initiation newsletter, which included the invitation to the first open house sessions, to residents and businesses of Pictou County, fishers groups, and government; and
- Placed ads in newspapers that included the project initiation and open house invitation.

2.1 Notification and Invitation

Notification of the project EA initiation and the engagement program was completed through newspaper advertisements, and direct mail.

20,000 project notification letters with open house invitations were mailed to residents of Pictou County and stakeholders such as government agencies and representatives, fishers, and local business owners.

Newspaper notifications with open house invitations were published in the Advocate (November 29, 2017), New Glasgow News (November 27, 2017), and the Chronicle Herald (November 27, 2017).

A project website (www.NorthernPulpFuture.ca) was launched to provide interested members of the public with a central point to access updates on the progress of the EA and relevant reports. The project website has received 2650 views to January 2018, since going live on November 5, 2017.

2.2 How Comments have been and can continue to be submitted

Email

A project specific email address (npns.effluenttreatmentfacility@dillon.ca) was set up to provide the public with an additional means of submitting comments or asking questions regarding the project. To date, 17 people have submitted comments or questions via the project email.

Comment Forms

Comment forms were provided at the open house sessions; completed forms could be mailed or faxed to Dillon. To date 80 comment forms have been received from the information sessions, by mail, or email.

Website
There is also an online submission form available on the project website. To date an additional 60 comment forms have been received through the project website.

3.0 What We Heard

During the project launch we heard from approximately 750 individuals through engagement sessions or meetings (see Section 4.0).

> *Everyone agrees: the protection of the Northumberland Strait and surrounding natural environment is very important for ecological, economic, and recreational reasons.*

Many comment forms and emails have been received. Many more conversations have occurred over the course of the project launch phase. These conversations, in addition to written feedback, provide valuable input to the project team to identify concerns, share information on the existing environment, and guide the detail design of the replacement ETF.

Feedback collected to date though comment forms, project emails, meetings, and the eight information sessions are summarized below. A total of 158 comment forms and emails were received as of January 10, 2018. Comment forms were provided to participants at in-person sessions and were received by Dillon in person (during a session), by email, and mail.

- 53 comment forms were submitted in person at the December 4th-6th sessions;
- 9 comment forms were submitted by mail;
- 51 comments were submitted via the project website "Contact Us" page; and
- 32 comments were submitted via email.

The issues identified and concerns raised, for the purposes of this summary have been categorized into seven main themes desribed in the subsections below. 98% of the comments related to one or more of these themes, with the others relating to future procurement opportunities or the remediation of Boat Harbour.

Potential for Environmental Impact

Issue Identified: Comments which confirmed the importance of protecting the natural environment.

Frequency: Approx. 80%

Concerns Raised: Respondents consistently stated the need to protect the environment. For some, that meant the marine outfall pipe should not be constructed because any risk to the envirionment is not acceptable, there's too much at stake. Others expressed favour or acceptance of the project providing it could be demonstrated that appropriate environmental protection plans are in place.

Effluent Treatment Facility Design & Alternatives

Issue Identified: Each comment or question related to how the proposed new ETF design and outfall location was determined and why it is considered as the optimal solution.
It is noted that for many, the basis of their questions is from an environmental perspective and potential for marine impacts is a concern.

Frequency: Approx. 35%

Concerns Raised: Focused on reasons for the proposed location of the outfall; intended emergency spill procedures; method of treatment; effectiveness and environmental impacts of similar systems in operation; reasons for proposed design; alternative solutions considered.

Feedback on Attended Sessions

Issue Identified: Each comment or question related to the effectiveness of the public consultation program to-date and feedback on how to improve consultation going forward.

Frequency: Approx. 30%

Concerns Raised: Approximately 80% of the comments received on this topic related to the December 4th-6th information sessions and were positive. People commented on the quality of the information presented, the format of the open houses, and found the project team to be informative, friendly, and knowledgable.

Approximately 20% of the comments received on this theme related to the December 4th-6th information sessions were negative. Among concerns raised included the public venues being too noisy, the lack of a public question and answer period/panel, and the project team not answering questions to the satisfaction of the questioner.

Comments received related to this theme also included questions regarding future information sessions being planned, and suggestions on future engagement sessions such as youth, and holding a session in other locations.

Water Quality/Marine Protection

Issue Identified: Each comment or question related to how the proposed new ETF system would impact water quality and marine life, particularly commercial fisheries.

Frequency: Approx. 20%

Concerns Raised: Focused on quality of water after treatment; concentration of chemicals and particulates in treated effluent; impacts of fresh water discharge/changes in salinity; diffusion rates; impacts of water temperature differences in pipe and at point of discharge; discharge volume/rates; risk posed to commercial fisheries in area; long term impacts on marine life and ecosystems of suspended solids and chemicals.

Forestry

Issue Identified: Each comment or question related to the greater socio-economic impacts of NPNS operation closure or disruption.

Frequency: Approx. 10%

Concerns Raised: Focused on the importance of NPNS to the province's forestry industry and the region's economy as a direct and indirect employer and producer; the need to find a solution in a timely manner to avoid economic disruption and unemployment for the NPNS, woodlot owners, suppliers, and contractors; importance of NPNS to manage provincial forests.

EA Study and Project Process

Issue Identified: Each comment or question related to the timeline and requirements for the EA, detailed design, and/or construction.

Frequency: Approx. 10%

Concerns Raised: The perceived short timeframes for the EA; the short timeframes given for detailed design and construction in two years; the need for effective consultation with local First Nations and fishers; desire for independent review; desire for a longer public review period and Class II EA requirements; concerns regarding the economic impacts of NPNS closure or disruption.

Air Quality

Issue Identified: Each comment or question related to how the new ETF would impact air quality performance.

Frequency: Approx. 10%

Concerns Raised: Frequency of sludge burning; concentrations and quantity of chemicals in the sludge to be burned; impact on air quality from the additional burning.

4.0 Details of Engagement During Project Launch

The Project EA Launch was initiated in late November with the project website going live on November 5, 2017, followed by project notification in the major newspapers and directed mailings to Pictou County residents and stakeholders to provide background and provide an invitation to the open houses or presentations.

The project website provides specific information on the project and the EA process, as well as opportunity to submit comments. A project email and toll free phone line for directing questions or comments was also arranged.

December 4, 2017

Media Information Session

An information session open to members of the media was held on December 4, 2017 at the Pictou County Wellness Centre between 3:00 and 5:00 pm. Invitations were sent to the local newspapers and Halifax media outlets. Six (6) representatives from four media outlets (two local newspapers and two major provincial television news networks) attended. The information panels were displayed throughout the room and a 30 minute presentation was provided by project representatives from NPNS, Dillon, and KSH Engineering (KSH Engineering is responsible for designing the new ETF). Representatives from NPNS, NSTIR, KSH Engineering, Dillon, and Unifor Local 440 were available for questioning and interviews during the remainder of the session.

Fishing Industry Meeting

A fishing industry information session was held on December 4, 2017 at the Pictou County Wellness Centre between 7:00 and 9:30 pm. Meeting invitations were sent to individual fishers through the major industry associations representing the various sectors and geographies (e.g. Northumberland Fisherman's Association). The information panels were displayed throughout the room and a 30 minute presentation was provided by project representatives from NPNS, Dillon, KSH Engineering. Representatives from NPNS, NSTIR, KSH Engineering, Dillon, and Unifor Local 440 were available for a question and answer period for the remainder of the session (2 hours). 178 people attended the session. While those in attendance were largely from Pictou County, there were also fishers from Antigonish County, Prince Edward Island, and New Brunswick.

December 5, 2017

Government Representatives and Agencies Information Session

An information session open to government officials and agencies was held on December 5, 2017 at Glasgow Square, New Glasgow, between 1:00 and 3:00 pm. Invitations were sent to Mayors, CAOs, and Councillors at the five local governments in the area (Municipality of Pictou County, Westville, New Glasgow, Town of Pictou, and Stellarton), the Pictou County MLAs, and various applicable provincial agencies. Elected officials from Antigonish, Truro and Colchester County received invitations to attend as well. Eleven (11) government officials attended the session. The information panels were displayed throughout the room and project representatives from NPNS, Unifor Local 440, NSTIR, Dillon, and KSH Engineering were available to answer questions.

Industry Information Session
An information session open to local businesses and forestry industry representatives was held on December 5, 2017 at Glasgow Square, New Glasgow, between 3:00 and 5:00 pm. Invitations were sent to NPNS suppliers, NPNS employees, and key industry contacts. There were 92 people in attendance. Information panels were displayed throughout the room and project representatives from NPNS, Unifor Local 440, NSTIR, Dillon, and KSH Engineering were available to answer questions.

Public Information Session
An information session open to the public was held on December 5, 2017 at Glasgow Square, New Glasgow, between 7:00 and 9:00 pm. Invitations were provided in the local newspapers. There were 147 people in attendance. Information panels were displayed throughout the room and project representatives from NPNS, Unifor Local 440, NSTIR, Dillon, and KSH Engineering were available to answer questions.

December 6, 2017

Government Representatives and Agencies Information Session
An information session open to government officials and agencies was held on December 6, 2017 at Abercrombie Fire Hall, Abercrombie between 1:00 and 3:00 pm. Invitations were sent to Mayors, CAOs, and Councillors at the five local governments in the area (Pictou County, Westville, New Glasgow, Town of Pictou, and Stellarton), the Pictou County MLA's, and various applicable provincial agencies. Nine government officials attended the session. The information panels were displayed throughout the room and project representatives from NPNS, Unifor Local 440, NSTIR, Dillon, and KSH Engineering were available to answer questions.

Industry Information Session
An information session open to local businesses and forestry industry representatives was held on December 6, 2017 at Abercrombie Fire Hall, Abercrombie between 3:00 and 5:00 pm. Invitations were sent to NPNS suppliers, NPNS employees, and key industry contacts. There were 97 attendees of the session. Information panels were displayed throughout the room and project representatives from representatives from NPNS, Unifor Local 440, six representatives from Dillon, and one representative from KSH Engineering were available to answer questions.

Public Information Session
An information session open to the public was held on December 6, 2017 Abercrombie Fire Hall, Abercrombie between 7:00 and 9:00 pm. Invitations were provided in the local newspapers. There were 161 attendees of the session. Information panels were displayed throughout the room and project representatives from NPNS, Unifor Local 440, six representatives from Dillon, and one representative from KSH Engineering) were available to answer questions.

December 21, 2017

Leadership from Commercial Fisheries Associations
Commercial fishers asked the project team to bring them to the design table seeking rationale behind an outfall pipe into the Northumberland Strait as the marine discharge option. Leadership from several commercial fishery associations met with the project team to share concerns about the project and discuss how to continue discussions to find a path forward. Leaders outlined their strong opposition to

an outfall marine pipe within the Northumberland Strait. Project representatives from NPNS, KSH Engineering, Dillon, and NSTIR met with representatives from the Northumberland Fishermen's Association, the Gulf Nova Scotia Fishermen's Coalition, the Gulf Nova Fleet Planning Board, the Inverness South Fishermen's Association, the Maritime Fishermen's Union, PEI Fishermen's Association, and the Gulf Nova Scotia Bonafide Fishermen's Association.

January 8, 2018

Pictou Landing First Nation
On the evening of January 8, 2017, beginning at 5:30 p.m., a community engagement session was held for the Pictou Landing First Nation community in the school gymnasium.

Invitations were distributed by the Pictou Landing First Nation. Approximately 70 people attended the session, including members of the public and Pictou Landing First Nation. The information panels were displayed throughout the room. Project representatives from NPNS, Unifor Local 440, NSTIR, Dillon, and KSH Engineering were available to answer questions.

January 10, 2018

Native Council of Nova Scotia (NCNS)
The NPNS project team reviewed project information with the Native Council of Nova Scotia (NCNS) Chief, staff, and affiliated organization staff mid-day on January 10, 2018. The meeting was held between 1:00 p.m. to 4:00 p.m. at the NCNS office in Truro with project representatives from NPNS, KSH, NSTIR, Unifor Local 440 and Dillon.

5.0 Next Steps

The discussions that began during the Project Launch phase will be continued:

- Follow up sessions will be sought with;
  - Pictou Landing First Nation,
  - leadership from commercial fisheries,
  - NPNS employees,
  - Forest industry representatives and stakeholders,
  - all levels of government and agencies,
  - local residents and businesses,
- Native Council of Nova Scotia will be kept informed on the project;
- Responses to questions that have been submitted will be provided directly to respondents;
- Reports prepared will be made available via the project website during the EA; and
- Frequently Asked Questions on the project website will continue to be updated.

Appendix A

Project Launch Newsletter

Project Initiation

Environmental Assessment for the Northern Pulp Nova Scotia Replacement Effluent Treatment Facility

The Northern Pulp Mill is located in Abercrombie Point, Pictou County. It is owned and operated by the Northern Pulp Nova Scotia Corporation, a Paper Excellence company.

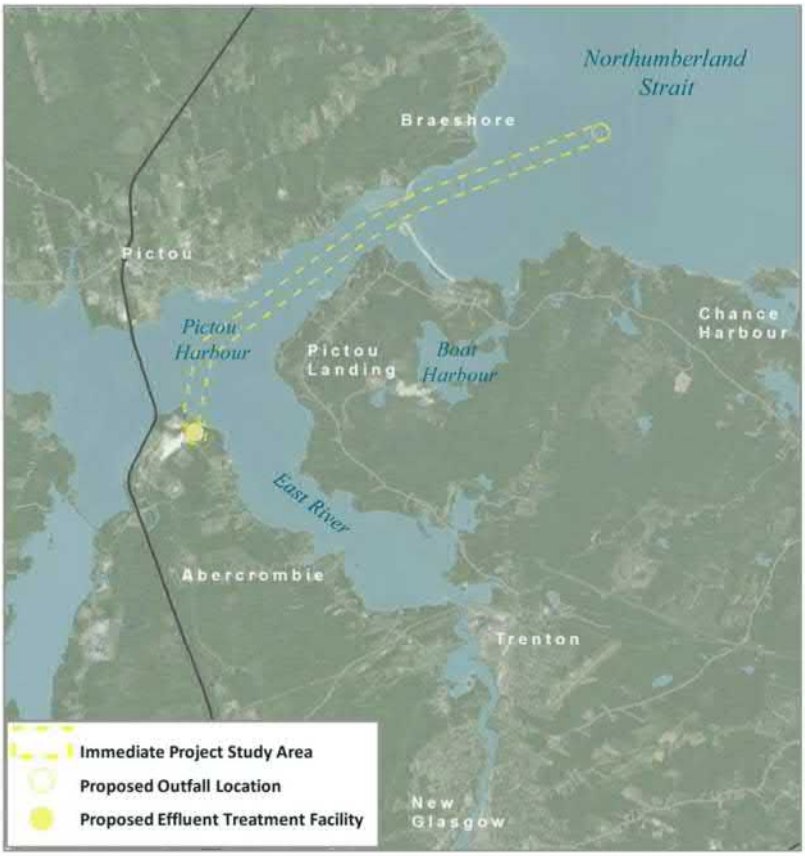
Dillon Consulting Limited has been hired to complete the Environmental Assessment for the replacement of the Effluent Treatment Facility.

PROJECT DESCRIPTION

The Northern Pulp Nova Scotia (NPNS) Pulp Mill manufactures northern bleached softwood kraft, more commonly known as pulp. The pulp is sold to manufacturers of household products (e.g. hygiene products, tissue, and paper towel). The NPNS Pulp Mill uses water as part of its processing to produce the pulp. After the water is used in production it is treated at the existing effluent treatment system at Boat Harbour. The NPNS Pulp Mill and effluent treatment system are operated under the most current March 2015 permit (Industrial Approval).

The existing treatment system needs to be replaced to meet the requirements of the *Boat Harbour Act*. In accordance with the *Environment Act*, the design and construction of a new treatment facility is a modification to the existing Industrial Approval and therefore will follow a Class 1 Environmental Assessment (EA). EA approval is required prior to construction and operation.

The proposed Effluent Treatment Facility (ETF) will be designed, built, and operated using current best practices. The main components of the new ETF will be located on Northern Pulp property, adjacent to the NPNS Pulp Mill. This means all treatment will occur on-site. The water, once treated and ready to discharge, will be released through a pipe to an 'outfall' in the Northumberland Strait.



STUDY PURPOSE

The detailed design of the ETF, including outfall design and location, has not been completed. The purpose of this study is to identify constraints and mitigation measures to protect the environment which will be incorporated into the final design and construction of the ETF.

Project Initiation

Environmental Assessment for the Northern Pulp Nova Scotia Replacement Effluent Treatment Facility

STUDY PROCESS The Environmental Assessment study will follow the process described below. We will engage with Indigenous Communities, the public, agencies, and stakeholders throughout. The project website (www.NorthernPulpEffluentTreatmentFacility.ca) has additional information on the study process and how you can be involved. It will be updated as the study progresses.

FALL 2017
Environmental Assessment Study Initiation

WINTER 2017
Consultation and Engagement: 'Project Launch'. Receive input on existing conditions. Understand community/stakeholder concerns

SPRING 2018
Consultation and Engagement: Receive feedback on proposed environmental planning.

SUMMER 2018
Register the Environmental Assessment

OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG

FALL/WINTER 2017
Environmental Sciences
Background research and field studies to document existing conditions

WINTER 2018
Environmental Sciences
Begin evaluating potential for impacts and appropriate environmental planning.

SPRING 2018
Environmental Sciences
Complete final field studies. Finalize environmental planning and project.

CONTACT US

You can contact us at any time with your feedback, ideas, and questions:

Annamarie Burgess, LPP, P.Eng
Project Coordinator
Dillon Consulting Limited
137 Chain Lake Drive, Suite 100
Halifax, NS B3S 1B3
1-877-635-8553 x5050
npns.effluenttreatmentfacility@dillon.ca

PLEASE JOIN US

Please join us at our first Open House. Our goal is to share information about the project, gather information on the existing conditions (natural and social), and identify key areas of consideration. The Open House will be a drop-in session format. It will be held at two locations, with the same information presented at each:

Tuesday December 5, 2017
Glasgow Square
155 Riverside Parkway
New Glasgow
5:00 pm – 7:30 pm

Wednesday December 6, 2017
Abercrombie Fire Hall
2030 Granton Abercrombie Road
Abercrombie
5:00 pm – 7:30 pm

Comments and information received will be considered, and kept on file for inclusion in the Environmental Assessment Registration. All personal information such as name, address, and telephone will be kept confidential, in accordance with the *Personal Information Protection and Electronic Documents Act*. Only comments will become part of the public record.

Appendix B

Newspaper Advertisement of Open House Sessions

NORTHERN PULP NOVA SCOTIA

ENVIRONMENTAL ASSESSMENT REPLACEMENT OF EFFLUENT TREATMENT FACILITY

Northern Pulp Nova Scotia's existing effluent treatment system needs to be replaced, as required by the Nova Scotia Boat Harbour Act. The detailed design of the new effluent treatment facility, including outfall design and location, has yet to be finalized. This Environmental Assessment study will provide input to the design and construction of the facility, through identifying constraints and mitigation measures to achieve sound environmental planning. Dillon Consulting Limited has been contracted by Northern Pulp Nova Scotia to complete the Environmental Assessment.

Engagement is an important component of the study. There will be opportunities throughout the study to provide input and meet with the project team. You are invited to the first Open House. Our goal is share information on the project, gather information on the existing conditions (natural and socio-economic), and identify key areas of consideration. The Open House will be a drop-in session format. It will be held at two locations, with the same information presented at each:

Tuesday December 5, 2017
Glasgow Square
155 Riverside Parkway
New Glasgow
5:00 pm – 7:30 pm

Wednesday December 6, 2017
Abercrombie Fire Hall
2030 Granton Abercrombie Road
Abercrombie
5:00 pm – 7:30 pm

Additional information on the project is available at www.NorthernPulpEffluentTreatmentFacility.ca

If you would like to be notified directly of future project updates, please contact us to be added to the notification list.

CONTACT US
You can contact us at any time with your feedback, ideas, and questions using any of the options below:

Kathy Cloutier
Communications Director
Paper Excellence Canada
Northern Pulp Nova Scotia Corporation
P.O. Box 549, Station Main
New Glasgow, NS B2H 5E8
902-752-8461 ext.231
info@northernpulp.ca

Annamarie Burgess, LPP, P.Eng
Project Coordinator
Dillon Consulting Limited
137 Chain Lake Drive, Suite 100
Halifax, NS B3S 1B3
1-877-635-8553 x5050
npns.effluenttreatmentfacility@dillon.ca

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Appendix C

Project Launch Materials Presented at Open Houses and Engagement Sessions

Replacement of the Effluent Treatment Facility

Northern Pulp Nova Scotia Mill

COMMUNITY OPEN HOUSES –
DECEMBER 2017 & JANUARY 2018

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WELCOME. THANK YOU FOR ATTENDING.

GOALS FOR COMMUNITY OPEN HOUSES

We need your input and ideas to find a path forward.

We want to meet with the community and begin a dialogue that will continue over the study.

WHAT WORK HAS BEEN DONE?

The Project Team has been working hard to gather information and complete studies in order to meet with the community and start discussing the proposed effluent treatment facility replacement.

We are currently working on reports and will share the results and information with you when complete.

WHAT IS BEING PROPOSED?

Based on the studies done to date, there is a technically recommended approach. A treatment facility would be constructed adjacent to the Northern Pulp mill to treat the mill effluent. Federal and Provincial regulations would be met before leaving the site. A pipeline carries the treated effluent to an outfall. Studying flow dynamics, it was clear that the outfall needs to be in the Northumberland Strait. The existing facility and pipeline will then be closed.

WHAT'S NEXT?

We are completing an Environmental Assessment (EA) Study, which will take months to complete before it is submitted to Nova Scotia Environment. There is data to collect, studies to be done, and more conversations will be needed to find a path forward.

APPROACH TO ENGAGEMENT

Northern Pulp is part of the community.
We want to find a solution that works for all of us.
Our approach to engagement and consultation is based on five principles:

Inclusivity

Involve those to be affected in the decision-making process.

Responsiveness

Address input received in a timely fashion.

Accessibility

The complex should be made clear. Materials and processes made accessible to a diverse range of participants.

Transparency

Clearly communicate how information received was used in the decision making process.

Respect

A safe and comfortable environment is always maintained, where individuals can freely contribute their opinions and directions.

ENVIRONMENTAL ASSESSMENT STUDY

PANEL 2

FALL 2017

Environmental Assessment Study Initiation

WINTER 2017

Consultation and Engagement: 'Project Launch'. Receive input on existing conditions. Understand community/stakeholder concerns

SPRING 2018

Consultation and Engagement: Receive feedback on proposed environmental planning.

SUMMER 2018

Register the Environmental Assessment

October	November	December	January	February	March	April	May	June	July	August

FALL/WINTER 2017

Environmental Sciences

Background research and field studies to document existing conditions.

WINTER 2018

Environmental Sciences

Begin evaluating potential for impacts and appropriate environmental planning.

SPRING 2018

Environmental Sciences

Complete final field studies. Finalize environmental planning and project.

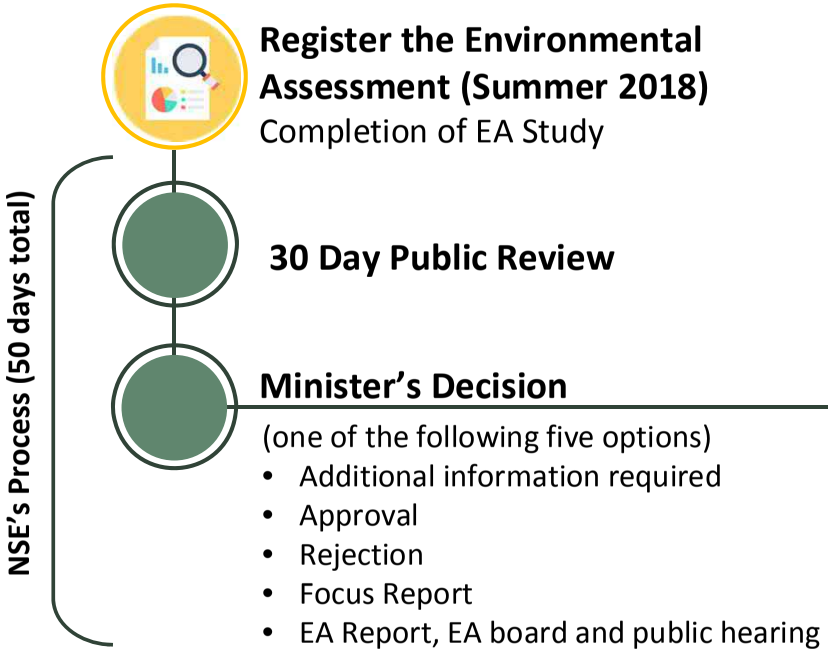
Engagement and consultation will occur during our study in order for the project team to understand community concerns and develop a more complete understanding of the area prior to Project Registration.

Environmental planning to protect or mitigate risks will be developed from this understanding.

ENVIRONMENTAL ASSESSMENT PROCESS

What's an Environmental Assessment (EA)?

- A decision-making tool used to promote sustainable development by evaluating the potential environmental effects of developments before they proceed.
- Public, Aboriginal Communities, stakeholders, along with government departments and agencies are engaged.
- Promotes better project planning by identifying and addressing environmental effects at the earliest stages of project development.



Government Agencies that have been engaged in the process:

Provincial:
Nova Scotia Environment (NSE)
Department of Natural Resources

Federal:
Fisheries and Oceans Canada
Environment & Climate Change Canada
Canadian Environmental Assessment Agency
Transport Canada

ORIGINS OF THE BOAT HARBOUR TREATMENT FACILITY

PANEL 4

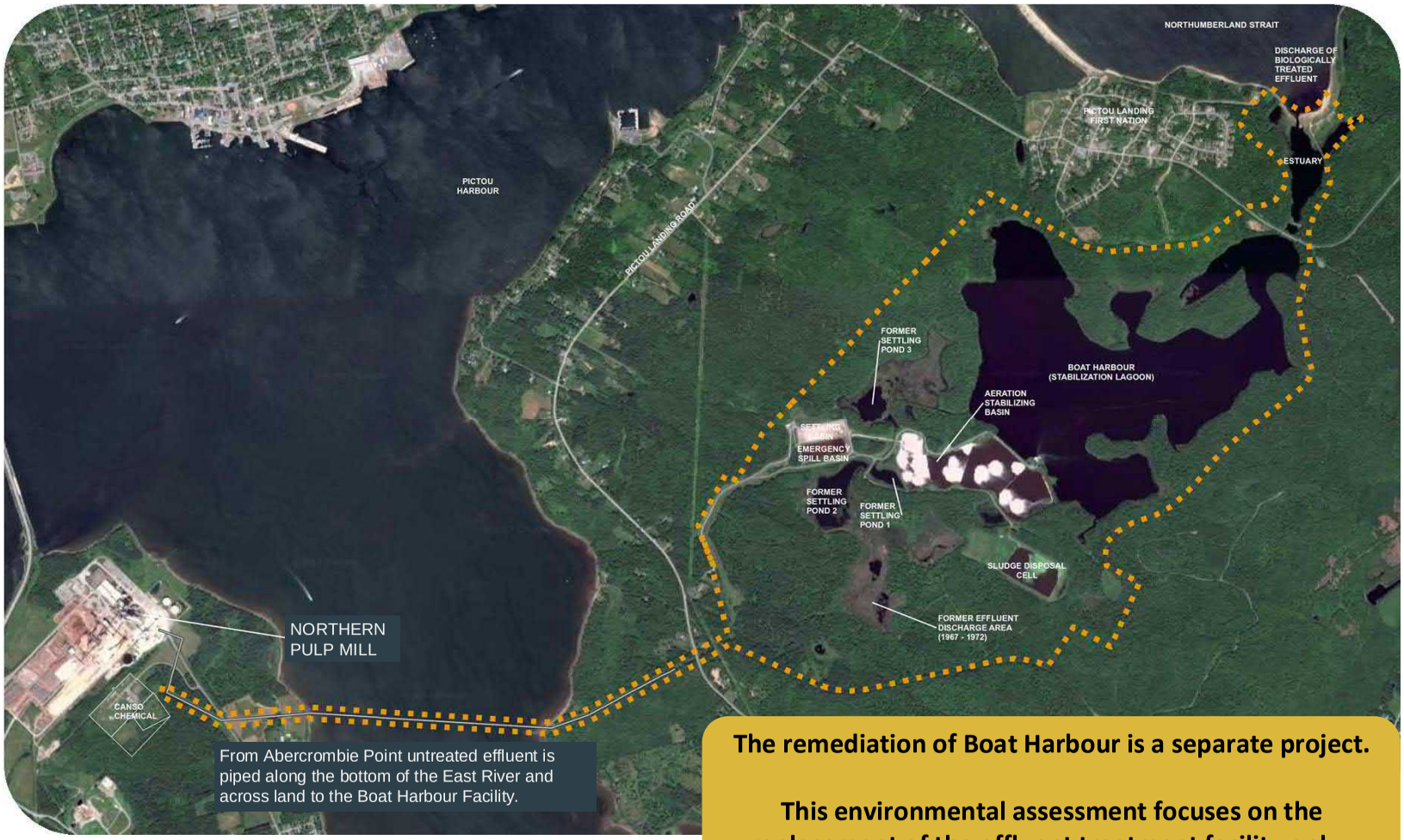
1965 As an incentive to attract industry to Pictou County, the provincial government offered raw water supply and effluent treatment to potential incoming industries.

3 companies were attracted to the County through these incentives (Michelin Tire, Northern Pulp's predecessor and Canso Chemicals).

Boat Harbour began operating as a treatment facility in 1967.

It is the wish of Pictou Landing First Nation that Boat Harbour be returned to tidal and be made a place that the community can once again enjoy.

Northern Pulp supports the government's actions to fulfill the promise made to Pictou Landing First Nation to close the existing facility.



The remediation of Boat Harbour is a separate project.

This environmental assessment focuses on the replacement of the effluent treatment facility only.

EXISTING BOAT HARBOUR TREATMENT FACILITY

What is now operated as the Boat Harbour Effluent Treatment Facility (ETF) is very different than how it began.

In fact, originally there was no formal treatment process. It was believed that nature and time were enough to treat the effluent.

Shortly following operation, it was recognized that additional treatment was necessary.

In 1995 NPNS took over operations of the facility under a lease agreement originally for 10 years, extended until 2030.

1967 Treatment plant began operating

1972 Treatment process at Boat Harbour was improved to include settling ponds and an aerated basin.

1992 Canso chemical chlor-alkali facility closed, stopping production of sodium hydroxide using mercury as a catalyst.

1996 Beginning in 1992 and finishing in 1996, multiple upgrades were made to the EFT including: additional aeration, separation curtains in the aeration basin, and the addition of a nutrient feed system to optimize microbiological activity.

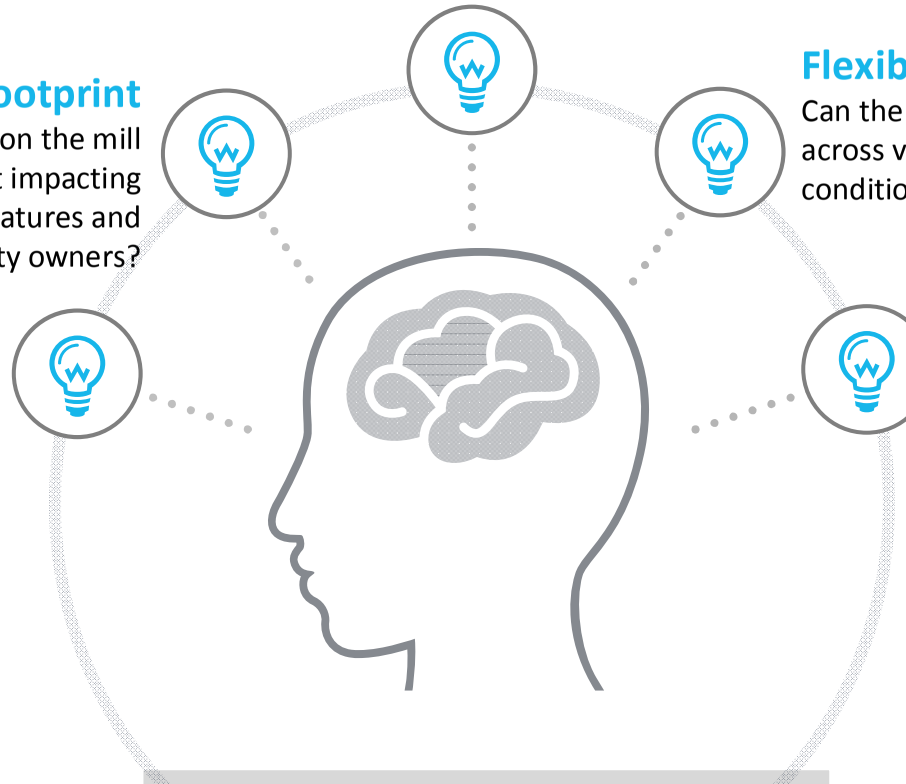
1997 The bleaching process was upgraded to meet new federal regulations for dioxins and furans by switching to chloride dioxide instead of elemental chlorine (Pulp and Paper Effluent Regulations (PPER)).

2015 Boat Harbour Act enacted in 2015, requiring the current Boat Harbour Treatment Facility to cease operations by January 31, 2020. A new effluent treatment facility is now required.

ALTERNATIVE TREATMENT PROCESSES CONSIDERED

PANEL 6

The recommended process was determined considering:



Efficiency
Does the technology match the requirement?

Flexibility
Can the process function across various operating conditions?

Economic Viability
Can the process allow for the continued viable operation of the mill?

Optimization
What process will reliably result in quality treatment, given the characteristics needing to be treated?

Footprint
Can the process fit on the mill property, without impacting adjacent natural features and property owners?

An **Activated Sludge Treatment (AST)** process is recommended based on evaluation of these criteria and other alternatives.

Alternative technologies (processes) were identified based on their potential to meet Pulp and Paper Effluent Regulations, minimize environmental risks, and be economically viable.

Several treatment process alternatives and combinations were considered:

- **Sequencing Batch Reactors;**
- **Rotating Biological Contactors;**
- **Biological Aerated Filters;**
- **Moving Bed Bio-Reactors;**
- **Anaerobic Treatment;**
- **Tertiary Treatment; and**
- **Closed Loop (Zero Effluent).**

WHY NOT A CLOSED LOOP SYSTEM?
WHAT TYPE OF PULP MILLS CAN BE ZERO-EFFLUENT?

Zero-effluent mills do exist, but use different processes. Because they make different products, they can use different pulping processes:

MECHANICAL PULPING where "grinders" separate wood fibres to form pulp.

- Pulp used for newspaper, magazines and paperboards
- Process uses less water than kraft pulping.

UNBLEACHED KRAFT pulp is a different process to form pulp.

- Pulp used for shipping boxes and brown bags
- "Zero-effluent" operations are not all the time every day. It's intermittent.
- Some of these mills use the treated effluent for irrigation, making them "zero-effluent" for that period of time.

NORTHERN PULP IS A BLEACHED KRAFT MILL. WHY NOT A ZERO EFFLUENT BLEACHED KRAFT MILL?

PANEL 8

BLEACHED KRAFT pulp is a chemical process to form pulp.
The bleaching process generates the majority of the effluent from a bleached kraft mill. The effluent contains chlorides that cause equipment corrosion.

! This is the same reason you use cathodic protection operating a boat in salt water.

11 bleached kraft pulp mills have attempted zero-effluent systems, but they weren't zero-effluent all the time.

- Some had full effluent closure for only short periods of time or partial closure only of the bleach plant effluent stream:
- Operating issues with the closure system occurred regardless of the bleaching process used.
- Of the 10 mills that remain in operation today, all have effluent treatment plants and discharge the treated effluent.

Full closure of a bleached kraft mill effluent cycle is not technically feasible on a sustainable basis

The bleaching process used at Northern Pulp (Elemental-Chlorine-Free, or ECF, bleaching) is considered "Best-Available-Technology" by every government in the world.

WHAT IS IN TYPICAL BLEACHED KRAFT PULP MILL EFFLUENT? HOW DOES IT CHANGE DURING TREATMENT?

Parameter Before Treatment	After Treatment
Fresh water	No change
Organics naturally present in wood – lignin, resins, fatty acids, sugars, alcohols, etc	85 to 95% removal through the biological activity in the treatment system
Metals naturally present in water and wood	Most metals leave with the biological sludge
Wood fibre	80 to 90% removal via settling (primary treatment)
Sand or dirt	80 to 90% removal via settling (primary treatment)
Lime	80 to 90% removal via settling (primary treatment)
Wood ash	80 to 90% removal via settling (primary treatment)
Black liquor (lignin, cellulose and sodium sulphide, sodium hydroxide)	85 to 95% removal through the biological activity in the treatment system
Chlorinated Compounds	45 to 65% removal through the biological activity in the treatment system

Lime can help in pH adjustment of effluent
Wood ash can provide some of the nutrients (nitrogen, phosphorus) required for effective treatment

FEDERAL PULP AND PAPER EFFLUENT REGULATIONS
WHY TREAT THE EFFLUENT?

Kraft pulp mill effluent must be treated to protect the receiving water and ensure fish are not harmed

Federal Pulp and Paper Effluent Regulations (PPER) developed in the mid 1990's to protect fish

- Prompted many mills in Canada to install Secondary Treatment Systems
- Prior to that, many mills had no treatment systems or primary treatment only

Primary Treatment	→	Removal of solids from the effluent
Secondary Treatment	→	Removal of biodegradable non-settlable organic pollutants using microorganisms

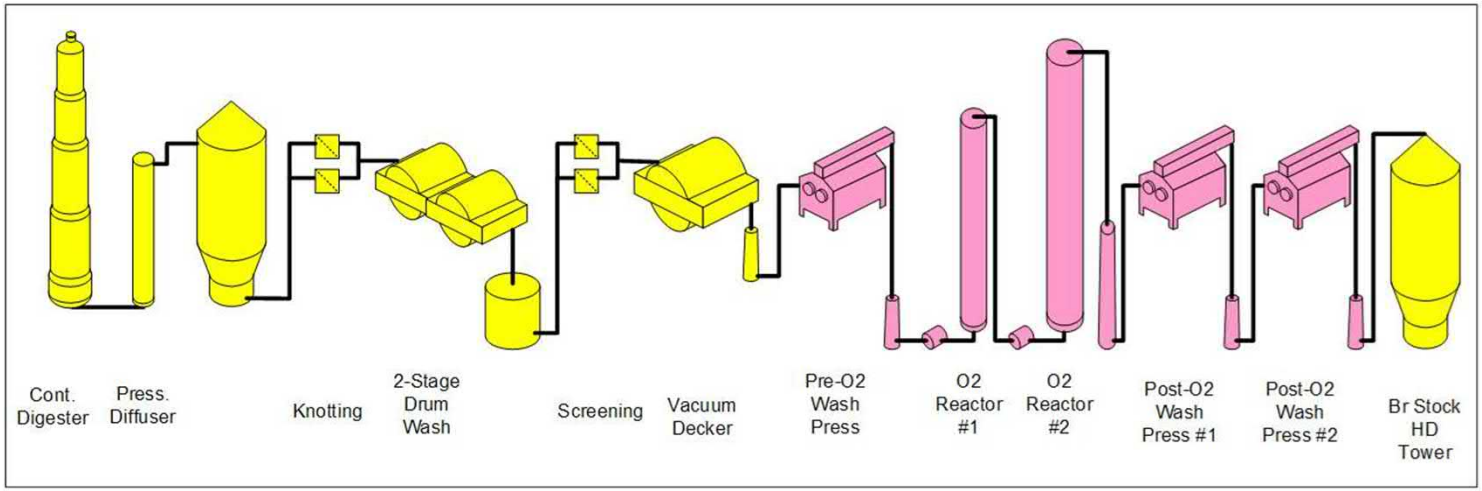
The process is very similar to the treatment provided for municipal effluent treatment systems

- These microorganisms occur naturally and consume organic food sources present in water.
- Secondary treatment uses this same process, but in an accelerated, controlled way.
- Microorganisms are concentrated and given the proper conditions (food, nutrients, oxygen) to degrade this organic pollution more quickly than what nature alone can achieve.

IN-MILL IMPROVEMENTS: OXYGEN DELIGNIFICATION

Two-stage Oxygen Delignification technology will be incorporated into the pulp making process.

The system, which consists of oxygen reactors and wash presses, will be installed after the brown stock washing stage and before the existing bleaching stages. The system uses oxygen gas to react with residual lignin that remains in the pulp after brown stock washing. The lignin removed in this new stage will result in the use of less bleaching chemicals to whiten the pulp in the existing bleach plant. It is a significant and well-proven process for ECF pulp and as such it is often referred to as the first stage of bleaching (oxygen bleaching).

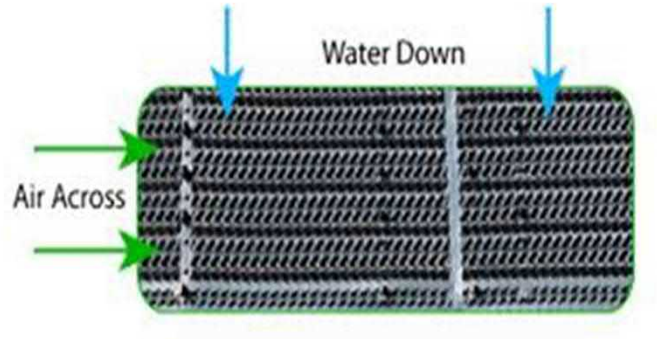


Yellow: Existing Equipment.
Pink: Future oxygen delignification equipment which will be installed in the mill.

The environmental benefits of Oxygen Delignification:

- Reduces Chlorine Dioxide bleaching chemicals by 30 – 40% - corresponding reduction in effluent organic loading and chlorinated compounds
- Reduces effluent color
- Reduces wood losses
- Increases recovery of lignin to the liquor cycle – reduction in carbon footprint
- Reduces energy consumption by reducing aeration requirements in the new ETF – reduction in carbon footprint
- Reduces nutrient addition in the new ETF

IN-MILL IMPROVEMENTS: EFFLUENT REDUCTION



Fresh water trickles down the medium, as air is blown across. Cooling occurs through evaporation.

Cooling towers are required to reduce high summer water flows. This will in turn reduce the total effluent flow.

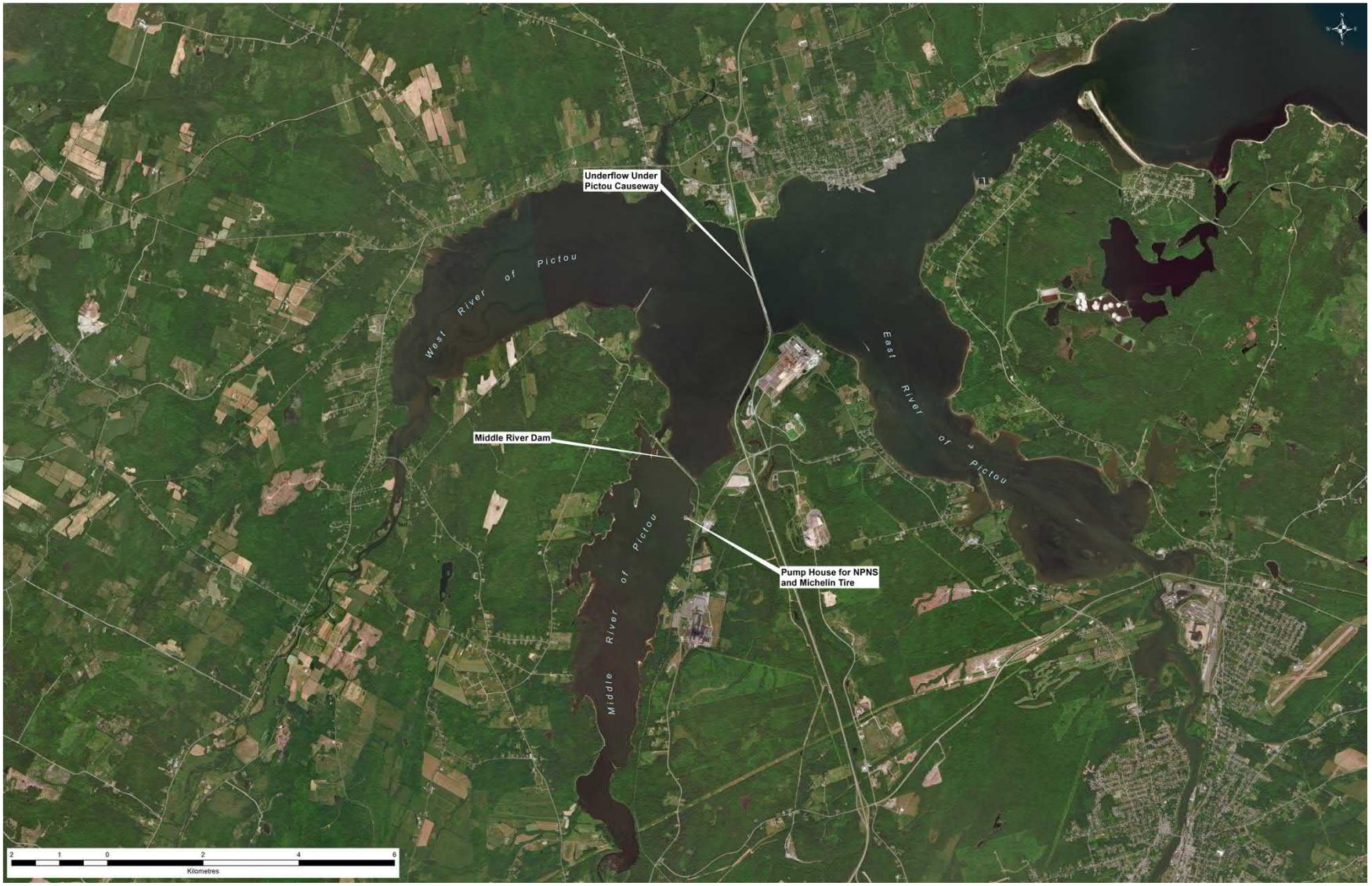
- New ETF is designed for 85,000 m^3/day peak effluent flow
- Current annual average < 70,000 m^3/day effluent flow
- Effluent flow varies by seasonal water temperature
- Non-contact cooling water makes up a considerable portion of the total effluent flow
- Summer effluent flows will be reduced as will annual average effluent flow

Colder incoming water → less cooling water needed

FRESHWATER RIVERS FEEDING INTO PICTOU HARBOUR

Three freshwater rivers flow into Pictou Harbour and the Northumberland Strait

RV Anderson Study (December 2015) was undertaken to determine the Middle River sustainable water withdrawal rate.



HISTORY OF EFFLUENT QUALITY

Effluent Quality Discharged to Strait	Date	Significant Events Affecting Effluent Quality
Apparent that additional modifications were required	1967	• NPNS start-up
	1971	• Canso Chemicals start-up
	1972	• Settling basins added; ASB constructed at Boat Harbour
Generation of mercury and dioxins & furans from chlor-alkali process ceases	1992	• Canso Chemicals closes
Significant improvement in all effluent parameters to meet Federal PPER	1995	• Closure of NPNS woodroom (wet debarking)
	1996	• Upgraded aeration system in ASB; curtains added in ASB
Generation of dioxins & furans from chlorine bleaching ceases to meet Federal PPER	1997	• Nutrient system added • NPNS switches from chlorine to chlorine dioxide bleaching
Improvement in all effluent parameters	2004	• Additional aeration installed in ASB
Boat Harbour basin still providing polishing effect on effluent (organics & solids)	2010	• Federal PPER regulatory point moved from outlet of Boat Harbour basin to inlet of Boat Harbour basin
Improvement in all effluent parameters	2011	• Closure of brown stock screen room
	2013	• Recycle of lime water in the lime kiln area

2020 Target

Reduced organic loading; reduced chlorinated compounds; small increase in solids loading

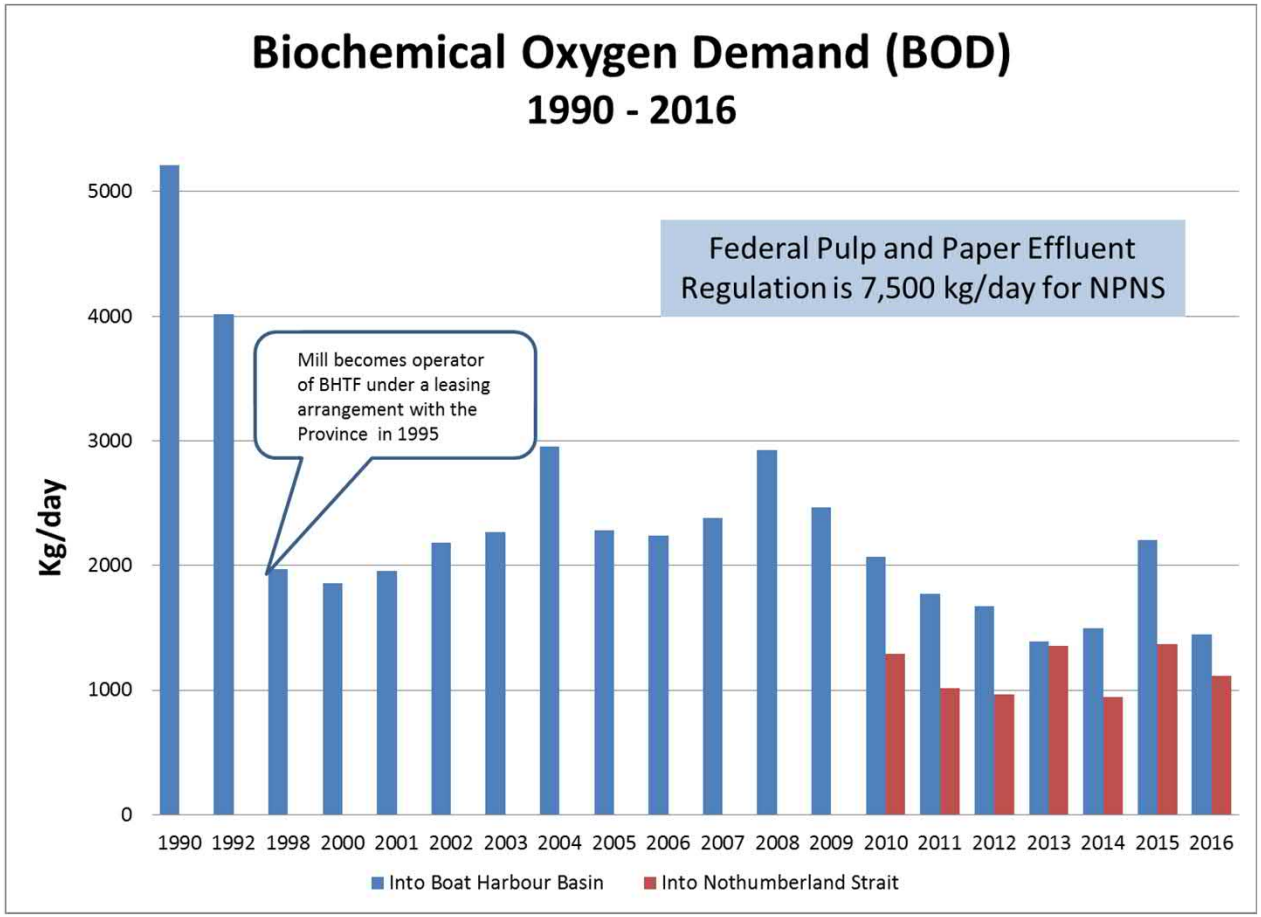
Replacement facility (AST) is in operation, and existing facility at Boat Harbour (ASB) ceases operation.

EFFLUENT QUALITY
BIOCHEMICAL OXYGEN DEMAND (BOD)

Historical improvements have been made with regards to organic loading in effluent.

Northern Pulp currently operates well under the PPER limit for BOD.

With the addition of the Oxygen Delignification process and switching to the AST process, Northern Pulp will see further reductions in organic loading



BOD - measure of organic pollutant in effluent
BOD is regulated by Environment Canada under PPER

EFFLUENT QUALITY
TOTAL SUSPENDED SOLIDS

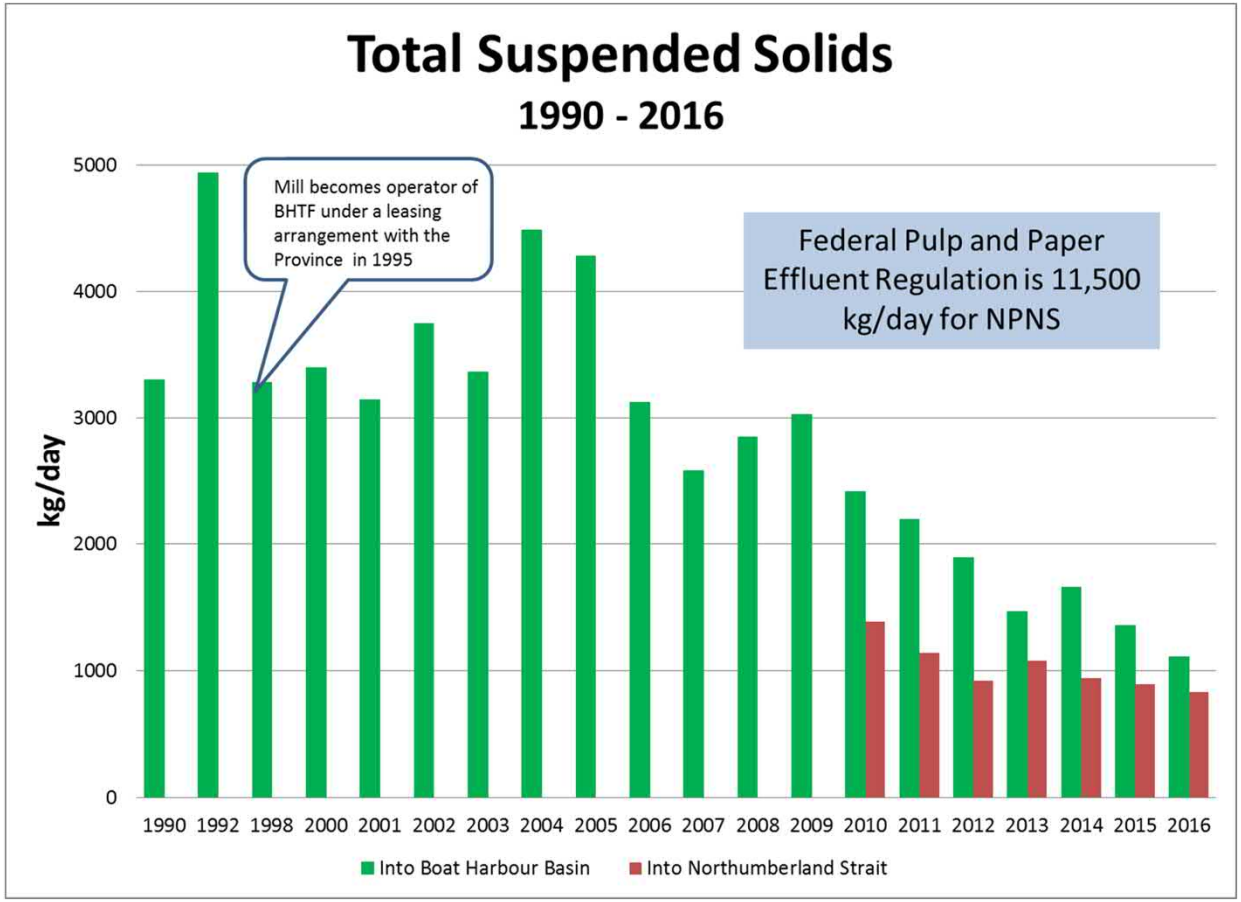
Historical improvements were made at NPNS regarding solids loading in effluent.

NPNS currently operates well under the PPER limit for TSS.

Switching to the AST Process will not have the polishing effect of the Boat Harbour Basin.

Solids loading will be similar to the current discharge of the ASB into the Boat Harbour basin and remain well below PPER limits.

TSS at the end of a biological treatment process is > 98% biodegradable organic material.



TSS - measure of solids in effluent
TSS is regulated by Environment Canada under PPER

RECOMMENDED APPROACH
EFFLUENT TREATMENT FACILITY

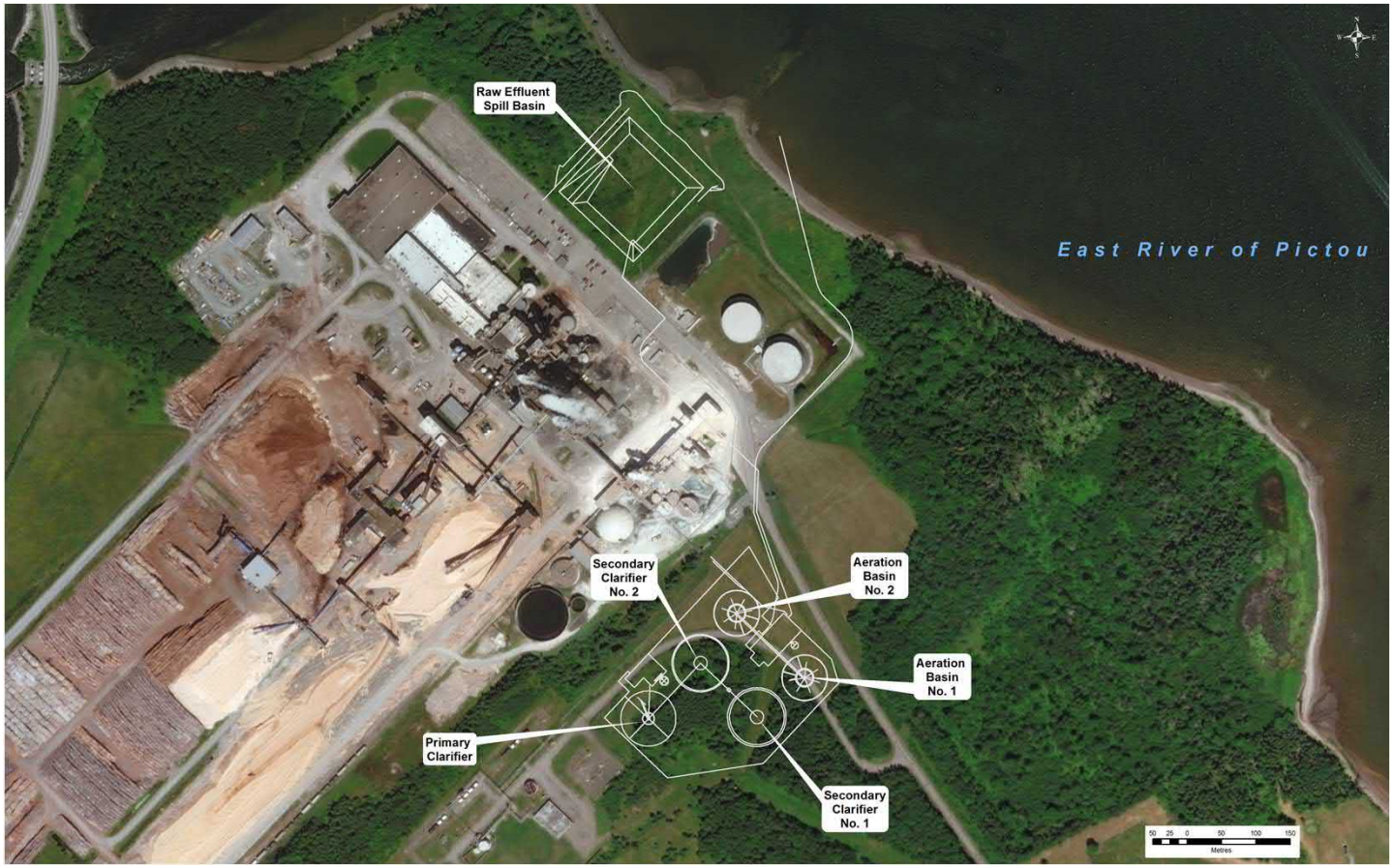
PANEL 17

Our proposal is to construct an ETF on land at the mill property, and lay a pipeline on the bottom of Pictou Harbour, avoiding constraints as much as possible.

The pipeline will carry treated effluent to an outfall and multi-port diffuser in the Pictou Road area of the Northumberland Strait. The proposed location of the diffuser is within the same body of water (Pictou Road) as the discharge point for the existing Boat Harbour facility.

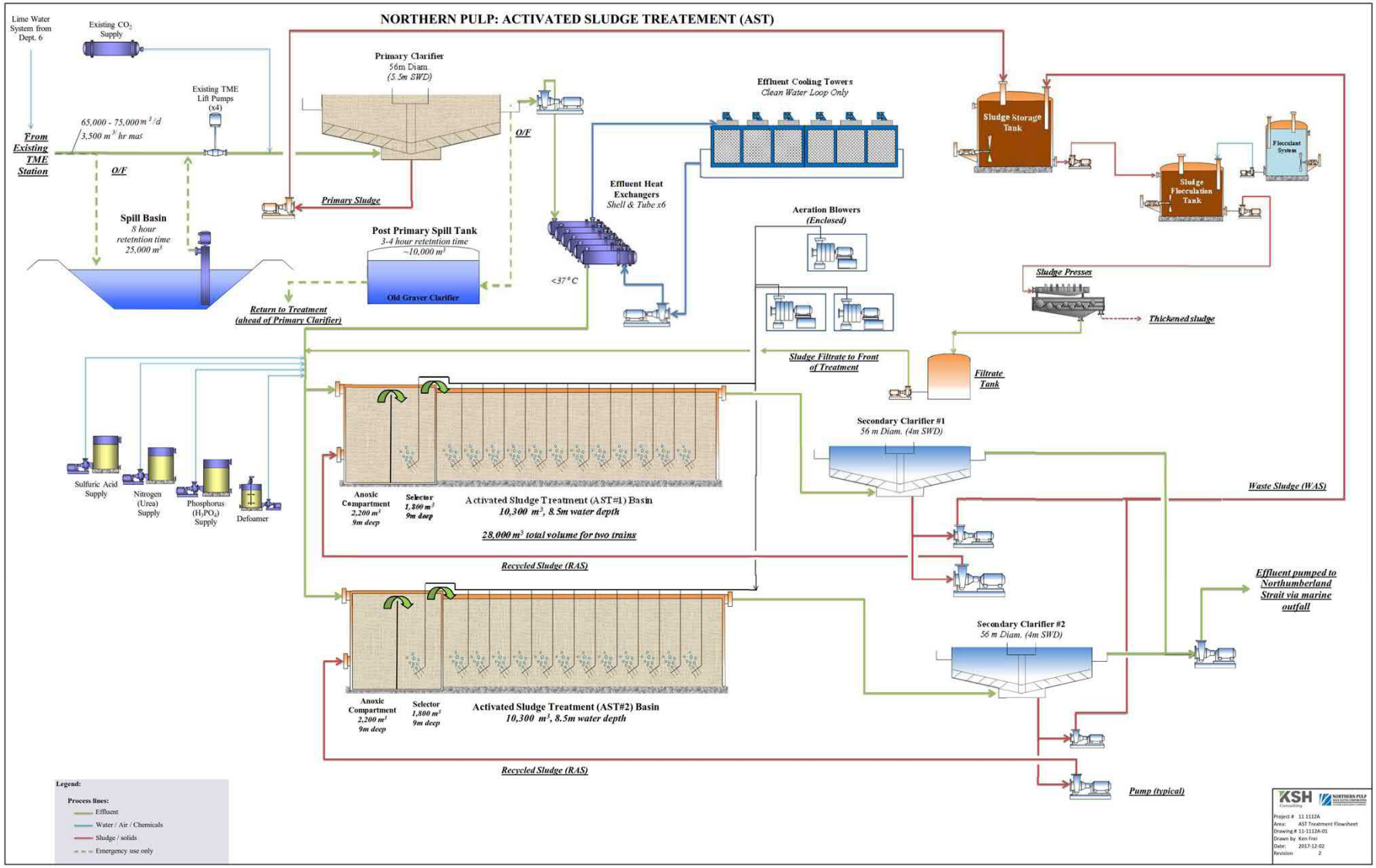
We are particularly looking for your input on the recommended route and outfall area.

We will be completing further studies to understand sensitivities in the proposed route. Right now, what we have identified is a 'corridor' rather than a specific path.



PROPOSED EFFLUENT TREATMENT FACILITY PROCESS STEPS DIAGRAM

PANEL 18



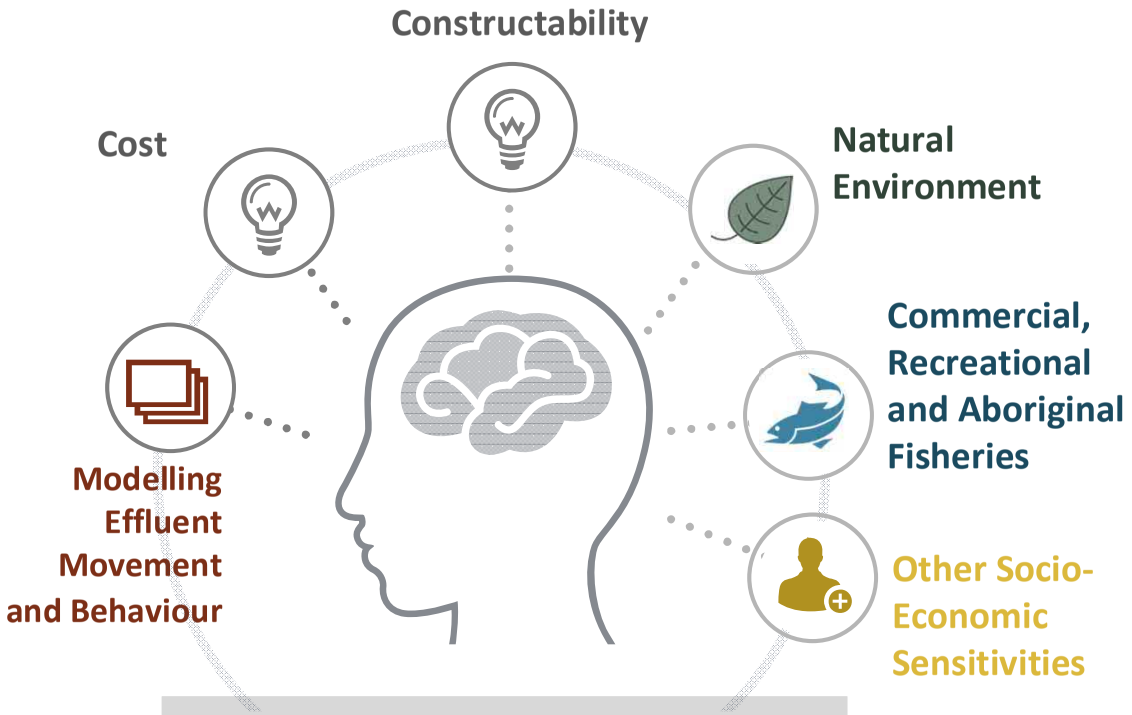
DESIGN CONSIDERATIONS IN NEW AST FACILITY: ODOUR CONTROL

TREATMENT PROCESS STAGE	CURRENT FACILITY	PROPOSED AST FACILITY
Primary Clarification	Large settling ponds, where solids settle over time and decompose under anaerobic conditions, generating hydrogen sulfide, hence creating odour similar to rotten eggs.	Solids removal is done on a continuous basis. Solids residence time is less than one day: this leaves little time for septic conditions to be created
Effluent Cooling	Effluent is cooled by the action of the surface aerators that throw the effluent into the air to allow it to absorb oxygen. This action also allows sulphur compounds to be released to the atmosphere by volatilization.	Uses indirect cooling (where cooling water is used to cool the effluent without coming into contact with it). Effluent cooling therefore occurs while the effluent is fully contained: no odours can be generated from this step of the process
Treatment Process	Solids decompose at the bottom of the ASB lagoon, which can create odours. Aeration is provided by surface aerators, which spray effluent in the air to bring it in contact with oxygen and, because of this, potentially release odorous compounds to the air through vapourization.	Solids are removed continuously and never allowed to settle within the basin. The aeration system selected is a combination of subsurface mixers and air injection (fine bubble diffuser). This system, combined with a sub-surface feed of the cooled effluent, minimizes the potential to volatilize odorous compounds
Sludge Handling	Sludge removal from the settling ponds and ASB lagoon occurs periodically as sludge inventories dictate.	The secondary clarifiers remove sludge continuously to prevent sludge accumulation that could lead to septic conditions. The dewatered solids will be collected and mixed in with existing biomass and burned in the Power Boiler.
		IMPROVED ODOUR CONTROL

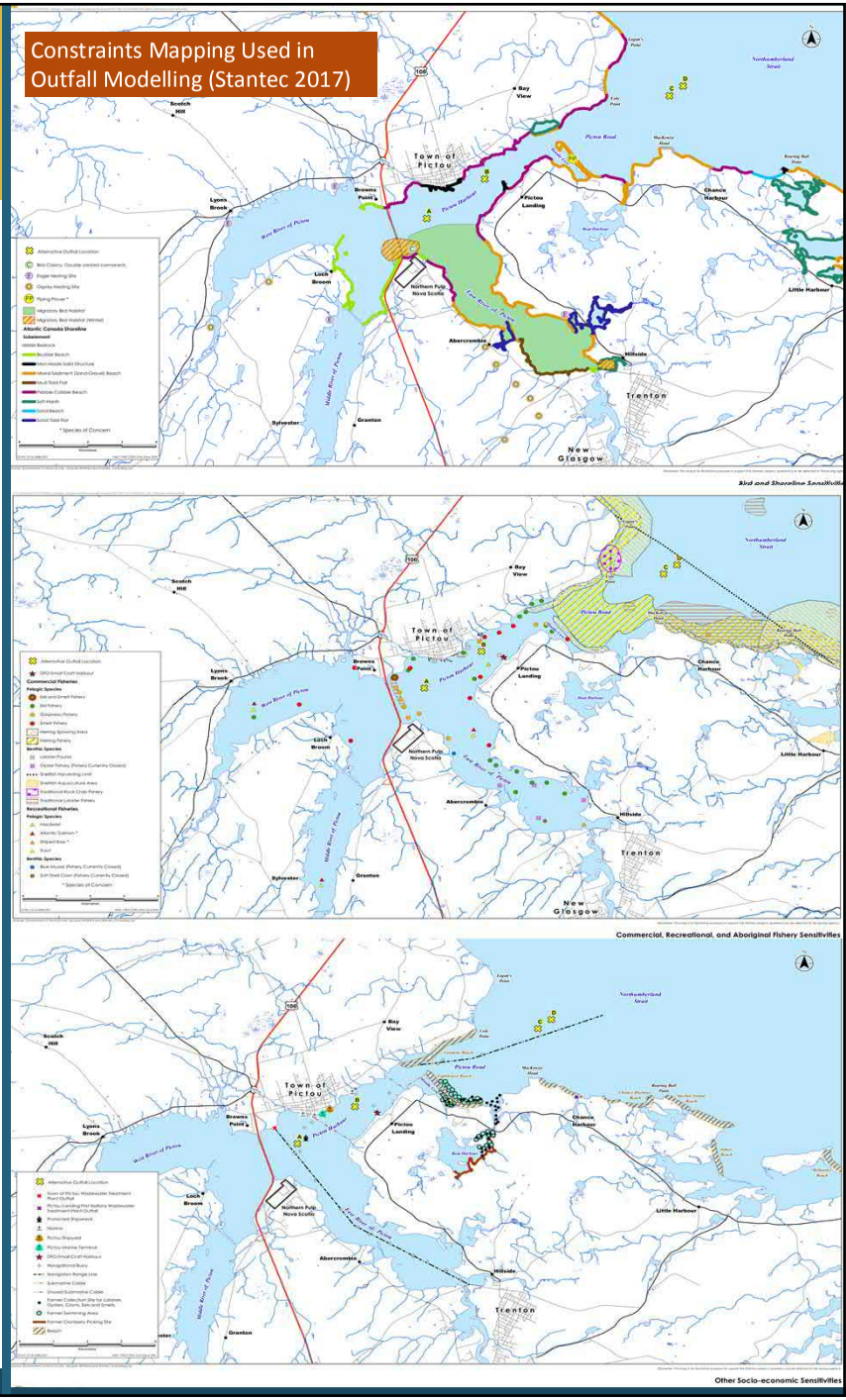
CONSTRAINTS ANALYSIS: LOCATING THE OUTFALL

PANEL 20

Possible Locations for Outfall were Modeled and Evaluated on:

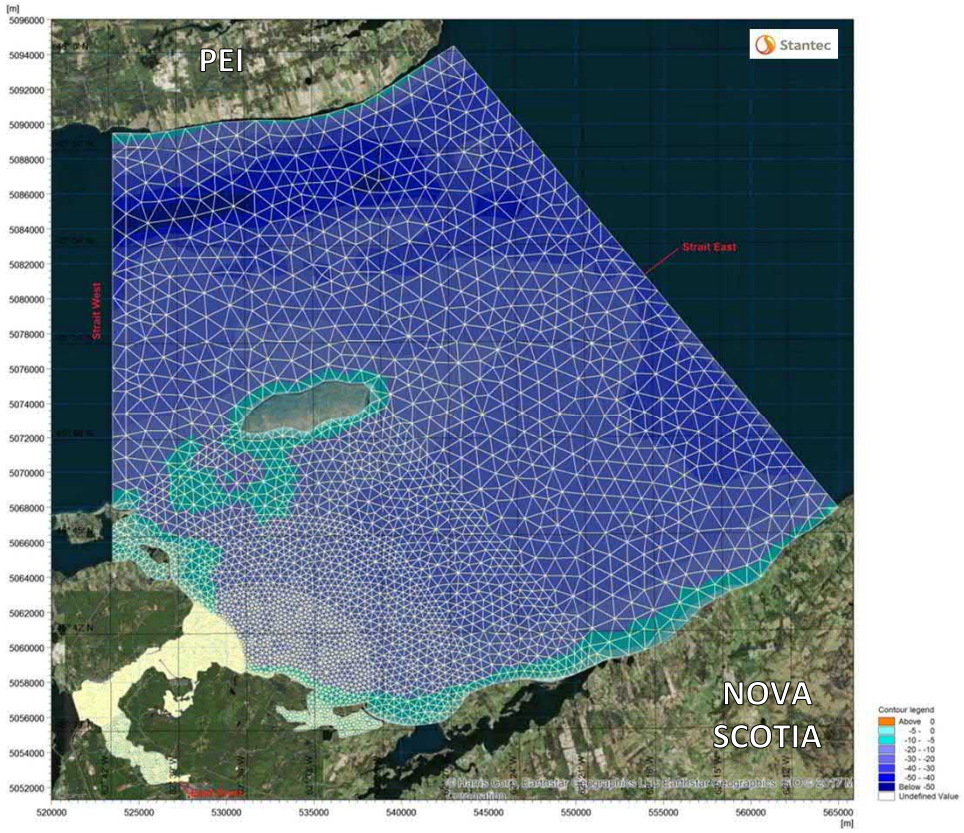


The Northumberland Strait was identified as the outfall location in order to minimize potential impact on the environment



RECEIVING WATER STUDY
LOCATING THE MARINE OUTFALL

PANEL 21



A series of models were created to evaluate the flow dynamics, dispersal rates, settling rates, water chemistry and temperature profiles of the effluent discharge location options. The study area is shown above.

Modeling was completed to identify the potential area for the outfall, and the route the pipeline would take to get there.

There are a lot of constraints - things we need to avoid - including available commercial, recreational, and Aboriginal fisheries sensitivities, bird and shoreline sensitives, and other socio-economic sensitivities.

We've identified a solution we believe balances these constraints.

A key consideration, in consultation with Pictou Landing First Nation, was to develop a solution that does not impact Boat Harbour in the future tidal state.

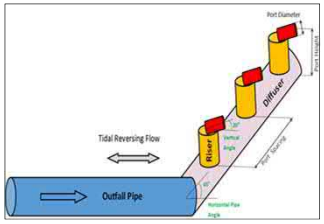
Studies have shown that if the outfall was inside Pictou Harbour the slow currents and other environmental factors inside the Harbour could result in eutrophication. Eutrophication is the creation of conditions that stimulate the growth of plants and algae that will consume oxygen in the water which will harm aquatic species.

The Northumberland Strait was identified as the outfall location. In this dynamic location, modelling predicts there will not be an accumulation of nutrients.

OUTFALL DESIGN : MULTI-PORT DIFFUSER

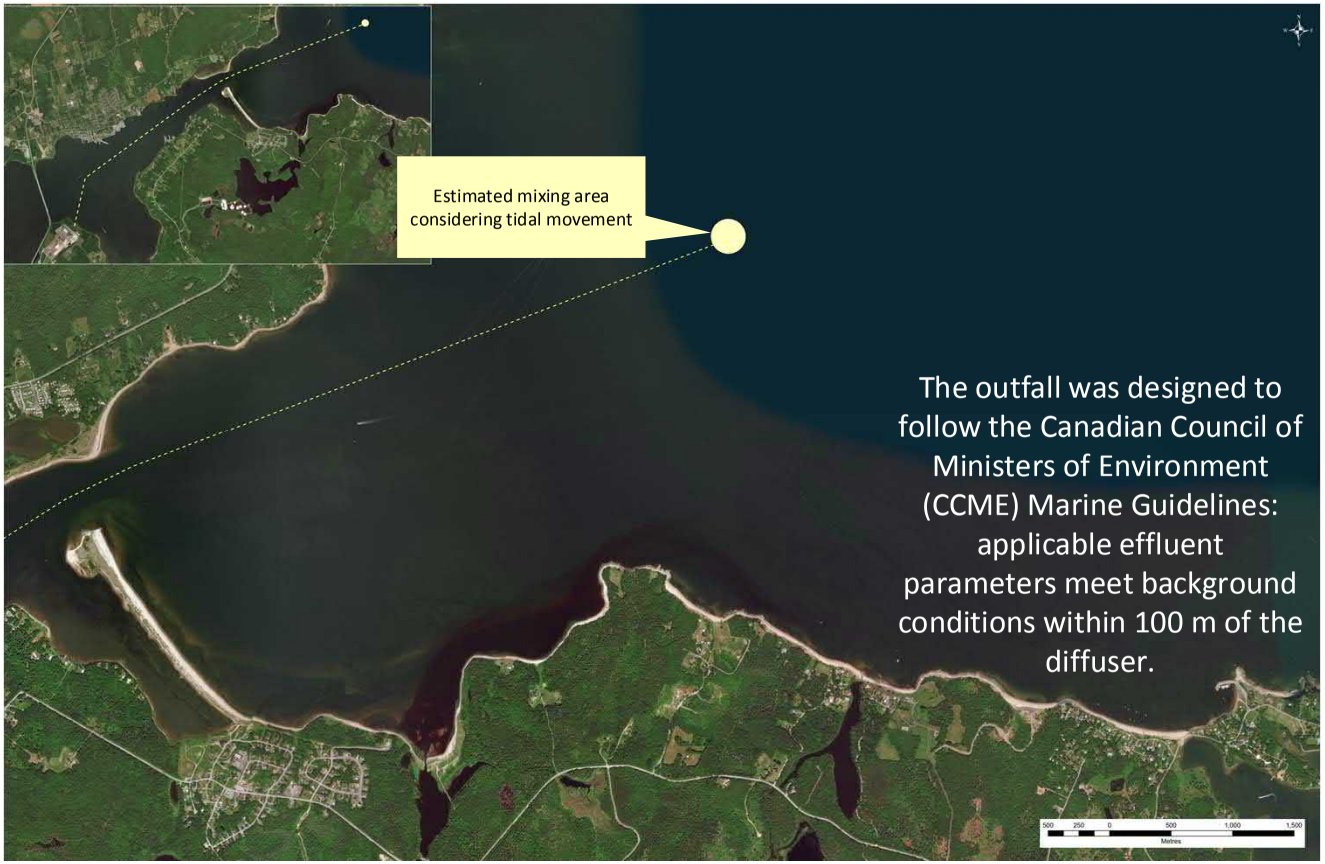
Once the effluent is treated on the mill site in the ETF, a pipeline will carry the treated effluent to the outfall location.

Example illustrations of a multi-port diffuser



Based on the design completed to date:

- The outfall will be a six-port diffuser
  - Selected for better mixing and therefore less potential for environmental impact.
- The pipeline will be approximately a 36" diameter pipe made out of high density poly-ethylene (HDPE) material.
  - HDPE is strong and has some flexibility to allow for the undulating ocean bottom profile.
- A rock mattress will be placed under the outfall pipeline on the bottom of Pictou Harbour, and then covered in armour-stone for protective cover.



PREDICTED CONCENTRATIONS OF EFFLUENT IN THE NORTHUMBERLAND STRAIT

PANEL 23

Parameter	What is it?	What types of effects could the parameter cause?	Predicted distance (Stantec 2017) from diffuser to meet water criteria:
Total Nitrogen (TN)	A nutrient.	Large concentrations in the nearshore can cause excessive algae growth (algae blooms), which can limit the amount of oxygen in the local area.	Within 2 metres - meets background (Pictou Road)
Total Phosphorus (TP)	A nutrient.	Large concentrations in the nearshore can cause excessive algae growth (algae blooms), which can limit the amount of oxygen in the local area.	Within 2 metres - meets background (Pictou Road)
Colour	Measures the colour of water.	Aesthetic consideration for humans. Potential visibility issue for fish if extensive.	Within 40 metres - meets background (Pictou Road)
Adsorbable Organic Halides (AOX)	AOX is a parameter group that encompasses organic halogen compounds from simple volatile substances such as chloroform, to complex organic molecules such as dioxins/furans (in trace amounts).	High AOX levels may have variable effects depending on the specific chemicals that comprise AOX and their levels in water.	Background data not available. Within 2 metres – well below World Bank guideline for pulp mills.
Total Suspended Solids (TSS)	TSS describes the amount of solids (clay, sand, silt, organic matter and particulates) that are suspended in water.	High TSS can affect dissolved oxygen (DO) levels or long term exposure to elevated levels may affect marine species.	Within 2 metres - meets CCME Marine Aquatic Life Guidelines (long term and short term exposure)
pH	pH indicates if a water body is acidic (low pH) or basic (high pH).	Although changes in pH can cause a variety of effects, the ocean will rapidly neutralize the effects of pH changes.	Within 5 metres – meets background (Pictou Road)
Biochemical Oxygen Demand (BOD5)	BOD measures the amount of oxygen used to decompose organic materials.	High BOD can reduce dissolved oxygen (DO) levels and may affect marine species.	Background data not available. Within 100 metres – meets levels typical of nearshore waters
Dissolved Oxygen (DO)	Amount of oxygen dissolved in the water.	Low levels of dissolved oxygen may mean there is less available oxygen for marine species to use.	Within 100 metres – meets background (Pictou Road)
Chemical Oxygen Demand (COD)	Amount of oxygen required or used by chemical reactions within the water. Required to breakdown organic and some inorganic material.	High COD may reduced dissolved oxygen (DO) and may affect marine species.	Background data not available. Within 100 metres – well below levels considered unpolluted by UNESCO
Water Temperature	How hot or cold the water is.	Marine life require a specific range of temperatures.	Within 8 m - meets CCME Marine Aquatic Life Guidelines of +/-1°C
Salinity	Salt content of the water.	Marine life require a specific range of salinity.	Within 100 m – meets background (Pictou Road)

Results from *Preliminary Receiving Water Study for Northern Pulp Effluent Treatment Plant Replacement, Pictou Harbour, Nova Scotia. 2017. Final Reports Stantec 2017.*

NEXT STEPS

Over the next few months we will complete additional studies, refine the engineering design, and continue evaluating for potential impacts and appropriate environmental planning.

We will share the results of our work.
We will summarize comments and ideas provided and make this document publicly available.

Engagement and consultation will continue.
Focused sessions with stakeholders and the community.

Thank you for engaging with us on the project.
Your comments and feedback are important.
Please complete a comment form.

NORTHERN PULP
NOVA SCOTIA CORPORATION
A PAPER EXCELLENCE COMPANY

DILLON
CONSULTING

Annamarie Burgess, LPP, P.Eng
Project Coordinator
Dillon Consulting Limited
137 Chain Lake Drive, Suite 100
Halifax, NS B3S 1B3
1-877-635-8553 x5050
npns.effluenttreatmentfacility@dillon.ca