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November 8, 2019

VIA EMAIL EA@novascotia.ca

Environmental Assessment Branch
Nova Scotia Environment
P.O. Box 442
Halifax, NS, B3J 2P8

Re: Northern Pulp Nova Scotia Corporation's Focus Report - Replacement Effluent Treatment Facility Project

This letter is submitted on behalf of the Ecology Action Centre (EAC), an environmental charity working since 1971 at the local, provincial, national and international level to build a healthier and more sustainable world. EAC's vision is a society in Nova Scotia that respects and protects nature and provides environmentally and economically sustainable solutions for its citizens. The authors of this submission are subject matter experts in terrestrial, coastal and marine conservation issues. Additionally, EAC has retained the services of East Coast Environmental Law and has consulted with experts in other specialties related to the environmental impacts of this proposal. We submit this letter as our response to Northern Pulp Nova Scotia Corporation's (NPNS) Focus Report, which was made public by Nova Scotia Environment on Thursday, October 3, 2019.

OUR POSITION

The Minister must reject the NPNS proposal as outlined in their Environmental Assessment Registration Document (EARD) and expanded upon in their Focus Report for four reasons:

1. There is irrefutable scientific evidence that this mill's proposed operations will have *major adverse effects on marine, coastal and terrestrial ecosystems that cannot be avoided or mitigated, and will cause significant harm to human health in the region*. Dumping inadequately treated toxic effluent in the ocean will cause lasting harm in the vicinity of the pipe and far beyond. Adding the burning of sludge to the current boiler will worsen air emissions from a system that is already regularly exceeding air emission limits. As outlined in the Environment Act, the Minister must reject an undertaking because of the likelihood that it will cause adverse effects or environmental effects that cannot be mitigated.

2. NPNS has *failed to fulfill the requirements of the Focus Report as set out in the Terms of Reference*. Please see the attached letter from East Coast Environmental Law, which outlines many of NPNS's shortcomings in meeting those requirements.

3. Due to errors, omissions and the use of inappropriate environmental protection standards, detection limits and modeling tools throughout the Focus Report, *critical gaps still exist in the information provided which was to enable understanding of the full range of impacts of this project on human and ecological values*. NPNS's incomplete Focus Report consists of studies which are not of adequate quality in several areas, false statements and misleading information, and data which appears to be skewed with frequent use of inappropriate detection limits. NPNS's use of unacceptably low, outdated industry standards and regulations for a project with a potential 50-100 year life span, while touting them as 'environmental protection', puts the long-term ecosystem health of the Northumberland Strait at too great a risk to proceed. Put simply, the Focus Report lacks credibility.

4. Throughout the Focus report, NPNS refers to abstract future monitoring notions and undetermined methodologies for crucial aspects of the ETF design as well as making faint references to possible technology solutions which may or may not be implemented after completion of the replacement ETF project. NPNS had an obligation to have these uncertainties resolved and to commit to defined methodologies for each aspect of the design as well as committing to solutions to reduce effluent toxicity (such as an Oxygen Delignification) before provide submitting this proposal. The Minister does not have the necessary information required in these yet-to-be-determined areas to be able to determine just how much harm the plan will cause to the environment.

For these reasons, NPNS has not met their obligation and the Minister must reject this proposal. At the very least, we believe that this project should be subject to a full environmental assessment report.

As the province embarks upon the complex and extremely expensive remediation of Boat Harbour (A'se'k), which has been devoid of life for more than five decades due to pollution from this pulp mill, the knowledge that similar remediation will be impossible in the fragile marine ecosystem of the Northumberland Strait makes this project unfathomable. In this letter, we will describe our key concerns about the adverse environmental impacts and other considerations, building on our initial submission (see attached) in response to the NPNS EARD. First, we begin by identifying the broader global environmental context which reflects the already compromised ecosystems which will be adversely impacted by this undertaking.

ENVIRONMENTAL CONTEXT

According to the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), ecosystems across most of the globe are now significantly altered by multiple human stressors, with the majority of indicators of biodiversity and ecosystem functioning showing rapid decline[1]. Approximately 25 percent of species in assessed animal and plant groups are threatened and may face extinction if the drivers of biodiversity loss cannot be mitigated[1]. In the marine environment, sixty-six percent of the ocean area is

[1] Díaz, S., Settele, J., Brondízio, E., Ngo, H., & Guèze, M. Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services.

experiencing increasing cumulative impacts[1]. As recently highlighted by the Intergovernmental Panel on Climate Change (IPCC) Special Report on the Oceans and Cryosphere in a Changing Climate, climate change is the most pervasive stressor in the oceans, with anthropogenic greenhouse gas emissions driving global ocean warming, acidification, de-oxygenation and sea level rise[2]. Human activities such as land- and sea-based pollution, overexploitation of harvested species, and coastal development combine with the effects of climate change, and each other, to further degrade biodiversity and ecosystems[1,2]. In Atlantic Canada, Fisheries and Oceans Canada reports that one quarter of commercial fish stocks are below healthy population levels[3]. At the same time, important coastal habitats like eelgrass meadows[4] and salt marshes[5] have declined or are at risk of decline from stressors such as agricultural run-off, land use changes and invasive species. The Gulf of St. Lawrence, in particular, is heavily stressed due to the combined effects of pollution, species overexploitation, climate change, invasive species and eutrophication[6].

The degraded state of the oceans, both globally and in Atlantic Canada, is the result of many decades of short-sighted decision-making in which we have failed to rigorously evaluate human activities in the broader context of marine environmental health and effectively mitigate adverse effects, particularly long-term cumulative effects. *The best and most current science is telling us loudly and clearly that this approach to doing business is no longer viable*. It is imperative that we prioritize building resilience back into our oceans to support human well-being, including sustainable industries that depend on healthy coastal and marine ecosystems, and mitigate the effects of climate change[2]. As Hans-Otto Pörtner, Co-Chair of IPCC Working Group II, stated: "Reducing other pressures such as pollution will further help marine life deal with changes in their environment, while enabling a more resilient ocean."[7]

KEY CONCERNS

The NPNS EARD and Focus Report raise numerous concerns about the adverse effects on marine, coastal and terrestrial ecosystems and the harm that will be caused to human health. NPNS's registration document solicited an overwhelming number of concerns raised by different government departments, non-governmental organizations and the public. Upon review of the Focus Report, the EAC's concerns include, but are not limited to:

- Composition, toxicity and impacts of effluent on the marine environment
- Increased toxicity and volume of already harmful air emissions by additional burning of sludge in the mill's power boiler

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[2] IPCC, 2019: Summary for Policymakers. In: IPCC Special Report on the Ocean and Cryosphere in a Changing Climate [H.- O. Pörtner, D.C. Roberts, V. Masson-Delmotte, P. Zhai, M. Tignor, E. Poloczanska, K. Mintenbeck, M. Nicolai, A. Okem, J. Petzold, B. Rama, N. Weyer (eds.)]. In press.

[3]https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/status-major-fish-stocks.html

[4] Murphy GEP, Wong MC, Lotze HK (2019) A human impact metric for coastal ecosystems with application to seagrass beds in Atlantic Canada. FACETS 4: 210-237.

[5] https://novascotia.ca/nse/wetland/historic-wetland-loss-ns.asp.

[6] Benoît, H. P., Gagné, J. A., Savenkoff, C., Ouellet, P., and Bourassa M.-N. (eds.). 2012. State-of- the-Ocean Report for the Gulf of St. Lawrence Integrated Management (GOSLIM) Area. Can. Manuscr. Rep. Fish. Aquat. Sci. 2986: viii + 73 pp.

[7] https://www.ipcc.ch/2019/09/25/srocc-press-release/

- Inadequate ETF Design to reduce harm
- Impact of the pipe construction on terrestrial and marine environment
- Potential of pipe leaks and risk of contamination of soil, wetlands, Pictou watershed and marine environment
- Indigenous opposition

Effluent

NPNS's proposed effluent characterization will be at least as toxic as the current effluent
Focus Report table 2.4-3 shows Effluent Loading Comparison between 2018 Point C Treated Effluent Loading and Veolia Expected Loading. From the information that NPNS has provided in this table, it is clear that the effluent quality will not be improved by this new ETF design, which is logical as this design does not allow the effluent to cool and experience the 'polishing' effects of the NPNS's current system. The current system enables more of the effluent's toxins and Total Suspended Solids (TSS) to settle into the 'receiving waters' of Boat Harbour.

It is important to note that a toxin is a toxic compound regardless of whether it is below the level of detection used in analysis. NPNS's information, with its varied and inconsistent toxicity detection limits, disregards the cumulative impact of discharging toxins in large volumes of effluent over an extended period of time. Additionally, the information provided in the Effluent Characterization information does not allow for a full determination of actual toxicity to be made. In the Baseline Marine Study, the lab uses a notably lower detection rate for total dioxins and furans than the rate used in the analysis of the effluent. Laboratories with sufficiently sensitive instruments are able to use maximum and minimum detection levels and analyze between that range. Detection limits are not the same as guidelines used to protect human life and marine life. The data reported in this Focus Report appears to be from instruments that are not sufficiently sensitive and are not detecting toxins at appropriate toxicity levels; therefore the information does not enable evidence-based decision making.

NPNS's effluent contains TSS that consist of lignin, cellulose, sodium sulphide and sodium hydroxide. The amount of these solids generated by the mill (anticipated at more than 4,000 kg/day) is problematic for NPNS and has led to the proposal to add to the mill's air emissions by burning sludge in the power boiler in an effort to reduce their volume. Even with the proposed burning of a portion of those solids, a considerable amount will remain and be discharged into the Strait. Discharging this proposed volume of insoluble fibres, with diffusion to a wide area and with limited ability to monitor impact has the potential to cause significant adverse impact by creating anoxia in the underlying sediment and impacting light attenuation. On Page 102 of the Focus Report, NPNS states that TSS are 'largely organic and biodegradable'. This is an absolutely false statement. The cellulose fibres are refractory, meaning that they will not decompose well in seawater, a fact that is mentioned elsewhere in the Focus Report.

NPNS's effluent is toxic to marine life. According to Environment and Climate Change Canada's proposal to modernize pulp and paper effluent regulations (PPER), "studies required by the PPER have shown that effluents from 70% of pulp and paper mills are impacting fish and/or fish habitat, and that the impacts at 55%

of these mills pose a high risk to the environment"[8]. As such, there is clear evidence of adverse pulp and paper effluent impacts on marine life, and the burden of proof should be on the proponent to rigorously demonstrate the lack of impact of their project on fish, fish habitat, and the broader marine environment.

While we appreciate that the PPER are currently being modernized, the 50-year history of the PPER is illustrative of a regulatory model that is fundamentally ineffective at achieving its goal. The enabling statute, the *Fisheries Act*, has two stated purposes:

(a) the proper management and control of fisheries; and
(b) the conservation and protection of fish and fish habitat, including by preventing pollution.[9]

Clearly, the PPER fall within the second purpose of the Act and yet they have repeatedly failed to meet that purpose (see [10] and a summary of the history of PPER as it relates to protection of fish and fish habitat in Canada [attached]). The proposal to modernize the PPER include addition of a few key considerations: COD, nitrogen, phosphorus, temperature and pH. However, the Regulations will not likely be fully implemented for 6 or 7 years. The modernized PPER also will not regulate a host of other harmful substances that may be found in effluent including AOX compounds, phenols, toluene, chloroform, cadmium, PAH, dioxins and furans, as examples. Nor do the modernized PPER give due consideration to cumulative effects or the long-term effects to ecosystem health (see 'Environmental Context'). Finally, the toxicity testing under the 1992 PPER will remain the same. Only the LC-50 test for acute lethality is and will be required. For this test, an effluent is considered acutely lethal if the treated effluent at 100% concentration kills more than 50% of the rainbow trout exposed to it during a 96-hour period.

Given the importance of fisheries (e.g. lobster, herring) to the local economy, livelihoods and cultures on the Northumberland Strait, meeting these modernized minimum standards is not enough. Committing to monitoring these effects through future EEM programs, as is often the tactic throughout the Focus Report, is also not enough. Given the necessary investment and the anticipated 50+ year life of the proposed system, forecasting and exceeding regulatory requirements is the only responsible choice.

NPNS' benthic habitat surveys are woefully inadequate. The benthic habitat surveys described in the Focus Report were extremely basic and the methods (video sampling) were inadequate for robust characterization of benthic communities (e.g. identification of marine algae). More intensive grab sampling or SCUBA surveys should have been conducted. Furthermore, it is extremely concerning that NPNS only conducted video surveys in the immediate vicinity of the proposed pipeline route and diffuser area. They did not conduct surveys in areas where the effluent is likely to flow. How can NPNS possibly conclude that "effluent sediment will not have a significant impact on the marine benthic environment" (Focus Report p. 102) when they haven't investigated the areas where sediment will eventually settle? TSS will indeed eventually settle out on

[8]https://www.canada.ca/en/environment-climate-change/services/managing-pollution/effluent-regulations-fisheries-act/consultation-modernization-pulp-paper-effluent-regulations/detailed-proposal-consultation-may-2019.html

[9] An Act to Amend the Fisheries Act, Statutes of Canada 2019, Chapter 14 (assented to 21 June 2019), s. 2.1.

[10] Environment Canada, Environmental Effects Monitoring Program, 6th National Assessment of Environmental Effects Monitoring Data from Pulp and Paper Mills Subject to the Pulp and Paper Effluent Regulations (April 2014). Accessed on-line at: http://publications.gc.ca/collections/collection_2014/ec/En14-84-2014-eng.pdf.

the bottom and could affect foundational plant life and sessile invertebrates in particular. In addition, TSS increase turbidity in the water column and, along with the dark colour of the effluent, reduce light availability to the sea bottom. This is a major potential impact on benthic habitats due to the sensitivity of many foundational marine plants to light limitation. Yet, this has not been considered.

Dumping effluent into the Northumberland Strait may exacerbate eutrophication and de-oxygenation. The volume of nutrients that will be pumped into the Strait by NPNS is significant. In particular, at a time when the Gulf of St. Lawrence is rapidly losing oxygen[6,11] and many estuaries around Prince Edward Island are experiencing anoxic events on a near annual basis[12], adding more nitrogen to the region's waters will exacerbate an already severe problem. Business as usual cannot continue.

The temperature of the effluent dumped into the Northumberland Strait will disrupt local marine life. The average water temperatures of the Northumberland Strait are 1°C in winter and 16.8°C in summer. Temperature is among the most significant environmental factors affecting the emergence of marine life, metabolic processes, and patterns of movement. For this reason, appropriate measures are needed to minimize changes in sea temperature caused by effluent. For example, the average maximum temperature limit for emissions in Maine is 29.4°C, and the average maximum temperature limit for U.S. states setting the emission limit is 29.5°C. According to NPNS, the temperature of the effluent released into the Northumberland Strait will reach between 25°C and 37°C, and may exceed modernized PPER limits during summer. We note that the Focus Report includes modeling that suggests that the temperature difference between the effluent and ambient water will be minimal at 2 m from the diffuser. Unfortunately, we do not have the capacity to evaluate this conclusion given the short comment period. However, we do have concerns about the influence of the temperature difference on the marine community around the diffuser area.

Dumping effluent into a protected area in the Northumberland Strait will directly undermine its conservation objectives. Given the degraded state of the Gulf of St. Lawrence[6], efforts have been made to set aside some areas for protection in order to rebuild ecosystem resilience. This includes the Scallop Buffer Zone within Scallop Fishing Area 24. This Marine Refuge, established under the *Fisheries Act*, was designated to protect juvenile American lobster and their habitat from physical disturbance of the seabed associated with scallop dragging. The proposed pipeline would dump directly into this protected area and is in direct conflict with its conservation objectives. Through potential impacts on benthic plants and sea-bottom habitats, this could put the local lobster fishery at risk while also negatively affecting other benthic species like winter flounder, which has experienced stock declines due to high natural mortality[13]. It simply makes no sense to do this.

Environmental remediation of the ocean is not possible

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[11] Claret M, Galbraith ED, Palter JB, Bianchi D, Fennel K, Gilbert D, Dunne JP (2018) Rapid coastal deoxygenation due to ocean circulation shift in the northwest Atlantic. Nat Clim Chang 8: 868-872.

[12] Bugden, G., Jiang, Y., van den Heuvel, M.R., Vandermeulen, H., MacQuarrie, K.T.B., Crane, C.J. and B.G. Raymond. 2014. Nitrogen Loading Criteria for Estuaries in Prince Edward Island. Can. Tech. Rep. Fish. Aquat. Sci. 3066: vii + 43 p.

[13] Surette, T., and Rolland, N. 2019. Assessment of the Winter Flounder (Pseudopleuronectes americanus) stock of the southern Gulf of St. Lawrence (NAFO Div. 4T) to 2016 and advice for the May 2017 to May 2022 fisheries. DFO Can. Sci. Advis. Sec. Res. Doc. 2019/026. x+94p.

In addition to the six concerns outlined above about the adverse effects of discharging a massive volume of toxic effluent into the Northumberland Strait, EAC is also deeply concerned because there cannot be a clean-up effort to undo or repair the damage once this effluent is discharged into the marine environment. The diffuser will ensure that adverse effects will be far-reaching and NPNS's plan to determine changes by monitoring will not allow a proactive response to mitigate these devastating impacts.

Air Emissions

NPNS's toxic air emissions will cause harm. In EAC's previous submission, concerns were raised about the chemicals and particulate matter to be released by the mill. The added impact of burning chemically laden toxic sludge in the mill's power boiler on top of the mill's already harmful emissions present a significant health risk. EAC's previously raised concerns have not been adequately addressed. Additionally, NPNS has failed to provide adequate information for the Minister to make an informed decision about the mill's air emissions. In this case, NPNS's consultant did not choose the appropriate air emissions modeling software for its computerized (theoretical) air pollution displacement modelling. The consultant used AERMOD which should not be used where a) there are nearby human populations in close proximity and b) there are large water bodies nearby. AERMOD ignores or underestimates these parameters, predicting a very high elevation and distant dispersion and settlement pattern for the emissions coming from the mill. AERMOD does not adequately take into account the atmospheric effects of the nearby large water bodies - Pictou Harbour and the Northumberland Strait. Water acts to condense and bring down the pollution plumes emitting from the seven smokestacks and vents at the mill. This is why the Town of Pictou, directly across the harbour, is frequently bathed in the pollution plume. The modelling software which the consultants should have used for this proposal is called CALPUFF as this software takes into account both proximity to population centres and the effects of nearby large water bodies. Without analysis using the proper modelling software, NPNS has not met this requirement of the Terms of Reference.

ETF Design

NPNS's ETF Design is in no way a 'state-of-the-art wastewater treatment facility'
The mill at Abercrombie Point is a very old, highly polluting (both air emissions and effluent) and has never been substantially upgraded by any of its five different owners in over five decades of continuous use. It is one of the most polluting mills in North America. The mills' current owner, Northern Pulp Nova Scotia Corporation, claims on page xxxix of the Focus Report that the proposal is for a 'state-of-the-art wastewater treatment facility' and suggests throughout the Focus Report that analysis predicts non-detectable amounts of environmental pollutants but this claim is neither credible nor possible. Modern mills of similar type and older mills which have had substantial upgrades both produce far less pollution than NPNS's Pictou County mill. The mill had been permitted to operate with non-functioning emissions controls on their recovery boiler for many years, and the mill continues to do so with the power boiler, lime kiln, smelt recovery stack and high level vent. Despite commissioning a report regarding Oxygen Delignification in 2017, NPNS has not made any commitment to add this effective pollution mitigation system to its operations and continues to defer on such a commitment in the Focus Report, despite the fact that the system would significantly improve the effluent composition. Additional brief exploration suggestions that installation of centrifugal hydrocyclones could

dramatically reduce the amount of Total Suspended Solids discharged into the marine environment, but NPNS does not appear to have considered that option.

To meaningfully reduce the organic and chemical pollution from a pulp mill, it is not adequate to 'clean' the effluent at the very end of the chemical pulping process. The mill needs to modernize and optimize the internal process during the production phase (i.e. in the recovery boiler) before sending it to a secondary effluent treatment system like the one proposed by NPNS. Optimization options such as brown stock washing and screening, reverse osmosis systems, chlorine-free bleaching systems and fail-safe systems have not been included in this proposal. Attached to this submission is a promotional brochure from the Irving Mill in Saint John which provides direct comparison to a mill which has done many of these internal process upgrades.

NPNS cannot credibly state that this proposal is for a 'state-of-the-art wastewater treatment facility' using the ETF Design they have provided.

Impact of the Pipe

Construction, maintenance and operation of the pipe will damage sensitive marine habitats like seagrass meadows and algae beds. Seagrasses like Nova Scotia's eelgrass are foundation species that generate valuable ecosystem services. They support coastal food webs and commercial fisheries (i.e. through creation of nursery habitat for species like lobster), buffer shorelines from storm surge and erosion, improve water quality, and capture and store carbon. However, seagrasses are facing a global crisis and are being lost at an accelerating rate around the world[14,15]. The NPNS registration document states that "there is evidence that eelgrass beds play an important role in the spawning and rearing of white hake in the Northumberland Strait area (AMEC 2007). Eelgrass beds have been in decline over the past several years in the Northumberland Strait, and Atlantic Canada in general (Hanson 2004). An eelgrass bed in Caribou was sampled and losses of 8.7% and 23.6% were recorded in 2001 and 2002, respectively (AMEC 2007)." In addition, "The Northumberland Strait Ecosystem Overview Report Technical Workshop on Biota (2006) identified the following key issues with respect to marine plants in the Northumberland Strait: (1) excessive growth of some species (i.e., *Furcellaria*); (2) disappearance of kelp beds in some areas; (3) disappearance of Irish moss; (4) declining health and range of eelgrass beds; and (5) presence of anoxic areas."

As the Focus Report (section 7.0) states: "Changes in the sediment quality from dredging activities may cause increased TSS and increase sedimentation in other areas which can impact life stages of all marine life in the area." Construction of the proposed NPNS pipeline may therefore damage eelgrass meadows and other sensitive benthic habitats in shallow coastal areas outside the immediate vicinity of the pipe, and leaks and spills during operation could also have serious detrimental impacts. While it may be argued that the footprint of this individual project will be small, this kind of narrow thinking is exactly what has led to degraded coastal ecosystems around the world and why the oceans are currently experiencing death by a thousand cuts.

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[14] Orth RJ, Carruthers TJB, Dennison WC, Duarte CM, Fourqurean JW, Heck Jr. KL, Hughes AR, Kendrick GA, Kenworthy WJ, Olyarnik S, Short FT, Waycott M, Williams SL (2006) A global crisis for seagrass ecosystems. BioSciece 56: 987-996.

[15] Waycott M, Duarte CM, Carruthers TJB, Orth RJ, Dennison WC, Olyarnik S, Calladine A, Fourqurean JW, Heck Jr. KL, Hughes AR, Kendrick GA, Kenworthy WJ, Short FT, Williams SL (2009) Accelerating loss of seagrass across the globe threatens coastal ecosystems. Proc Nat Acad Sci 106: 12377-12381.

Construction, maintenance and operation of the pipe will damage coastal/tidal wetlands.
On Page 100 of the Focus Report, NPNS admits that there will be adverse impacts on wetlands: "It is expected that the vast majority of the land-based portion of the effluent pipeline, including the short section on NPNS property, will utilize trench and bury methodology for effluent line installation. It is anticipated that both wetland compensation and watercourse alteration permits will be required for construction." Yet NPNS provides no information about the scope of the impact and the methodology for the pipeline installation is left undetermined. The Wetland Baseline Study also does not meet the required quality to provide a sufficient baseline of information, with limited field studies for the 19 impacted wetland sites.

Coastal wetlands such as salt marshes (and sub-tidal vegetated habitats like seagrass meadows and kelp forests) play an important role in fighting climate change by sequestering carbon and enhancing ecosystem resilience[16]. The international scientific community is clear in its support for protecting these 'natural carbon sinks' as an effective component of climate change mitigation strategies[2,14]. However, the NPNS Focus Report makes no mention of climate change and does not consider the impact of its proposal on these sensitive 'blue carbon' habitats in the Northumberland Strait. Again, this type of narrow, short-term thinking reflects a business-as-usual approach that is no longer viable.

This region of Nova Scotia does not have abundant coastal wetlands, placing greater importance on the vibrant coastal wetlands being considered for this pipe's pathway. As described on the NS Environment Wetlands website, 'wetlands perform many important functions and services in our landscape such as, improving water quality, controlling floods, recharging groundwater, protecting coastal infrastructure and providing critical habitat for rare and endangered species. Wetlands are also among the most productive and diverse of all the ecosystems on earth, so the loss of wetlands can mean the loss of species or local populations of fish, wildlife and plants that depend on them for habitat or food. Because many of Nova Scotia's wetlands have already been lost due to various human activities (e.g. over half of all original salt marsh habitat has been converted to other uses), wetlands that remain take on a heightened level of importance.'

Due to the crucial nature of these tidal wetlands and the missing information about the scope of adverse impacts, the methodology for pipeline installation and the inadequate quality of the wetland baseline study, the Minister does not have sufficient information to make a decision about adverse impacts to wetlands.

Potential Leaks and Contamination

NPNS provides extremely limited information about a proposed leak detection system which is stated to be effective in detecting leaks as small as 60 L/hr and which is not included in the marine portion of the pipe. The marine portion of the pipe requires a leak detection system as this section of pipe may be even more subject to potential leaks from the impact of ice scour then the terrestrial section of pipe. With the proposed leak detection system, chronic small leaks will not be detected and could go on for extended periods. The localized

[16] Mcleod E, Chmura GL, Bouillon S, Salm R, Björk M, Duarte CM, Lovelock CE, Schlesinger WH, Silliman BR (2011) A blueprint for blue carbon: toward an improved understanding of the role of vegetated coastal habitats in sequestering CO_2. Front Ecol Environ 9: 552-560.

impacts of such leaks on the Pictou water supply, the important wetland areas, the marine environment and the soil will have significant adverse environmental impacts.

Indigenous Opposition

The EAC supports Chief Andrea Paul of Pictou Landing First Nation in her unequivocal opposition to NPNS's proposal to discharge effluent into the Northumberland Strait. Pictou Landing First Nation deserves to have clean land, water and air. NPNS states that this proposal will allow 'community healing and rebuilding' but that is not possible when the community is in opposition with NPNS's plan. Nova Scotia's government must keep their promise to Pictou Landing First Nation by honouring the Boat Harbour Act and saying no to a plan which will cause new and greater damage.

The EAC supports the Mi'kmaq.

CONCLUSION

Northern Pulp Nova Scotia Corporation has proven over the past several years that they are prepared to operate the mill in a manner that has attributed to two known effluent leaks and repeated air emission violations. Throughout their proposal, NPNS uses unacceptably low, outdated industry standards and regulations for a project with a potential 50-100 year life span, while touting them as 'environmental protection'. Putting this proposal forward as a 'state-of-the-art effluent treatment facility' is a grievous insult to the Minister of Environment, the taxpaying citizens of Nova Scotia and especially to the Pictou Landing First Nation and the community members of Pictou County.

The Ecology Action Centre requests that the Minister of Environment reject the NPNS proposal as outlined in their Environmental Assessment Registration Document (EARD) and expanded upon in their Focus Report. NPNS's proposal will have major adverse effects on marine, coastal and terrestrial ecosystems that cannot be avoided or mitigated, and will cause significant harm to human health in the region. NPNS has failed to fulfill the requirements of the Focus Report as set out in the Terms of Reference, as outlined in the attached letter from East Coast Environmental Law. The information provided in the Focus report contains errors, inconsistencies, misleading information and undetermined methodologies and as such, NPNS has not successfully provided the necessary information to enable the Minister to understand the full range of impacts on human and ecological values.

Respectfully submitted,

Raymond Plourde, Wilderness Coordinator
Jordy Thomson, Marine Science and Conservation Coordinator
Nancy Anningson, Coastal Adaptation Senior Coordinator

East Coast Environmental Law Association
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Halifax NS, B3H 4H9

08 November 2019

Ecology Action Centre
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Halifax NS, B3K 4L3

Dear Ms. Anningson;

Re: Northern Pulp Replacement Effluent Facility Environmental Assessment Focus Repot

The following represents the East Coast Environmental Law Association's review on behalf of the Ecology Action Centre of the Northern Pulp Nova Scotia Corporation's Focus Report for its proposed Replacement Effluent Facility Project.

The purpose of this review is to determine whether the Focus Report meets the requirements of the Terms of Reference ("TOR") and will meet the criteria set out in the *Environment Act* and its regulations regarding the environmental assessment.

1. Overview

On 07 February 2019, the Northern Pulp Nova Scotia Corporation ("Northern Pulp" or "NPNS") registered its proposed Replacement Effluent Treatment Facility Project ("Effluent Facility") with Nova Scotia Environment ("NSE") for an environmental assessment ("EA") under the Nova Scotia *Environment Act* and its *Environmental Assessment Regulations*.

On 29 March 2019, the Nova Scotia Minister of Environment (the "Minister"), informed Northern Pulp that a review of its Registration Document for its proposed Effluent Facility had been completed. The Minister determined that, pursuant to section 13(1)(c) of the *Environmental Assessment Regulations*, a focus report was required to better understand the potential for adverse effects or significant environmental effects of the project.

During the review period for Northern Pulp's project registration document, a large number of public comments were submitted to the Minister. A number of concerns related to adverse effects or significant environmental effects from the project were raised in these comments, including (but not limited to) impacts to fish and fish habitat, concerns about the facility's design, concerns about the use of, and impact to, water resources, impacts from air emissions and noise, impacts on flora, fauna and human health, impacts on local archaeological sites, and the impacts on Mi'kmaq land uses and rights.

Then Minister Margaret Miller identified an initial list of key information gaps, which she outlined in her letter to Northern Pulp. These identified gaps in information were further expanded on by the EA Administrator in a Terms of Reference (the "TOR") for the Focus Report. Northern Pulp was given up to one year to submit its Focus Report.

Northern Pulp submitted its Focus Report to NSE on 02 October 2019 and it was released for a public comment period. The public was provided until 08 November 2019 to comment on the Focus Report. Once the comment period ends, the Administrator has 25 days to summarize public comments received and provide these along with a recommendation respecting the approval or rejection of the project to the Minister. The Minister then has 14 days to make a final decision. The Minister's options include:

1. Approval of the project subject to terms and conditions and other approvals;
2. Requiring an Environmental Assessment Report;
3. Referring all or part of the assessment to alternative dispute resolution; or
4. Rejecting the proposed project.

2. Summary of Findings

The Terms of Reference sets out what must be included in Northern Pulp's Focus Report. All impact assessment, mitigation and impact conclusions that are outlined in the initial Environmental Assessment Registration Document must be updated to reflect the requirements in the TOR. The TOR identified 11 key categories where more information was necessary for the Minister to make a decision, as follows:

1. Public, Mi'kmaq and Government Engagement
2. Project Description
3. Facility Design, Construction & Operation, and Maintenance
4. Marine Water and Marine Sediment
5. Fresh Water Resources
6. Air Quality
7. Fish and Fish Habitat
8. Flora and Fauna
9. Human Health
10. Archaeology
11. Indigenous People's Use of Land and Resources

We conclude that Northern Pulp has failed to fulfil multiple requirements of the TOR. The Minister must reject the project or require an environmental assessment report. It is our finding that Northern Pulp failed to fulfil 15/35 of the TOR requirements. We were unable to determine whether Northern Pulp adequately fulfilled 9/35 of the TOR requirements.

The table that follows is a summary of our findings:

Table 1: Summary of whether Focus Report met requirements of Terms of Reference

Category	Requirement	Requirement Met (Y/N)	Notes
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.	**NO**	Northern Pulp did not provide responses to comments other than to reference the Focus Report.
	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.	**NO**	Northern Pulp did not create a plan, only an engagement strategy for the initial environmental assessment. Its strategy did not include Environmental Effects Monitoring.
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.	**NO**	The realigned route remains on the ROW of Highway 106. Maps and drawings of the new pipeline route were included (Figure 2.1-1). A list of properties was provided (Table 2.1-1).
	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.	**NO**	While geotechnical survey was completed, viability was not confirmed.

	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.	**NO**	While characterization of physical and chemical composition of raw wastewater is provided, the characterization does not appear to be complete; nor does it provide information on how wastewater will meet regulations found in CEPA.
	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: • 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.	**NO**	Data from laboratory trials was included (Appendix 2.4). Modeling results data was included (Appendix 2.4). Effluent characterization was not compared against appropriate (relevant) CEPA regulations for pulp and paper effluent (*Pulp and Paper Mill Defoamer and Wood Chip Regulations* and *Pulp and Paper Mill Effluent Chlorinated Dioxins and Furans Regulations*)
	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,	**YES**	Changes to construction will result in larger volumes of soil being excavated and an anticipated 7-fold increase

	excavation, blasting, disposal at sea, and others where applicable).		in the scheduled timeline from original timelines for excavation. This will result in greater impacts on the marine environment.
3. Facility Design, Construction & Operation, and Maintenance	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.	**NO**	Northern Pulp has not indicated how proposed temperature levels would meet proposed changes (additions) in the *Pulp and Paper Effluent Regulations*.
	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.	**NO**	Flow data from Point A is not provided.
	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	**YES**	Updates were provided.
	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	**YES**	The information was provided.

	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).		
	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**	Northern Pulp does not provide options for the marine component of the pipeline.
	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.	**YES**	Information included.

4. Marine Water and Sediment	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.	**YES**	Baseline study included.
	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.	**YES**	The Receiving water study was updated.
	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.	**YES**	Results were provided. However; see above for comments on characterization.
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).	**NOT CLEAR**	The wetland survey was done; however, see above on comments on re-aligned effluent pipeline. This requirement is contingent on another component of the TOR, which is not completed. Note that in the Dillion Report (Appendix 5.1, p. 1) it states that "only a small fraction [of the wetlands] was available for 'on-the-

			ground- assessment due to property access restrictions".
	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.).	**NO**	A number of monitoring methodologies are not complete, including monitoring for the example areas.
6. 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.	**NO**	Despite providing a revised inventory, it appears that not "all" potential air contaminants were included. It is also recommended that the applicability of sections 67 and 68 of the Nova Scotia *Environment Act* be considered.
	6.2 Update the air dispersion modelling for the pulp mill facility for all potential air contaminants of concern related to the Project.	**NOT CLEAR**	See above in comments addressing 6.1.
	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).	**YES**	An updated ambient air monitoring plan was submitted.
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.	**NOT CLEAR**	The fish and fish habitat baseline surveys for the freshwater environment were provided.

			Neither the Focus Report nor Appendix 7.1 offers insight into what will satisfy Fisheries and Oceans Canada, or whether these criteria were pre-determined.
	7.2 Conduct fish habitat baseline surveys for the marine environment, to the satisfaction of Fisheries and Oceans Canada.	**NOT CLEAR**	The fish and fish habitat baseline surveys for the marine environment were provided. Neither the Focus Report nor Appendix 7.2 offers insight into what will satisfy Fisheries and Oceans Canada, or whether these criteria were pre-determined.
	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.	**NOT CLEAR**	Note that there is no indication that the assessment methodology used for this impact assessment corresponds or meets the requirements of NSE. This is a gap in information. Without a clear indication to that effect, it is impossible to determine

			whether this TOR requirement was met.
	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	**NO**	Northern Pulp did not submit an updated EEM.
	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.	**YES**	Contingency measures were discussed.
8. Flora and Fauna	8.1 Complete a plant baseline survey along the proposed re-aligned effluent pipeline route.	**NOT CLEAR**	Revised plant baseline survey was completed; however, the proposed pipeline route remains essentially unchanged and runs along the Highway 106 TIR Right-of-way.
	8.2 Complete a migratory bird survey along the re-aligned pipeline route.	**NOT CLEAR**	Revised migratory bird survey was completed; however, the proposed pipeline route remains essentially unchanged and runs along the Highway 106 TIR Right-of-way.
	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.	**NOT CLEAR**	Requested bird baseline surveys were completed; however, the proposed pipeline route remains essentially unchanged and

			runs along the Highway 106 TIR Right-of-way.
	8.4 Complete a herptile survey for the Project area which includes the re-aligned pipeline route.	**NOT CLEAR**	Herptile survey was completed; however, the proposed pipeline route remains essentially unchanged and runs along the Highway 106 TIR Right-of-way. It is recommended that a precautionary approach be taken in this respect; further analysis and study is required to determine Northern Pulp's ability to comply with statutory requirements with respect to two identified species at risk potentially within pipeline route or area.
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.	**NO**	Data collection for studies is on-going.
	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	**NO**	The HHRA was not completed and is not anticipated to be completed until spring 2020.

	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.		
10. Archeology	10.1 Complete an Archaeological Resource Impact Assessment for the marine environment related to the Project.	**YES**	An Archaeological Resource Impact Assessment was completed.
	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.	**YES**	The shovel testing was completed.
11. Mi'kmaq Ecological Knowledge Study	11.1 Complete a Mi'kmaq Ecological Knowledge Study (MEKS) for the Project.	**NO**	The process of producing a MEKS includes a review by the Kwilmu'kw Maw-klusuaqn Negotiation Office ("KMKNO") to ensure consistency with its EKS Protocol. While Northern Pulp indicated the completion of this process, the KMKNO had not yet completed its review.

3. Discussion of the Terms of Reference

3.1 Public, Mi'kmaq and Government Engagement

Northern Pulp was required to provide a response to questions and comments raised by the public, Mi'kmaq and government departments ("public comments") and to incorporate these comments into the Focus Report. Northern Pulp created a Concordance Table for public comments it received and attached it as Appendix 1.1 to the Focus Report. The Concordance Table has four columns: comments grouped into issues related to Valued Environmental Components ("VECs"), summaries of concerns, the source of concerns, and response comments.

A summary review of the concordance table reveals that the majority of Northern Pulps responses are in the form of references to the Focus Report. In fact, in the concordance table, the phrase "refer to section X" occurs a total of 809 times as Northern Pulp's response. In other parts of the concordance table, Northern Pulp states that a particular concern will be addressed in the future; for example, on page 3 of 40 of the government comments, it responds to multiple concerns surrounding the atmospheric environment by stating that the concerns "will be addressed in the IA and with discussion with NSE".

Many of the responses from Northern Pulp are not adequate responses for the purposes of the *Environment Act,* the *Environmental Assessment Regulations* and the environmental assessment process. The public expects, and Northern Pulp is obligated to provide, actual responses to their concerns, detailing how adverse effects or environmental effects would be prevented or mitigated by Northern Pulp.

The objectives of public participation in an environmental assessment are rooted in fair process and the democratic process. Legislatures across Canada, both provincially and federally, have incorporated public participation into their environmental assessment processes because public engagement is an important part of living and participating in a democratic society. Imbedded in the environmental assessment process is the recognition that the larger and longer lasting the impacts of a project, the more capacity must be provided to the public to have their concerns heard AND addressed. This recognition of fair process in administrative decision-making, such as the environmental assessment process, has been acknowledged and protected by the courts.

Section 2 of the Nova Scotia *Environment Act* sets out the purposes of the Act, and includes (emphasis added):

> *(h) providing access to information and facilitating effective public participation in the formulation of decisions affecting the environment, including opportunities to participate in the review of legislation, regulations and policies and the provision of access to information affecting the environment;*

Effective public participation requires more than soliciting public comments; it requires engagement and response. The public has highlighted concerns and asked Northern Pulp how their concerns will be addressed. Northern Pulp must provide an adequate answer. Providing blanket statements (809 times) to the numerous concerns expressed by the public is not effective public participation and does not provide access to information relevant to mitigation efforts for the adverse effects or environmental effects of the proposed effluent treatment facility that were identified by Mi'kmaq, the general public and government.

Northern Pulp was also required to provide a plan to share future reports or relevant studies with the Public and Mi'kmaq, including future Environmental Effects Monitoring results.

Northern Pulp developed a "Stakeholder Engagement Plan" ("SEP") which is found in Appendix 1.2; there, it is described as an engagement guide. The Focus Report states that "[a]s key reports are prepared for each phase of the project, they will be provided to the appropriate stakeholders and rights holders". This statement does not meet the criteria of the TOR, which requires a plan to share future reports or relevant studies with the Public and Mi'kmaq.

Table 1.2- 1, found in the Focus Report, is a summary of the documents that Northern Pulp has shared and with whom. There are three categories of "stakeholders" or "rights holders" – Pictou Landing First Nation, Federal Government and NSE. There is no category for "public". The Focus Report states that "moving forward, reports will be similarly shared with stakeholders and rights holders".[1] The purpose of Northern Pulp's engagement guide is described in section 1.1:

> *"This SEP serves as a guide to engagement during the environmental assessment stage. This version of the SEP is an initial guide to engagement and will need to be revised following project approval to inform ongoing stakeholder engagement through the various stages of the ETF project development, construction, operation and closure/rehabilitation"*

Section 3.0 of the SEP identifies all the stakeholders, divided into three groups: internal/external, government, and civic, business leaders and others. The general public, including members of Pictou county, communities, etc. are not identified as stakeholders. Indigenous communities other than PLFN are also not identified. Despite the TOR requiring the inclusion of a plan to share Environmental Effects Monitoring ("EEM") results, EEM is not mentioned at all in the SEP.

Northern Pulp failed to fulfil both requirements for public engagement as set out in the TOR. It failed to respond to public comments and did not prepare an engagement plan as required.

3.2 Project Description

Northern Pulp was required to provide the following information regarding the on-land portion of the effluent pipeline:

[1] Focus Report, p. 11.

- 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.

Despite the explicit and clear statement that the Nova Scotia Department of Transportation and Infrastructure Renewal ("TIR") does not permit the pipeline to be placed in the shoulder of Highway 106, Northern Pulp states the following in its Focus Report (emphasis added):

- "Approximately 8.7km of the on-land proposed pipeline is proposed to be installed in the TIR ROW (right of way) between Pictou and Caribou"
- "Land-based installation outside of NPNS property will occur predominantly within the existing NSTIR's ROW adjacent to and paralleling provincial Highway 106"
- "The on-land pipeline will be placed at the eastern most edge of the Highway 106 ROW for the majority of the route".[2]

The description of the effluent pipe route in Northern Pulp's registration document closely mirrors the descriptions of its new route found in the Focus Report (see table 2 below).

Table 2 – Comparison of Focus Report with Registration Document for Pipeline Route

Focus Report **[section 2.2 – page 13-14]**	**Registration Document** **[section 5.2.3.1 – page 47-48]**
The pipeline begins at the ETF pump station at the NPNS facility. The pipeline will run on NPNS property until it meets and enters Pictou Harbour. The pipeline is submerged across Pictou Harbour, aligned immediately to the east of the Pictou Causeway until it meets the north bank of Pictou Harbour. On the north side of Pictou Harbour, it enters NSTIR's Highway 106 (Trans-Canada Highway, also known as Jubilee Highway) ROW and follows Highway 106 north to Caribou, NS, mostly on the eastern side of the Highway 106 ROW. The pipeline will be installed generally parallel to Highway 106, along the outermost eastern portion of the NSTIR ROW. It will be situated	The pipeline will begin on land at a pump station where treated effluent from the secondary clarifiers at the ETF is pumped into the pipeline. Pumping will be required to overcome static pressure exerted on the pipeline to achieve proper dispersion of the treated effluent at the outfall. Pumping will also be required to overcome forces of gravity in order for treated effluent to reach the outfall. This facility will operate in a similar manner to municipal pumping stations. The land-based pipeline portion extending from NPNS property to the edge of shore at Caribou Harbour, will be approximately 11.4 km in length. The pipeline will be buried for

[2] Focus Report, p 13.14.

predominantly on the east side until it reaches Caribou. At this point, the pipeline will cross under Highway 106 to the west side and enter the marine environment at Caribou Harbour to the north, and to the west of the Northumberland Ferries marine terminal building and parking area. The exact location where the pipeline will enter the marine environment will be determined in consultation with the marine designer, the land-based designer, the construction contractor, and Northumberland Ferries Limited in an effort to reduce impact on ferry operations. Construction of the on-land portion of the treated effluent pipeline will require an approximate working area width of 10 m. Along Highway 106, the pipe will be generally installed in undeveloped and unmaintained areas. The pipe will be located outside the existing road shoulder but within the ROW, and specific details of the location will be determined in agreement with NSTIR.	the majority of the route. Based on the proposed design there will be one area where the pipeline will be exposed to cross the spillway of the Pictou Causeway, where it will be suspended and attached to the exterior of the bridge due to limited roadway width. The exposed area will be protected from damage by existing guide rails. For approximately the first kilometer of the pipeline, the pipe will be located on NPNS property. The pipeline then moves across NPNS property and enters NSTIR's Highway 106 (Trans-Canada Highway, also known as Jubilee Highway) ROW at the northwest corner of NPNS property. The pipeline then follows Highway 106 north to Caribou. The pipeline will be installed generally parallel to Highway 106, within the outer portion of the developed road shoulder. It will be situated on the south side until it reaches the Pictou roundabout. Utilizing horizontal directional drilling (HDD) or other boring method to avoid traffic and roadway disturbance, it will be constructed under the roundabout crossing to the north side of the road and continuing there for the remaining extent of the land-based por□on. HDD or other boring methods, or open cut crossing methods will be used for pipeline crossings of local public roads and driveways as required. The pipeline will stay within disturbed portions of NSTIR's road right-of-way (Highway 106) until it reaches Caribou Harbour and enters the marine environment, immediately to the west of the Northumberland Ferries marine terminal building and parking areas.

Northern Pulp has not identified an alternative route as required by the TOR, with respect to the primary issue – that TIR will not allow the pipe to be built along the right-of-way along Highway 106.

Northern Pulp has indicated in the Focus Report that "conversations between NPNS and TIR regarding installation of the pipeline within the right-of-way (ROW) are ongoing". A letter from TIR is attached as Appendix 2.1.[3] It is noteworthy to highlight that the letter from TIR, while indicating that discussions with regard to the pipeline route are on-going, does not indicate that these discussions are with respect to the right-of-way. Considering that construction of any pipeline is within TIR jurisdiction, this is misleading.

Northern Pulp has included a single map of the proposed altered pipeline route and included information about all properties along the proposed route. Considering the misleading information and failure to meet the previous terms of the TOR, we cannot comment on whether all the properties have been identified.

Northern Pulp was also required to conduct geotechnical surveys and provide the survey results to confirm viability of the marine portion of the pipeline route. The surveys must also determine the potential impacts of ice scour on the pipeline.

The purpose of the geotechnical surveys required by this TOR is to confirm viability of the marine portion of the pipeline route – that is, the physical pipeline itself must actually be a viable construction project, and this must be confirmed by the surveys. While a geotechnical survey was completed, the Focus Report does not positively or explicitly confirm the viability of the proposed pipeline, nor does it offer any statement of an expert's opinion to that effect.

Furthermore, the Focus Report identifies two possible complications: 1) "there were some restrictions in portions of the survey near the shorelines due to the shallow water in these areas" and 2) "the depth to bedrock is not known and may be encountered during the pipeline installation".[4] This may lead to areas in which dredging is limited due to the sub-bottom geology. These issues are not dealt with in the Focus Report.

The geotechnical survey report ("GSR") summary also highlighted these issues. The GSR discussed the difficulty with mapping nearshore sections of the route and interpreting the sub-bottom geology.[5] Additionally, the GSR identified three main areas along the proposed Caribou Harbour pipeline route where dredging activities might be constrained – dredging being the method used to reach the planned trench depth of 3 meters.[6]

[3] Focus Report, p. 13.
[4] Focus Report, p. 20 and 21.
[5] Geotechnical Survey Report, Appendix 2.2 of Focus Report, p. 120.
[6] Geotechnical Survey Report, Appendix 2.2 of Focus Report, p. 121.

Finally, the GSR made a number of recommendations for work to be considered in further supporting the engineering, design and installation of the proposed pipeline that indicate more work is required before viability can be confirmed.[7]

As part of this aspect of the TOR, Northern Pulp was also required to submit data regarding the complete physical and chemical characterization of the raw wastewater to support its assessment of the appropriateness of the proposed treatment technology.

Northern Pulp notes in its Focus Report that the bleaching process used to remove residual lignin from the pulp, in a step generally referred to as "delignification", used chlorine dioxide (ClO2) as the bleaching chemical in a process known as Elemental Chlorine Free ("ECF") bleaching.[8] The Focus Report notes that "several studies" have reported that replacement of older systems with the ECF process has resulted in the virtual elimination of detectable amounts of dioxins and furans.

The proposed replacement effluent facility will use an Activated Sludge Treatment ("AST") process involving aeration and recirculation of bacterial population back into the intake of the system. The Focus Report suggests that this process results in effluent that meets the *Pulp and Paper Effluent Regulations* under the *Fisheries Act*, which set out limits on amounts of TSS and BOD that can be released from mills and prohibit the release of effluents that cause harm to fish.[9]

However, under the *Canadian Environmental Protection Act* ("CEPA"), the *Paper Mill Effluent Chlorinated Dioxins and Furans Regulations* (SOR/92-267) require that all pulp and paper mills produce effluent in which there are no measurable quantities of dioxins and furans. Table 2.3-1 of the Focus Report provides a summary of the NPNS's current sampling of untreated effluent (Point A) and indicates that no sampling of dioxins or furans occurred.[10] Table 2.3-3 of the Focus Report provides the laboratory analytical results summary, and does not include any indication of the level of dioxins or furans at Point A (the untreated effluent).[11]

Furthermore, the KSH Consulting Report used to facilitate the Focus Report summary findings found that results for dioxins and furans, indicated in the form of total toxic equivalency ("TEQ") at Point C are in line with TEQ of raw water or Caribou Harbour samples. It concludes that the results demonstrate effectiveness of the PPERs in achieving virtual elimination of dioxins and furans in the effluent.[12] However, there is no indication of how the levels present compare to regulatory requirements under CEPA, using the approved (required) methods for testing for measurable amounts found in those regulations. In fact, Table 1-11 of that KSH report shows

[7] Geotechnical Survey Report, Appendix 2.2 of Focus Report, p. 123.
[8] Focus Report, p. 25.
[9] Focus Report, p. 46.
[10] Focus Report, p. 27.
[11] Focus Report, p. 30.
[12] Appendix 2.3 – KSH Consulting Report, p. 32.

detected levels at Point A and Point C of some forms of dioxins and furans.[13] The KSH report then provides its conclusion that:

> *The analysis shows that because of their potential impact on the receiving waters and despite no direct indication that these effects have been observed in the environment, some compounds should be considered for further scrutiny, either as part of future testing or as part of more long-term investigations, such as the Environmental Effects Monitoring (EEM) program or Human Health Risk Assessment (HHRA)"*.

The components of effluent that warrant further study include dioxins and furans.[14]

Therefore, considering the legal requirements under CEPA and the regulations, the non-inclusion of the levels of dioxins and furans at Point A (the current untreated effluent) leads to the conclusion that the physical and chemical characterization of the raw wastewater (at Point A for the Project) is not complete. Additionally, there are indications that the proposed effluent treatment process is not appropriate, given the identified need for additional studies related to dioxins and furans and indications that regulatory requirements would not be met.

Finally, Appendix 2.3 has a full Raw and Treated Effluent Characterization report conducted for this Focus Report that supposedly provides the complete physical and chemical characterization of expected effluent following treatment. Its objective is to answer the question: *What are the expected list of contaminants that may be generated specifically by the new NPNS Effluent Treatment Facility*? It appears to us that the appropriateness of the proposed treatment technology was not part of the work done.

Northern Pulp was also required to submit a complete physical and chemical characterization of NSPN's expected effluent following treatment by the proposed technology, including:

- 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.

In undertaking this component of the TOR, Northern Pulp states that a comparison of the untreated (Point A) and treated (Point C) effluent components against published effluent composition data from other Canadian jurisdictions indicates that the mill's effluent is similar to effluent from other bleached kraft mills using similar technology. Northern Pulp notes that the proposed replacement ETF will provide performance comparable to other mills, and furthermore, that the current and proposed ETF will have comparable performance. It concludes

[13] KSH Consulting Report, p. 31.
[14] KSH Consulting Report, p. 33-34.

that the data collected from Point C can be used to accurately represent what effluent from the replacement ETF will resemble.[15]

The comparison of effluent characterization results from both laboratory trials and modelling work against appropriate regulations or guidelines was incomplete. Table 2.4-2 of the Focus Report sets out the comparison.[16] The characterization data used was BOD and TSS from the Veolia expected performance data against the PPER (1992 – current) and the First Draft of the Modernization of the PPER, released in May 2019, as well as provincial limits on BOD and TSS. There is no comparison against other appropriate regulations, including against those created under CEPA (see: *Pulp and Paper Mill Defoamer and Wood Chip Regulations* and *Pulp and Paper Mill Effluent Chlorinated Dioxins and Furans Regulations*). Furthermore, while there are regulatory daily maximums for both BOD and TSS in regulations provided, the data provided for the comparison did not include daily maximums, and instead, looked only at monthly averages. No comparison with any guidelines was provided.

Northern Pulp was required to 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.

Note that Table 2.5-1 shows a summary of the changes to construction; this includes many changes that were made as a result of the marine geotechnical survey. This includes an estimated increase of 6,500 cubic meters of soil per kilometer in excavated volume of soil from dredging.[17] There is also an anticipated change in the excavation rate of 300-500 cubic meters per hour and 3-4 day per kilometer timeline to a rate of 60-120 cubic meters per hour and a timeline of at least 21 days per kilometer. These are large increases (it is a 7-times increases in the time taken) and will have an impact on the length of time required for excavation. This will have an impact on the marine environment that is much greater than originally anticipated and highlights the need for further evaluation.

3.3 Facility Design, Construction & Operation and Maintenance

Northern Pulp was required to submit treatment technology specifications and an assessment of the efficacy of the proposed treatment technology for use at the NPNS facility, to the satisfaction of NSE. The TOR provides, as an example of the type of assessment required, that the peak effluent temperature is proposed to be above generally accepted range of temperatures to achieve optimal biological treatment; it asks Northern Pulp to explain how the proposed higher temperatures would affect the temperature performance.

[15] Focus Report, p. 32-33.
[16] Focus Report, p. 37.
[17] Table begins at p. 40 of the Focus Report.

This TOR requirement likely came about as a result of comments from the NSE Inspection, Compliance and Enforcement Division and Industrial management Unit, which had a concern that temperatures would be above 25-35 degrees Celsius; more specifically, NSE was concerned about the ability of the ETF to meet and not exceed effluent limits.[18]

Neither the Focus Report, nor the KSH Consulting Report found in Appendix 3.1, discuss in any manner the reason that peak effluent temperatures are above generally accepted range of temperatures. In fact, there is no discussion whatsoever of the generally accepted range of temperatures of effluent. Likewise, there is no discussion of the "optimum treatability" temperatures of the proposed effluent technology.[19] Northern Pulp has also failed to indicate how it plans to comply with changes in the PPER, since ECCC has proposed to limit temperature of effluent to 35 degrees C daily and 40 degrees C monthly.

Finally, it is not clear that an explanation of how the proposed higher temperatures would affect treatment performance. In the Focus Report, Northern Pulp acknowledges that the rate of biological reaction will increase with temperature to a maximum value of around 35.5 degrees Celsius for most aerobic effluent systems, and that temperatures above 39 degrees will result in a decreased oxidation rate for mesophilic organisms.[20] Since oxidation is the process used to remove organic material from the wastewater, the reduced oxidation rates found at the higher than normal temperatures seem counterintuitive to the purposes of the process. This is not reconciled within the Focus Report. Northern Pulps statement that "with increasing effluent temperature, bacterial activity increases" is misleading because the bacterial activity appears to level off at a certain temperature and then decline.[21]

As part of the TOR for facility design, Northern Pulp was also required to provide effluent flow data to support proposed peak treatment capacity of 85,000 m3 maximum flow of effluent per day, with a minimum of 2017 and 2018 data required.

Part of this TOR requirement is the provision of flow data from Point A of the current effluent plant; however, the Focus Report states that there is an "absence of accurate Point A data".[22] The Report in Appendix 3.2 confirms that "flow is not measured at Point A".[23] Northern Pulp's statement that "A design of 85,000 m3/day is appropriate and well supported by the operating data of the last three years" is not accurate; no operating data for Point A is provided and so all calculations for flowrate are approximations of the actual flowrate at Point A. No reason is provided for not providing data for Point A, other than in the Report as follows:

[18] Focus Report, Appendix 1.1, Concordance Table p. 9/40 – Government comments.
[19] Refer to government submissions in Registration Documentation, p. 255.
[20] Focus Report, p. 46.
[21] Focus Report, p. 47.
[22] Focus Report, p. 49.
[23] Focus Report, Appendix 3.2, p. 3.

Flow is measured using a doppler-type system at the effluent feed pumps at the mill, but this measurement is for indication purposes only, as its accuracy is not sufficient for either data analysis or regulatory purposes.[24]

The Report also notes that: "Effluent flow exceeded 85,000 m3/day one day in 2016 and not at all in both 2017 and 2018"; yet, the Table showing historic flowrates (in monthly averages and expressed in m3/day) indicate two separate instances where flowrate was above: in July 2017 and in August 2017. Furthermore, there are two instances where the flow rate is above 84,000 m3/day, including in July and August 2018.[25] Considering that flowrates are expressed as monthly averages, it is difficult to reconcile the fact that averages consist of figures both below and above that average. It is likely that flowrate went above the 85,000 m3/day more than once.

Northern Pulp is required to provide the following information regarding the effluent pipeline:

- Viable options for leak detection technologies and inspection methodologies, with specific consideration of the Pictou water supply protection area
- Viable options for the enhanced pipeline projection, including justification for how the chosen option is an adequate option for secondary containment

Northern Pulp identifies several possible leak detection technologies it might use; however, the Focus Report does not provide for any leak detection technology to be deployed for the marine component of the effluent pipeline.[26] The Focus Report also does not provide specific consideration of the Pictou water supply protection area with respect to leak detection technologies and inspection.

3.4 Marine Water and Marine Sediment

Northern Pulp is required to update the receiving water study to model for all potential contaminants of concern in the receiving environment.

In the Receiving Water Study ("RWS"), the Focus Report states that for near-field modeling, a three-dimensional software model was used to assess "regulatory mixing zones" resulting from continuous source discharges. The "mixing zone" for the purposes of this study was defined as per the Canadian Council of Ministers of the Environment (CCME, 2003) as "an area contiguous with a point source (effluent) where the effluent mixes with ambient water and where concentrations of some substances may not comply with Water Quality Guidelines or objectives".[27] The objective of the modelling was to confirm ambient water quality

[24] Focus Report, Appendix 3.2, p. 3.
[25] Focus Report, Appendix 3.2, p.4.
[26] Focus Report, p. 62: pipeline [see specifically, p. 62, PDF 102 – re "leak detection system…will be installed…in the overland portion…of the route between Pictou and Caribou…"; and: "Automated leak detection will not be installed in the rest of the fused HDPE pipeline outside of this land-based section".[26]
[27] Focus Report, p. 85.

concentrations or established water quality guidelines were met at the edge of the mixing zone (100m).

There are several issues with this approach. First, the CCME is a forum of federal and provincial Ministers to discuss common issues related to environmental issues of national and international concern. The guidelines created within this forum are only that – guidelines; they do not form part of the legal framework that would ultimately guide the proposed effluent discharge. Second, there is no "mixing zone" or "regulatory mixing zone" created under provincial or federal legislation for the purposes of the proposed effluent pipeline and outlet.

Under the *Fisheries Act* and the *Canadian Environmental Protection Act* and their regulations, the release of substances into the marine environment (the "receiving environment" in this case) occurs at the point where the substance is released, not the edge of a 100m mixing zone. Therefore, the effluent released from the proposed pipeline must meet all regulatory requirements at the moment that the effluent exits the pipe at the diffuser.

3.5 Fresh Water Resources

Northern Pulp was required to provide monitoring methodologies for areas with significant risk of pipeline leaks or spills.

Appendix 5.2 of the Focus Report is left intentionally blank and refers to the corresponding section of the Focus Report. The TOR identifies several issues to be addressed, including: the two areas where the pipeline crosses Source Water Protection Delineated Boundaries for Town of Pictou wellfields, below water table, wetlands, water crossings. It leaves open the possibility of others.

The Focus Report is vague on the methodologies it will use to monitor impacts from the pipeline. A surface water monitoring program will be "developed".[28] A Construction Monitoring Program will be "developed".[29] The current NPNS monitoring program will continue to be used to monitor groundwater and it will "develop a surface water monitoring program".[30]

With respect to wetlands, the Focus Report identifies that future monitoring will be conducted to assess success of wetland compensation that it anticipates. It also states that the degree of disturbance in wetlands adjacent to the proposed project will be "assessed" prior to and subsequent to construction activities. It proposed to assess disturbed portions of wetlands with undisturbed portions of the same wetland – this assumes that impacts on part of a wetland do not affect other parts of that same wetland. Assessment criteria are included.

[28] Focus Report, p. 106.
[29] Focus Report, p. 106.
[30] Focus Report, p 106-07.

This TOR requirement is not fulfilled. The two pages of "methodologies", with no attached appendix. Other than the limited description of wetlands monitoring, within the narrow scope of compensation, no other methodologies are provided. The Focus Report simply identifies that future monitoring will be developed. This is not a methodology.

Considering the ordinary or common meaning of the word "methodology", a statement to the effect that a study will be "developed" is not sufficient to meet that definition. Methodology means the body or system of practices, rules, principles that will be used to develop and undertake the study. For example, the Collins English Dictionary (online) defines methodology as "a system of methods and principles for doing something, for example for teaching or for carrying out research".[31]

The Focus Report states that "leak detection technologies and inspection methodologies are addressed in other sections of this report";[32] however, relevant sections of the report (assuming section 3.5 – Leak Detection Technologies) does not provide methodologies. That section also does not address specific areas with significant risk of pipeline leaks or spills, such as the identified areas explicitly set out in section 5.2 of the TOR.

Finally, it is important to note that there are other areas that will be faced with "significant risk of pipeline leaks or spills", not least the marine components of the pipeline. While the TOR provides specific examples of areas facing these significant risks, the requirement relates to all areas that face significant risk.

3.6 Air Quality

Northern Pulp was required to 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. Furthermore, Northern Pulp is required to update the air dispersion modelling for the pulp mill facility for all potential contaminants of concern related to the Project.

Northern Pulp creates its inventory based on the selection of contaminants as indicated in section 6.1 of the TOR; it appears then, that the inventory (found in Appendix 6.2) is not of all potential contaminants. The Focus Report states that:

> *The air contaminants considered in the development of the revised inventory for the project included CACs, metals, PAHs, VOCs, reduced Sulphur compounds, dioxins and furans and terpenes, as per Section 6.1 of the Terms of Reference for the Focus Report and through further communication with NSE.*[33]

[31] See: https://www.collinsdictionary.com/dictionary/english/methodology
[32] Focus Report, p. 106.
[33] Focus Report, p. 109.

It should be noted that section 6.1 of the TOR explicitly lists the substances to be included in the inventory but does not limit Northern Pulp to those substances for the purposes of the TOR requirement. There is no indication of the substance of communications with NSE; however, the NSE Air Quality Unit had provided comments, provided in the concordance table, that Northern Pulp "should have identified the full air emissions inventory for the facility and modeled all potential air contaminants of concern, as a result of the proposed project".[34]

Moreover, the following is a more detailed description of the process to develop the inventory, as found in Appendix 6.1 of the Focus Report (emphasis added):

> *The air contaminants considered in the development of the revised inventory for the Project included criteria air contaminants (CACs), metals, polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), reduced Sulphur compounds, dioxins and furans and terpenes, as per Section 6.1 of the Terms of Reference (NSE 2019b) and further communication with NSE (S. Vervaet, personal communication, July 12, 2019). The considered list was refined using published literature focused on the pulp and paper industry, including the National Council for Air Stream Improvement Inc.'s (NCASI) Handbook of Substance-Specific Information for National Pollutant Release Inventory Reporting (NPRI) for Pulp and Paper Mills (NCASI 2007) and those presented as being released from pulp and paper mills in Ontario's Technical Standards to Manage Air Pollution (Appendix 4-A) (MECP 2018a). Of the refined contaminant list, those included in the revised emission inventory, and therefore assessed through modelling, were identified based on site-specific data, data obtained from Kraft mills with similar operations (e.g. AST ETF and co-combustion of biosludge and biomass – mills included Howe Sound and Crofton), and published literature specific to the Project operations, as per the following considerations[…].*[35]

Therefore, the inventory of contaminants was refined twice. First, the full list of identified contaminants was refined using publishing literature; second, this refined list was further refined using additional criteria or "considerations". It should be noted that this does not meet the requirement that "all potential contaminants" be included in the inventory. In fact, an inventory is generally considered a complete list. For example, the Collins English Dictionary (online) defines inventory as "a written list of all the objectives in a particular place".[36]

It is noted in the Focus Report that the contaminants that are part of the updated and expanded air dispersion modelling are not currently regulated under the *Air Quality Regulations* created under the *Environment Act*. However, section 67 of the *Environment Act* is explicit that (emphasis added):

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[34] Focus Report, Appendix 1.1, Concordance Table, p. 2.
[35] Focus Report, Appendix 6.1, Stantec, "Expanded Air Dispersion Modelling Study", p. *v*.
[36] See: https://www.collinsdictionary.com/dictionary/english/inventory

> *(1) No person shall knowingly release or permit the release into the environment of a substance in an amount, concentration or level or at a rate of release that causes or may cause an adverse effect, unless authorized by an approval or the regulations.*
>
> *(2) No person shall release or permit the release into the environment of a substance in an amount, concentration or level or at a rate of release that causes or may cause an adverse effect, unless authorized by an approval or the regulations.*

Substances within this context include any solid, liquid or gas. Therefore, although some contaminants are explicitly regulated in the *Air Quality Regulations*, any potential substance released from the proposed effluent facility that causes or may cause an adverse effect will be the focus of provisions under the law and should have been included in the inventory.

3.7 Fish and Fish Habitat

Northern Pulp is required to submit an updated Environmental Effects Monitoring ("EEM") program based on the results of various relevant baseline studies and an updated receiving water study. As part of this TOR requirement, Northern Pulp must also refer to Addendum 4.0, which states that several field studies and monitoring are "likely to be required as part of an EEM program regulated under the PPER for the project if it is approved". This includes biological monitoring studies covering a benthic invertebrate community study, fish population study, and dioxin and furan levels in fish.

Northern Pulp did not submit an updated EEM program. The accompanying Appendix 7.4 is Schedule IV.1 of the *Pulp and Paper Effluent Regulations*. It is noted in the Focus Report that:

> *The proposed EEM investigations related to the NPNS Caribou Harbour outfall relocation was provided by EcoMetrix Incorporated as part of the original EARD (Appendix G of the EARD)(EcoMetrix, 2018a) and remains relatively unchanged based on the various baseline studies and the updated RWS.*[37]

While the FR suggests that the EEM is "relatively unchanged", it does not provide further details on what parts were changed, or how so. An EEM proposed program was submitted in the EARD (Appendix G).

The requirement for an EEM is set out in the *Pulp and Paper Effluent Regulations* created under the *Fisheries Act*, as follows:

> *28 (1) The owner or operator of a mill shall conduct environmental effects monitoring studies of the potential effects of effluent on the fish population, on fish tissue and on the benthic invertebrate community.*

[37] Focus Report p. 148.

(2) Environmental effects monitoring studies consist of the sublethal toxicity testing referred to in section 29 and the biological monitoring studies referred to in section 30.

(3) The studies shall be performed and their results recorded, interpreted and reported in accordance with generally accepted standards of good scientific practice at the time that the studies are performed.

The Focus Report states that there are provisions in the PPER that removes the requirements for specific study components of the EEM program based on the dilution of effluent, as follows:

- If the effluent concentration is less than 1% at a distance of 250m, no fish community study is required; and
- If the effluent concentration is less than 1% at a distance of 100 from the discharge, no benthic invertebrate community study is required.[38]

Northern Pulp refers to the 3D modeling in the local study area and suggests because it indicates that dilution of the effluent will occur to less than 1% at approximately 20m from the discharge location, neither a fish community nor benthic community study is required.[39] Northern Pulp goes on to state that predictions of effluent dilution will need to be confirmed as part of the first EEM study. Finally, the Focus Report states that some fish and benthic studies are still warranted as part of the EA follow-up and monitoring program and that "it is intended that they will be completed by a third party consultant for the current project".[40]

The requirements for biological monitoring studies are set out in more detail in Schedule IV.1 of the PPER:

3 Biological monitoring studies consist of

(a) a study respecting the fish population, if the concentration of effluent in the exposure area is greater than 1% in the area located within 250 m of a point of deposit of the effluent in water;

(b) a study respecting fish tissue if:

(i) since the submission of the most recent interpretive report, the effluent contained a measurable concentration of 2,3,7,8-TCDD or of 2,3,7,8-TCDF, within the meaning of the Pulp and Paper Mill Effluent Chlorinated Dioxins and Furans Regulations, or

[38] Focus Report, p. 150.
[39] Focus Report, p. 150.
[40] Focus Report, p. 150.

(ii) an effect on fish tissue was reported in the most re- cent interpretive report; and

(c) a study respecting the benthic invertebrate community, if the concentration of effluent in the exposure area is greater than 1% in the area located within 100 m of a point of deposit of the effluent in water.

As noted in Addendum 4.0, Northern Pulp is likely to be required as part of an EEM program regulated under the PPER for the project if it is approved to include a benthic invertebrate community study and fish population study. This likely refers to the PPER modernization efforts currently under way by Environment and Climate Change Canada ("ECCC"). As part of that modernization, ECCC is considering adding critical effect sizes (CES) as criteria for determining when investigation studies are required. CES are based on the size of effects on fish or fish habitat.[41]

3.8 Flora and Fauna

Northern Pulp is required to complete a number of baseline surveys along the proposed re-aligned effluent pipeline route, including:

- Plant baseline survey;
- Migratory bird survey;
- Bird baseline surveys for the Common Nighthawk, Double-crested Cormorants, owls, and raptors and raptor nests for the entire project area; and
- Herptile survey

Note that potential turtle habitat was identified; there may be species at risk under the provincial *Endangered Species Act*. The ETF was identified as being within range of two species identified in the Herptile Survey as being species at risk or endangered species: wood turtle and snapping turtle.[42] It is recommended that further analysis and study is required to determine Northern Pulp's ability to comply with statutory requirements with respect to these species.

3.9 Human Health

Northern Pulp was required to complete baseline studies for fish and shellfish tissue of representative key marine species important for commercial, recreational and Aboriginal fisheries in the vicinity of the proposed effluent pipeline and diffuser location.

[41] See: Environment and Climate Change Canada, "Proposed Modernization of the Pulp and Paper Effluent Regulations – Consultation Document" (September 2017), p. 3-4.
[42] See Focus Report, Appendix 8.4, Herptile Study, p. 1.

Additionally, Northern Pulp was required to commence a Human Health Risk Assessment ("HHRA") to assess potential project related impacts on human health. The HHRA must include 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 RWS.

Northern Pulp has not completed the HHRA; it is ongoing and is not anticipated for completion until the spring of 2020.[43] Furthermore, Northern Pulp appears not to have finished collecting data on key representative species, since it has plans to conduct additional rounds of tissue collection prior to construction targeting additional shellfish (scallop, blue mussel and oyster), and locally relevant fish (such as Atlantic striped bass, Atlantic mackerel and Atlantic herring).[44]

3.10 Archeology

Northern Pulp was required to complete an Archaeological Resource Impact Assessment ("ARIA") for the marine environment related to the project. While it appears that the ARIA was meant to be included in Appendix 10.1, that appendix only has a letter from the Nova Scotia Department of Communities, Culture and Heritage indicated the ARIA was completed. It is our recommendation that the ARIA be provided for public comment.

3.11 Indigenous Peoples' use of land and resources

Northern Pulp was required to complete a Mi'kmaq Ecological Knowledge Study (MKES) for the project.

The process of producing a MEKS includes a review by the Kwilmu'kw Maw-klusuaqn Negotiation Office ("KMKNO") to ensure consistency with its EKS Protocol. While Northern Pulp indicated the completion of this process, the KMKNO had not yet completed its review.

Similar to the lack of completion of the HHRA, this requirement is started but not completed. Given that Northern Pulp has a statutorily granted period of one year to complete its Focus Report and given that it may also be granted an extension of that period by the Minister, it is not clear why these components were not completed prior to submission. No explanation is offered.

Sincerely,

[43] Focus Report, p. 165.
[44] Focus Report, p. 165-66.

Mike Kofahl
Staff Lawyer
East Coast Environmental Law

The Role of the Pulp and Paper Effluent Regulations in the long-term protection of fish and fish habitat.

1.0 Introduction

The Pulp and Paper Effluent Regulations (PPER) allow pulp and paper companies to release deleterious substances into water frequented by fish. Such a release would otherwise violate subsection 36(3) of the *Fisheries Act.*

> **36(3)** Subject to subsection (4), no person shall deposit or permit the deposit of a deleterious substance of any type in water frequented by fish or in any place under any conditions where the deleterious substance or any other deleterious substance that results from the deposit of the deleterious substance may enter any such water.

However, subsection 36(4) of the Fisheries Act permits certain deposits if they are in accordance with regulations.

> **36(4)** No person contravenes subsection (3) by depositing or permitting the deposit in any water or place of **(b)** a deleterious substance of a class and under conditions — which may include conditions with respect to quantity or concentration — authorized under regulations made under subsection (5) applicable to that water or place or to any work or undertaking or class of works or undertakings;

The authority to make these regulations sits with the Governor in Council (Cabinet), the details of which can be found in subsection 36(5) of the Act.

2.0 Brief History of the PPER

The first Pulp and Paper Effluent Regulations were passed in 1971. The Regulations were created in response to evidence that pulp and paper effluent was causing dissolved oxygen depletion in marine environments and releasing substances that were toxic to fish. The 1971 Regulations set limits on total suspended solids (TSS), biological oxygen demanding (BOD) matter and effluent that was acutely toxic to fish. Owing to the high cost of installing effluent treatment systems, the 1971 PPER applied only to new mills and in some instances mills that were expanded or altered.[1]

By the late 1980s, Environment Canada had determined that the 1971 Regulations had not yielded all of the desired effluent quality improvements that were initially sought through the Regulations. [2]

> "In 1985, about 25% of mills were meeting the requirement for effluents to be non-acutely lethal to Rainbow Trout."[3]

The Government amended the PPER in 1992. The changes in 1992 included application of the Regulations to all mills and off-site treatment facilities and a requirement that all effluent not

be acutely toxic to rainbow trout. Older mills required upgrades to meet the 1992 Regulations so existing mills were given until 1996 to come into compliance with the Regulations.[4] By 1996, the Regulations had been in place for 14 years and the regulator had clear knowledge that the 1971 Regulations were not effective for 11 years.

Following the full implementation of the 1992 Regulations, the rate of compliance improved and discharges of TSS and BOD improved significantly. Between 1987 and 1996, total discharges of TSS and BOD matter to water decreased by approximately 60% and 90%, respectively. Most of these improvements took place because the Regulations applied to all mills and many mills added secondary biological treatment systems.[5]

3.0 The Impact of Environmental Effects Monitoring

The 1992 Regulations also added requirements for Environmental Effects Monitoring (EEM). During the period 1992 to 2010, the Regulations were amended to enhance requirements for EEM.

Environmental Effects Monitoring Protocol Evolution

Cycle	Years	Requirements
1	1992 – 1996	EEM study results used as initial data but not used to assess effects.
2	1996 – 2000	EEM studies to assess effects.
3	2000 – 2004	EEM studies to assess and confirm effects, and assess magnitude and extent of effects.
4	2004 – 2007	EEM studies to assess and confirm effects, and assess magnitude and extent of effects. Investigation of Cause (IOC) studies
5	2007 – 2010	EEM studies to assess and confirm effects, and assess magnitude and extent of effects. IOC and Investigation of Solution (IOS) studies.
6	2010-2013	Requirement to conduct a fish test was removed by the 2008 PPER amendments.

As a result of the evolution of the EEM, the data revealed that despite the increase in compliance with the Regulations post-1992 and the reduction in TSS and BOD, effluent was continuing to cause unacceptable environmental harm.

3.1 Sublethal Toxicity

As part of the EEM protocol each mill had to measure the sublethal toxicity of its final effluent discharge 2 x each year (summer and winter). Analysis of this data showed that mill effluent toxicity decreased between 1992 and 1996 (the year the 1992 Regulations were fully applied) and then generally remained constant. Between 1996 and 2010, 50% of the tests showed

sublethal toxicity.[6] In cycle 6 of the EEM testing (2010-2013) showed an increase in sublethal toxicity to 63% of all effluent tests.[7]

3.2 Biological Monitoring

Analysis of EEM biological monitoring studies over the same period revealed mill effluents were causing effects on fish (increase liver size, decrease gonad size) and fish habitat (benthic invertebrate communities) and in rare instances causing elevated levels of dioxins and furans in fish tissue.[8] In Cycle 2, ten mills were required to analyze fish tissue for dioxins and furans and 6 of those had levels of dioxins and furans in fish tissue that exceeded Health Canada guidelines for fish consumption.[9]

In cycle 6 of the EEM testing 11 mills conducted 9 biological monitoring studies for different purposes. In 7 of the 9 studies effects on fish or fish habitat were observed or confirmed.[10]

The results of the 6 EEM study cycles have shown that approximately 70% of the mills confirmed an effect for at least one of the effect indicators, with approximately 45% of mills confirming effects relating to eutrophication and 20% confirming a reduced gonad size effect.

4. Modernizing the PPER

It took 20 years for the EEM protocol to evolve to a point where the regulator (ECCC) could deem that the 1992 Regulations were not effective at preventing harm to fish and fish habitat.

In 2017, 4 years after the results for cycle 6 of the EEM and 5 years after the 2012 Status Report that clearly identified regulatory failure, engagement on the modernization of the 1992 PPER began. Two years later, in May 2019, Environment and Climate Change Canada released the Modernization of the *Pulp and Paper Effluent Regulations* – Detailed Proposal.

The proposal to amend the PPER includes increasing the effluent intensity factors for biochemical oxygen demand (BOD), suspended solids (SS), and adding an intensity factor for chemical oxygen demand (COD). The proposal will also add effluent concentration limits for nitrogen and phosphorus and limits for temperature and pH.[11] The final version of the revised PPER is planned for 2021.[12]

Graphic evidence provided by ECCC indicates that operating mills have, for the most part, been meeting the 1992 PPER requirements for BOD and TSS.[13] However, despite general compliance and nearly 50 years of regulation, pulp and paper effluent continues to cause dissolved oxygen depletion in marine environments and continues to release substances that are toxic to fish. Presuming the modernized regulations come into force in 2021,one can anticipate that there will be a transition period of 4 years for operating mills, meaning full compliance could be expected by approximately 2025.

[1] Environment Canada, Environmental Stewardship Branch, Status Report on the Pulp and Paper Effluent Regulations (June 2012) at page 2, on-line at: http://publications.gc.ca/collections/collection_2012/ec/En14-66-2012-eng.pdf
[2] *Ibid.*
[3] *Ibid* at 4.
[4] *Ibid* at 5.
[5] *Ibid* at 11.
[6] *Ibid* at 18.
[7] Environment Canada, Environmental Effects Monitoring Program, 6th National Assessment of Environmental Effects Monitoring Data from Pulp and Paper Mills Subject to the Pulp and Paper Effluent Regulations (April 2014) at page 5, on-line at: http://publications.gc.ca/collections/collection_2014/ec/En14-84-2014-eng.pdf
[8] Supra Note 1 at 18.
[9] SHERRY L. WALKER,* KATHLEEN HEDLEY AND EDWARD PORTER, Pulp and Paper Environmental Effects Monitoring in Canada: An Overview, *Water Qual. Res. J. Canada, 2002 Volume 37, No. 1, 7–19* at page 14, on-line at https://www.cawq.ca/journal/temp/article/151.pdf
[10] Supra Note 7 at 9.
[11] Environment and Climate Change Canada, Modernization of the Pulp and Paper Effluent Regulations, Details Proposal (May 2019).
[12] Environment and Climate Change Canada, Forest Products and Fisheries Act Division, Presentation on the Modernization of the Pulp and Paper Effluent Regulations, Detailed Proposals, August 15, 2019 on-line at https://drive.google.com/drive/folders/1tpZlB4bv_8T0UeQUwp3olh91qEVIxn7x
[13] Environment and Climate Change Canada, Forest Products and Fisheries Act Division, PPER Modernization Graphs, on-line at https://drive.google.com/drive/folders/1R3DOdRQPcvriSrZ5I8yz9oH1S1ZzBFbE

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March 9, 2019

Environmental Assessment Branch
Nova Scotia Environment
P.O. Box 442
Halifax, NS, B3J 2P8

Re: Northern Pulp Nova Scotia Corporation's Replacement Effluent Treatment Facility Project

This letter is submitted on behalf of the Ecology Action Centre (EAC), an environmental charity working since 1971 at the local, provincial, national and international level to build a healthier and more sustainable world. Our vision is 'a society in Nova Scotia that respects and protects nature and provides environmentally and economically sustainable solutions for its citizens'. The EAC works to catalyze change through policy advocacy, community development and awareness building. And, when required, we serve as a watchdog for our environment.

In that capacity, we respectfully request that the Minister reject Northern Pulp Nova Scotia Corporation (NPNS)'s proposal as outlined in their registration document under Section 34(1)(f) of the Environment Act "because of the likelihood that it will cause adverse effects or environmental effects that cannot be mitigated". We also cite that there are a number of areas in the registration document where crucial information is lacking or unknown, triggering Section 34(1)(a-c) requiring additional information and focus reports. We also cite Section 2(b)(ii) "the precautionary principle will be used in decision-making so that where there are threats of serious or irreversible damage, the lack of full scientific certainty shall not be used as a reason for postponing measures to prevent environmental degradation."

Despite its impressive volume, NPNS's registration document is very poor and fails to provide necessary information about key elements of their plan, including and importantly - the content of the substances they wish to pump in large volumes into the Northumberland Strait and the potential impacts that it undoubtedly will have on marine life and air quality. The registration document seems designed to obfuscate essential details, downplay them or intentionally omit them altogether. It essentially says there will be no impact of any kind. This is simply not credible. In Table E.1.1-1: Summary of the Significance of Project-Related Residual Environmental Effects Predicted. Every row and column of the table contains 'NS' which represents 'No Significant Residual Environmental Effects Predicted', including water quality, fish and fish habitat, surface and groundwater and the entire 'Accidents, Malfunctions and Unplanned Events' column. It is inconceivable that after NPNS's lengthy history of leaks, ruptures, over-limit emissions and other unplanned events that these predictions could be put forward credibly in a registration document for environmental assessment of this proposed effluent treatment facility.

NPNS has not done its due diligence to fully determine the potential impacts of their proposed project. It is the duty of Nova Scotia Environment to apply a rigorous standard of environmental protection when assessing risk and we do not feel that NPNS has provided sufficient information within their registration document to enable the province to complete the assessment. In light of this, the only acceptable decision is to reject the proponent's proposal for this effluent treatment facility. The potential for damage to our land, water and air from this proposed effluent treatment system is far too great for the province to grant approval.

The EAC's concerns about this proposed effluent treatment facility are numerous. Despite the very limited time available under this 'Class 1 undertaking' environmental assessment process (30 days) to review the proponent's registration document (1,586 pages spread over 17 documents), this letter outlines our primary concerns, which are:

- Use of an insufficient standard for effluent;
- The potential impact on the marine environment from the massive volume of effluent with its undetermined chemical and physical composition;
- Cumulative impacts and the fragility of the ecosystem of the Northumberland Strait;
- The risks associated with the effluent pipe and its pathway;
- Air pollution from burning waste sludge;
- Socio-economic impacts on fisheries and other sectors; and
- Indigenous opposition
- Lack of serious consideration of alternatives

Insufficient Standard for Effluent

NPNS had a responsibility to develop a solution that enables their operations to continue in Nova Scotia while preventing harm to the environment and the wider community. Rather than identifying an innovative solution which does these things, it is clear that NPNS's objective is simply to meet the minimum Pulp and Paper Effluent Regulations (PPER). The federal regulations are very old and are currently undergoing a major overhaul. NPNS will be required to comply with the updated PPER once the new standards are complete and accordingly, it is irresponsible for their effluent goals to just meet the existing standard. And this statement assumes that their effluent would meet the current standard, something that NPNS cannot guarantee since they cannot say what will be in their effluent until the new system is operational.

A key reasoning behind the proposed modifications to current PPER has been the ongoing degradation of fish habitat by most mills, even when in regulatory compliance. The PPER are primarily designed to prevent effluents that cause acute lethality to fish from entering nearby waterways (pg. 357) and do not deal with long-term cumulative effects or ecosystem impacts. Furthermore, according to Caroline Blais, the Director of the Forest Product and *Fisheries Act* Division at Environment and Climate Change Canada (ECCC), 70% of pulp and paper mills abiding by today's PPER have still shown deleterious impact on fish or fish habitat. A 2016 EcoMetrix study also found enlarged gonads and livers in fish tested near the current Boat Harbour effluent treatment facility's outfall location, despite the fact that Northern Pulp has routinely passed the acute lethality testing. Director Blais, in presentation for the Prince Edward Island Standing Committee on Agriculture and Fisheries in February 2019, described widening the scope of deleterious substances that may call for regulation and "reviewing the regulatory limits for existing and new substances," as central to the government's PPER modification effort. This process will also seek to develop new regulations to treat nutrient inputs, which to date have not been addressed in PPER legislation. NPNS's proposal has not adequately addressed how the company intends to meet new and more stringent effluent regulations that the federal government is working towards.

Simply meeting the PPER is a tremendously low bar to set in environmental protection and is no guarantee that harm to the environment and ecosystem will not occur, only that outdated regulatory maximums of permissible harm might be reached. This is unacceptable, particularly since NPNS cannot even identify what will be in the effluent - a major red flag that this undertaking carries unacceptable levels of risk of impact to the environment and the legitimate interests of other stakeholders. Nova Scotia Environment clearly stated to NPNS that their EA must go beyond the parameters in the Federal PPER. Their proposal as outlined in the

registration document does not do that. Aiming to achieve the lowest possible standard after decades of causing significant environmental damage to the natural world and communities surrounding the mill is simply not enough.

Effluent Content and Potential Impacts on the Marine Environment

The volume and toxicity of the liquid waste produced at the NPNS mill is significant. Boat Harbour provides incontrovertible evidence of the impact of the effluent to the current "receiving waters" - the area is devoid of life. Redirecting the effluent into the Northumberland Strait and the lower Gulf of St. Lawrence will certainly be detrimental to the health and productivity of the new "receiving waters". But unlike Boat Harbour, where most of the damage to date has been contained (and will cost taxpayers hundreds of millions to clean up), the potential damage to the Northumberland Strait will not be easily contained and will be impossible to clean up.

The Northumberland Strait is a relatively shallow area with slow moving currents far from the open sea. This makes it a very low "flushing" system. It takes approximately a year for the water to fully exchange. Northern Pulp's own reports say that on top of 60 to 80 million liters of liquid effluent they also anticipate releasing up to four tons of suspended solids in their waste water each day. In addition to that it is important to note that every drain, toilet and sink inside the mill is attached to the effluent disposal system meaning that in addition to human waste every oil or chemical spill inside the plant ends up in their effluent system. Test results in the current receiving waters (Boat Harbour) show the presence of dioxins, furans, chlorinated compounds, halogenated organic compounds and traces of heavy metals. These substances are known to have serious negative impacts to aquatic and other life. In addition to the chemicals and solids produced in the pulping process the new effluent treatment system "will require several chemical inputs, including urea, phosphorus, sodium hydroxide, sulfuric acid and an anti-foam agent to support its process." (pg. 46). So these too would be sent out into the Northumberland Strait. With so many deleterious inputs it's no wonder NPNS doesn't know what will be in their own effluent stream.

Dioxins and Furans

Research from other pulp and paper mills can provide insight on the potential risks to the marine environment associated with some of the products referenced in NPNS's project proposal. In British Columbia's Howe Sound, the Port Mellon and Woodfibre bleach kraft pulp mills contaminated the local waters so badly that several fisheries had to be shut down in the 1980s. This was due in large part to the dioxins and furans released as a byproduct of the chlorine bleaching process, the same process used by NPNS. Dioxins and furans are toxic, carcinogenic and bioaccumulative pollutants, posing a significant threat to marine species and human health via ingested seafood or otherwise. These compounds have been linked to cancer and diabetes, among other serious conditions.

In 1992, national Pulp and Paper Effluent Regulations (PPER) were put in place to mitigate harmful impacts to fish habitat, and the marine life at Howe Sound slowly began to recover. But while the dioxin and furan content in the Sound's commercial fish and crab species have been reduced by 95% or more since that time, in three of eight Dungeness crab samples collected near the Port Mellon mill in 2012, the dioxin and furan content still exceeded Health Canada's safe-consumption criteria. Federal advisories to limit crab consumption remain in effect in the area to this day. The same results also held for testing done on Dungeness crab near the Woodfibre mill, despite the fact that Woodfibre was in a relatively good "flushing" position at the mouth of the Squamish River, up until the facility's closure in 2006.

NPNS's registration document, in Section 1-7, states that "Dioxins and furans in [Northern Pulp's] effluent have virtually been eliminated since the conversion to chlorine dioxide bleaching in 1998. NPNS has never exceeded the limits as per the Pulp and Paper Mill Effluent Chlorinated Dioxins and Furans Regulations." But we know that during NPNS's 2014 spill, on sacred burial grounds at the Pictou First Nation (PFN), proved that

at least five distinct dioxin or furan compounds were indeed still present in the mill's effluent, sixteen years after that conversion to chlorine dioxide bleaching. One of the dioxins was detected more than a kilometre down the beach from the spill site. ECCC regulations stipulate that dioxin and furan content must be non-detectable in pulp mill effluent. In addition, NPNS was found exceeding the daily release allowance for suspended solids by almost double the legal limit. Ultimately, the mill was fined $225,000 for the incident. Today, NPNS refuses to release the full suite of information on the components of the effluent they would see released into Northumberland Strait under their new proposal, and claims that the risk of contamination to marine habitat is "Not Significant". This is simply not credible.

In an attempt to explain this lack of transparency, the NPNS registration document states, "At this time, effluent chemistry characteristics (including the specific substances present in treated effluent and their anticipated concentrations) will not be known with certainty **until the project is operational**" (pg. 489). An expectation that NS Environment would grant approval to this project without provision of full details of the content of this effluent to be discharged into the Northumberland Strait should be extremely suspect, particularly given the company's track record of non-compliance. This includes not only the regulatory disregard displayed during the 2014 PFN spill, but also another spill by the Mackenzie Pulp Mill Corporation, owned by Paper Excellence (NPNS's parent company). In this case, Mackenzie Pulp was fined $900,000 and added to the Canadian Environmental Offenders Registry for violating the *Fisheries Act* by neglecting to properly treat the effluent spilled into British Columbia's Williston Lake on two occasions in 2014 and 2016. Paper Excellence has proven in spill scenarios in both Nova Scotia and British Columbia that their standard of care is simply not high enough for Maritime citizens to entrust this company to operate within the bounds of legality, let alone safety, in the Northumberland Strait.

Additionally, it is important to consider the cumulative effects of adding the toxins from NPNS's effluent into the proposed discharge area. In 2002, a study conducted on Nova Scotia's North Shore tested mussels for leukemia. At a site just 500 metres from the current Boat Harbour Treatment Facility outfall location, 30% of the tested mussels were infected. At a distance of one kilometre, 23% of the tested mussels showed signs of leukemia. In contrast, 56% of tested mussels in Pictou Harbour showed leukemia - a higher rate because of the dumping of untreated sewage at the time. Conversely, mussels tested in Merigomish Harbour did not show any effects of leukemia. In the end, the scientific team pinned the results on both municipal and industrial waste products. With the proposed level of effluent expected to be released into the Strait under NPNS's new plan, we may risk a future in which continued inputs render the local area entirely unusable for shellfish aquaculture or shellfish harvest altogether.

Total Suspended Solids (TSS) and Cellulose Fibers

NPNS public relations messaging from NPNS says that the new effluent treatment facility will be better than the existing one at Boat Harbour. However, this is not credible because Boat Harbour currently allows all the solids and the worst toxic elements to settle out and for the fluid to cool, often called "polishing off", as it is held for approximately a month before its release into the Northumberland Strait. The new effluent system will attempt to "treat" and cool the effluent in a matter of hours before it is released directly into the marine environment. In private documents and in recent media interviews, NPNS executives have admitted that the effluent is likely to be no better - and could potentially be worse - than what now flows into the Boat Harbour basin (Point C).

Total Suspended Solids (TSS) largely consists of cellulose fibers. Although the document states that 85 to 95% of the lignin, cellulose, sodium sulphide and sodium hydroxide will be removed from the sludge via biological activity in treatment, there is no information provided about the 5-15% which survives treatment - the cellulose. Cellulose fibers are refractory, meaning that they don't degrade quickly or decompose well in water, especially seawater. The registration document provides, in section 5.2.2.9 on Effluent Quality, that the effluent annual average flow will have an anticipated TSS concentration of 48 mg/l of effluent which equates to

a total 3053 kg of TSS per day, i.e., a full dump truck load each day in equivalent tonnage. These fibers have the potential to settle into a deep hole or depression, smothering the bottom and causing anoxia in the underlying sediment. The document hints at this on page 347: "The discharge of effluent containing elevated levels of TSS could also cause a change in sediment quality near the diffuser due to the settlement of suspended sediment, which could cause a change in sediment characteristics such as sand and silt size fractions and/or a change in chemical composition of sediments". The TSS could very likely spread beyond the area near the diffuser due to the buoyant nature of effluent and the likelihood that the effluent plume will reach the surface of the marine water column. This is the very same TSS, known to be harmful to marine life, that NPNS was found to be pumping at a rate of double the daily legal limit into Boat Harbour during the company's 2014 spill on First Nations land.

The insoluble nature of these fibers, the proposed volume of TSS discharge, the potentially wide area of impact and the inability to observe and monitor the effluent stream make this incredibly risky and appear to guarantee a significant impact on the marine environment.

Cumulative Effects: Long Term risk in a Fragile Ecosystem

The Gulf of St. Lawrence is already one of the most highly-stressed marine ecosystems on earth. In a recent study published in the journal Nature Climate Change indicates that the Gulf of St. Lawrence is showing a dramatic decline in oxygen.

A separate study done by DFO and University du Quebec entitled "Man-Made Environmental Changes in the Southern Gulf of St. Lawrence, and their Possible Impact on Inshore Fisheries" states: "Major sources of stress on the Gulf of St. Lawrence ecosystem include climatic changes on one hand and human-induced interferences such as physical modification, pollution and harvesting on the other hand. There are indications that these changes have significant impact on the oceanography, ecology and fisheries of the Gulf. The potential danger to the fishery includes physical, biological and chemical contamination."

This is research that should be covered in effective cumulative effects assessment processes examining marine environments. Northern Pulp's Cumulative Effects research presents a marine "Regional Assessment Area" between Pictou Harbour and Charlottetown to the north, spanning approximately 60 kilometres in an east-west direction. The proponents claim that the majority of the disruption to ocean habitat is likely to take place during the project's construction phase, when the seafloor is to be dredged and laid with a rocky substrate to lay the pipeline and keep it place over the long-term. As for the operations phase, during which the pipe will dump its tens of million litres of treated effluent into the Strait, the report suggest that all concerns related to the quality of the water will dissipate within five metres of the discharge location.

The report claims that "given the likely lack of spatial overlap at this location, significant cumulative residual environmental effects to water quality or sediment quality as a result of treated effluent discharge are not likely." But several studies, as well as ECCC expert testimony before the Prince Edward Island Standing Committee on Agriculture and Fisheries referenced above, tell us that pulp and paper effluent *is* known to be harmful to fish and fish habitat in the majority of tested circumstances. In essence, the substance that Northern Pulp would inject into the Northumberland Strait *would*, undoubtedly, pose a threat to aquatic life - and the assessment document says as much - *but suggests that*, because of dilutive power of the ocean, no great harm should occur in this instance. This simply is not true and this type of outdated Industrial Age thinking, suggesting that, because the ocean is big, it should be able to absorb our waste forever, is the same thinking that now sees the entire planet awash with plastic waste.

In a Northumberland Strait context, the cumulative impacts of over 25 billion liters of toxic effluent flowing into the water every year in perpetuity are potentially catastrophic. The NPNS registration document clearly shows that there will be very little, if any, positive change in wastewater quality with the proposed effluent treatment system and information revealed through the FOIPOP requested showed NPNS suggesting that the effluent could in fact be worse. With a myriad of chemical and nutrient inputs from municipal wastewater systems, industrial operations and agricultural runoff, among others, this is no time to augment present threats to marine life by adding a continuous, high volume stream of toxic pollution into a shallow, low flowing section of the ecosystem. We need our governments and our commercial industries to work together to reduce the inputs already entering into the Strait, and we need to put plans in place to start restoring this natural Maritime treasure, as has been called for by federal studies. If we don't, we are at significant risk of creating contaminated marine habitats and unfishable dead zones in the future.

Pipeline Pathway

The effluent pipeline will go over Pictou Harbour, attached to the causeway across Highway 106 and then in a trench through the Town of Pictou's water supply area, putting both at risk in the event of a pipeline breach or spill. Similarly, the potential for pipeline failure at Caribou Harbour is considerable. These are unacceptable risks.

Air Pollution

In the plan outlined in NPNS's registration document, toxic sludge will be collected early in the effluent treatment process and will then be burned in the NPNS power boiler. Chemicals from this process, including Polycyclic Aromatic Hydrocarbons, Volatile Organic Compounds, sulphur and chlorinated compounds, benzine, cadmium, as well as fine particulate matter will be released. The NPNS registration document speaks virtuously about displacing unspecified amounts of fossil fuels by collecting and burning chemically-laden sludge from the pulping process. It states the sludge will have a 40% moisture content. This will provide no fuel (heat) value and will likely require as much or more fossil fuel to burn. Much worse is the fact that it will actually make the mill's already terrible air emissions problems even worse by burning this toxic sludge in the mill's power boiler which has no precipitator and reportedly malfunctioning/non-functioning scrubbers to "clean" the Sulphur, VOCs and other chemical compounds, and carcinogenic fine particulate matter (PM10 and PM 2.5). The NPNS registration document indicates incineration of up to 20 tonnes of chemically laden sludge per day in the power boiler. The power boiler is very old and has repeatedly failed stack emissions tests. This is a significant public health risk and yet another compelling reason to reject this proposal. Although the provincial Class 1 Environmental Assessment does not specifically require the proponent to conduct a human health risk assessment (HHRA) study, such a study should be ordered by the minister under Environment Act Section 34(1)c or b.

The NPNS registration document acknowledges that there will be additional pollutants released by burning the sludge in the power boiler and that these airborne pollutants will land on nearby "receptors" (e.g. people, animals, land, water, etc.):

"Emissions of combustion gases, particulate matter, and possibly odour from the replacement ETF during operation and maintenance could result in air contaminants that could disperse in the atmosphere to off-site receptors. Additionally, since the project will include the combustion of sludge generated in the replacement ETF for energy recovery and odour control, emissions from the combustion of such sludge in the power boiler during operation and maintenance could disperse from mill stacks to off-site receptors." (Pg. 142)

Air quality testing has been incredibly lax in and around the NPNS mill. A new, robust independent air quality monitoring program should be required of NPNS by the Minister. This should include continuous stack emissions monitoring and multiple remote sensors. This data should be made available to the public in a continuous, real-time feed over the internet.

A sample of some of NPNS's recent air pollution violations:

- In 2014 the mill reported the release of 1,290 tonnes of fine particulate matter — the equivalent of 13 Irving St. John pulp mills in one location.
- Air emissions exceeded limits 4 times in a two year span - March and September 2015, June and December 2016.
- NSE investigation in 2017 as mill exceeded air contaminant emissions limits by nearly 50 per cent in June.
- The mill exceeded emissions 3 years in a row (2015, 2016 and 2017) despite the purchase and instillation of a new electrostatic precipitator on the recovery boiler stack.

Socio-Economic Impacts

Risk to Fisheries and Aquaculture

Despite NPNS's claim that the project proposal's impact on marine life will not be significant, the company's Receiving Waters Study, prepared by Stantec in August of 2017, states, "Among the four potential outfall locations … the [chosen] outfall location provides the *smallest potential long-term cumulative effects* on the fishery and socio-economic environments, and therefore is considered the better outfall location for the discharge of the treated wastewater from the mill." (Conclusion 2.4) Here we see suggestion that NPNS is well aware that the fishery will be adversely impacted in the long term, despite public claims to the contrary. The potential impacts to fish, bivalves, crustaceans, fish habitat and critical spawning areas are outlined above. While the deleterious short term impacts of NPNS's proposed effluent treatment facility on fisheries may be limited to a relatively small area, the long-term effects could still be significant. The Lobster Fishing Area 26A, stretching east-west from Pugwash to Port Hastings and north of Souris, PEI, supports more than 700 licenses at 300 traps per license. This is a marine area worth upwards of $40 million on fisheries alone. The Northumberland Fishermen's Association notes in a position letter that the Strait is one of the "most lucrative habitat and spawning grounds for lobster, crab, scallop, herring, mackerel and groundfish" in the Gulf. Each haul is significant to the fishermen that live and work there and, as such, the long term effects on the larger fishery should be more carefully considered.

Northern Pulp has demonstrated a clear unwillingness to do the work necessary to address these concerns in their environmental assessment registration document; particularly those concerns of the lobster fishermen in the region. NPNS's consultants at Dillon Consulting even went so far as to prompt Northern Pulp via letter in February of 2018, noting the importance of further research on lobster at all of the animal's life developmental stages: "… Conducting research on lobster larvae, and potential alternative to pipe discharge into the Strait needs to be completed to demonstrate to regulators that these were properly considered and stakeholder concerns are being addressed as much as reasonably possible."

In spite of this recommendation, NPNS did not conduct any studies or provide any information on potential impacts over the various life stages of the most important commercial marine species in the Canadian Atlantic, simply dismissing the issue by saying, "It was the conclusion that it is highly unlikely that there will be serious

impact on lobster or lobster larvae given the limited area of potential impact." The assessment goes on to admit that marine studies "have been hampered by both seasonal constraints and by physical opposition and obstruction... The existing environmental conditions and associated potential environmental effects of the project therefore have been defined based on existing available information." Again, we see a standard of care set far too low, in the face of significant risks and potential consequences.

Maritimers and Maritime fishermen have told NS Environment and NPNS loud and clear that this is a risk they are not willing to have foisted upon them; that the social and economic value of the region's fisheries are simply too great. Fishing unions and associations alike have since called, for a federal environmental assessment. At a broader scale, the economic value of Atlantic Canadian seafood production is immense. Fisheries and aquaculture products account for upwards of $3 billion to the Atlantic economy, with more than 15,000 licensed fishing boats and more than 500 aquaculture outfits. The Northumberland Strait is major component of that system, and the Southern Gulf of St. Lawrence has been one of the most productive lobster regions in the country. Today, there are some 700 fishing licenses. The legitimate concerns of the Northumberland Strait fishermen, and Canadian fishermen more broadly, need to accepted and respected.

Reputational Risk to Nova Scotia Seafood Brand

Nova Scotia has an international reputation for producing high-quality seafood from "cold, clean and pristine northern waters". This is particularly true for our shellfish - lobster, scallops and oysters. The reputational risk to the industry if any harvested species becomes contaminated with pollutants is significant - particularly in emerging markets in China and southeast Asia where demand from an expanding middle class is dependent on the "clean and pristine" brand. In this regard it is instructive to recall that the discovery of a single reported case of BSE or mad cow disease in 2003 led to an immediate worldwide ban on all Canadian beef imports which lasted for years and cost the industry billions of dollars in lost sales. Imagine what one contaminated lobster could do the Canadian lobster industry's access to foreign markets. Even the idea of seafood produced in polluted waters could be enough to shut down or seriously curtail demand in sensitive markets like China. This is a serious financial risk that Nova Scotia cannot afford to take.

EAC supports the fishermen.

Tourism Industry

The tourism industry in Nova Scotia is worth $2.7 Billion and growing, creating 40,000 jobs and producing $300 million in taxes. At a regional level, tourism revenue in the Northumberland Shore Region of Nova Scotia is 7.8% of the total tourism revenues translating to $210.6 Million and over 3,200 jobs, generating about $24M in tax revenues. This sector of the economy could be much greater but is hampered by the presence of the NPNS mill.

Tourism operators have reported the length of stay in the Town of Pictou has declined from 2010, an average of 3.3 days to 2017 at 2.5 days. Tourism Operators explain the decline in visitor stays is a direct result of the air and water pollution emanating from the NPNS mill. Allowing the mill to release its effluent into the Northumberland Strait and to increase its harmful air emissions by burning large quantities of toxic sludge will only make things worse for this industry. Tourism operators in western Cape Breton (Inverness County), along the south coast of PEI and the New Brunswick coastline of the Northumberland Strait are all at risk of impacts from the proposed discharge of large volumes of effluent into the marine environment.

EAC supports the tourism operators.

Indigenous opposition

It is important to note that all of the Mi'kmaq Chiefs in the three Maritime Provinces are opposed to piping the NPNS mill's effluent into the Northumberland Strait. Chief Terry Paul identified the mill's proposal for a new effluent treatment plant as the top issue raised by Mi'kmaq leaders in their annual meeting with Provincial Cabinet in December 2017. "The first consideration is the environment" he said. "We want to ensure that whatever is done to mitigate the effluent there isn't detrimental to the fishery". He stated clearly that the chiefs cannot support the NPNS effluent pipe plan. Chief Andrea Paul of Pictou Landing First Nation has been unequivocal in stating her communities firm opposition to the proposed new effluent treatment system. "The effluent discharge is in the Northumberland Strait and for that we are opposing it" she said in July 2018. "We do not want this pipe in our waters. We need to protect our resources. All of us have an inherent duty to do that".

EAC supports the Mi'kmaq.

Unwillingness to Explore Alternatives

The pulp mill in Pictou County has a long history of putting Nova Scotia's environment and citizens at risk. Despite five years to find a suitable alternative to the Boat Harbour treatment facility and taking the opportunity to improve their environmental performance, NPNS simply offers one single option: to pollute a different area, this time spreading the potential impact much further. The registration document has been carefully tailored to reach the NPNS's preferred outcome of pumping the effluent into the sea. In preparing the document the consultants, appear to have relied almost exclusively on information provided by NPNS. There is no evidence of serious independent analysis of the options, assumptions or conclusions in the report. The Ecology Action Centre strongly disagrees and believes that NPNS could do much to 1) reduce the toxicity of their effluent by improving internal process inside the mill and 2) negate the need to dispose of their effluent into the environment at all by modifying their production process (i.e. eliminate chemical bleaching) and installing a closed-loop system.

It is clear from NPNS's registration document that the scope of exploration of alternative options was deliberately narrow and entirely restricted to finding an alternative dumping site for the effluent. All other options to reduce or eliminate the mills liquid pollution output are summarily dismissed early in the registration document, abandoning any further consideration or research for better options. On its project website, NPNS confirms this: "At the onset of the design phase a closed loop (zero effluent) treatment alternative was immediately ruled out as it is not an option for Northern Pulp. A closed loop system does not exist anywhere in the world for an elemental chlorine free (ECF) bleached kraft pulp mill. The concept is not technically or economically achievable." This is consistent with NPNS's long-held public position that only a pipeline into the Northumberland Strait will work. NPNS says the technology does not exist to close their loop. They are lying by omission.

NPNS could install and run a closed-loop system if it simply changed its production process and stopped bleaching their semi-finished kraft pulp product prior to shipping it to their Asian parent company. The result would be a light brown fiber product rather than a bright-white one. If the parent company wished to bleach some or all of the kraft pulp during its subsequent product production processes (making tissue, napkins, diapers, etc.) they could easily do so at their end. Another workable alternative would be to retool the NPNS mill to use peroxide and ozone instead of chlorine dioxide to whiten their kraft pulp and thus become a Totally Chlorine Free (TCF) mill.

The truth is NPNS could change its process and install a closed loop system but they have chosen not to. They admit as much in their registration document (Project Alternative 3: Change the NPNS Mill Type and Make a

Closed Loop System, Pgs. 25-26), stating the reason for not doing so is that it is “market prohibitive”, not that it is technically impossible. Their justification for not doing so is cost: “NPNS would not remain competitive due to high wood and electricity costs” and that “NPNS must continue to operate by producing NBSK to be economically viable”. They admitted that “Production of a different type of pulp can allow operation using closed loop systems.” But that “NPNS would not be economically viable with a different product”. Although NPNS says changing their product process is “not economically viable”, they provide no proof for these claim.

Notwithstanding their refusal to seriously consider altering their process and implementing a closed loop system, before the NPNS mill starts pumping their effluent anywhere they should first be required to improve the inside performance of their very old mill in order to significantly improve the quality of the effluent before it is sent for secondary treatment. In industry parlance this is called “tightening up the loops” inside the mill prior to the effluent treatment process. The mill employs very old (1960s era) technology. There are three specific areas that need to be modernized before sending effluent into a secondary treatment system, regardless of where the effluent is subsequently dumped. They are: #1 Optimize brown stock washing, #2 Install an oxygen delignification system in the bleaching plant and #3 Implement fail-safe systems to ensure against process upsets into the effluent treatment system. Process upsets can come from overflows of brown stock, bleach and/or black liquor.

It’s important to point out that with regard to #2, NPNS has previously said they would be installing an oxygen delignification system which would result in a 30 to 40% reduction in chlorine dioxide bleaching chemicals and thus much “cleaner” effluent. That oxygen delignification system is now missing from NPNS's registration document.

It’s also important to highlight why NPNS should be required to build in effective fail-safe systems to minimize and contain process upsets whereby the system becomes overloaded with pulping chemicals and shuts down the biological activated sludge (BAS) treatment process. In brief: NPNS has a history of frequent process upsets with its current effluent treatment system in Boat Harbour. When this happens the biological agents (bacteria, fungi and protozoa) that are used to consume organic pollution from the effluent prior to release are killed and the process stops working. In the Boat Harbour lagoon, the untreated effluent can be contained at an early stage while the system is re-inoculated with replacement biological agents so treatment can be resumed. This can take several days. In the event of black liquor or other chemical spills into the proposed new effluent treatment system, the biological agents will be killed and the system will stop functioning as it’s supposed to. In the registration document, NPNS says it plans to build a 35 million liter raw effluent spill basin that, assuming optimum conditions, will be sufficient to contain 10 to 13 hours of effluent diversion in the event of process upsets (pg. 42). That means only half a day’s worth of effluent can be contained while they try to fix the problem. But process upsets often take much longer to fix than half a day. Therefore the risk of potentially large volumes of untreated effluent by-passing the new effluent treatment system and flowing directly out into the marine environment is very high as their proposed spill basin will be too small to contain effluent volumes greater than half a day’s output while NPNS works to restore the biological agents to sufficient levels to function again.

NPNS has repeatedly minimized serious concerns about their effluent treatment plan. Vague assurances through the registration document with phrases such as ‘no significant residual environmental effect predicted’ are simply not credible, particularly in light of the vast evidence of ecosystem destruction committed at Boat Harbour. With an effluent leak only months ago in October 2018, which was discovered by a citizen walking in the vicinity of the mill, and another in June 2014 that released 47 million litres before detection, public trust is at an all-time low. Attribution of pollution in the Northumberland Strait will be challenging, ensuring that the province of Nova Scotia will have a very difficult time seeking remediation for damages. Fastidious monitoring will be required to intervene as quickly as possible and ideally this monitoring would be administered by an independent body to ensure compliance.

Conclusion

The Ecology Action Centre strongly recommends that the Minister of Environment reject NPNS's effluent treatment facility proposal as outlined in their registration document. The document fails to provide the Province with the required information to assure itself and all Nova Scotians that their proposed effluent treatment facility would be safe for the community or the environment. All evidence points to the fact that this effluent treatment facility will cause at least as much pollution as the levels at Boat Harbour, if not more, and this time the pollution will be spread over a far greater area with even less ability to contain and repair that damage in the future. It is also clear that the burning of large amounts of toxic sludge in the power boiler will make the mill's already terrible air emissions even worse. The claims by NPNS that there will be no impact of any kind is not credible and they have failed to provide evidence that this even possible. It is unconscionable of NPNS to ask, nay, demand that Nova Scotian's accept all the risks and harms so an ancient, highly-polluting pulp mill can continue operating for a few more years.

NPNS has shown a consistent sense of entitlement, often operating outside of the rules and boundaries which exist to protect our environment. NPNS even made a request to begin building elements of its proposed new effluent treatment system in mid-2018, well before submitting its proposal for environmental assessment. The sheer audacity of this request demonstrates a corporation that fully expects Nova Scotia to continue to bend to their wishes, regardless of the impacts. Now that we are within a year of the January 31, 2020 shut down date for the Boat Harbour effluent treatment system, the corporation has requested an extension to continue polluting Boat Harbour, citing a lack of time to get an alternative in place. Complying with this request would require repealing that legislation and would be an unforgivable violation of the faith of the Pictou Landing First Nations community and to every other Nova Scotian who is counting down the days until January 31, 2020.

It is time for this province to stop operating with a methodology of privatizing our shared natural resources for private profit while socializing the enormous risks and costs. Nova Scotian taxpayers will long be paying for the damage that has already been done by the pulp mill at Abercrombie Point in Pictou County. The investment to create the new pipe, a piece of infrastructure which will cost an enormous amount and likely to be charged again to the taxpayer, is making a commitment to allow this mill to continue discharging toxic effluent into our environment for many years to come. That is unacceptable. The Minister should reject this project outright. Failing that the Minister must, at the very least, order focus reports in a number of areas where information is lacking, including the composition of the effluent, baseline studies on lobsters and other marine species, baseline benthic surveys of the bottom of Caribou Bay, plans for air pollution controls and monitoring, etc. The minister should also order the mill to upgrade its internal processes and equipment to reduce its already substantial air and water pollution levels regardless of if or where they might send their effluent. But at the end of the day the Minister must not make a bad situation worse by allowing another place to be fouled and one that can never be cleaned up.

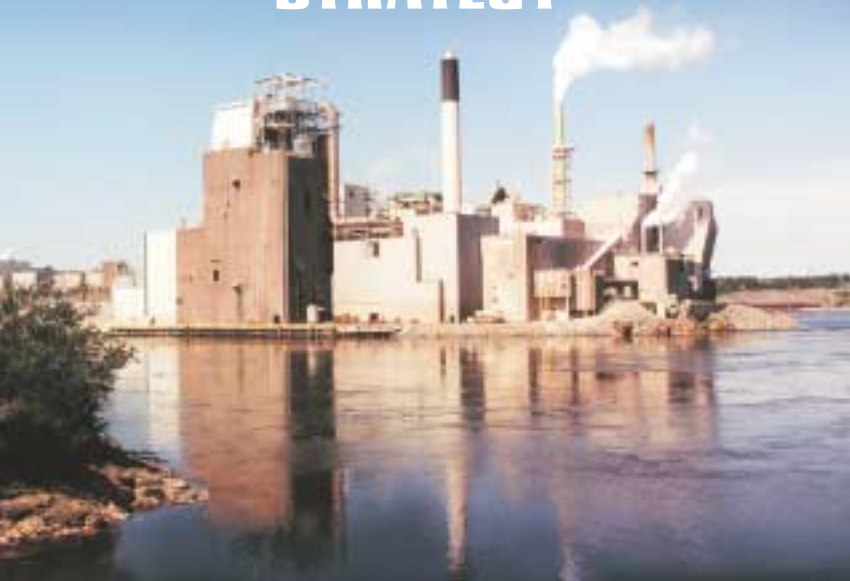
In closing we cite Premier Stephen McNeil's wise words at the annual meeting of Nova Scotia Cabinet and Mi'kmaq Chiefs on December 14th, 2017 in Millbrook: "*It has never been our government's intention and never will be our government's intention to clean up one environmental problem and move it somewhere else*."

And that is the right answer. No pipe.

Respectfully submitted,

Raymond Plourde, Wilderness Coordinator
Nancy Anningson, Coastal Coordinator
Simon Ryder-Burbridge, Marine Conservation Officer

IRVING PULP & PAPER'S
POLLUTION PREVENTION STRATEGY



An Alternate Route to Environmental Compliance

IRVING

THE CHALLENGE

Pollution Prevention is the use of processes, practices, materials, products and energy that avoid or minimize the creation of pollutants and waste and reduce the overall risk to human health or the environment. ***— Environment Canada Mission Statement, 1995***

New Options For Environmental Compliance

To meet government regulations most mills went with a conventional secondary treatment lagoon. Treating pollution after it has exited the mill pipe has been the standard technology enabling mills to meet regulations with limited costs. Faced with local opposition to a lagoon, Irving Pulp & Paper underwent a complete Environmental Impact Assessment. Following this assessment and after researching other options, the mill decided to go in an unprecedented direction. Irving Pulp & Paper launched a pollution *prevention* strategy that would see them meet regulations by recovering, reducing and reusing pulp-making materials. Irving Pulp & Paper would break new ground in the industry by preventing pollution at the source, inside the mill, before it exited the pipe. This approach was complementary to the Environment Canada initiative for Pollution Prevention.

The Strategy

Irving Pulp & Paper planned their pollution prevention strategy around the best available technologies of the day. At the time of design there were not enough known technologies to take them all the way to environmental compliance, but they believed that with the rate of technological advancement and the ongoing research, new technology would evolve by the time the known technologies were in place.

PIONEERING CHANGE

1. Objectives Of The Strategy

- Remove, reuse and recycle chemicals and other pulp-making materials.
- Modernize technology to improve efficiency, cost-competitiveness and environmental performance.
- Address community concerns against a conventional secondary treatment lagoon.
- Minimize mill outflow.

Condensate Stripping Column

2. Implementing Best Available Technologies - Highlights

- **Improved Brown Stock Washing** - Recovers more used chemicals and unusable wood components.
- **Closed Brown Stock Screening** – Decreases outflow volume from the mill by recovering dirty process wash water that contains used chemicals and unusable wood components.
- **Elemental Chlorine Free Bleaching** – Replaces former process with more environmentally responsible bleaching agents.
- **Condensate Stripping Column** – Removes wood alcohol for incineration allowing the cleaned water to be reused.

Elemental Chlorine Free Bleaching

Improved Brown Stock Washing

3. Oxygen Delignification

- Decreases amount of chemicals needed in bleaching process by removing unusable wood products.
- Unusable wood products are incinerated and generate heat for the mill.

Oxygen Delignification

Reverse Osmosis

4. Reverse Osmosis

- Filters products from water by using specialized membranes under high pressure. This allows increased recycling and reuse of filtered water.
- Awarded patent for unique application of well-known technology.
- Removes compounds largely responsible for endocrine disruption in fish.

A WORLD 1ST

210 specialized membranes on 5' x 10" spools remove 10 - 15 gallons of concentrated filtrate per minute.

Reverse Osmosis

5. Moving Bed Bioreactor

- Consumes wood alcohols from the largest contributor to the mill's outflow.
- A unique application for the biological system. It had never been used before in the kraft pulping industry in this application.
- This system was the final technology needed to bring the mill into environmental compliance with all the federal regulations.

Moving Bed Bioreactor
3.5 million plastic carriers house bacteria that consume wood alcohol from the largest contributor to the mill's outflow.

6. Environmental Performance Review

- Pioneered advances in pollution prevention technologies in our industry.

- Non-traditional approach to meeting environmental regulations and community concerns.
- Irving Pulp & Paper has discovered new technological application that eliminates their potential for endocrine disruption at Reversing Falls. The University of New Brunswick in Saint John is working in cooperation with Environment Canada to research some of the compounds responsible for endocrine disruption that are removed by Irving Pulp & Paper's reverse osmosis system. Endocrine disruption is an emerging global issue with implications for both humans and wildlife.
- Involved mill employees and experts in the industry to reach significant environmental and scientific milestone.
- Patented applications of new technologies for export potential to pulp mills around the world.

THE NEXT CHAPTER

1. Seek out additional opportunities to further improve our environmental performance.
2. Continue publicizing our progress and results within the industry and academic community.
3. Communicate with the public and interested stakeholders on new industry advances and ongoing progress.

REFLECTIONS

"Implementing this pollution prevention program was an important and innovative step. Many of the technologies are new in their application to the pulp and paper industry, providing greater options to the industry in how they deal with their wastes. The reduction in endocrine disrupters was an unexpected and positive environmental benefit."

- John Clarke, Head of Pollution Control with Environment Canada, Atlantic Region

"Pollution Prevention is a new option the industry has that they didn't have five years ago. This is a technology the company can export."

- Wally Vrooman, President Vrooman Environmental Inc.

"Irving Pulp & Paper is further ahead on the endocrine disrupter issue than probably every other mill in Canada."

- Dr. Deborah MacLatchy, University of New Brunswick Saint John Campus

"When you look at the chemistry of the effluent produced in the pulp making process and what you have to get rid of, you know there's a way either by recycling, reusing or removing elements. We just had to find it."

- Wayne Sprague, Irving Pulp & Paper employee

"Throughout this project there was an excitement and a pride — amongst all of the employees — that we were pioneering new applications of new technologies for export potential to pulp mills around the world."

- Jim Brewster, Production Manager, Irving Pulp & Paper

"This environmental achievement is a tremendous tribute to the teamwork, determination and skills of the men and women at Irving Pulp & Paper. No other mill in the world has done what they have accomplished."

- Jim Irving, President, J.D. Irving, Limited

"In addressing community concerns, a real scientific advancement has been achieved for the industry."

– Willa Mavis, Innkeeper, Inn on the Cove, Saint John, NB

CONTACT US

For more information on Irving Pulp & Paper's innovative approach to pollution prevention, please contact:

Environmental Coordinator

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E-mail:
environmental@irvingpulp.com

Tours are available for individuals and groups.

Please contact Irving Pulp & Paper's Human Resources Department for more information or to set up a tour.
Phone: (506) 635 – 7735

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