

McKiggan Hebert

L A W Y E R S

November 8, 2019

File No. 8463-019

The Honourable Gordon Wilson
Minister of Environment
Barrington Tower
1894 Barrington Street, Suite 1800
P.O. Box 442
Halifax, NS
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Dear Mr. Wilson,

Re: *Consultation with Pictou Landing First Nation on an Application by Northern Pulp Nova Scotia Corporation for Approval of a Replacement Effluent Treatment Facility at Abercrombie Point and Pipeline to Caribou Harbour pursuant to the Environment Act.*

Introduction

Further to your letter of October 1, 2019 notifying Chief Andrea Paul that Northern Pulp was expected to file a Focus Report for the proposed Replacement Effluent Treatment Facility Project, located in Pictou County, Nova Scotia (the Project) on October 2, 2019 and inviting comments on the Focus Report on or before November 8, 2019, please accept the following comments on behalf of Pictou Landing First Nation.

Pending Decision

The decision currently before you is whether to approve the Project, reject the Project or require a full environmental assessment of the Project: ***Environment Act*** (the "***Act***"), s. 35(3).

In ***Nova Scotia (Aboriginal Affairs) v. Pictou Landing First Nation***, 2019 NSCA 75, the Nova Scotia Court of Appeal upheld the earlier decision of Justice Timothy Gabriel of the Nova Scotia Supreme Court in which he ruled that the Province has a duty to consult with Pictou Landing First Nation in respect of the pending decision as to whether or not to fund the Project.

Further, Pictou Landing First Nation has asserted that the Province has a duty to consult with Pictou Landing First Nation before deciding whether to extend the Boat Harbour closure deadline beyond January 31, 2020. The Province has taken the position that, while it has no duty to consult with respect to a change in the closure date for Boat Harbour, it will nonetheless consult with Pictou Landing First Nation on that issue. Indeed a consultation meeting is scheduled for Tuesday, November 12, 2019 on that matter.

In light of this, we must make it clear that the comments which follow are restricted to the consultation on the decision whether to approve the Project under the *Environment Act* and are not intended to address other pending decisions relating to the Project or the Boat Harbour Treatment Facility.

Consultation Process

Given the volume of information contained in the Focus Report, we must state for the record that our consultants have not had an opportunity to review the documents as thoroughly as we would have liked within the time period imposed by the *Act*. While Northern Pulp took steps to share some of the reports with our consulting firm, Exp Consulting, prior to finalizing the Focus Report, unfortunately those reports were sent to an incorrect email address and this was not discovered until the latter part of September, just before the Focus Report was completed. Even at that, those reports comprised only a fraction of the information contained in the report.

Given the importance of the issues raised in the application before you to Pictou Landing First Nation and the potential impacts of a new treatment facility on its Aboriginal and Treaty rights, as detailed in the attached, Pictou Landing First Nation takes the position that despite its best efforts, 30 days has simply proven to be an inadequate to review the Focus Report and fully comment upon it.

The duty to consult may be carried out, in part, through a regulatory process, such as the current assessment process under the *Environment Act*. Fortunately however, the timelines governing consultation are not tied to the process. As indicated, while we tried our best, 30 days turned out to be insufficient.

In this regard it is worth noting the decision of the Supreme Court of Canada in *Clyde River (Hamlet) v. Petroleum Geo-Services Inc.*, [2017] 1 SCR 1069, in which the Court held that the consultation process itself is subject to consultation. Governments must be prepared to listen to concerns that Indigenous participants have about the consultation process itself:

[23] Further, because the honour of the Crown requires a meaningful, good faith consultation process (*Haida*, at para. 41), where the Crown relies on the processes of a regulatory body to fulfill its duty in whole or in part, it should be made clear to affected Indigenous groups that the Crown is so relying. Guidance about the form of the consultation process should be provided so that Indigenous peoples know how consultation will be carried out to allow for their effective participation and, if necessary, to permit them to raise concerns with the proposed form of the consultations in a timely manner.

As a result, Pictou Landing First Nation, after having tried to comply with the deadline, must state for the record that it finds the 30 day comment period insufficient and notwithstanding that it is providing the interim comments below, hereby reserves the right to make additional comments as and when Pictou Landing First Nation's consultants have completed a thorough

review of the Focus Report. We respectfully request that you acknowledge these concerns regarding the consultation timeline and advise accordingly.

To the extent that the consultation timeline is being driven by the impending closure of the Boat Harbour treatment facility pursuant to the *Boat Harbour Act*, and in particular a desire to have a decision on Northern Pulp's application in time to introduce, debate and pass legislation to amend the *Act* before that deadline, the timeline is arbitrary and subject to review by the Courts as having been imposed in bad faith. Northern Pulp has had five years to bring forward the information contained in its Focus Report. Pictou Landing First Nation was given 30 days to review and comment.

PLFN Comments

Pictou Landing First Nation submits that the decision as to whether to approve the Project can only be made with the benefit of a full environmental assessment. Minister Miller, in requesting a Focus Report, acknowledged that the original environmental assessment registration document (EARD) was deficient and that further study and information was needed.

While the Focus Report does provide further information, it is still deficient in many respects as detailed in the Review Report prepared by EXP for Pictou Landing First Nation (Chapters 25 to 31 - attached) and as further summarized in Schedule A attached to this letter.

Overall the Focus Report is incomplete in that it does not address several of the items required by the Focus Report terms of reference (TOR) including: (a) failure to provide an alternate pipeline route; (b) inadequate geotechnical work to assess pipeline and construction; (c) inadequate raw effluent flow data (in violation of the existing Industrial Approval); (d) inadequate characterization of the raw effluent, (e) inadequate characterization of the proposed treated effluent; (f) failure to consider technically feasible tertiary level treatment; (g) failure to update discharge parameters; (h) excluding many chemicals of concern from the receiving water study; (i) lack of leak detection for underwater portion of the pipeline; (j) inadequate baseline studies for pipeline leaks; (k) insufficient baseline studies for fish habitat; (l) limitations on air dispersion modelling; (m) lack of proper environmental effects monitoring plan; (n) failure to outline contingency measures for marine environment; (o) failure to meet a migratory bird study; (p) failure to do baseline studies on fish tissue; and (q) failure to advance human health risk assessment.

As you can see this is an ominous list of deficiencies. Overall the report seems rushed and prepared to meet a deadline rather than to accomplish a task.

The Focus Report does confirm that the Project will emit many chemicals of concern (even more than identified in the EARD) into the water and the air. Given that the Focus Report, combined with the information contained in the EARD, does not adequately assess the impacts of these chemicals of concern on people and the food they eat (not to mention the terrestrial and marine environment), it appears that as Minister you have little choice but to require a full environmental assessment report pursuant to s. 35(3)(c) of the *Act*.

The options following your review of the Focus Report are governed by s. 18 of the ***Environmental Assessment Regulations*** which sets out the basis for a decision following a review of the Focus Report and a summary of comments received by the public:

18 Within 14 days following the date of the summary and recommendation provided under Section 17, [the] Minister shall advise the proponent in writing of the decision

(a) that a review of the focus report indicates that, within the limits of the focus report terms of reference, there are no adverse effects or significant environmental effects which may be caused by the undertaking or that such effects are mitigable and the undertaking is approved subject to specified terms and conditions and any other approvals required by statute or regulation;

(b) that a review of the focus report indicates that there may be adverse effects or significant environmental effects which may be caused by the undertaking and an environmental-assessment report is required; or

(c) that a review of the focus report indicates that there is a likelihood that the undertaking will cause adverse effects or significant environmental effects which are unacceptable and the undertaking is rejected.

Subsection 18(a) cannot apply in the circumstances of this application since the Focus Report does not reveal that there are no significant or adverse effects that may be caused by the Project. The EARD and Focus Report note that there are a variety of toxic and carcinogenic chemicals that will be discharged or emitted by the Project in large quantities. Because the Focus Report has been rushed and the additional information it provides, while improved in some instances, is still deficient in many ways, it cannot form the basis for a determination that all adverse impacts can be mitigated. It does not provide sufficient evidence on which to determine what mitigation measures are required. As a result, it would be impossible to create an approval document that would meaningfully address the plethora of deficiencies by way of terms and conditions, as contemplated by subsection 18(a).

As a result, the available options are to either reject the application as provided for in s. 35(3)(d) or require a full environmental assessment report under s. 35(3)(c) of the ***Act***.

Clearly the criteria set out in subsection 18(2) of the ***Regulations*** for an environmental assessment report have been met: the Focus Report and the EARD have identified significant adverse impacts and a full environmental assessment is required. In this regard I would remind you of the heightened public interest in, and concern about the impacts of, this project and the number of comments received from the public in response to the EARD. Most of those concerns have not been adequately addressed in the Focus Report.

One suspects that the reason for rushing the report is that Northern Pulp wished to submit the Focus Report in advance of the legislated closure date for the Boat Harbour treatment facility. It rushed the report notwithstanding that it had acknowledged that the Project could not be built in time to meet the closure date even if approval is granted now. The company is gambling that a rushed and inadequate report will be sufficient to convince the Province to extend the closure deadline for the Boat Harbour Treatment Facility. No doubt the company took note of the remarks made by the Premier this summer when he suggested that if the Project received environmental approval he would have to take that into consideration; which could only have meant that he would consider extending the deadline for the closure of the Boat Harbour Treatment Facility.

While it was open to the company to proceed in that manner, it ran the risk of submitting a rushed report that did not satisfy the terms of reference for the Focus Report. That risk has materialized and should lead to a finding under s. 35(3)(c) that a full environmental report is necessary. Given the seriousness of the potential environmental impacts of the Project and the unprecedented level of public interest and concern, it is imperative that the environmental assessment process not be rushed, or seen to be rushed. This is simply not a case where a permit can be issued with conditions and the hard work of assessing the Project left to the permitting stage.

It is time to ensure that the Project receives a full environmental assessment beginning with an environmental assessment report under s. 35(3)(c) of the *Act*.

Summary

Pictou Landing First Nation has always been primarily concerned about the impacts of the proposed Project on its Treaty and Aboriginal fishing rights and on its Treaty and Aboriginal rights to its traditional land, including the right to reside there free from water pollution and air contamination. There were significant gaps in the baseline information provided in the EARD and the Focus Report has not succeeded in addressing those issues. Pictou Landing First Nation remains unconvinced that, in light of the decades-long history of environmental harm caused by the existing effluent treatment system, the Project could be allowed to proceed without a full environmental assessment. As stated before, the Honour of Crown requires it. The members of Pictou Landing First Nation deserve nothing less.

Respectfully,

McKiggan/Hebert

Per: Brian Hebert



Pictou Landing First Nation Document Review

Northern Pulp Nova Scotia Corporation –
Existing and Proposed Effluent Treatment Plant

Revision 6

Project Number: HFX-00247484-A0



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Date Submitted: November 2019

quality system checks

project number:

HFX-00247484-A0

document type:

Final

date:

November 8, 2019

revision No.:

6

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Chapter 25 – KSH Consulting Wetlands Power Point

EXP has reviewed the work completed in 2011 by ADI Limited (the former identity of EXP) and the wetland area assessment that KSH has estimated in a Power Point presentation provided in July 2019. The following poses to summarize the information provided by both ADI (EXP) and KSH.

This review was undertaken by Eric Bell, P.Eng. and Tony Whalen, P.Eng. of EXP.

The primary reason the issue of tertiary treatment is being investigated is to return Boat Harbour back to its natural state. Boat Harbour is currently being incorporated into the wastewater treatment process that is associated with Northern Pulp kraft mill in Abercrombie, NS. The study performed by ADI looked to identify three potential solutions and to provide a +/- 30% Opinion of probable cost.

In the EXP report, it was concluded that one of the following three options would be appropriate for tertiary treatment, in order to meet the objectives stated above:

1. Engineered wetlands;
2. Chemical precipitation followed by clarification; and
3. Ozonation.

With respect to the ADI (EXP) evaluation it was anticipated that the engineered wetland was tertiary treatment with a new primary and secondary treatment facility in operation. The flows were also anticipated to be reduced (45,000 m³ per day), and the effluent was anticipated to “mild/weak” because of the new primary and secondary treatment that had been undertaken. The anticipated retention time was ~7 hours based on a pore space of 30%. Abydoz Environmental Inc. provided guidance that 3-4 hours of treatment time would be sufficient for the weak waste stream in an engineered wetland. The engineered wetland design was provided to EXP by Abydoz Environmental Inc. (Abydoz).

The information provided in the KSH PowerPoint style presentation provided to EXP noted that the design was based on 65,000 m³/day and examined a free water surface (FWS) wetland system. KSH appears to have investigated with more detail a preliminary design, looked into detail on an engineered wetland for the same pulp mill. Some points required for clarification would be:

- Design temperature
- Chemical parameters to identify the waste water strength
- Engineered wetland design approach (pore space, anticipated plant types and expected uptake rates.)

KSH estimated up to 245 acres required for the given process, while ADI recommended between 15 – 20 acres.

In September 2019, EXP engaged Abydoz to re-examine their initial design size based on 65,000 m³/day.

Abydoz is a Canadian based wastewater treatment firm that concentrates on the engineering, construction, and operation of engineered wetland systems.

Abydoz has unprecedented experience in the design, construction and operation of engineered wetland facilities in Atlantic Canada, having designed and constructed over 35 engineered wetland wastewater treatment facilities in Atlantic Canada over the past 20 years. The Abydoz system has a proven capability of treating wastewater and sludge from a variety of sources including industrial, municipal, residential, and commercial.

With regard to operation of wetlands in northern climates: Abydoz has successfully operated within Atlantic Canada for 20 years, with a proven track record of operation through all seasons. Treatment of the wastewater is maintained below effluent regulations throughout the year, and the systems are designed for worst case scenarios during cold winter weather. The main concerns with cold weather are the freezing of pipe components causing backups and reduction in biological activity within the treatment process. Abydoz has developed multiple design modifications to ensure that temperature within the wetlands maintains biological activity and keeps water temperatures above freezing.

EXP has compared lagoon sizing, originally presented in the 2011 report by ADI for the Northern Pulp Tertiary Treatment Study Pictou Landing First Nation, with the sizing undertaken in 2019 by Abydoz Environmental and KSH Consulting and are pleased to provide the following clarifications:

2011 ADI Report vs. 2019 Abydoz Environmental Sizing

- The original engineered/constructed wetland area of 20 acres (sized by Abydoz) provided in the Northern Pulp Tertiary Treatment Study Pictou Landing First Nation report in 2011 was based on a flow of 45,000 m³/day and the effluent criteria at that time which were much less stringent than the current regulations of 2019. Furthermore, the 2019 sizing is based on 65,000 m³/day (vs. the 45,000 m³/day). The change in design volume and application of more stringent regulations explain the variation in surface area compared to the 58 acres provided by Abydoz in 2019.

Comparison of 2019 Abydoz vs. KSH Wetland

- Effluent criteria used by both Abydoz and KSH in 2019 were the same, albeit more stringent than criteria used in 2011, that is:
 - BOD₅ = 13 mg/L
 - TSS = 13 mg/L
 - Ammonia = ~4 mg/L
 - Total Phosphorus = ~0.4 mg/L
- Comparisons (especially surface area and associated costs) between Free Water Surface (FWS) Wetlands and Engineered/Constructed Wetlands are not straight forward since these technologies used to treat wastewater are vastly different in nature.
- In free water surface (FWS) wetlands the water travels above the growing medium of the wetlands. FWS wetlands employ the aeration of the open water to provide oxygen to the water. They have minimal surface area for the attachment of bacteria and require a much larger surface area than subsurface flow wetlands for treatment.

- Engineered/Constructed wetlands, like the proposed Abydoz horizontal flow type, have water flowing subsurface through the wetland growing matrix. The subsurface flow allows bacteria to grown on a large surface area of the aggregate, increasing biological activity within the wetland. This allows the wetlands to be smaller and provide significantly higher level of treatment.

Based on the above, one would expect the two technologies to warrant much different sizing, which is evidenced by the numbers provided by Abydoz and KSH.

Chapter 26 – Underwater Benthic Habitat Survey of Caribou Harbour and Pictou Harbour Pipeline Corridors

Underwater Benthic Habitat Survey of Caribou Harbour and Pictou Harbour Pipeline Corridors prepared 18 July 2019 by Stantec was reviewed by James Foulds, Ph.D.

The report is a good picture of the bottom types along the proposed corridor and will be a base line or “before” picture of the marine bottom communities going forward. Mapping is clear as to substrate types in the area of proposed development.

It also presents a good qualitative description of macroflora and fauna along and adjacent to the proposed corridor.

The construction and writing style of the report makes it difficult to follow in places:

For example: The description and therefore distinction between “High-Level Video Analysis” (sometimes referred to as “Video Transects” and “Detailed Video Analysis” is confusing. This is made more confusing by labelling all “video transects” in Figure 2 and 3 as P1, P2, etc – for both the Pictou and Caribou sites. In Figure 3 the video transects labeled should be labelled C1, C2...etc. as shown in Appendix A – page 40. This would have made the use of the letter “P” more meaningful.

High-Level Video Analysis – described as covering substrate and benthic communities along the pipeline corridor, diffuser area and reference area (where is reference area?). The concept of a Reference area and a description of how they were determined needs to be added to the body of the text. For example Table C3 Transect 3 has the first 150 metres as “Reference” under the heading of “location”. Similar at the 300-450 m of Transect 5; Transect 6 as well. It should be explained in the Methods section that any part of a transect, outside the defined corridor of the pipeline, was automatically identified as a reference area. The reader must work that out by referring to the Appendix.

Figure 10 – based on other data presented, especially the description of the organisms present at the diffuser area (page 17 and Section 4.2.6), the description of “Mixed Sediment with Low Diversity Benthic Community” for that area seems unsupported.

One of the stated purposes of the study was to characterize fish and fish habitat along the footprint of the effluent pipeline. There was no discussion of what the results meant in terms of this stated purpose. The widespread presence of an eelgrass community would support a conclusion that this would be a significant habitat as a nursery area for many fish species.

Chapter 27 – Freshwater Fish and Fish Habitat

Appendix Focus Report – Section 7.1 Freshwater Fish and Fish Habitat prepared by Dillon Consulting and Northern Pulp Nova Scotia, reviewed by James Foulds, Ph.D.

The document was an update to the 2019 EARD as a result of the revised project description. The project description was revised to include the proposed re-aligned effluent pipeline route.

The following general comments were noted in the review:

- Done mainly in June 2019 as well as some work in May and July 2019.
- The document attempts to describe water courses which may be impacted by the re-aligned pipeline – in terms of their potential as fish habitat.
- Identifies 18 water courses, and based on water flow, substrate, hydraulic features, water chemistry, fish captured and general field observations, made conclusions about the potential for fish habitat either within the corridor and/or downstream.
- Figure A7.1-2 – the map of the watersheds and flow paths is confusing. Not sure about red dotted lines marking Secondary Watersheds.....suggests a Primary Watershed. Hard to find SD (Shore Drainage) but, when found, unclear as to what it means.
- It does a satisfactory job of describing Freshwater Fish and Fish Habitat along the proposed re-alignment of the effluent pipeline. Would serve as a baseline for monitoring programs during and after construction.

As part of this report a variety of wetlands (N=16) were identified in close proximity to the proposed corridor. We would expect another report assessing those habitats.

Chapter 28 - Locations of Temperature Profiles at Caribou, NS May and June 2019

This document was a power point presentation of the temperature profiles at monitoring station CH-B during flooding and ebbing tide over 24 and 25 May 2019. This review was completed by James Foulds, Ph.D.

It was noted that flooding tide was represented in Profiles 1, 2, 3, 4 (May 2019) while the ebbing tide was represented in Profiles 11 (May 2019); and 1, 2, 4 (June 2019).

There was nothing particular or special noted about these profiles. Water at surface is a bit warmer than at depth. No separation of water with depth. Would be nicer to see if a thermocline gets established – August would be a good time for that.

EXP assumes that this document and data are referred to by some other document in the focus report or EARD.

Chapter 29 – Marine Sediment Sampling July 2019

The following comments summarize EXPs findings based upon a peer review of the following document:

“Stantec, July 2019, Final Report – Marine Sediment Sampling Program: Caribou Harbour and Pictou Harbour Pictou County, Nova Scotia.

This review was completed by Fred Baechler, M.Sc., P.Geo.

1.0 Focus And Extent of EXP’s Review

EXP’s peer review focused on reviewing the approach, concepts, level-of-effort and overall findings from a technical standpoint, using our experience and expertise in such matters. EXP did not re-visit and/or re-run the calculations, nor undertake a field visit to gather new data. It is assumed that the regulators identified the appropriate guidelines for comparison.

2.0 Findings

2.1 Summary

EXP was not given background as to Terms of Reference, time line, or budgets for the study. In overview EXP found that the level-of-effort applied to the assessment and approach utilized were generally acceptable. Overall EXP agrees with the findings; with further consideration given to the points raised below in order to refine the assessment.

2.2 Specific Points of Note for further consideration:

CONCEPT – Field Program Design

There is no information provided on how the frequency of drill holes was selected in order to obtain representative samples over the range of sediment to be encountered, and including impacts of potential sources of contamination.

It is recognized that the criteria used by Environment and Climate Change Canada (ECCC) for disposal at sea is appropriate to compare results to. However, it would also have been appropriate to obtain cores from nearby “background” sites for comparison. It maybe that even background conditions exceed guidelines, in which case it would provide additional support for dealing with dredged materials that exceed guidelines.

CONCEPT – Selection of samples for analysis:

With sediment geochemistry analyses the selection of “representative samples” from the cores is critical, as selection of finer grained portions would lead to higher concentrations. There is no discussion in the report as to who made that selection, using what approach..

CONCEPT – Laboratory Protocols

Since most of the parameters exceeding guidelines were metals, it would be important to identify the laboratory protocols utilized in terms of grain size, whether it was a leach or digestion and at what pH.

Chapter 30 - EcoMetrix Marine Fish and Fish Habitat Assessment Methodology

This chapter documents the review of the memo from EcoMetrix titled “Northern Pulp Nova Scotia Effluent Treatment Project - Marine Fish and Fish Habitat Impact Assessment Methodology” dated 07 June 2019.

This review was conducted by James Foulds, Ph.D., EP.

This methodology provided by EcoMetrix was part of the requirements of the Focus Report which was ordered by NSE after submission of the Registration documents. It pertains to section 7.3 of the Terms of Reference (TOR) for the Focus Report.

To do:

1. Assess the impact of treated effluent on key marine fish species
2. Define key species as those which are important for commercial, recreational and Aboriginal use
3. Base assessment on updated information, additional studies and/or an understanding of the expected movement of contaminants

This document outlines how these requirements will be met as part of a “consultation with NSE...” i.e. they want to get some level of agreement from NSE that this approach will be sufficient.

They use the Federal Canadian Environmental Assessment Act (CEAA, 2012) and the Nova Scotia EIS Guidelines as their guide to impact assessment methods. These documents provide an excellent guide to impact assessment.

They outline the basics of a thorough assessment of potential impacts on marine habitat and a wide range of marine organisms (Table 1 page 5 of the Memo). This list is considered to be comprehensive.

They provide the regulatory framework for this project and then provide further description of the bulleted list. Generally speaking, each element is described adequately although there is always room for more details. The sections on Mitigation, Significance and Monitoring are fine. The main criticism would be under the identification of potential effects.

Identification of Potential Effects (page 4) – “Potential effects.... will be identified and assessed.” – this is fine but what’s missing is information of how Ecometrix will measure the potential effects on any particular VEC. For example, Table 1 provides a comprehensive breakdown list of the “Marine Fish and Fish Habitat” VEC but it is not clear how they will measure/assess the potential effect of the project on each. The wording that best addresses this aspect is on page 3: “..will consider the discharge...on..marine biota...based on predicted concentrations...relative to available toxicity thresholds and reference values.”

And on page 7: ...”The analysis of effects may use a number of existing benchmarks, analysis, and tools to estimate the potential for a Project-related effect on the marine environment.” This phrase can cover a lot of things. A more detailed description, for each of the indicators in Table 1, of how potential effects will be

assessed/measured should be provided. There should be a forth column in the Table that describes the method of assessment for each indicator.

As an example, a main impact of the project will be the treated effluent that is discharged into the Northumberland Strait off Caribou Harbour. It will be described chemically, but how will we determine what effect it might have on, for example, the herring fishery or the lobster fishery? The nature of the effluent, based on the new effluent treatment facility, is that has not yet been subjected to toxicity testing. i.e., there are no “available toxicity thresholds”. Will they use the approach of assuring a 99% dilution at 100 m from the diffuser.....or maybe they plan to create thresholds by toxicity testing of species?

Chapter 31 – Focus Report

1.0 Introduction

For this chapter EXP has taken the Terms of Reference (TOR) for a Focus Report and attempted to assess whether the intent of the TOR had been achieved or if there was any outstanding information. For each of the project elements, reports and studies that have been reviewed, EXP, was not made aware of the actual scope of the assessor nor what their agreed upon budget was. The purpose of the review is not to lay blame but rather examine from an unbiased perspective how the contents of each report or study have affect PLFN. In this regard EXP was tasked with examining the following:

- a) whether the focus report addresses all of items that the Minister requested in her decision last Spring.
- b) whether the information now contained in the EARD combined with the information in the Focus Report is sufficient to allow an assessment of the environmental impacts of the project as regards PLFN interests – namely
 - a. its fishing activities
 - b. air quality on and around the reserve lands
 - c. water quality around reserve lands as well
 - d. health of members, and
 - e. the short term and long term water quality of the Northumberland Strait.
- c) what the risks to those interests are from the project; and
- d) how those risks can be mitigated or managed and what the options for mitigation and management are, including alternatives not mentioned in the reports.

2.0 Focus Report Elements

The overview shows several graphs that demonstrate NPNS effluent characteristic. They typically show that the effluent is characterized in the middle of the pack, ie a weak to moderate strength effluent. It would be more appropriate to demonstrate the impacts from these other plants in relation to the predicted model impacts.

1. PUBLIC, MI'KMAQ AND GOVERNMENT ENGAGEMENT

- 1.1 PROVIDE A RESPONSE (VIA A CONCORDANCE TABLE) TO QUESTIONS AND COMMENTS RAISED BY THE PUBLIC, MI'KMAQ AND GOVERNMENT DEPARTMENTS, AND INCORPORATE THESE COMMENTS IN THE FOCUS REPORT WHERE APPLICABLE. COMMENTS MAY BE SUMMARIZED PRIOR TO PROVIDING THE RESPONSE.

The concordance table does not provide a quick description of the response to most of PLFN concerns. The document starts off providing a description of the response but trails off quickly to references to multiple sections which is rather time consuming.

Much of the concordance table provides references to specific sections in technical documents. It would be expected that plain term responses would be provided in addition to the necessary supporting technical details. Some of the responses direct the reader to the technical reports and while this is fine for government and consultants, it does not allow the public the opportunity to understand from a basic perspective what the response details.

1.2 PROVIDE A PLAN TO SHARE FUTURE REPORTS AND/OR STUDIES RELEVANT TO THIS PROJECT WITH THE PUBLIC AND THE MI'KMAQ SUCH AS THE PICTOU LANDING FIRST NATION, INCLUDING BUT NOT LIMITED TO THE FUTURE ENVIRONMENTAL EFFECTS MONITORING RESULTS FOR THE NEW EFFLUENT TREATMENT FACILITY.

Section 2.3 is just a list of engagement techniques they could use. There is no commitment to what NPNS will use.

Section 2.3 Consultation Methods (Section typo) again a list of consultation methods that could be used.

Section 2.4 Stakeholder Register. This is an example of what NP will use to keep track of stakeholders but there is no details pertaining to how an individual gets added to the list.

Section 3.0 lists Identified Stakeholders. PLFN are referenced in the list as well as the Minister of Aboriginal Affairs. There is no reference to other First Nation Communities. There is no reference to FN communities in Prince Edward Island. These communities should be identified now that the effluent will be pumped into the Northumberland Strait.

This document is rather high level and does not cover how actual information is provided. Further, there was no reference as to how actual future monitoring data will be provided. An example would be: All monitoring data will be supplied to PLFN via email when transmitted to the regulators.

2. PROJECT DESCRIPTION

2.1 PROVIDE THE FOLLOWING INFORMATION REGARDING THE ON-LAND PORTION OF THE EFFLUENT PIPELINE:

- **A RE-ALIGNMENT ROUTE FOR THE EFFLUENT PIPELINE, GIVEN DEPARTMENT OF TRANSPORTATION AND INFRASTRUCTURE RENEWAL DOES NOT PERMIT THE PIPELINE TO BE PLACED IN THE SHOULDER OF HIGHWAY 106;**
- **MAPS AND/OR DRAWINGS OF THE NEW PIPELINE LOCATION;**
- **A LIST OF PROPERTIES (I.E., PREMISES IDENTIFICATION NUMBER OR PID) THAT WILL INTERSECT WITH THE NEW PIPELINE ALIGNMENT.**

Pipeline routing – refers to a design report in Appendix 3.5 which refers the reader back to a section 3.5 of the Focus Report....?? The design report is actually in Appendix 2.1 and only offers one possible pipeline route.

The cover letter from TIR notes that TIR is continuing to hold talks with NPNS but does not confirm nor deny the use of TIR ROW for use. A fact that TIR has recently come out in the news to clarify.

What is the thermal transfer through the pipe? What affect (if any) will this have on the stream crossings, specifically during winter months.

The list in the focus report lists multiple properties with the “Owner Undetermined” would this result in some land disputes?

It would be expected that this document would go into better detail on the required water crossings.

At this point this document would be considered a planning document and does not meet the level of details request in the focus report.

Have there been any consultations with the Town of Pictou?

A shape file showing this proposed route would be appreciated and useful for overlaying with mapped watercourses and wetlands. The proposed route looks like the pipe is going right through a small pond in the middle of the roundabout.

What is the option if TIR do not agree? Seems premature to submit the Focus Report without this very key detail in agreement with TIR.

2.2 CONDUCT GEOTECHNICAL SURVEYS AND PROVIDE THE SURVEY RESULTS TO CONFIRM VIABILITY OF THE MARINE PORTION OF THE PIPELINE ROUTE. THE SURVEYS MUST DETERMINE THE POTENTIAL IMPACTS OF ICE SCOUR ON THE PIPELINE.

Marine Geotechnical Survey – Report details in Appendix 2.2 – Depth of 3 m planned to prevent ice scour issues. Looks like they have anticipated all variables.

- The survey seems technically complete.
- No ice scour is predicted in the vicinity of the diffusers.
- Ice scour observed along the pipe route.
- Ice scour in 2018/2019 in the bottom substrate was reportedly measured at a maximum of 0.4m outside the route and 0.3m within the route. How does 2018/2019 compare to previous years in terms of ice in the harbour? Perhaps this information is available via the ferry operator. Also, what is the impact of climate change on ice scour?
- Significant inflections observed in Pictou Harbour that could be archaeological in nature. What will be done to investigate these potential archaeological resources.

EXP conducted a quick review for additional sources of information on ice scour in the Northumberland Strait. The FHWA Study Tour of Northumberland Strait Crossing Project (NSCP), published in 1996 notes that the ice scour occurs most commonly at the edge of the landfast ice and can occur at depths of 8 to 11 metres.

The goal of the program was to characterize the bathymetry, geology, harbour bottom surficial features, benthic habitats, and potential archeological resources within the proposed pipeline route in Pictou and Caribou Harbour.

The work involved geophysical, geotechnical and video investigations. Environmental testing of sediments is mentioned in the Executive Summary and various methodology sections.

In general the program appears to have been fairly complete and performed in a manner consistent with achieving their stated objectives.

The methods employed in the CSR survey are in keeping with what EXP has seen in similar investigations in Halifax Harbour. A number of geophysical methods were employed to characterize the conditions. The document was reviewed with EXP's GIS scientist, who also thought that the primary geophysics tools that would typically be expected were employed.

Some potential issues or study limitations that EXP noted:

- The vibracore samples were taken at offsets (~35 m to 50 m) from the pipeline route in Pictou Harbour so the conditions at the pipeline could vary somewhat along this part of the alignment.
- The vibracore is mainly for sediment sampling so limited information with respect to the depth of investigation where till and rock are present. This is acknowledged by the authors and additional geotechnical investigations are recommended.
- Basic factual geotechnical data were provided. It was indicated that geotechnical recommendations for the pipeline development would be provided at a later date.
- Environmental results were not included. It is not known if sufficient testing was completed to meet provincial or federal dredging and disposal requirements in terms of the review of this document. EXP understands that this work was covered under another report completed by Stantec.

EXP's conclusion is that the geotechnical work is incomplete based on the recommendations for additional investigation into the till and bedrock thickness. In addition the report is only looking at one season of ice scour data. It is deemed that this would be insufficient to make a current design prediction. With the recommendations for pipeline development to be provided at a later date, it makes it near impossible to address the items outlined in Section 2.5 (proposed changes to pipeline routing/construction).

2.3 *SUBMIT DATA REGARDING THE COMPLETE PHYSICAL AND CHEMICAL CHARACTERIZATION OF NPNS' RAW WASTEWATER (I.E., INFLUENT AT POINT A FOR THE PROJECT), TO SUPPORT THE ASSESSMENT OF THE APPROPRIATENESS OF THE PROPOSED TREATMENT TECHNOLOGY. THE INFLUENT CHARACTERIZATION RESULTS MUST BE COMPARED AGAINST THE PROPOSED TREATMENT TECHNOLOGY SPECIFICATIONS.*

Characterization of Effluent – Effluent “not appreciably different from effluent characteristics from other bleached kraft mills in Canada”...but what about the impacts – if any, of these mills?

- i. Defined effluent and what has to be treated.
- ii. Treated effluent characterization – page 32 – reference to Table 2.4-1 is an error. Perhaps 2.4-2?

What percentage of Total Chromium is represented by hexavalent chromium. Should have analyzed for this so the values can be compared to the NSE Tier 1 EQS.

List of parameters analysed was reasonably comprehensive. Would have been good to have guidelines (including NSE Tier 1 EQSs) listed in the tables where applicable. There could be some exceedances.

Site plan showing sample locations?

Sampling data for analysis:

- Raw water (Middle River): samples taken on April 24, 2018, and May 14, 2019;
- Raw wastewater/ Influent (Point A): samples taken on May 29, 2018, and May 14, 2019
- Treated effluent (Point C): samples taken on May 29, 2018, May 14, 2019, and July 17, 2019
- Receiving water/Background (ambient) water (Caribou Harbour): samples taken on May 24 and May 25, 2019
- Production rate: data recorded on May 29, 2018, May 14, 2019 and July 17, 2019. Production rates were within the typical design range for the plant.

The report does not detail why there is so much variability in the days of sampling. For instance Point C was sampled on July 17, 2019 but not Point A. In addition the samples mentioned above were taken only in April, May, and July of the year 2018 and 2019. Not sure if the analytical results in Table 1-2 could be used as the representative data for the characterization.

Raw wastewater data of flow, BOD, COD, TSS, pH, and temperature in 2016 was used to determine and develop design specifications for the new treatment plant.

Analytical parameters:

In addition to the Physical, Chemical and Biological parameters, the parameters of pathogenic and Whole Effluent Toxicity (WET) - describes the proportion of effluent that can enter the receiving water without causing toxicological effects (both acute and chronic) - should be tested.

2.4 SUBMIT A COMPLETE PHYSICAL AND CHEMICAL CHARACTERIZATION OF NPNS'S EXPECTED EFFLUENT FOLLOWING TREATMENT BY THE PROPOSED TECHNOLOGY. TO ASSESS THE EFFICACY OF THE PROPOSED TREATMENT TECHNOLOGY, THE FOLLOWING MUST BE INCLUDED:

1) Average and design values for AOX

"The average and design values for AOX in untreated effluent were artificially raised in the design specification to add a margin of safety to the design" (Page 2). It was not clearly mentioned how was the design values for AOX raised. Normally, based on the relationship of geometric standard deviation values to the ratio of peak to mean factor, the peak value in design is determined.

2) Expected Treated Effluent Quality and EQOs:

In the ETF design specifications, the phrase of "Expected Treated Effluent Quality" was given to the Bidders as a basis for the system performance guarantees. However, the values shown were based on average conditions and

represent the performance levels expected of the system. It was not mentioned as the limits or objectives that the ETF must comply with.

Environmental Quality Objectives (EQOs) are numerical values and narrative statements established to protect the receiving water. The determination of the EQOs should proceed with statistical data of untreated effluent, background water quality, and a hydrodynamic model. The model shall consider the concentration of the substance in the effluent, the dilution ratio available at the edge of the mixing zone, and the naturally occurring background concentration of the particular substance. Based on site-specific EQOs, the Effluent Discharge Objectives (EDOs) will be determined.

3) Regulatory limits and guidelines to be referred to:

- Canadian Environmental Quality Guidelines (CEQGs).
- The Canadian Council of Ministers of the Environment (CCME) Water Quality Guidelines (WQGs) for the Protection of Aquatic Life.
- The US EPA National Recommended Water Quality Criteria (saltwater) will be used when there is no CCME marine criteria provided.
- The Canadian Council of Ministers of the Environment (CCME) Freshwater Guidelines will be used for substances where a marine criterion is not specified by either CCME or US EPA.
- Pulp and Paper Effluent Regulations, SOR/92-269.

Data from laboratory trials on NPNS's raw wastewater that were conducted at Veolia/AnoxKaldnes in Lund, Sweden in May 2018;

- Modelling results using the raw wastewater parameters and quality;
- A comparison of the effluent characterization results from the laboratory trials and modelling work, against appropriate regulations and/or guidelines.

Northern pulp are planning a future increase in production. They had asked bidders to propose technology that could be upgraded. Is this planned increase in production being carried through all calculations and design phases? RWS, pipe size, etc. When ADI (EXP) was asked to look at wetlands, we were looking at a reduced volume.

The report does conclude that Point C is representative of what the future treated effluent will look like. The site compliance with the PPER, ok, but what about the NSE CSR and other applicable guidelines.

The trial used effluent from Point A that was shipped to Sweden for testing. What was the time between sample collection and shipment? This time between collection and analysis is critical as you can lose metals and bacteriological concentrations would change over time and with changes in temperature. Typically when you collect a COD or BOD sample, you have 24 hours to get the sample to the lab or it starts to exceed its hold time.

The trial was ran for three weeks. The trial was conducted on 60 Litres of effluent that was supplied to Veolia in three (3) 20 Litres containers that were received on April 3, 2018. (to make all of these reports tie together, they

should have done a full chemical characterization on the April 2018 sample as well). Veolia noted that they placed the effluent in cold storage at 2°C until it was used. They note they started the test the same day the samples were received on a scale design of a BAS system and brought them back up to 37°C prior to use.

The analysis of the parameters was completed using Hach-Lange analytical kits. So the analysis was not completed in an accredited laboratory but rather by field kits. These kits can provide decent results but are typically used for field measurements to supplement chemical analysis. They do note that AOX and BOD were sent to an external lab.

The trial used an active biomass from a nearby Kraft Pulp Mill, there is no mention as to whether this will be the same biomass that is used in the proposed new system.

Based on EXPs review of Item 2.4 it is EXP's opinion that a bench scale test was completed but does not feel that it represents "a complete physical and chemical characterization of NPNS's expected effluent following treatment by the proposed technology". It is believed that the 60 Litres used from a one-time sample collected at an unknown date does not provide a suitable baseline of what the effluent would look like.

2.5 PROVIDE ANY PROPOSED CHANGES TO THE PIPELINE CONSTRUCTION METHODOLOGY AND OTHER ASSOCIATED PIPELINE CONSTRUCTION WORK, RELATED TO THE POTENTIAL CHANGES TO THE MARINE PORTION OF THE PIPELINE ROUTE (E.G., INFILLING, TRENCHING, TEMPORARY ACCESS ROADS, EXCAVATION, BLASTING, DISPOSAL AT SEA, AND OTHERS WHERE APPLICABLE).

Changes to Pipeline – Pipe will be thicker than originally planned and buried 3 m below the surface to avoid ice scour. Installation will be a "messy" time although the impacts will be relatively short-lived. There may be areas with layers of glacial till or bedrock. This would make the construction of the dredge channel more challenging.

- Document was an opinion on possible ways....it is believed that the province is looking for something more detailed and definitive for making a decision than that.
- In the exec summary trenching was looked at via three options. All mechanical excavation style. Not via the side dredge method looked at previously. There were several additional options presented in the body of the report.
- The document is leaving the option up to the Contractor performing the work. If this is the case it is expected that the VECs must be examined via all three methods asked.
- Excavated materials will be used to cover the pipe back over.
- Note that excess spoils will be disposed of according to local regulation and permitting, detailed disposal options not discussed.
- Laydown and staging areas have been identified by temporary construction roads were not noted.
- Blasting is not expected.

A realignment route should NSTIR not permit the pipeline through the ROW has not been provided. At this point this document would be considered a planning document and does not meet the level of details request in the focus report.

Proposed changes to Pipeline Construction Method: Noted leaving up to contractors to decide method. Not appropriate for assessment of risks which were not appropriately addressed in the EARD. It is simply noted that the marine portion of the pipe will be covered in an EPP which has not yet been produced. Ocean disposal (troughing) not adequately assessed. Detailed disposal options of dredge spoil pile was not assessed.

3. FACILITY DESIGN, CONSTRUCTION & OPERATION AND MAINTENANCE

Treatment Technology – Keeps stressing how outputs from treated effluent will be within PPER guidelines. Assumption is that if the treated effluent is better than regulatory limits, there are no impacts – or the impacts are not significant.

Treated Effluent Quality – a thorough description of a wide variety of elements in the effluent and the amounts that will be discharged into the Northumberland Strait.

Effluent Flow Data – 85,000 m³/day is justified in a couple of ways.

Treated Effluent (Discharge) Parameters – a good review of what the treated effluent is like chemically.

Spill Basin – well rationalized and described.

Pipeline Leak Detection – final selection of leak detection technology will be left to the detailed design phase.

Pipeline protection – the pipeline passes through the Pictou Water Supply Protection Area and so it was decided to have a thicker walled pipe (2.667 inches).

Dangerous Goods – well covered.

3.1 SUBMIT TREATMENT TECHNOLOGY SPECIFICATIONS (E.G., OPTIMAL PERFORMANCE RANGE OF THE TECHNOLOGY) AND AN ASSESSMENT OF THE EFFICACY OF THE PROPOSED TREATMENT TECHNOLOGY FOR USE AT THE NPNS FACILITY, TO THE SATISFACTION OF NSE. FOR EXAMPLE, PEAK EFFLUENT TEMPERATURE IS PROPOSED TO BE ABOVE THE GENERALLY ACCEPTED RANGE OF TEMPERATURES TO ACHIEVE OPTIMAL BIOLOGICAL TREATMENT. EXPLAIN HOW THE PROPOSED HIGHER THAN OPTIMAL TREATMENT TEMPERATURE WOULD AFFECT THE TREATMENT PERFORMANCE.

- Average weir loading of the outflow of the Primary Clarifier of the new ETF is much larger than normal. If the system overflowed the clarifier might overload too quick. Need to identify the sizing of the clarifier to get the flows within range.

Table 1-1: Standard Design Values for Primary Clarifiers.¹

Process	Overflow Rate (m ³ /m ² /d)		Detention Time (hours)		Weir Loading (m ³ /d/m)	
	Average	Peak	Average	Peak	Average	Peak
Primary Treatment followed by Secondary Treatment	30 – 50	80 – 120	2.5	1.5	125	500
Primary Treatment with Waste Activated Sludge Return	24 – 32	48 – 70	2.5	1.5	125	500
Northern Pulp New ETF	26.4	34.5	5.7	4.3	369	483

Did not note in review where site runoff is going in the new system. This should be clarified.

3.2 PROVIDE EFFLUENT FLOW DATA TO SUPPORT THE PROPOSED PEAK TREATMENT CAPACITY OF 85,000 M3 MAXIMUM FLOW OF EFFLUENT PER DAY. AT A MINIMUM, DATA FROM 2017 AND 2018 IS REQUIRED. PROVIDE FLOW DATA FOR POINT A, CLARIFY SOURCE OF THE EFFLUENT FLOW VOLUMES GIVEN IN THE EARD, AND PROVIDE OTHER RELEVANT DATA AND INFORMATION TO SUPPORT THE PROPOSED TREATMENT SYSTEM DESIGN. IF THE 85,000 M3 CANNOT BE JUSTIFIED BASED ON HISTORICAL DATA, IDENTIFY WATER REDUCTION PROJECTS, OR RE-EVALUATE THE TREATMENT SYSTEM DESIGN AND UPDATE THE RECEIVING WATER STUDY ACCORDINGLY.

The document failed to provide flow data for Point A. They noted they have a doppler based flow meter at the plant but that it is not suitable for calculation purposes and that it is used as an indicator only. It would be good to see this data presented somewhere. The obviously use it for plant purposes. Perhaps some sort of correlation curve could be established to determine how reliable this data is. The exact text from the focus report reads as follows:

“The flow measurements at Point C were used because the measurement equipment at Point C is the most accurate and reliable. Point A flow data would have been used for the design review if the flow meter at that location possessed the accuracy required for the evaluation. The flow measurement at Point A, used only to assist operations at the mill, is less accurate than the regulatory flow measurement (i.e., Parshall Flume) used at Point C.”

The Industrial Approval No. 2011-076657-R03 Section 7 Effluent Treatment System states the following:

- d) The Approval Holder shall monitor flow at Point A, the end of the effluent transmission pipe on a continuous basis. This data shall be recorded daily and tabulated monthly.

- e) The Approval Holder shall operate and maintain real time flow monitoring equipment at the end of the effluent transmission pipeline which is designed to immediately notify the Approval Holder in the event of a total loss of flow or a reduction of flow below normal operating conditions.
- h) The Approval Holder shall ensure all monitoring equipment is calibrated and maintained in accordance with manufacturers specifications. Records of calibration and maintenance performed shall be maintained for not less than three (3) years and shall be made available upon request to the Department.

Based on the requirements of the IA, not only has Task 3.2 of the focus report not been addressed, but NPNS is in noncompliance with their IA.

If oxygen delignification proceeds and they increase productivity as alluded to elsewhere, how does this affect their flow calculations. Their average is 65K but they are creeping upward of 85K.

Flowrate monitoring point and the difference between inlet vs outlet flow.

The hereunder comment is made based on the understanding of the followings:

- Point A is a monitoring point of untreated effluent, located after the Effluent Lift Pump and before the Primary Clarifier.
- Point C is a monitoring point of treated effluent, located at the discharge point from the Aeration Stabilization Basin to Boat Harbour Stabilization Lagoon.
- The measurement error at Point A has not been officially investigated and confirmed.

The measurement at Point A is able to reflect the actual daily flow fluctuation of raw mill effluent. The treated effluent is partly equalized in the Aeration Stabilization Basin. Results at Point C, therefore, are “flatten” and less varied than Point A.

Wastewater loss, evaporation, and leakage within piping and basins of the treatment plant might be one of the reasons for the consistent lower flow at Point C.

Point A should be used as a monitoring point of raw effluent for the projection of design capacity (average, peak daily, and peak hourly) of the treatment facilities.

3.3 EFFLUENT DISCHARGE PARAMETERS MUST BE UPDATED (WHERE NECESSARY) BASED UPON THE RESULTS OF THE EFFLUENT CHARACTERIZATION IN SECTION 2.4 AND RELEVANT ADDITIONAL STUDIES. REFER ALSO TO ADDENDUM ITEM 2.0

The focus report noted that Total Dissolved Solids (TDS) was the only parameter updated because of the evaluation; however, cadmium, total dioxins and furans, phenanthrene, total resin acids, total fatty acids, and total pulp and paper phenols were also identified as COPC to be included in the RWS. The other parameters already under assessment were AOX, total nitrogen, total phosphorous, colour, COD, BOD₅, TSS and DO.

If we examine the Effluent Characterization (Task 2.3) we can note the following that should be considered when examining the effluent discharge parameters.

1. Hexavalent Chromium (Cr₆) was not analyzed. However given the receiving water is marine based and will have significant oxygen content available, Cr₆ would be expected to be the most available form. As such, the Chromium values of 3.4 (Point A) and 2.3 (Point C) µg/L would be in exceedance of the NSE Contaminated Sites Regulations (CSR) for discharge to a Marine Surface Water Tier 1 Environmental Quality Standards (EQS). Chromium (Cr₆ and Cr₃) should be an effluent discharge parameter.
2. Cadmium was in exceedance of the NSE CSR Tier 1 EQS at Point A and Point C.
3. Lead was in exceedance of the NSE CSR Tier 1 EQS at Point A and Point C.
4. Copper was in exceedance of the NSE CSR Tier 1 EQS at Point A and Point C.
5. Mercury was in exceedance of the NSE CSR Tier 1 EQS at Point C.
6. Zinc was in exceedance of the NSE CSR Tier 1 EQS at Point A and Point C.
7. The product resemblance on the laboratory certificates for Point C were within the fuel/lube oil range which would result in an applicable NSE CSR Tier 1 EQS guideline for modified total petroleum hydrocarbons (mTPH) of 0.1 mg/L. The concentration of mTPH at Point C as reported in Table 1-10 was 0.3 mg/L and at Point A was 2.38 mg/L at Point C, both in exceedance of the guideline.

Based on EXPs review, the above parameters should have been included in the effluent discharge parameters. It is EXP's opinion that Task 3.3 of the Focus Report has not been addressed.

3.4 PROVIDE THE FOLLOWING INFORMATION REGARDING THE SPILL BASIN:

SUBMIT INFORMATION TO ASSESS THE SIZING AND APPROPRIATENESS OF THE DESIGN OF THE SPILL BASIN. THE EARD INDICATES A RETENTION TIME OF 10-13 HOURS AT A DESIGN CAPACITY OF 35,000 M3. THE BASIS OF THIS DESIGN HAS NOT BEEN PROVIDED. IF FLOWS EXCEED 85,000M3 PER DAY ON A CONSISTENT BASIS (E.G., DURING SUMMER MONTHS), CONFIRM THAT THERE WILL BE SUFFICIENT RECOVERY TIME IN THE TREATMENT SYSTEM TO EMPTY THE BASIN BEFORE THE ADDITIONAL VOLUME IS REQUIRED;

EXPLAIN WHERE THE OVERFLOW WILL BE DIRECTED IN THE EVENT OF UNFORESEEN SCENARIOS (E.G., POWER OUTAGE).

It is the opinion of EXP that Task 3.4 was not sufficiently addressed in the focus report.

Purpose of Spill Basin:

It was not clear the purpose of the use of the spill basin. Is it for:

- Flows/loads equalization basin?
- Storage basin for the overflow in the event of unforeseen scenarios?
- Waste Activated Sledge (WAS) storage basin? Drawing 220-0-0311 shows a drain line from MBBR and the secondary clarifiers to the spill basin. WAS shall be directed to a sludge treatment facility instead of returning to the inlet wastewater flow.

Capacity of Spill Basin

It is depended on the purpose of the spill basin. For the flows/loads equalization purpose, the capacity will be determined based on the peak hourly flowrate (monitored at Point A) and the capacity of treatment facilities.

General

Process Flow Diagram drawing Should be provided for further understanding and comment on the process.

Drawing of all process by-passes within the project. Should be provided to determine if there are any bypasses to divert the raw effluent around the treatment plant.

Back-up/ emergency power for treatment facilities.

The conceptual design indicates the basin is open to atmosphere. The design flow for sizing the basin relates to inflow volumes from the plant e.g. 10 to 13 hours of full mill diversion. Consideration should also be given to a design storm event that may add additional water to the basin during an outage event, especially during non-summer periods when evaporation is minimal.

The conceptual basin design appears quite large, with no interior “finger” berms that would allow access by heavy equipment to clean out any solids that settle out during use. Where would that material be disposed of?

3.5 PROVIDE THE FOLLOWING INFORMATION REGARDING THE EFFLUENT PIPELINE:

PROVIDE VIABLE OPTIONS INCLUDING THE SELECTED OPTION FOR LEAK DETECTION TECHNOLOGIES AND INSPECTION METHODOLOGIES, WITH SPECIFIC CONSIDERATION TO ANY PORTION OF THE PIPELINE LOCATED IN THE TOWN OF PICTOU’S WATER SUPPLY PROTECTION AREA;

PROVIDE VIABLE OPTIONS INCLUDING THE SELECTED OPTION FOR THE ENHANCED PIPELINE PROTECTION, SUCH AS TRENCH LINING AND JUSTIFY HOW THE CHOSEN OPTION IS AN ADEQUATE OPTION FOR SECONDARY CONTAINMENT. BE SURE TO ADDRESS ANY POTENTIAL CHANGES IN FLOW REGIMES, ESPECIALLY WITHIN THE TOWN OF PICTOU’S WATER SUPPLY PROTECTION AREA, DUE TO THE INSTALLATION OF THE PIPELINE AND SECONDARY CONTAINMENT. IF DIFFERENT OPTIONS ARE PROVIDED FOR DIFFERENT AREAS OF THE PROPOSED RE-ALIGNED PIPELINE ROUTE, THE LOCATIONS FOR EACH OPTION MUST BE IDENTIFIED.

They did provide some leak detection methods for the overland portion of the pipe but nothing for the underwater. What if a leak were to occur within 10 metres of the shoreline?

The identified increasing the pipe thickness as their improved containment options. This does nothing to improve containment in areas where the length of pipe will be coupled.

They did note that based on LiDAR, the pipe is downgradient of the well head protection area for the Town of Pictou. But this means little without a hydrogeological assessment. There could be highly fractured bedrock near surface allowing a quick release pathway into the shallow or deep bedrock. In fact the Geotech assessment on the underwater portion noted that the SB was ripable, meaning it is highly fractured. Further, they will require a Geotech assessment along the proposed pipeline. Which they can’t do until the route is approved.

Discussion is provided as to how to protect the Town’s groundwater supply as the pipeline transits the protection area. A range of options for the pipeline construction in this area were discussed. Double walled pipeline was not considered necessary. A single pipeline was considered given “the likelihood of a leak occurring after the proper installation and commissioning of the line is extremely low. A properly a properly designed, specified, installed,

tested/commissioned pipeline will result in a leak-free system over its design lifetime”. There is no information on what the design lifetime is, nor what an “extremely low” probability is. This is essentially a “fail safe” design approach assuming nothing could happen and therefore no back-up. Given the importance of this water supply we would suggest that a “Safe-Fail” approach is more appropriate built around the concept that it will be safe in failure by incorporating backup systems so that if one fails other systems are in place.

The report only assesses surface water flows in estimating what would happen if a leak occurs. This indicates flow away from the well field. However, no consideration is given to groundwater flow patterns in the sand/gravel quire underlying the site.

It is noted that construction phase monitoring program for environmental compliance will be developed with NSE. The Town of Pictou should also be included for those wetlands within the Town of Pictou’s water supply protection area.

3.6 CLARIFY WHERE THE POTENTIAL RELEASES OF WASTE DANGEROUS GOODS AT THE PROJECT SITE WILL BE DIRECTED FOR TREATMENT AND/OR DISPOSAL. IT IS IMPORTANT TO NOTE THAT THE NEW TREATMENT FACILITY IS NOT PROPOSED TO TREAT WASTE DANGEROUS GOODS BASED ON THE INFORMATION PROVIDED IN THE EARD AND REQUIREMENTS OF NSE.

It is appropriate if NPNS are going to note the their emergency response and release of dangerous goods will follow their Standard Operating Procedures (SOP), that a public version of the SOP is made available for review and should have been included in the Focus Report.

4. MARINE WATER AND MARINE SEDIMENT

Baseline studies have been carried out for marine water quality and sediment quality. The data provide a necessary baseline/background level for a wide variety of compounds (page 71). There are currently exceedances in some parameters – more so in Pictou Harbour. Arsenic is a good example. The addition of other contaminants from the effluent discharge should be considered.

Receiving Water Study – updated with new, more realistic data. Predictions are all better than the 2018 RWS.

Sediment Transport & entrainment – not considered significant problem due to low settling rates of suspended solids in the treated effluent.

4.1 CONDUCT BASELINE STUDIES FOR THE MARINE ENVIRONMENT (SUCH AS MARINE WATER QUALITY AND MARINE SEDIMENT) IN THE VICINITY OF PROPOSED MARINE OUTFALL LOCATION.

The marine sediment report has been reviewed.

Baseline data, in terms of chemical parameters, seems sufficient.

Typically require seasonal samples not just one time. The Environmental Impact Statement will define what is required for baseline studies but typically the minimum listed requested requirements for a baseline study of a surface water body would include wording such as: *seasonal water quality field and lab analytical results (e.g.*

water temperature, turbidity, pH, dissolved oxygen profiles) and interpretation at several representative local stream and water body monitoring stations established at the project site;

Based on the lack of season water quality and sediment data, EXP would deem that Task 4.1 has not been fully completed.

4.2 UPDATE THE RECEIVING WATER STUDY TO MODEL FOR ALL POTENTIAL CONTAMINANTS OF CONCERN IN THE RECEIVING ENVIRONMENT (BASED ON THE RESULTS OF THE EFFLUENT CHARACTERIZATION AND/OR OTHER RELEVANT STUDIES SUCH AS HUMAN HEALTH RISK ASSESSMENT). BASELINE WATER QUALITY DATA FOR CARIBOU HARBOUR MUST BE APPLIED TO THIS STUDY. REFER ALSO TO ADDENDUM 3.0.

Table 4.2 notes a list of chemical parameters utilized to characterize the effluent to be discharged from the plant and then to determine baseline conditions in the Northumberland Strait.

The characterization of the effluent water does not include micro-biologicals, which may also have impact on marine aquatic organisms in the receiving water.

There is no information provided on the chemicals, micro-biologicals attached to sediment particles that may be leached off under sea water conditions.

The numerical models that were utilized to assess dispersion of dissolved contaminants and sediment are documented with various scenarios results provided in figure format. There is no discussion as to the accuracy of the model results.

We would like to review and have First Nations involved in reviewing and being involved with establishing stipulations appended to any permits provided for this work. One additional concern with a project this large is does NSE have the necessary experienced personnel that they could dedicate to monitoring compliance during construction and operation? Could First Nations personnel be seconded to NSE to aid in this aspect?

The Marine geotechnical survey notes the outflow site is presently positioned at a depth of -20 m. During the last de-glaciation sea level was approximately -50 m around 9,000 years BP. Therefore, the route alignment and disposal site was terrestrial and may have included springs. If present they may now appear as Submarine Groundwater Discharge zones (SGD's) and have an impact on the geotechnical assessment of the routing and discharge site. In addition, if present they may have created unique marine bottom ecosystems. Such SGD's should be considered in the analysis. There is an indication that bottom photography was undertaken, which would aid in assessing marine ecosystems; but was not reported on in the text. These elements were not included in the RWS.

The Marine geotechnical survey noted the potential presence of gas charged sediments along the routing. There was no indication as to what gases were involved (hydrocarbons?) and how they would be dealt with if dredging for the pipeline opened these zones for greater discharge. These elements were not included in the RWS.

- 4.3 PROVIDE RESULTS OF SEDIMENT TRANSPORT MODELLING WORK TO UNDERSTAND THE IMPACTS OF POTENTIAL ACCUMULATION OF SEDIMENT WITHIN NEAR FIELD AND FAR FIELD MODEL AREAS. THIS SHOULD INCLUDE CHEMICAL AND PHYSICAL CHARACTERIZATION OF THE SOLIDS PROPOSED TO BE DISCHARGED BY NPNS AS WELL AS A DISCUSSION OF HOW THESE SOLIDS WILL INTERACT WITH THE MARINE SEDIMENTS AND WHAT THE POTENTIAL IMPACT WILL BE ON THE MARINE ENVIRONMENT AS A RESULT.**

This requirement appears to be addressed.

5. FRESH WATER RESOURCES

- 5.1 COMPLETE A WETLAND BASELINE SURVEY ALONG THE PROPOSED RE-ALIGNED EFFLUENT PIPELINE ROUTE (IF WETLANDS ARE EXPECTED TO BE ALTERED).**

This was fairly comprehensive. But as previously noted, if NSTIR do not grant approval of use of the ROW, then all these wetland assessments will need to be repeated along whatever new route is selected.

- 5.2 PROVIDE MONITORING METHODOLOGIES FOR AREAS WITH SIGNIFICANT RISK OF PIPELINE LEAKS OR SPILLS (E.G., TWO AREAS WHERE THE PIPELINE CROSSES THE SOURCE WATER PROTECTION DELINEATED BOUNDARY FOR THE TOWN OF PICTOU WELLFIELDS; BELOW WATER TABLE; IMPORTANT WETLANDS; WATERCOURSE CROSSINGS; ETC.).**

Baseline surface water monitoring is presently underway. Would have expected this to be in place prior to submittal of the focus report.

Further study will be done to assess potential wetland compensation which is covered under necessary project approvals.

6. AIR QUALITY

The Stantec expanded report was conducted to support the Environmental Assessment for the replacement of the Effluent Treatment Facility (ETF) owned by the Government of Nova Scotia and operated by the Northern Pulp Nova Scotia Corporation, located at Abercrombie Point, Pictou County, Nova Scotia hereinafter referred to as “the Project”. The Project includes the replacement ETF and the co-combustion of bio-sludge from the replacement ETF and hog fuel in the power boiler, while the operation of all other Facility activities remains the same. The Stantec expanded report updates an original air dispersion study (Stantec 2017) to support the Environmental Assessment (EA) for the replacement ETF. The Ministry of the Environment determined and issued a Focus Report (NSE 2019b) with the following conditions pertaining to air quality:

“6.1 Provide a revised inventory of all potential air contaminants to be emitted from the proposed Project, including but not limited to, speciated volatile organic compounds, semi-volatile organic compounds, reduced sulphur compounds, polyaromatic hydrocarbons and metals.

6.2 Update the air dispersion modelling for the pulp mill facility for all potential air contaminants of concern related to the Project.

6.3 Complete an updated ambient air monitoring plan for the Project site based on the air dispersion modelling results. This plan must include the potential air contaminants to be monitored and proposed air monitoring locations.”

The stated objective of the Stantec expanded report is “the objective of assessing the Project’s potential effects on ground-level concentrations (GLCs) for air contaminants of interest to the Project.”

EXP’s scope of work is to conduct a peer review of the Stantec expanded report and provide a professional opinion on its suitability as an assessment of the potential effects on air quality in the region around the pulp mill.

The following report reviews the approach, findings, and recommendations of the Stantec expanded report and provides recommendations regarding an assessment of the potential effects on air quality in the region.

2.2 Assessment

2.2.1 Documents Reviewed

The following documents were provided for review:

- Stantec Consulting Inc., Expanded Air Dispersion Modelling Study – Replacement Effluent Treatment Facility. August 27, 2019
- Dillon Consulting, January 2019. Appendix J2 Environmental Assessment Registration Document Replacement Effluent Treatment Facility.
- Stantec Consulting Inc., Appendix K1, Air Dispersion Modelling Study – Replacement Effluent Treatment Facility. January 21, 2019.
- Stantec Consulting Inc. Comments on Paper – Pilot study investigating ambient emissions near a Canadian kraft pulp and paper facility in Pictou County, Nova Scotia by Hoffman et al (2017 a b). June 15, 2018.
- Northern Pulp’s Industrial Approval 076657-A01.

2.3 Peer Review

The following review is divided into the same sections as presented in Stantec’s expanded report.

2.3.1 Introduction

This section adequately describes the Project background and study requirements

2.3.2 Facility Description and Process Overview

The Stantec expanded report provides a much more comprehensive list of emission sources and has been updated as follows:

- operation of the power boiler has been updated to include the combustion of a mixture of hog fuel and AST bio-sludge at an approximate ratio of 14:1.
- Identification of six (6) smaller exhausts to the High-Level Roof Vent (HLRV)
- Identification of the primary sources of emission as:
 - power boiler

- recovery boiler
- smelt dissolving tank
- lime kiln
- high level roof vent
- replacement AST ETF
- Identification of the following secondary sources:
 - bleach pulp dryer
 - causticizer
 - salt cake mix tank
 - lime mud precoat filter
 - precoat filter vacuum pump exhaust
 - white liquor tank
 - dregs filter hood exhaust
 - green liquor clarifier
 - slaker with a wet scrubber
 - unbleached pulp storage tank
 - steam stripper-off gases (when not able to be incinerated)

The Stantec expanded report provides a process overview but does not include a process flow diagram identifying each source of emission in the process. This should be provided along with more detailed description of the steps associated with each process to ensure that all emissions associated from the sources identified above are captured.

2.3.3 Air Contaminants of Interest

The air contaminants of interest list has been revised based on Section 6.1 of the Terms of Reference, published literature, Ontario's Technical Standards to Manage Air Pollution and site-specific data from similar operations. This is an acceptable method for source inventory and the revised inventory of air contaminants potentially emitted from the Project.

2.3.3.1 Ambient Air Quality Criteria

The Stantec expanded report notes that the Nova Scotia Maximum Permissible Ground Level Concentration for hydrogen sulphide (H₂S) has 1 hour and 24-hour limits and that contaminants of interest that do not have a Nova Scotia provincial standard are assessed against the limits prescribed in the Ontario Regulation 419/05: Air pollution Local Air Quality (O. Reg. 419/05). H₂S has a low odour threshold with limiting effects based on odour and health resulting in 10-minute criteria of 13 ug/m³ H₂S being established in Ontario. While it is recognized that only 1-hour and 24-hour monitoring is required in the existing approval (2011-076657-A01), given that Nova Scotia has not established a 10-minute criterium it is recommended that the 10-minute criterium prescribed in O. Reg. 419/05 also be assessed by dispersion modelling, in accordance with the MECP published technical bulletin on

Methodology for Modelling Assessments of Contaminants with 10-Minute Average Standards and Guidelines. This bulletin addresses modelling assessments for B1 values with a 10-minute averaging period.

The criteria provided in Table 3.2 Ontario Regulation 419/05 Air Quality Standards (MECP 2018A) are correct with the following exceptions as shown in **red**. It is recommended that Table 3.2 be updated as follows.

Air Contaminant	CAS No.	Averaging Period	Ontario Air Quality Standards (µg/m ³)	Limiting Effect
Silver	7782-49-2	24-hour	1	Health
Naphthalene	91-20-3	24-hour	22.5	Health
		10-minute	50	Odour
Quinoline	91-22-5	24-hour	0.005	Health
Hydrogen Sulphide	7783-06-4	10-minute	13	Odour

2.3.4 Emissions Inventory

The revised report updates the emission inventory to include Project operation changes. While the method for estimating emission rates is described and is an acceptable approach, it is standard practice to provide sample calculations specifying the factor used for each source and contaminant. This is required to verify modelling input. Further, when two methods are used to estimate, such as with Power Boiler metal emissions, clarification is required which method was used and that it represents the worst-case scenario. The CAS number for Quinoline should be revised to 91-22-5.

Supporting documentation, such as stack testing results or CEMs data are not provided.

2.3.5 Air Dispersion Modelling Methodology

2.3.5.1 Model Selection

The AERMOD dispersion modelling system is an appropriate choice, however it is noted that the most recent AERMOD version is version 19191. It is not expected the version of AERMOD used would impact the model to any detriment, the key concern with the model is noted in Section 2.3.5.3 – Model Selection.

2.3.5.2 Model Domain

The modelling domain is acceptable.

2.3.5.3 Model Selection

The proposed ETF is located 0.2 km from the coast line with other on-site sources with elevated stacks located within 0.35 km of the shoreline. The plume from a tall stack source located near the shoreline may intersect this turbulent layer and be rapidly mixed to the ground, a process called “fumigation,” resulting in high ground level concentrations. AERMOD does not treat the effects of shoreline fumigation. Use of Shoreline Dispersion Model (SDM) to assess the potential concentrations due to shoreline fumigation conditions would typically be done in combination with the AERMOD model to assess concentrations during non-fumigation conditions.

2.3.5.4 Meteorological Data

While the choice of a recent 5-year surface and upper air data provided by Lakes Environmental is generally accepted by regulatory authorities, it is noted that details with respect to the location and proximity of the surface monitoring station or upper air data are not provided. Also, no comment or comparison of the data to on-site meteorological data which may be available.

2.3.5.5 Buildings

The approach for building input parameters and the use of BPIP is acceptable, however, it is noted that the version of BPIP is not provided.

2.3.5.6 Receptors

The Stantec expanded report has revised the receptor grid to include 20m spacing for 200 m in all directions surrounding a box enclosing all sources and is acceptable.

2.3.5.7 Source Information

The classification of sources as point or area sources is acceptable.

2.3.5.8 NO_x to NO₂ Conversion

The use of on default in-stack and equilibrium values and background ozone (O₃) concentration is acceptable.

2.3.6 Air Dispersion Modelling Results

Electronic copies of modelling input data and results were not provided for verification. 10-minute assessment of hydrogen sulphide is not provided.

2.3.7 Discussion

The discussion includes a frequency analysis suggests that since methyl mercaptan, dimethyl disulphide and dimethyl sulphide are set based on odour and that a frequency of less than 0.5% is acceptable, however no assessment was provided for frequency of 10-minute hydrogen sulphide exceedances.

Exceedances were identified with the power boiler with the expectation that more representative data would be obtained from stack testing during a pilot test. It is recommended that details of the pilot study parameters and

stack testing methods and contaminants selected for ambient air quality monitoring be provided in a formal stack testing plan be provided to regulatory authorities to ensure acceptability.

2.3.8 Summary and Conclusions

The Stantec revised report recommends “that once the replacement ETF is operational, source emissions testing (with air dispersion modelling) and ambient air monitoring of selected contaminants of interest be conducted to evaluate compliance with the applicable ambient air quality criteria.” EXP recommends that that details of the pilot study parameters, stack testing methods and contaminants selected for ambient air quality monitoring be provided in a formal stack testing plan be provided to regulatory authorities to ensure acceptability.

2.4 Recommendations and Conclusions

EXP recommends the following:

- Provide model input and output electronic files to verify model parameters and model processing.
- Provide details on calculation of emission rates as recommended in the Ontario Procedure for Preparing an Emission Summary and Dispersion Modelling Report version 3.0 PIBs # 3614e03 (ESDM Procedure).
- Assess for 10-minute time averaging for hydrogen sulphide in accordance with ADMGO.
- Consideration be given to providing details of the pilot study parameters, stack testing methods and contaminants selected for ambient air quality monitoring be provided in a formal stack testing plan be provided to regulatory authorities to ensure acceptability.

Stantec’s expanded report has substantially improved the source inventory and assessment criteria, however EXP cannot verify Stantec’s findings without provision of the model input and output files and supporting calculations for emission rates as identified above.

6.1 ***PROVIDE A REVISED INVENTORY OF ALL POTENTIAL AIR CONTAMINANTS TO BE EMITTED FROM THE PROPOSED PROJECT, INCLUDING BUT NOT LIMITED TO, SPECIATED VOLATILE ORGANIC COMPOUNDS, SEMI-VOLATILE ORGANIC COMPOUNDS, REDUCED SULPHUR COMPOUNDS, POLYAROMATIC HYDROCARBONS AND METALS.***

The response in the focus report lists the compounds study in the new Stantec Report. They omitted SVOCs from their list despite being requested above.

Most comments provided above.

6.2 ***UPDATE THE AIR DISPERSION MODELLING FOR THE PULP MILL FACILITY FOR ALL POTENTIAL AIR CONTAMINANTS OF CONCERN RELATED TO THE PROJECT.***

Only one (1) Receptor station situated at PLFN.

Most comments provided above.

6.3 COMPLETE AN UPDATED AMBIENT AIR MONITORING PLAN FOR THE PROJECT SITE BASED ON THE AIR DISPERSION MODELLING RESULTS. THIS PLAN MUST INCLUDE THE POTENTIAL AIR CONTAMINANTS TO BE MONITORED AND PROPOSED AIR MONITORING LOCATION(S).

Are the monthly and annual existing air monitoring reports made available to PLFN. This information is required every month to NSE.

Most comments provided above.

7. FISH AND FISH HABITAT

7.1 CONDUCT FISH AND FISH HABITAT BASELINE SURVEYS FOR THE FRESHWATER ENVIRONMENT, TO THE SATISFACTION OF FISHERIES AND OCEANS CANADA.

Freshwater: fish and habitat baseline studies – all watercourses identified and classified – details in Appendix 7.1 – these were reported and presented on the standard assessment forms.

Managed to get field investigations completed the summer of 2019.

Followed industry best practice for the wetland assessment.

7.2 CONDUCT FISH HABITAT BASELINE SURVEYS FOR THE MARINE ENVIRONMENT, TO THE SATISFACTION OF FISHERIES AND OCEANS CANADA.

Marine: fish habitat baseline survey – a cursory description of the habitat types identified by video review is given in Table 7.2-1 page 120. The overview in the Focus report does not suggest that the results were issued to DFO. It would be expected that the Fish Habitat Survey for the Marine Environment would be conducted seasonally to address the types of species present and the life stages observed. There was online one baseline survey completed in May 2019. Based on this it is EXP's opinion that Item 7.2 is not complete.

7.3 CONDUCT ADDITIONAL IMPACT ASSESSMENT OF TREATED EFFLUENT ON REPRESENTATIVE KEY MARINE FISH SPECIES IMPORTANT FOR COMMERCIAL, RECREATIONAL AND ABORIGINAL FISHERIES. THIS MUST BE BASED UPON UPDATED INFORMATION, ADDITIONAL STUDIES AND/OR AN UNDERSTANDING OF EXPECTED MOVEMENT OF CONTAMINANTS. ASSESSMENT METHODOLOGY MUST FIRST BE AGREED UPON BY NSE IN CONSULTATION WITH RELEVANT FEDERAL DEPARTMENTS.

The focus report notes that the assessment was “developed in consultation with relevant Federal and Provincial Governments”. EXP is aware that the methodology was distributed for review at the Consultation Meeting in June/July but are unaware if any comments were supplied by NSE.

The Benthic study was completed by side scan sonar and underwater video.

Not really any new assessment of the fisheries in this area.

1. Impacts on Marine Fish – i.e., what effects might the treated effluent have on important fish species?

2. Some studies are on-going or planned to get a better picture of what's there. The results of any ongoing or planned studies were not provided with the focus report.
3. A heavy reliance on a Federally regulated Environmental Effects Monitoring (EEM) program and additional EA follow-up monitoring.
4. Claim that the effluent discharge parameters will be equal to baseline conditions 5 metres from the diffuser.
5. Also state that the 200 m wide area around the diffuser will have effluent concentrations greater than 1%.
6. Assumption that any interaction between the project and marine species will be "short" and thus not significant. It is not clear how the interaction would be considered short. Would the increase in temperature at the diffuser possibly attract or shift the known boundaries for various commercial fisheries?
7. An admission – page 124 - "Prior to determining the potential effects of the project on the marine aquatic environment, there needs to be a greater understanding of the existing environment."
8. They state (pg. 131) that"the proposed pipeline route will interact with the herring fishery" and "...the Rock Crab resource.." ...but they do not indicate how it will interact. One would have to conclude that the interaction would be a negative one. You are then left with deciding if the effect is "significant" and in all cases they conclude that there are no residual negative impacts.
9. They also state (page 141) that...."three key indicator species that warrant further investigation due to their importance in commercial and Indigenous harvests..." "American lobster, rock crab, and Atlantic herring."
10. Table 7.3-2 summarizes the EA analysis for marine impacts and raises a few questions:
 - a. If the "Herring harvest areas will be directly affected by the pipeline in outer Caribou Harbour and Northumberland Strait" what is the Overall Significance – the last column – page 143?
11. Page 144 – American lobster....under Proposed Mitigation, why was Physical Effect not mitigated by the restriction of construction during the lobster season?
12. Who will be responsible for ensuring that "Work will be staged and incorporate fisheries timing windows to avoid sensitive life stages?" This is a commonly used mitigation statement that sounds great but needs to be backed up by information about when the sensitive life stages are for each VEC.
13. This general section would be more convincing in terms of the degree of impact if examples were provided about the lack of significant effect on fisheries at other kraft pulp mills.

Overall the request in Item 7.3 has been somewhat addressed, however even the author's of the studies admit that information is pending and that further assessments are planned that will factor into the VEC. In EXP's opinion the baseline marine fish habitat surveys have not been fully completed and the list of COPCs is not complete. Given the outstanding information EXP concludes that Item 7.3 is not complete but acknowledges that it is underway. Secondly, EXP would note that the purpose of the baseline studies is to define the existing environment in a sufficient enough manner that future monitoring programs will have something to compare. As such it would

be expected that greater detail than only video surveys would be captured and any data collected needs to be georeferenced.

7.4 SUBMIT AN UPDATED ENVIRONMENTAL EFFECTS MONITORING (EEM) PROGRAM BASED ON THE RESULTS OF VARIOUS RELEVANT BASELINE STUDIES AND AN UPDATED RECEIVING WATER STUDY. REFER ALSO TO ADDENDUM ITEM 4.0

The EEM has not been altered very much between what was already reviewed in the EARD. Unchanged from EARD really and driven by PPER regulations. What is important to note is that they seem to be focusing this EEM on what is required through the PPER and have very little mention on the significant monitoring and reporting requirements under the Approval.

They are noting that the RWS is predicting less than 1% concentration of the effluent as such they note there is provision under the PPER to not do fish community or benthic community studies. They note they will confirm as part of the first EEM study this requirement and note that some aspects will be required as an outcome of the EA. The wording suggests that not even one round of these assessments will be performed until the results of the RWS are confirmed through the first sampling program. While this may be acceptable under the regulatory framework, EXP believes that this leaves a risk for PLFN use of the area around the discharge as a fishing ground. Further the EEM program should be reviewed for additional COPCs that have been identified in this Focus Report as well as based on comments to the focus report provided by others.

7.5 CLARIFY WHAT CONTINGENCY MEASURES WILL BE IN PLACE TO MITIGATE POTENTIAL IMPACTS (E.G., THERMAL SHOCK TO FISH) DUE TO POTENTIAL LARGE AND RAPID FLUCTUATIONS IN WATER TEMPERATURE IN THE WINTER AT THE DIFFUSER LOCATION DURING LOW PRODUCTION OR MAINTENANCE SHUT DOWN PERIODS.

Contingency – issue of temperature shock – argument is that temperatures will never exceed 37 degrees and will be at ambient levels within a few metres of the diffuser. Like most of this report, it depends on modelling the interactions between the project and the environment. The models might be right but will only be confirmed through an Environmental Monitoring program.

Ultimately the question here is what contingency measures will be in place. The response outlined the diffuser design – not a contingency measure and design aspects to control temperature – not a contingency plan. The response also noted that there will be several SOPs developed to address issues such as low production; loss of power; and annual maintenance shut downs and resumption of production. These would satisfy the requirements above. It would also be expected that end of pipe monitoring would be conducted as is stipulated in the IA Section 7c for Point C – “monitoring continuously for flow, pH and conductivity, recorded daily.”

8. FLORA AND FAUNA

There seemed to be no reference to Fauna in the NSE terms of reference. From experience, there are some studies such as Lynx that need to be completed in the winter months.

8.1 COMPLETE A PLANT BASELINE SURVEY ALONG THE PROPOSED RE-ALIGNED EFFLUENT PIPELINE ROUTE.

Appears acceptable.

8.2 COMPLETE A MIGRATORY BIRD SURVEY ALONG THE RE-ALIGNED PIPELINE ROUTE.

Technically the study appears acceptable. However this study cannot be complete as it requires early spring (end of March to May) and fall field studies that would still be on-going. The studies completed were conducted May 9, May 24, June 10 and July 5, 2019. In addition there is no approved pipeline route. **8.3 COMPLETE A BIRD BASELINE SURVEY FOR COMMON NIGHTHAWK (*CHORDEILES MINOR*), DOUBLE CRESTED CORMORANTS (*PHALACROCORAX AURATUS*), OWLS, AND RAPTORS AND RAPTOR NESTS, FOR THE ENTIRE PROJECT AREA WHICH INCLUDES THE RE-ALIGNED PIPELINE ROUTE.**

Technically the study appears acceptable.

8.4 COMPLETE A HERPTILE SURVEY FOR THE PROJECT AREA WHICH INCLUDES THE RE-ALIGNED PIPELINE ROUTE.

Herptile (Reptiles and Amphibians) Survey – all common species found.

9. HUMAN HEALTH

9.1 COMPLETE BASELINE STUDIES FOR FISH AND SHELLFISH TISSUE (VIA CHEMICAL ANALYSIS) OF REPRESENTATIVE KEY MARINE SPECIES IMPORTANT FOR COMMERCIAL, RECREATIONAL AND ABORIGINAL FISHERIES IN THE VICINITY OF THE PROPOSED EFFLUENT PIPELINE AND DIFFUSER LOCATION.

Only one round of field studies has been completed with this issuance of the Focus Report. The study was completed between June 10 and July 5 but only included American lobster, rock crab and quahogs. There was no assessment completed on fish. This study was to reflect key marine species for the Aboriginal Fisheries. It is EXPs opinion that this element of the focus report is incomplete. The HHRA identifies “Common commercially important species include cod, White Hake (*Urophycis tenuis*), American Plaice (*Hippoglossoides platessoides*), Atlantic Halibut (*Hippoglossoides hippoglossus*), Winter Flounder (*Pseudopleuronectes americanus*), Witch Flounder (*Glyptocephalus cynoglossus*), Yellowtail Flounder (*Pleuronectes ferruginea*), Atlantic Salmon (*Salmo salar*), herring, mackerel, Bluefin Tuna (*Thunnus thynnus*), Gaspereau (alewife; *Alosa pseudoharengus*), American Eel, and Rainbow Smelt (*Osmerus mordax*; JWEL, 2001)” .

9.2 COMMENCE A HUMAN HEALTH RISK ASSESSMENT (HHRA) TO ASSESS POTENTIAL PROJECT-RELATED IMPACTS ON HUMAN HEALTH. THE RISK ASSESSMENT MUST CONSIDER HUMAN CONSUMPTION OF FISH AND OTHER SEAFOOD, CONSUMPTION OF POTENTIALLY CONTAMINATED DRINKING WATER, EXPOSURE TO RECREATIONAL WATER AND SEDIMENT, OUTDOOR AIR INHALATION, AND ANY OTHER POTENTIAL EXPOSURE PATHWAYS. THE ANALYSIS MUST INFORM THE IDENTIFICATION OF CONTAMINANTS OF CONCERN AND UPDATING OF THE RECEIVING WATER STUDY.

Human Health Risk Assessment – it has been commenced – as directed by NSE. Plan of approach appears comprehensive and rational.

In the determination of the receptors it is noted that the most sensitive age group will be used (toddlers) for non-carcinogenic compounds but then they note that a “lifetime composite receptor” will be used for the evaluation of carcinogenic compounds. Why change the receptors?

Food injection rates “will be” developed based on the survey created specifically for this project. Assumed this is the one on the NPNS website. Community engagement to capture the most relevant demographic. Does someone complete this on behalf of the toddlers. Is that even an option.

Section 2.7 “ Stantec found little information related to the combustion of pulp and paper sludge but used a sewage sludge incineration guidance to assist with predicting emissions for volatile organic compounds and NSE criteria air contaminants. As such, there is uncertainty in the predicted emission rates.”

The last section of the HHRA Section 3.0 notes the information required to complete the HHRA:

1. Final Air Dispersion Model with concentrations predicated at First Nation and non-first nation residences.
2. Results of the food surveys
3. Mixing zone assessment reports.
4. Results of the baseline study near the diffuser.

For some reason the groundwater pathway has been omitted. The Town of Pictou and PLFN rely on groundwater for potable water. This pathway should be included in the HHRA.

Basically, this is just a planning document. The HHRA is not complete but it has been commenced as the focus report TOR has requested.

10. *ARCHAEOLOGY*

10.1 *COMPLETE AN ARCHAEOLOGICAL RESOURCE IMPACT ASSESSMENT FOR THE MARINE ENVIRONMENT RELATED TO THE PROJECT.*

Archeological Studies – marine and land-based are done – some “possible archeological resources” were identified. They will be accounted for during construction.

10.2 *COMPLETE SHOVEL TESTING FOR AREAS IN THE TERRESTRIAL ENVIRONMENT THAT ARE IDENTIFIED TO HAVE ELEVATED OR MEDIUM POTENTIAL OF ARCHAEOLOGICAL RESOURCES, TO CONFIRM THE PRESENCE OR ABSENCE OF THESE RESOURCES.*

This was completed.

11. *INDIGENOUS PEOPLE’S USE OF LAND AND RESOURCES*

11.1 *COMPLETE A MI’KMAQ ECOLOGICAL KNOWLEDGE STUDY (MEKS) FOR THE PROJECT.*

A complete MEK was not submitted with the Focus Report. A cover letter noting that the draft MEK was under review by the KMKNO was issued in its stead. There is a review/overview of the MEK process and some very brief descriptions of the land use. Dillon note that there could be no hunting in the HWY 106 ROW, however there is no approval for use of the HWY 106 ROW. What about trapping within the ROW?

EXP was provided a copy of the 2019 draft MEK dated July 2019. This is not the most recent MEK report as it is noted in the MGS cover letter that Version 1 dated September 2019 was issued to KMKNO for review.

ADDENDUM: ITEMS RAISED BY REVIEWERS REQUIRING CLARIFICATION

THE FOLLOWING ITEMS MUST BE ADDRESSED WITH NSE AND INCLUDED IN THE FOCUS REPORT WHERE APPROPRIATE:

ADDENDUM 1.1 PROVIDE INFORMATION REGARDING WHETHER AND WHEN NEW TECHNOLOGY AND EQUIPMENT WILL BE INSTALLED AT THE NPNS PULP MILL TO IMPROVE THE EFFLUENT QUALITY, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

O WILL O₂ DELIGNIFICATION BE INSTALLED AT THE NPNS PULP MILL?

NPNS are planning to install oxygen delignification. There are several benefits to this upgrade but it is noted it will occur at an undetermined time following the ETF. Further, the addition of the technology will also result in an increase in daily effluent production. It is unclear what this predicted level would be.

O WHAT OTHER TECHNOLOGY AND EQUIPMENT WILL BE INSTALLED AT THE NPNS PULP MILL?

New cooling towers in addition to the cooling towers with the ETF.

O HOW WILL EACH PROPOSED NEW TECHNOLOGY AND/OR EQUIPMENT IMPROVE THE EFFLUENT QUALITY?

Oxygen Delignification – will reduce Cl, BOD, COD and colour.

Cooling towers are projected to reduce summer discharge volume by 5000 m³/day.

2.1 WITH RESPECT TO THE EFFLUENT DISCHARGE PARAMETERS:

O EXPLAIN WHY THE TOTAL NITROGEN PARAMETER HAS CHANGED TO 6 MG/L (DAILY MAXIMUM) FROM THE 3 MG/L (PROPOSED IN THE AUGUST 11, 2017 RECEIVING WATER STUDY);

A logical explanation was given for this increase. What are they impacts associated with this increase?

O PROVIDE DATA TO SUPPORT ASSERTIONS THAT CHEMICAL OXYGEN DEMAND (COD) CAN BE REDUCED TO THE PROPOSED LIMIT.

This question was not really answered but a note was made that it would be further assessed once the new cooling towers were installed.

3.1 WITH RESPECT TO THE UPDATING OF THE RECEIVING WATER STUDY:

- 1. PROVIDE A RESPONSE TO QUESTIONS AND COMMENTS ON THE RECEIVING WATER STUDY (NOT ALREADY OUTLINED IN THIS DOCUMENT) FROM ENVIRONMENT AND CLIMATE CHANGE CANADA'S EARD REVIEW SUBMISSION DATED MARCH 18, 2019, AND UPDATE THE RECEIVING WATER STUDY AS APPLICABLE;**

These questions and comments were on the original RWS. Some of these questions/comments from ECCC were carried forward into the new RWS.

- 2. EXPLAIN HOW THE INITIAL MIXING AND DISPERSAL OF THE PLUME WAS TAKEN INTO ACCOUNT WHEN SIMULATING FAR-FIELD EXTENT AND CONCENTRATIONS OF EFFLUENT IN SECTION 3 OF APPENDIX E1 OF EARD. IT APPEARS THAT THE FAR-FIELD MODEL SIMULATIONS WERE RUN BEFORE THE NEAR-FIELD MODEL. ONE COULD EXPECT THAT THE BEHAVIOR OF THE PLUME FURTHER AFIELD DEPENDS A LARGE EXTENT ON HOW IT BEHAVED AT THE DIFFUSER, I.E. HOW QUICKLY IT MIXED AND SPREAD AND ROSE TO THE SURFACE;**

This was addressed in the responses to ECCC and is based on the old RWS.

- 3. CONFIRM DILUTION RATIOS AND DISTANCES REQUIRED TO ACHIEVE BACKGROUND LEVEL FOR WATER QUALITY PARAMETERS IN APPENDIX E1 OF THE EARD, AS THE DILUTION RATIOS AND DISTANCES MAY BE OVERESTIMATED;**

This was addressed in the updated RWS.

- 4. EXPLAIN IF THE SALINITY AND TEMPERATURE DIFFERENTIAL BETWEEN THE EFFLUENT AND THE RECEIVING WATERS HAS BEEN ACCOUNTED FOR IN THE MODEL. WHEN THE BUOYANCY DIFFERENTIAL BETWEEN THE EFFLUENT AND RECEIVING WATERS ARE GREATER IN WINTER, IT RESULTS IN A FASTER RISING PLUME. THIS CAN POTENTIALLY AFFECT THE VISIBILITY OF THE EFFLUENT IN THE RECEIVING ENVIRONMENT. HAS THIS BEEN ACCOUNTED FOR IN THE MODEL? ALSO PROVIDE RESULTS FOR WINTER CONDITIONS;**

This was accounted for in the model.

- 5. EXPLAIN IF RE-ENTRAINMENT OF EFFLUENT AND SEDIMENT AT THE DIFFUSER LOCATION WAS ACCOUNTED FOR IN THE ONE-HOUR PERIOD SURROUNDING SLACK TIDE. SUPPORT THIS EXPLANATION WITH MODEL RESULTS USING A SMALLER TIME STEP (30 MINUTES) IF NECESSARY.**

This was accounted for and is in the updated RWS model according to the response.

4.0 IT IS IMPORTANT TO NOTE THAT THE FOLLOWING FIELD STUDY AND MONITORING ARE LIKELY TO BE REQUIRED AS PART OF AN EEM PROGRAM REGULATED UNDER THE PULP AND PAPER EFFLUENT REGULATIONS FOR THE PROJECT IF IT IS APPROVED:

- A. FIELD DELINEATION OF TREATED EFFLUENT PLUME TO CONFIRM THE PREDICTION FROM THE RECEIVING WATER STUDY;**

NPNS note that they will conduct a tracer test over several tidal cycles to monitoring the plumes extent and validate the predictions of the RWS. The methodology for the tracer test is considered acceptable.

- B. MONITORING OF MARINE WATER QUALITY AND MARINE SEDIMENT QUALITY;**

The response here is good in that it provides a comprehensive list of chemicals to be monitored I the water and sediment. However, there is no reference to when such sampling would occur or the frequency.

- C. SUBLETHAL TOXICITY TESTING AND CHEMISTRY TESTING OF THE TREATED EFFLUENT; AND**

The only commitment is to following the requirements of the PPER.

D. **BIOLOGICAL MONITORING STUDIES INCLUDING BENTHIC INVERTEBRATE COMMUNITY STUDY, FISH POPULATION STUDY, AND DIOXIN AND FURAN LEVELS IN FISH AS APPLICABLE.**

Again the only commitment is to what is required as part of the EARD and under the PPER. They note that there is no requirement for assessing the D&F levels in fish tissue under the regulations. They note that they test the effluent annually for D&F.

Addendum 4 Environmental Effects Monitoring – EEMs are driven by regulations such as PPER. This is the context for typical discussions of EEM work. Work planned that goes beyond the regulations should be more clearly stated here – to show an environmental commitment that goes further than the minimum. There is no commitment beyond the minimum.

3.0 Conclusions

Based on EXP's review of the focus report, the following conclusions have been made:

1. The focus report, while having a significant portion of the requirements of NSE addressed, does not address all of the items listed in the Focus Report TOR.
 - a. Item 2.2: EXP's conclusion is that the geotechnical work is incomplete based on the recommendations for additional investigation into the till and bedrock thickness. In addition the report is only looking at one season of ice scour data. It is deemed that this would be insufficient to make a current design prediction. With the recommendations for pipeline development to be provided at a later date, it makes it near impossible to address the items outlined in Section 2.5 (proposed changes to pipeline routing/construction).
 - b. Item 2.3: Based EXPs review of the data in Section 2.3 and comments supplied by others examining the focus report, EXP concludes that this report requires a detailed review by the authors to correct errors found within. In addition it would be expected that the effluent characterization would examine additional samples at Point A to ensure a representative set of values could be used for comparing against the design model. In EXPs opinion this element (2.3) of the focus report is incomplete.
 - c. Item 2.4: Based on EXPs review of Item 2.4 it is EXP's opinion that a bench scale test/pilot study was completed but do not feel that it represents "a complete physical and chemical characterization of NPNS's expected effluent following treatment by the proposed technology". It is believed that the 60 Litres used from a one-time sample collected at an unknown date does not provide a suitable baseline of what the effluent would look like.
 - d. Item 2.5 A realignment route, should NSTIR not permit the pipeline through the ROW, has not been provided. At this point this document would be considered a planning document and does not meet the level of details request in the focus report.
 - e. Item 2.5 Proposed changes to Pipeline Construction Method: Noted leaving up to contractors to decide method. Not appropriate for assessment of risks, which were not appropriately addressed in the EARD. It is simply noted that the marine portion of the pipe will be covered in an EPP which has

not yet been produced. Ocean disposal (troughing) not adequately assessed. Detailed disposal options of dredge spoil pile was not assessed.

- f. Item 3.2 NSE requested for Flow Data from Point A. The Focus Report failed to provide flow data for Point A. They noted they have a doppler based flow meter but that it is not suitable for calculation purposes and that it is used as an indicator only. It is a stipulation in the IA that this equipment is maintained, calibrated and data provided with the Annual Reports. It would be good to see this data presented somewhere. NPNS would obviously require this data for plant operational purposes.
- g. Item 3.3: Based on EXPs review, chromium, cadmium, lead, copper, mercury, zinc and total petroleum hydrocarbons should have been included in the effluent discharge parameters. It is EXP's opinion that Task 3.3 of the Focus Report has not been addressed.
- h.
- i. The RWS: The characterization of the effluent water does not include micro-biologicals, which may also have impact on marine aquatic organisms in the receiving water
- j. The Marine geotechnical survey noted the potential presence of gas charged sediments along the routing. There was no indication as to what gases were involved (hydrocarbons?) and how they would be dealt with if dredging for the pipeline opened these zones for greater discharge.
- k. Baseline surface water monitoring is presently underway for areas of significant risk of pipeline leaks. Would have expected this to be in place prior to submittal of the focus report.
- l. Air Quality report should to be amended with the following corrections in red:

Air Contaminant	CAS No.	Averaging Period	Ontario Air Quality Standards (µg/m3)	Limiting Effect
Silver	7782-49-2	24-hour	1	Health
Naphthalene	91-20-3	24-hour	22.5	Health
		10-minute	50	Odour
Quinoline	91-22-5	24-hour	0.005	Health
Hydrogen Sulphide	7783-06-4	10-minute	13	Odour

- m. The proposed ETF is located 0.2 km from the coast line with other on-site sources with elevated stacks located within 0.35 km of the shoreline. The plume from a tall stack source located near the shoreline may intersect this turbulent layer and be rapidly mixed to the ground, a process called "fumigation," resulting in high ground level concentrations. AERMOD does not treat the effects of shoreline fumigation. Use of Shoreline Dispersion Model (SDM) to assess the potential concentrations due to

- shoreline fumigation conditions would typically be done in combination with the AERMOD model to assess concentrations during non-fumigation conditions. (Cal-Puff)
- n. The revised inventory of all potential air contaminants was missing SVOCs as requested by NSE, with no rationale provided for the omission.
 - o. Who will be responsible for ensuring that “Work will be staged and incorporate fisheries timing windows to avoid sensitive life stages?” This is a commonly used mitigation statement that sounds great but needs to be backed up by information about when the sensitive life stages are for each VEC.
 - p. Item 7.3: Overall the request in Item 7.3 has been addressed, however even the author’s of the studies admit that information is pending and that further assessments are planned that will factor into the VEC. In EXP’s opinion the baseline marine fish habitat surveys have not been fully completed and the list of COPCs is not complete. Given the outstanding information EXP concludes that Item 7.3 is not complete but acknowledges that it is underway.
 - q.
 - r. Only one round of field studies for fish and shellfish tissue have been completed with this issuance of the Focus Report. The study was completed between June 10 and July 5 but only included American lobster, rock crab and quahogs. There was no assessment completed on fish. This study was to reflect key marine species for the Aboriginal Fisheries. It is EXPs opinion that this element of the focus report is incomplete. The HHRA identifies “Common commercially important species include cod, White Hake (*Urophycis tenuis*), American Plaice (*Hippoglossoides platessoides*), Atlantic Halibut (*Hippoglossoides hippoglossus*), Winter Flounder (*Pseudopleuronectes americanus*), Witch Flounder (*Glyptocephalus cynoglossus*), Yellowtail Flounder (*Pleuronectes ferruginea*), Atlantic Salmon (*Salmo salar*), herring, mackerel, Bluefin Tuna (*Thunnus thynnus*), Gaspereau (alewife; *Alosa pseudoharengus*), American Eel, and Rainbow Smelt (*Osmerus mordax*; JWEL, 2001)”
 - s. Task 8.3: Technically the study appears acceptable. However, this this study cannot be complete as it requires early spring (end of March to May) and fall field studies that would still be on-going. The studies completed were conducted May 9, May 24, June 10 and July 5, 2019. In addition there is no approved pipeline route.
 - t. The MEK study is not complete and was not provided with the Focus Report.
2. It is concluded the following studies and assessment should be considered in order to provide a more thorough answer to the Focus Report TOR.
- a. In addition to the Physical, Chemical and Biological parameters, the parameters of pathogenic and Whole Effluent Toxicity (WET) - describes the proportion of effluent that can enter the receiving water without causing toxicological effects (both acute and chronic) - should be tested.
 - b. Point A should be used as a monitoring point of raw effluent for the projection of design capacity (average, peak daily, and peal hourly) of the treatment facilities. Or even more representative the discharge at the Mill.
 - c. Treatment Design: Spill Basin

- a. Process Flow Diagram drawing Should be provided for further understanding and comment on the process.
- b. Drawing of all process by-passes within the project. Should be provided to determine if there are any bypasses to divert the raw effluent around the treatment plant.
- c. Back-up/ emergency power for treatment facilities.
- d. The conceptual design indicates the basin is open to atmosphere. The design flow for sizing the basin relates to inflow volumes from the plant e.g. 10 to 13 hours of full mill diversion. Consideration should also be given to a design storm event that may add additional water to the basin during an outage event, especially during non-summer periods when evaporation is minimal.
- e. The conceptual spill basin design appears quite large, with no interior “finger” berms that would allow access by heavy equipment to clean out any solids that settle out during use. Where would that material be disposed of?
- f. Geotechnical investigation along the pipeline route is required. In addition they should assess the hydrogeological conditions in the vicinity to factor in the HHRA.
- g. There is no information on what the design lifetime is for the pipeline, nor what an “extremely low” probability is. This is essentially a “fail safe” design approach assuming nothing could happen and therefore no back-up. Given the importance of this water supply we would suggest that a “Safe-Fail” approach is more appropriate built around the concept that it will be safe in failure by incorporating backup systems so that if one fails other systems are in place.
- h. The report only assesses surface water flows in estimating what would happen if a leak occurs. This indicates flow away from the well field. However, no consideration is given to groundwater flow patterns in the sand/gravel quire underlying the site.
- i. It is noted that construction phase monitoring program for environmental compliance will be developed with NSE. The Town of Pictou should also be included for those wetlands within the Town of Pictou’s water supply protection area.
- j. We would like to review and have First Nations involved in reviewing and being involved with establishing stipulations appended to any permits provided for this work. One additional concern with a project this large is does NSE have the necessary experienced personnel that they could dedicate to monitoring compliance during construction and operation? Could First Nations personnel be seconded to NSE to aid in this aspect?
- k. The Stantec revised Expanded Air Dispersion Modeling Study report recommends “that once the replacement ETF is operational, source emissions testing (with air dispersion modelling) and ambient air monitoring of selected contaminants of interest be conducted to evaluate compliance with the applicable ambient air quality criteria.” EXP recommends that that details of the pilot study

parameters, stack testing methods and contaminants selected for ambient air quality monitoring be provided in a formal stack testing plan be provided to regulatory authorities to ensure acceptability.

- I. For some reason the groundwater pathway has been omitted. The Town of Pictou and PLFN rely on groundwater for potable water. This pathway should be included in the HHRA.

**COMMENTS OF PICTOU LANDING FIRST NATION ON THE
NORTHERN PULP FOCUS REPORT**

SCHEDULE A

1. PUBLIC, MI'KMAQ AND GOVERNMENT ENGAGEMENT

1.1 Provide a response (via a concordance table) to questions and comments raised by the public, Mi'kmaq and government departments, and incorporate these comments in the Focus Report where applicable. Comments may be summarized prior to providing the response.

The concordance table provided in the focus report makes reference to specific sections of the technical reports as a response to various concerns raised rather than providing a plain language explanation. Because of this it is inaccessible to the lay person. Our technical consultants did not have time to review each item as it was focused on review the materials. Further time would be needed to prepare a proper response to the concerns raised.

1.2 Provide a plan to share future reports and/or studies relevant to this Project with the public and the Mi'kmaq such as the Pictou Landing First Nation, including but not limited to the future Environmental Effects Monitoring results for the new effluent treatment facility.

While Section 3.0 of the Focus Report provides a list of stakeholders, including Pictou Landing First Nation, it does not include Mi'kmaq communities in Prince Edward Island who also make use of the Northumberland Strait for fishing.

Further, while Section 2.3 lists various methods of engagement and consultation, there is no actual strategy set out in the Focus Report. This includes for future monitoring activities.

2. PROJECT DESCRIPTION

2.1 PROVIDE THE FOLLOWING INFORMATION REGARDING THE ON-LAND PORTION OF THE EFFLUENT PIPELINE:

- **A RE-ALIGNMENT ROUTE FOR THE EFFLUENT PIPELINE, GIVEN DEPARTMENT OF TRANSPORTATION AND INFRASTRUCTURE RENEWAL DOES NOT PERMIT THE PIPELINE TO BE PLACED IN THE SHOULDER OF HIGHWAY 106;**
- **MAPS AND/OR DRAWINGS OF THE NEW PIPELINE LOCATION;**
- **A LIST OF PROPERTIES (IE., PREMISES IDENTIFICATION NUMBER OR PID) THAT WILL INTERSECT WITH THE NEW PIPELINE ALIGNMENT.**

The only change to the route is to the portion that passes over Pictou Harbour. Otherwise, the pipeline route is still within the shoulder of Highway 106 which the Department of Transportation and Infrastructure Renewal still does not permit the pipeline to be placed in the shoulder of Highway 106.

EXP's comments on the adequacy of this part of the Focus Report for the purposes of an environmental assessment are: "At this point this document would be considered a planning document and does not meet the level of details requested in the focus report."

While PID numbers have been provided for properties that will intersect the route, in many instances the property owners are undetermined. This will pose problems in obtaining the approval of those landowners in a timely fashion.

2.2 Conduct geotechnical surveys and provide the survey results to confirm viability of the marine portion of the pipeline route. The surveys must determine the potential impacts of ice scour on the pipeline.

EXP identified several deficiencies with the methodology and scope of the geotechnical survey work which limits the usefulness of the survey results for environmental assessment purposes:

1. The vibracore samples were taken at offsets (~35 m to 50 m) from the pipeline route in Pictou Harbour so the conditions at the pipeline could vary somewhat along this part of the alignment.
2. The vibracore is mainly for sediment sampling and provides limited information with respect to the depth of investigation where till and rock are present. This is acknowledged by the authors and additional geotechnical investigations are recommended. In other words the geotechnical survey is incomplete.
3. While basic factual geotechnical data were provided, the Focus Report acknowledges that geotechnical recommendations for the pipeline development would be provided at a later date.
4. Ice scour was observed and measured in winter 2019 along the pipeline route but there is no indication as to how representative the ice conditions were in the area at that time. This would require a more rigorous comparison with ice conditions in previous years. No effort was made to obtain data on ice conditions from previous years to determine how representative the ice conditions that were measured in 2019 were.
5. EXP conducted a cursory review for additional sources of information on ice scour in the Northumberland Strait. The FHWA Study Tour of Northumberland Strait Crossing Project (NSCP), published in 1996 notes that the ice scour occurs most commonly at the edge of the landfast ice and can occur at depths of 8 to 11 metres.
6. Evidence of archeological features of interest was seen along the Pictou Harbour route and there is no plan for how this would be dealt with.

In conclusion without data on the till and bedrock thickness and without further geotechnical recommendations in respect of the pipeline to be built, which the Focus Report acknowledges are yet to be completed, it is not possible to ascertain the viability of the marine route for the pipeline options outlined under section 2.5. In addition the report is only looking at one season of ice scour data which is insufficient to predict impacts on the proposed pipeline along the proposed route.

2.3 SUBMIT DATA REGARDING THE COMPLETE PHYSICAL AND CHEMICAL CHARACTERIZATION OF NPNS' RAW WASTEWATER (IE., INFLUENT AT POINT A FOR THE PROJECT), TO SUPPORT THE ASSESSMENT OF THE APPROPRIATENESS OF THE PROPOSED TREATMENT TECHNOLOGY. THE INFLUENT CHARACTERIZATION RESULTS MUST BE COMPARED AGAINST THE PROPOSED TREATMENT TECHNOLOGY SPECIFICATIONS.

Northern Pulp relied on an analysis of samples taken at Point A of the Boat Harbour treatment facility as representative of the raw effluent that will be treated in the proposed new effluent treatment facility. Currently runoff water, i.e. rain water that collects on Northern Pulp's mill site, is drained into the effluent and mixes with effluent before being discharged at Point A. Thus the characterization of raw effluent at Point A is dependent on the amount of runoff water entering the pipeline on the day the samples were taken. The two samples of effluent from Point A were taken in the same month (May) in 2018 and 2019.

Further, the flow, BOD, COD, TSS, pH, and temperature were all based on data collected in 2016.

EXP was not able to determine based on the information presented in the report why those sampling dates were used and whether conditions on those dates were representative such that the analytical results in Table 1-2 could be relied on to characterize the raw effluent to be treated in the new treatment facility. More data is required.

Historic flow volumes at Point A were not measured reliably as the current equipment was said to be inadequate to scientifically measure flows. Yet, reporting of flow volumes is a requirement of the current Industrial Approval. Flows from Point C were used as a proxy for flows at Point A. Maximum flow rates at Point A cannot be adequately inferred from flow rates at Point C due to the smoothing effect of the large retention areas between Point A and Point C. Maximum flow rates should have been measured at Point A. They were not.

Another significant concern noted by EXP is that only Total Chromium is reported. An important question is what percentage of Total Chromium is comprised of hexavalent chromium, a recognized human carcinogen. This would have allowed comparison with Nova Scotia Environment's Tier 1 Environmental Quality Standards for hexavalent chromium.

While physical, chemical and biological parameters were listed in the Focus Report, no parameters were listed for pathogens and Whole Effluent Toxicity (WET). WET describes the proportion of effluent that can enter the receiving water without causing toxicological effects (both acute and chronic). This test was omitted completely.

2.4 Submit a complete physical and chemical characterization of NPNS's expected effluent following treatment by the proposed technology. To assess the efficacy of the proposed treatment technology, the following must be included:

- 1) Average and design values for AOX**
- 2) Expected Treated Effluent Quality and EQOs:**
- 3) Regulatory limits and guidelines to be referred to:**

The Focus Report bases its characterization of the effluent expected following treatment in the new ETF on an analysis of samples collected at Point C in the current Boat Harbour Treatment Facility, i.e. effluent after it is treated at the current Boat Harbour facility is used as a proxy for effluent after it is treated in the new ETF. The Point C effluent analysis was compared to an analysis of effluent generated during trials of model of AST treatment facility at the Veolia/AnoxKaldnes facilities in Lund, Sweden in May 2018.

There are deficiencies in both analyses.

Point C samples were taken in May of 2018 and 2019 and again in July 2019. Once again it cannot be said that these samples are representative of the effluent throughout the year.

The Veolia/AnoxKaldnes model of the AST processed only 60 Litres of untreated effluent that was shipped from Northern Pulps mill to Sweden in three (3) 20 litre containers that were received on April 3, 2018. Unfortunately no analysis was done on samples from Point A and Point C on the same day the 60 litres was captured. This would have allowed the best comparison between samples at Point A, Point C and the following the trial in the model BAS system in Sweden.

Also it is not known how long it took to ship the 60 Litres of effluent to Sweden. The time between collection and analysis is critical as metals and bacteriological concentrations can change over time and with changes to temperature. Typically a COD or BOD sample, can be held for no more than 24 hours without sample degradation.

Further the 60 Litres was taken on the same day and once again it is impossible to confirm that the sample was representative.

Veolia noted that prior to the trials they placed the effluent in cold storage at 2°C until it was used. They note they started the test the same day the samples were received on a scale design of a BAS system and brought them back up to 37°C prior to use.

The analysis of the parameters was completed using Hach-Lange analytical kits. The analysis was not completed in an accredited laboratory but rather using field kits. These kits can provide decent results but are typically used for field measurements to supplement laboratory chemical analysis. Only AOX and BOD were sent to an external lab.

The trial used an active biomass from a nearby Kraft Pulp Mill, there is no mention as to whether this will be the same biomass that is used in the proposed new ETF as this could affect the outcome..

While the Focus Report states that “The average and design values for AOX in untreated effluent were artificially raised in the design specification to add a margin of safety to the design”, it is not stated how the average and design values for AOX were raised. The peak value in design is determined normally, based on the relationship of geometric standard deviation values to the ratio of peak to mean factor. There is no mention of whether this was used or not.

Environmental Quality Objectives (EQOs) are numerical values and narrative statements established to protect the receiving water. The determination of the EQOs should proceed with statistical data of untreated effluent, background water quality, and a hydrodynamic model. The model should consider

the concentration of the substance in the effluent, the dilution ratio available at the edge of the mixing zone, and the naturally occurring background concentration of the particular substance. Based on site-specific EQOs, the Effluent Discharge Objectives (EDOs) will be determined. This was not done.

Further, in the ETF design specifications, the phrase of “Expected Treated Effluent Quality” was used in connection with system performance guarantees. However, the values shown were based on average conditions and represent the performance levels expected of the system. The limits or objectives that the ETF must comply with were not mentioned.

Northern Pulp has stated that it is planning a future increase in production. They had asked bidders to propose technology that could be upgraded. There is no indication that the planned increase in production has been taken into account in each calculation and design phase: RWS, pipe size, etc.

While the results show the effluent would comply with the Pulp and Paper Effluent Regulations, there is no discussion of compliance with NSE CSR and other applicable guidelines.

EXP concluded that the approach taken by Northern Pulp did not result in “a complete physical and chemical characterization of NPNS’s expected effluent following treatment by the proposed technology”. In its opinion 60 Litres from a one-time sample collected on an unknown date does not provide a suitable baseline for characterization of the effluent.

2.5 Provide any proposed changes to the pipeline construction methodology and other associated pipeline construction work, related to the potential changes to the marine portion of the pipeline route (e.g., infilling, trenching, temporary access roads, excavation, blasting, disposal at sea, and others where applicable).

As we set out in our comments on the original EARD, an environmental assessment cannot be performed without knowing how the pipeline is proposed to be installed. While the Focus Report provides additional options for installing the pipeline, it simply defers the decision on the installation method to the contract eventually hired to perform the work. Where, as here three methods are possible, each method should be assess the VEC’s as if it were the method ultimately selected in order to conduct a proper environmental assessment. Referring to a future EPP is not adequate to allow assessment of the risks.

EXP’s conclusions in reviewing this section were: “At this point this document would be considered a planning document and does not meet the level of details requested in the focus report.”

In addition EXP noted that as discussed above, geotechnical survey was inadequate to identify glacial till and bedrock along the pipeline route. Without property geotechnical data the environmental risks associated with design and constructions cannot be known.

EXP also noted that excess soils will be disposed of according to local regulation and permitting, but the Focus Report lacked any discussion of detailed disposal options, including ocean disposal (troughing), and that laydown and staging areas have been identified by temporary construction roads were not noted.

3.1 Submit treatment technology specifications (e.g., optimal performance range of the technology) and an assessment of the efficacy of the proposed treatment technology for use at the NPNS facility, to the satisfaction of NSE. For example, peak effluent temperature is proposed to be above the generally accepted range of temperatures to achieve optimal biological treatment. Explain how the proposed higher than optimal treatment temperature would affect the treatment performance.

EXP noted that the weir load on the primary clarify ($125 \text{ m}^3/\text{d}/\text{m}$) is much larger than usual. If the system overflowed the clarifier might be overloaded too quickly. The report does not address the sizing of the clarifier required to keep flows within range. It is not clear whether site runoff water will be diverted to the primary clarify. This has potential for sudden increases in flow volumes.

The Focus Report does not adequately explain why a tertiary treatment option was not incorporated into the Project. Nor does it provide for the diversion of clean “non-contact water” from the pulp effluent.

Tertiary Treatment

The concept of tertiary treatment was discussed in a 2011 report prepared for Pictou Landing First Nation by EXP (then known as ADI) entitled Northern Pulp Tertiary Treatment Study (the “ADI Study”):

By definition, tertiary treatment is applied after a traditional mechanical process. The term tertiary treatment typically applies to reducing the BOD and TSS in the effluent to levels lower than 20 ppm (known as the 20-20 level). This is usually the case when specific issues are present with the receiving water such that lower BOD and TSS concentrations are necessary. Tertiary treatment is also considered as advanced wastewater treatment for specific issues with the effluent. Typically this is not related to BOD and TSS (i.e., an effluent with a BOD and TSS concentration of 20/20 is generally suitable and acceptable for the receiving stream); however, it is related to other detrimental attributes of the effluent. Some examples of this include nutrient removal (nitrogen and phosphorous), hardness removal, reduction of endocrine disrupters or removal of colour from the effluent. (see p. 35)

The ADI Report identified 3 types of tertiary treatment that would be effective at lowering TSS, BOD and colour. The engineered wetlands option was the least expensive at an estimated \$7.8 million (ADI Report, p. 43). EXP estimated that the wetlands would take up between 15 and 20 acres of land (ADI Report, p. 6). A wetland this size could be sited within Northern Pulp’s property at Abercrombie Point next to the mill.

The ADI Report described engineered wetlands:

Engineered wetlands take advantage of the natural processes that occur for the breakdown of colour forming constituents (Figure 2-3). They also filter the suspended solids (TSS) and further remove (BOD). A typical engineered wetland would be constructed with a geo-membrane liner that would prevent the effluent from coming in contact with the natural environment. In the lined bed, a configuration of various media types and a piping distribution network would distribute the effluent and treatment will

occur with a variety of plant species and micro-organisms that naturally occur in the root structure. This technology would typically require at least 15 acres of usable area for the potential flows that are predicted from the mill.

The cost of engineered wetlands could be offset by a reduction in the cost of secondary treatment as the secondary treatment may not need to be as robust:

Given that the design will largely be dominated by the hydraulic requirements of such a large flow (and not the biodegradation capabilities), the use of an engineered wetland could potentially reduce the treatment requirements of secondary treatment or at a minimum, provide additional protection in the event of a process upset in the secondary treatment operation.

The ADI Report was prepared as an adjunct to an engineering report prepared for the Province of Nova Scotia in 2010 entitled "Boat Harbour: Return to Tidal Re-Evaluation"(AMEC, April 2010). The recommendations for secondary treatment in the AMEC report and an even earlier report (AGRA Simons, 2000) were identified in the ADI Report:

One aspect of this study is to evaluate options of final effluent discharge and treatment required for eliminating the use of Boat Harbour as part of the wastewater treatment process for the operation of the Northern Pulp mill in Amhercrombie, Nova Scotia. Past study reports (AMEC, 2010; AGRA Simons, 2000) have investigated this issue and two re-occurring options for proceeding toward the final corrective action have been:

1. Construct a treatment plant using an activated sludge process (ASP) on the mill site, construct a storage basin and pumping system for 6hr capacity, discharge the effluent in 6hr (tidal) cycles to a new outfall located at Lighthouse Beach (or other location).
2. Construct a treatment plant using an activated sludge process (ASP) on the mill site, along with a tertiary treatment system and pumping system for a new continuous outfall into Pictou Harbour.

Pictou Landing First Nation urged the Province and Northern Pulp to implement an engineered wetlands solution in the design of the Project based on the ADI Report. Northern Pulp ruled out tertiary treatment for the Project. Pictou Landing First Nation raised this as an issue in its comments on the EARD. In the concordance table it prepared for the Focus Report (Appendix 1.1, p. 11), Northern Pulp indicated that it would address this concern directly with Pictou Landing First Nation during the ongoing consultation process. KSH Consulting subsequently prepared power point presentation slides (attached) which it provided to representatives of Pictou Landing First Nation in July 2019.

The KSH slides discuss free water surface (FWS) wetlands and discuss issues with FWS wetlands such as freezing during winter months in northern climates thereby necessitating extra storage capacity for effluent to be stored until it can be treated in warmer months. KSH also provided a chart that suggested that the size of a FWS wetland would need to be 258 acres to treat effluent from the mill. The suggestion is that an engineered wetland is not feasible.

Pictou Landing First Nation asked EXP to review the comments of KSH Consulting contained in the in the power point slides. EXP has prepared comments in Chapter 25 of its review document (attached). EXP

explains that in preparing the 2011 report ADI consulted with well know engineered wetlands supplier, Abydoz Environmental. EXP explains that Abydoz has installed many engineered wetlands for purposes of providing tertiary treatment for over 20 years. Abydoz has installed many systems in Atlantic Canada which are designed to operate year round.

With respect to the area required for a wetland to treat the volume of effluent that is expected to be generated by Northern Pulp, the 2011 report was based on an expected volume of 45K m³/day. This was based on the 2010 AMEC study (attached) which found that Northern Pulp could reduce the volume of its effluent to 45K m³/day by carrying out certain improvements, the most significant one being the diversion of non-contact (clean) cooling water from effluent stream (AMEC Study, pp. 47-48).

The Project under review does not include significant water reduction improvements as identified by AMEC in 2010. Instead Northern Pulp proposes to discharge an average of 65K m³/day of effluent. Northern Pulp has provided no explanation as to why this is the case.

EXP notes that a larger system is required to treat a larger volume of effluent. Failure to make reductions in wastewater as suggested by AMEC in 2010 has resulted in the need for a larger treatment facility with a higher volume. If effluent volumes were reduced the tertiary treatment facility described by EXP in the ADI Report would still be 15-20 acres and not the 258 acres as suggested by KSH Consulting.

Water volume alone does not determine the size. KSH Consulting describes a free water surface (FWS) wetland whereas Abydoz Environmental recommended an engineered/constructed (EC) wetland. EXP describes the difference:

In free water surface (FWS) wetlands the water travels above the growing medium of the wetlands. FWS wetlands employ the aeration of the open water to provide oxygen to the water. They have minimal surface area for the attachment of bacteria and require a much larger surface area than subsurface flow wetlands for treatment.

Engineered/Constructed wetlands, like the proposed Abydoz horizontal flow type, have water flowing subsurface through the wetland growing matrix. The subsurface flow allows bacteria to grown on a large surface area of the aggregate, increasing biological activity within the wetland. This allows the wetlands to be smaller and provide significantly higher level of treatment.

EC wetlands take up less area.

The last factor that influences the area required for an engineered wetland is how much of each contaminant it is designed to remove. The 2011 proposed system was designed to meet the yet-to-be proclaimed federal municipal wastewater regulations. Notably this called for BOD of 20m³/l and TSS of 20m³/l. These guidelines were later implemented but in just 8 years have been lowered by Canada to 13m³/l for both BOD and TSS.

Using the more stringent design criteria required to meet the current federal municipal wastewater regulations and allowing for effluent flows of 65Km³/day, Abydoz Environmental currently recommends an engineered wetland of 68 acres (EXP Chapter 25, p. 68).

With over 450 acres of land at the mill site, the original 2011 findings that engineered wetlands near the proposed ETF are feasible still stands.

3.2 Provide effluent flow data to support the proposed peak treatment capacity of 85,000 m3 maximum flow of effluent per day. At a minimum, data from 2017 and 2018 is required. Provide flow data for Point A, clarify source of the effluent flow volumes given in the EARD, and provide other relevant data and information to support the proposed treatment system design. If the 85,000 m3 cannot be justified based on historical data, identify water reduction projects, or re- evaluate the treatment system design and update the receiving water study accordingly.

EXP notes that if oxygen delignification proceeds as suggested and production increases, average volumes will be higher and will be approaching peak capacity of 85K m3/day. The systems appears under-designed for future expansion of production.

Northern Pulp reports that it has not kept reliable flow data for Point A for 2017 and 2018 due to the limitations of the Doppler based flow meter used at Point A. As EXP points out, this is a breach of its current Industrial Approval which requires continuous monitoring at Point A. It is not clear whether the data collected at Point A is completely unusable or what steps were taken to determine its reliability, for example through the use of a correlation curve.

Northern Pulp has used flow data from Point C as a proxy for flows at Point A. EXP points out that this is not satisfactory since the area between Point A and Point C acts to smooth out peak volumes through wastewater loss, evaporation, and leakage within the basins. In other words peak volumes at Point A would not be the same as peak volumes at Point C. Standard practice is to use raw effluent flow data (Point A) for the projection of design capacity (average, peak daily, and peak hourly) when designing treatment facilities.

3.3 Effluent discharge parameters must be updated (where necessary) based upon the results of the effluent characterization in Section 2.4 and relevant additional studies. Refer also to Addendum item 2.0

It is EXP's opinion that Task 3.3 of the Focus Report has not been addressed. The effluent characterization in Section 2.4 revealed the following chemicals of concern:

1. Hexavalent Chromium (Cr₆) was not analyzed. However given the receiving water is marine based and will have significant oxygen content available, Cr₆ would be expected to be the most available form. As such, the Chromium values of 3.4 (Point A) and 2.3 (Point C) µg/L would be in exceedance of the NSE Contaminated Sites Regulations (CSR) for discharge to a Marine Surface Water Tier 1 Environmental Quality Standards (EQS). Chromium (Cr₆ and Cr₃) should be an effluent discharge parameter.
2. Cadmium was in exceedance of the NSE CSR Tier 1 EQS at Point A and Point C.
3. Lead was in exceedance of the NSE CSR Tier 1 EQS at Point A and Point C.
4. Copper was in exceedance of the NSE CSR Tier 1 EQS at Point A and Point C.
5. Mercury was in exceedance of the NSE CSR Tier 1 EQS at Point C.
6. Zinc was in exceedance of the NSE CSR Tier 1 EQS at Point A and Point C.
7. The product resemblance on the laboratory certificates for Point C were within the fuel/lube oil range which would result in an applicable NSE CSR Tier 1 EQS guideline for modified total petroleum hydrocarbons (mTPH) of 0.1 mg/L. The concentration of mTPH at Point C as reported

in Table 1-10 was 0.3 mg/L and at Point A was 2.38 mg/L at Point C, both in exceedance of the guideline.

The Focus Report was only updated for Total Dissolved Solids (TDS) despite the fact that cadmium, total dioxins and furans, phenanthrene, total resin acids, total fatty acids, and total pulp and paper phenols were all identified as chemicals of potential concern (COPC). These should have been added to the parameters that were identified (AOX, total nitrogen, total phosphorous, colour, COD, BOD₅, TSS and DO) for purposes of the receiving water study. Accordingly, these parameters are not addressed in the receiving water study.

3.4 Provide the following information regarding the spill basin:

Submit information to assess the sizing and appropriateness of the design of the spill basin. The EARD indicates a retention time of 10-13 hours at a design capacity of 35,000 m³. The basis of this design has not been provided. If flows exceed 85,000m³ per day on a consistent basis (e.g., during summer months), confirm that there will be sufficient recovery time in the treatment system to empty the basin before the additional volume is required;

Explain where the overflow will be directed in the event of unforeseen scenarios (e.g., power outage).

EXP notes that in its opinion, this task was not sufficiently addressed in the focus report. The Focus Report lacks a clear statement as to the purpose of the spill basin. It appears from Drawing 220-0-0311 that the waste activated sludge storage basin is designed to drain back into the spill basin. This is a design flaw. WAS must be directed to a sludge treatment facility instead of returning to the inlet wastewater flow.

Lack of data for peak hourly flow rate hampers the design of the spill basin.

The Focus Report is missing key information including a process flow diagram, drawing showing all process by-passes and back up electrical supply. Further as the spill basin is open to atmosphere consideration should have been given to a design storm event that may add additional water to the basin during an outage event, especially during non-summer periods when evaporation is minimal.

Finally, the conceptual basin design appears quite large, with no interior “finger” berms that would allow access by heavy equipment to clean out any solids that settle out during use. Additionally, there is no indication as to where material removed from the berm would be disposed of.

3.5 Provide the following information regarding the effluent pipeline:

Provide viable options including the selected option for leak detection technologies and inspection methodologies, with specific consideration to any portion of the pipeline located in the Town of Pictou’s water supply protection area;

Provide viable options including the selected option for the enhanced pipeline protection, such as trench lining and justify how the chosen option is an adequate option for secondary containment. Be sure to address any potential changes in flow regimes, especially within the Town of Pictou’s water supply protection area, due to the installation of the pipeline and secondary containment. If different

options are provided for different areas of the proposed re-aligned pipeline route, the locations for each option must be identified.

No leak detection was described for the underwater portion of the pipeline.

While increasing thickness appears more secure, this does nothing to improve containment in areas where the length of pipe will be coupled.

Exp notes the lack of hydrogeological assessment of the area around the well head protection area for the Town of Pictou. Even though the LiDAR shows that the pipe is downgradient of the well head protection area for the Town of Pictou there could be highly fractured bedrock near surface allowing a quick release pathway into the shallow or deep bedrock. In fact the Geotech assessment on the underwater portion noted that the surface bedrock was ripable, meaning it is highly fractured.

A Geotechnical survey of then proposed pipeline is required but was not done because the route has not been selected.

EXP notes that the approach to protecting the Town of Pictou well head protection area is “essentially a ‘fail safe’ design approach assuming nothing could happen and therefore no back-up.” EXP recommends that given the importance of this water supply a “Safe-Fail” be used whereby backup systems are incorporated which are designed to prevent contamination in the event of a failure. If one system fails others are in place.

The report only assesses surface water flows in estimating what would happen if a leak occurs. This indicates flow away from the well field. However, no consideration is given to groundwater flow patterns in the sand/gravel quire underlying the site.

3.6 Clarify where the potential releases of waste dangerous goods at the Project site will be directed for treatment and/or disposal. It is important to note that the new treatment facility is not proposed to treat waste dangerous goods based on the information provided in the EARD and requirements of NSE.

It is appropriate if NPNS are going to note the their emergency response and release of dangerous goods will follow their Standard Operating Procedures (SOP), that a public version of the SOP is made available for review and should have been included in the Focus Report.

4.1 Conduct baseline studies for the marine environment (such as marine water quality and marine sediment) in the vicinity of proposed marine outfall location.

While the issue of chemical parameters seems sufficient, normally sampling is required for a full year (seasonal sampling) owing to variations that may occur throughout the year. Typical language used in Environmental Impact Statements tend to define what is required for baseline studies but typically the minimum listed requested requirements for a baseline study of a surface water body would include wording such as: *seasonal water quality field and lab analytical results (e.g. water temperature, turbidity, pH, dissolved oxygen profiles) and interpretation at several representative local stream and water body monitoring stations established at the project site.*

Based on the lack of season water quality and sediment data, EXP found that this requirement has not been fully completed.

4.2 Update the receiving water study to model for all potential contaminants of concern in the receiving environment (based on the results of the effluent characterization and/or other relevant studies such as Human Health Risk Assessment). Baseline water quality data for Caribou Harbour must be applied to this study. Refer also to Addendum 3.0.

Table 4.2 notes a list of chemical parameters utilized to characterize the effluent to be discharged from the plant and then to determine baseline conditions in the Northumberland Strait.

The characterization of the effluent water does not include micro-biologicals, which may also have impact on marine aquatic organisms in the receiving water.

There is no information provided on the chemicals, micro-biologicals attached to sediment particles that may be leached off under sea water conditions.

The numerical models that were utilized to assess dispersion of dissolved contaminants and sediment are documented with various scenarios results provided in figure format. There is no discussion as to the accuracy of the model results.

The Marine geotechnical survey notes the outflow site is presently positioned at a depth of -20 m. During the last de-glaciation sea level was approximately -50 m around 9,000 years BP. Therefore, the route alignment and disposal site was terrestrial and may have included springs. If present they may now appear as Submarine Groundwater Discharge zones (SGD's) and have an impact on the geotechnical assessment of the routing and discharge site. In addition, if present they may have created unique marine bottom ecosystems. Such SGD's should be considered in the analysis. There is an indication that bottom photography was undertaken, which would aid in assessing marine ecosystems; but was not reported on in the text. These elements were not included in the RWS.

The Marine geotechnical survey noted the potential presence of gas charged sediments along the routing. There was no indication as to what gases were involved (hydrocarbons?) and how they would be dealt with if dredging for the pipeline opened these zones for greater discharge. These elements were not included in the RWS.

Due to limitations of time and data the results of the RWS have not been fully reviewed and analyzed to date.

4.3 Provide results of sediment transport modelling work to understand the impacts of potential accumulation of sediment within near field and far field model areas. This should include chemical and physical characterization of the solids proposed to be discharged by NPNS as well as a discussion of how these solids will interact with the marine sediments and what the potential impact will be on the marine environment as a result.

While EXP found that this modelling appeared to be performed satisfactorily, EXP has acknowledged that it lacks expertise in that area and has since seen reports which show that sediment accumulation could occur within 4 kilometers of the discharge point and could impact fishing areas.

5.1 Complete a wetland baseline survey along the proposed re-aligned effluent pipeline route (if wetlands are expected to be altered).

As previously noted, these wetland assessments are only useful if the final route is as described.

5.2 Provide monitoring methodologies for areas with significant risk of pipeline leaks or spills (e.g., two areas where the pipeline crosses the Source Water Protection Delineated Boundary for the Town of Pictou wellfields; below water table; important wetlands; watercourse crossings; etc.).

Baseline surface water monitoring is presently underway but has not been completed. This is a serious limitation to the Focus Report.

6.1 Provide a revised inventory of all potential air contaminants to be emitted from the proposed project, including but not limited to, speciated volatile organic compounds, semi-volatile organic compounds, reduced sulphur compounds, polyaromatic hydrocarbons and metals.

6.2 Update the air dispersion modelling for the pulp mill facility for all potential air contaminants of concern related to the Project.

6.3 Complete an updated ambient air monitoring plan for the Project site based on the air dispersion modelling results. This plan must include the potential air contaminants to be monitored and proposed air monitoring location(s).

Some limitations on the air dispersion modelling were noted. Speciated volatile organic compounds (SVOCs) were omitted from the list of potential air contaminants. There is only one air monitoring station in the vicinity of Pictou Landing First Nation. Final air dispersion modelling should include Pictou Landing First Nation in the design process and in the actual monitoring.

EXP provided a peer review of the air modelling section of the Focus Report and recommends the following:

1. Provide model input and output electronic files to verify model parameters and model processing.
2. Provide details on calculation of emission rates as recommended in the Ontario Procedure for Preparing an Emission Summary and Dispersion Modelling Report version 3.0 PIBs # 3614e03 (ESDM Procedure).
3. Assess for 10-minute time averaging for hydrogen sulphide in accordance with ADMGO.
4. Consideration be given to providing details of the pilot study parameters, stack testing methods and contaminants selected for ambient air quality monitoring be provided in a formal stack testing plan be provided to regulatory authorities to ensure acceptability.

There was one significant limitation to EXP's peer review: While EXP concluded that the modeling is improved from the previous version, EXP cannot verify Stantec's findings without provision of the model input and output files and supporting calculations for emission rates as identified above. In other words, Pictou Landing First Nation has not had an opportunity to fully review the proposed air dispersion modelling.

7.1 Conduct fish and fish habitat baseline surveys for the freshwater environment, to the satisfaction of Fisheries and Oceans Canada.

See EXP summary report.

7.2 Conduct fish habitat baseline surveys for the marine environment, to the satisfaction of Fisheries and Oceans Canada.

EXP has concluded that fish habitat baseline survey is incomplete. Industry practice requires that a Fish Habitat Survey for the Marine Environment would be conducted seasonally to address the types of species present and the life stages observed. The Focus Report relied on only one baseline study conducted in May 2019.

7.3 Conduct additional impact assessment of treated effluent on representative key marine fish species important for commercial, recreational and Aboriginal fisheries. This must be based upon updated information, additional studies and/or an understanding of expected movement of contaminants. Assessment methodology must first be agreed upon by NSE in consultation with relevant federal departments.

EXP lists several issues of concern with this section of the report. Rather than do the tests and studies required, Northern Pulp appears to rely on the assumption that the receiving water study will be correct and that there will be total mixing of the effluent and seawater within 2 meters. However, this does not address the specific task: “conduct additional impact assessment of treated effluent on key marine fish”. EXP summarizes its comments as follows:

Overall the request in Item 7.3 has been somewhat addressed, however even the authors of the studies admit that information is pending and that further assessments are planned that will factor into the VEC. In EXP’s opinion the baseline marine fish habitat surveys have not been fully completed and the list of COPCs is not complete. Given the outstanding information EXP concludes that Item 7.3 is not complete but acknowledges that it is underway. Secondly, EXP would note that the purpose of the baseline studies is to define the existing environment in a sufficient enough manner that future monitoring programs will have something to compare. As such it would be expected that greater detail than only video surveys would be captured and any data collected needs to be georeferenced.

7.4 Submit an updated Environmental Effects Monitoring (EEM) program based on the results of various relevant baseline studies and an updated receiving water study. Refer also to Addendum item 4.0

The Environmental Effects Monitoring (EEM) has not been altered substantially from the original EARD. Northern Pulp appears to be proposing an EEM based solely on the requirements of the Pulp and Paper Effluent Regulations (PPER). This is insufficient since the contaminants of concern go beyond those identified by the PPER. In particular Northern Pulp proposes to rely on an exemption in the PPER as

regards EEM. Under PPER no monitoring is required where concentrations are less than 1% as predicted by the receiving water study. Based on this no fish community or benthic community studies are proposed. EXP believes that this creates a risk for Pictou Landing First Nation and as its members use of the area around the discharge as a fishing ground. EXP recommends that the EEM program should be reviewed for additional COPCs that have been identified in this Focus Report as well as based on comments on the Focus Report provided by others. As with air dispersion monitoring, Pictou Landing First Nation should be involved in the design of an EEM program and also in carrying out the monitoring. Pictou Landing First Nation should be provided with results of the monitoring and with funding to access independent consultants to interpret monitoring results and provide direction for future monitoring.

7.5 Clarify what contingency measures will be in place to mitigate potential impacts (e.g., thermal shock to fish) due to potential large and rapid fluctuations in water temperature in the winter at the diffuser location during low production or maintenance shut down periods.

No contingency measures are provided. Like much of the Focus Report the response relies on the accuracy of the modelling. If the modelling is correct no contingency plan is needed. This is not how environmental assessments work. In fact environmental assessments were designed to avoid the wait and see approach. The fact is no contingency plan has been provided as requested. While several safe operational policies will be developed and these may satisfy this requirement, they have not been prepared. The Focus Report is deficient.

8.1 Complete a plant baseline survey along the proposed re-aligned effluent pipeline route.

EXP notes that this aspect of the Focus Report appears acceptable.

8.2 Complete a migratory bird survey along the re-aligned pipeline route.

These cannot have been fully completed as they require early Spring and Fall field study. The studies completed were only conducted on May 9, May 24, June 10 and July 5, 2019. These may need to be repeated depending on the pipeline route.

8.3 Complete a bird baseline survey for common nighthawk (*Chordeiles minor*), double crested cormorants (*Phalacrocorax auratus*), owls, and raptors and raptor nests, for the entire project area which includes the re-aligned pipeline route.

Technically the study appears acceptable.

8.4 Complete a herptile survey for the Project area which includes the re-aligned pipeline route.

Herptile (Reptiles and Amphibians) Survey – all common species found.

9.1 Complete baseline studies for fish and shellfish tissue (via chemical analysis) of representative key marine species important for commercial, recreational and Aboriginal fisheries in the vicinity of the proposed effluent pipeline and diffuser location.

Only one round of field studies has been completed with this issuance of the Focus Report. The study was completed between June 10 and July 5 but only included American lobster, rock crab and quahogs. There was no assessment completed on any finfish. This study was to reflect key marine species for the Aboriginal Fisheries. It is EXPs opinion that this element of the Focus Report is incomplete. The Human Health Risk Assessment (HHRA) identifies “*Common commercially important species include cod, White Hake (Urophycis tenuis), American Plaice (Hippoglossoides platessoides), Atlantic Halibut (Hippoglossoides hippoglossus), Winter Flounder (Pseudopleuronectes americanus), Witch Flounder (Glyptocephalus cynoglossus), Yellowtail Flounder (Pleuronectes ferruginea), Atlantic Salmon (Salmo salar), herring, mackerel, Bluefin Tuna (Thunnus thynnus), Gaspereau (alewife; Alosa pseudoharengus), American Eel, and Rainbow Smelt (Osmerus mordax; JWEL, 2001)*” .

9.2 Commence a Human Health Risk Assessment (HHRA) to assess potential project-related impacts on human health. The risk assessment must consider human consumption of fish and other seafood, consumption of potentially contaminated drinking water, exposure to recreational water and sediment, outdoor air inhalation, and any other potential exposure pathways. The analysis must inform the identification of contaminants of concern and updating of the receiving water study.

Pictou Landing First Nation points out that this requirement merely required Northern Pulp to commence a Human Health Risk Assessment. The assessment has been barely started and will take some time. The Focus Report notes that the HHRA cannot be completed without:

1. Final Air Dispersion Model with concentrations predicated at First Nation and non-first nation residences.
2. Results of the food surveys
3. Mixing zone assessment reports.
4. Results of the baseline study near the diffuser.

While EXP found that the plan appeared comprehensive and rational, it will not be useful in determining adverse impacts in time for a decision under s. 35 of the Act.

Of particular concern to Pictou Landing First Nation is the following comment found in the Focus Report: Section 2.7 “Stantec found little information related to the combustion of pulp and paper sludge but used a sewage sludge incineration guidance to assist with predicting emissions for volatile organic compounds and NSE criteria air contaminants. As such, there is uncertainty in the predicted emission rates.”

Pictou Landing First Nation also notes that groundwater pathways have been omitted from the report. The Town of Pictou and PLFN rely on groundwater for potable water. This pathway should be included in the HHRA.

EXP concludes that the Focus Report is little more than a planning document at this stage as far as the HHRA is concerned.

10. ARCHAEOLOGY

10.1 Complete an Archaeological Resource Impact Assessment for the marine environment related to the Project.

Archeological Studies – marine and land-based are done – some “possible archeological resources” were identified. They will be accounted for during construction.

10.2 Complete shovel testing for areas in the terrestrial environment that are identified to have elevated or medium potential of archaeological resources, to confirm the presence or absence of these resources.

This was completed.

11. INDIGENOUS PEOPLE’S USE OF LAND AND RESOURCES

11.1 Complete a Mi’kmaq Ecological Knowledge Study (MEKS) for the Project.

Pictou Landing First Nation has expressed concerns about the MEKS process during the consultation process and refers and adopts those comments again herein.