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Canada-Nova Scotia Offshore Petroleum Board
1791 Barrington St., 8th Floor TD Centre
Halifax, Nova Scotia B3J 3K9
comments@cnsopb.ns.ca

Re: Strategic Environmental Assessment for the Middle and Eastern Scotian Slope and Sable Island Bank Areas

Dear Canada-Nova Scotia Offshore Petroleum Board,

Thank you for the opportunity to provide comments on the Strategic Environmental Assessment (SEA) for the Middle and Eastern Scotian Slope and Sable Island Bank Areas. WWF-Canada supports SEA processes as they can help to determine whether industrial activities should be carried out and, if so, help ensure that such activities contribute to a region's broader sustainability objectives and are conducted safely with the lowest possible risk to human health and the environment. We commend the Canada-Nova Scotia Offshore Petroleum Board (CNSOPB) for engaging stakeholders and seeking public feedback on the SEA.

World Wildlife Fund (WWF) is one of the largest conservation organizations in the world with projects in more than 100 countries. As part of this global network, WWF-Canada has worked to protect nature in Canada, creating solutions to the environmental challenges that matter most for Canadians. We work in places that are unique and ecologically important, so that wildlife, nature and people can thrive. WWF-Canada believes healthy coastal communities depend on healthy oceans. We work in partnership with Indigenous peoples, coastal communities, and other groups to advocate for marine protected areas and sustainable oceans management, and to ensure the rules governing offshore oil and gas activities are consistent with international best practices for safety, accountability and environmental protection.

WWF-Canada has reviewed the Strategic Environmental Assessment for the Middle and Eastern Scotian Slope and Sable Island Bank prepared by Wood Environment & Infrastructure Solutions. This submission provides an overview of our key concerns and recommendations on how to improve the SEA and what is needed to provide the CNSOPB with the analysis required to accurately assess the potential risks, benefits and viability of offshore oil and gas in Nova Scotia.

Sincerely,

Sigrid Kuehnemund
Vice President, Wildlife and Industry

General Comments

To be effective, a SEA should clearly consider how any proposed development activities are justified as being in the public interest, based on several considerations including, but not limited to, economic factors, and as being superior to numerous possible alternatives, including the ‘no development’ option, in promoting environmental, economic and social sustainability. For instance, any economic benefits of industrial development in the offshore must be weighed against the associated environmental and social impacts, which could have serious consequences for local economies. The goal of the assessment should therefore be to advance the overall well-being of local communities and ecosystems. Whether resources end up benefiting local people or leading to adversity and ecological decline is very much dependent on how well resource development is planned and managed.

It is concerning that the Middle and Eastern Scotian Slope and Sable Island Bank Areas SEA does not consider any other development alternatives or sustainability goals and instead describes only “the nature, purpose, and results of...potential offshore petroleum exploration activities” (page 1). This is a misguided approach from the outset. As WWF-Canada had recommended in our previous submission, petroleum exploration and development is only one of several possible development options for this region and it is likely to be the option with the highest risk both economically and environmentally, as explained below.¹

In addition, it is not clear why an exploratory oil and gas licensing SEA is needed at this time. The CNSOPB’s Call for Bids NS21-1 for the southwestern Scotian Slope, which was issued in May 2021, **resulted in no bids**. The parcels that made up Call for Bids NS21-1 are no longer up for bid and will remain as Crown land. Previous exploration wells in the region have been plugged and abandoned, and development projects have all been decommissioned.

The development of new oil and gas resources in high-cost regions such as the North Atlantic offshore is not promising. In a landmark report earlier this year, the International Energy Agency (IEA) concluded that there can be **no new oil, gas or coal development if the world is to reach net zero emissions by 2050**.² According to the IEA, net zero will require “nothing short of the complete transformation of the global energy system” and massive deployment of all available clean energy technologies – such as renewables, electric vehicles and energy efficient building retrofits – between now and 2030.³ And crucially, this will lead to a “**huge decline in the use of fossil fuels**...There is no need for investment in new fossil fuel supply” in the net zero pathway, according to the IEA.

The world is undergoing an accelerating energy transition, driven by the global consensus that to avoid disaster, the Earth’s overall rise in temperature must be limited to well below 2°C, with a safer aspirational target of 1.5°C.⁴ However, carbon emissions from the full production of currently

¹ For example, see: Organization for Economic Cooperation and Development. 2006. *Applying Strategic Environmental Assessment: Good practice guidance for development cooperation*. Paris. See additional resources in section 4.7 below.

² <https://www.iea.org/reports/net-zero-by-2050>

³ <https://www.iea.org/reports/net-zero-by-2050>

⁴ United Nations Climate Change. The Paris Agreement. <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement> ²¹ See Carbon Tracker Initiative. 2011. Unburnable Carbon – Are the world’s financial markets carrying a carbon bubble? <https://www.carbontracker.org/reports/carbon-bubble/>; M. Raupach et al. 2014. Sharing a quota on cumulative carbon emissions.

operating oil and gas fields and coal mines across the world will lead to a global temperature rise beyond 2°C. To stay within this target, studies indicate that 68-80 per cent of existing global fossil fuel reserves must stay in the ground.⁵ The lowest cost reserves will be burned first, whereas higher priced oil, such as in the North Atlantic offshore, will be much less viable in a low carbon world. Thus, the development of oil and gas resources in the Nova Scotian offshore may not be consistent with international efforts to limit the worst impacts of climate change, may result in stranded assets for fossil fuel companies and/or may require significant public investment to make exploration and production drilling activities economically viable.

Protected and Special Areas

While we are pleased to see that information on the proposed Eastern Canyons marine refuge is now included in the text of the document, it is very confusing as to why the proposed boundaries are not on the map on page 143. This is especially puzzling since the map does include the Fundian Channel-Browns Bank Area of Interest (not Area of Importance as the map says) and the Eastern Shore Islands Area of Interest, both of which are proposed marine protected areas under the *Oceans Act*. All three sites were announced at the same time, with proposed boundaries, and it is concerning that the sites outside the project area were included on the map, but the one that falls within the project area (Eastern Canyons) was excluded. This is extremely pertinent information, especially for potential developers, and makes it seem that this is information the CNSOPB would rather people not see. A new map should be issued that contains this information.

We also note that while the SEA does mention that fisheries closures (such as marine refuges) are known to be sensitive to human activities in the offshore, it is also clear in stating that oil and gas exploration is not explicitly prohibited from marine refuges. Just because there is no explicit prohibition does not mean that the CNSOPB should not or cannot follow the precautionary principle and be proactive in removing a known pressure from areas of known ecological importance and sensitivity.

WWF-Canada continues to attest that oil and gas activities should not be permissible within marine protected areas or other effective area-based conservation measures and recommends that the CNSOPB prohibit offshore oil and gas development in these areas in order to help conserve biodiversity and uphold Canada's commitments to marine conservation under the Convention on Biological Diversity. Page 289 of the SEA notes that the CNSOPB has the authority to approve offshore activities and can therefore limit the potential for overlap and interaction between individual exploration programs and their potential effects. Therefore, the CNSOPB has the authority to proactively put sites off limit to development and should do so for marine refuges such as the Western/Emerald Banks Conservation Area and the soon-to-be designated Eastern Canyons Conservation Area. We agree with the SEA that “though not legally protected under regulations that prevent oil and gas activities, these areas should be considered in environmental planning efforts that aim to prevent harm to marine animals and their habitats especially those special areas identified for the presence of benthic species and habitats

⁵ *Nature Climate Change* 873; Oil Change International. Sept. 2016. The Sky's Limit: Why the Paris Climate Goals Require A Managed Decline of Fossil Fuel Production. (<http://priceofoil.org/2016/09/22/the-skys-limit-report/>)

(e.g., sponges, corals) and marine and migratory birds.” In this case, preventing harm should be to put these sites of limits to development.

While page 151 does note that there are Significant Benthic Areas for large gorgonian corals, small gorgonians corals, sea pens and sponges in the Project Area, it does not provide detail on what mitigations are needed to reduce harm to these habitat forming species. It is also unclear how on page 262, effects on protected and special areas, including coral and sponge communities, are expected to be minimal when on page 264 it was noted that recovery times for cold-water deep-sea species are likely to be longer than decades were they to be impacted by offshore oil and gas activities. There are several instances where the SEA notes that standard mitigations to reduce impacts on corals and sponges include pre-drilling surveys to assess potential presence of sensitive benthic habitats, but it does not say what will happen if these are found. We reiterate findings from the Canadian Science Advisory Secretariat¹ that recommend that for areas with defined benthic conservation areas that the mitigation hierarchy be applied: (1) avoid; (2) mitigate; and (3) offset (though recognizing that offsetting will not be possible for areas with benthic conservation objectives as there is no way to offset these unique, structurally complex habitats). As the first mitigation measure should be to avoid significant benthic areas by eliminating the possibility of interaction, video surveys should be done to confirm the presence or absence of sensitive species and/or habitats, and minimum setbacks applied to planned well and infrastructure locations. The report suggested minimum proposed setbacks for areas with defined conservation objectives as 200 meters from seafloor infrastructure with no expected discharges, and 2 kilometers from any discharge points and/or surface (i.e., floating) infrastructure. It also suggested setback distances of 50 meters from corals and other sensitive benthic species and habitats for associated pipelines.



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WWF-Canada	Review Comment #1
Subject/Topic	Nature, Purpose and Context of the SEA
References	Section 1.1
Summary	SEA mandate is insufficient as it is limited only to potential offshore petroleum activities. International SEA standard practice calls for an analysis of potential development alternatives against a framework of sustainability objectives.
Importance of the issue to the SEA process	To be effective, it is important that a SEA clearly consider how any proposed development activities are justified as being in the public interest, based on several considerations (including, but not limited to, economic factors), and as being superior to numerous possible alternatives, including the ‘no development’ option, in promoting environmental, economic and social sustainability. To this end, a SEA must take a holistic view and not artificially divide potential oil and gas development from other environmental and social issues, including the overall well-being of communities.
Specific Comments	<ul style="list-style-type: none"> • Page 1 of the SEA states “This document describes the nature, purpose, and results of the Strategic Environmental Assessment (SEA) of potential offshore petroleum exploration activities in the Middle and Eastern Scotian Shelf and Sable Island Bank Areas (the Study Area) off southeastern Nova Scotia.” • A primary concern with the CNSOPB’s proposed approach is the absence of any consideration of potential economic alternatives to oil and gas development. This is a critical piece of any SEA according to standard international practice including the OECD’s 2006 report <i>Applying Strategic Environmental Assessment: Good practice guidance for development cooperation</i> and the Arctic Council’s <i>Arctic Offshore Oil and Gas Guidelines</i> • Section 1.1 states that “The CNSOPB approach to SEA broadly aligns with international standards <i>within the context of their mandate to oversee all activities through the full lifecycle of an offshore oil or gas project.</i>” This sentence needs to be clarified with better examples provided of the international standards being referenced here. WWF-Canada disagrees that the CNSOPB approach “aligns with international standards” as the SEA does not consider sustainability goals for the region, nor does it provide justification for the selection

	of offshore oil and gas projects as the option that would “do the most good” ⁶ as opposed to other possible alternatives. ⁷
Recommendation/ Request	The SEA should analyze the potential effects, risks and benefits of the proposed hydrocarbon development and its alternatives, against a framework of sustainability objectives, principles and criteria tailored to Nova Scotia. It must provide explicit justification for the selection of preferred options and for the acceptance of significant trade-offs related to hydrocarbon development and the SEA should include other development options, including the alternative of no action, within the context of agreed-upon sustainability goals for the region.

WWF-Canada	Review Comment #2
Subject/Topic	CNSOPB conflict of interest
References	Section 2.1
Summary	CNSOPB mandate puts the Board in a potential conflict of interest
Importance of the issue to the SEA process	The knowledge, experience and motivations of the people who form the regulatory system are critical. There is a public expectation that risks from offshore petroleum operations will be properly regulated and controlled.
Specific Comments	<ul style="list-style-type: none"> • The CNSOPB’s overall mandate is to apply the provisions of the federal-provincial <i>Accord Acts</i> legislation governing offshore oil and gas activities while ensuring safety of operations and environmental protection. • While there is no doubt that the CNSOPB takes safety and environmental protection very seriously, the industry is attempting increasingly technically ambitious operations in very deep water. In the Scotian Slope, for instance, drilling could occur in nearly 3,000 meters of water. The responsibility of the CNSOPB for environmental protection may be inappropriate given that the Board is also mandated to ensure economic benefits from oil and gas, according to the Accord Acts.⁸ Article 35.01 of the <i>Canada-Nova Scotia Offshore Petroleum Resources Accord Act</i> states unequivocally that the Parties (Canada and Nova Scotia) shall “encourage interest holders to actively pursue the goal of early commercial oil and gas production” and the CNSOPB was thus established by the Accord to “act in all such matters relating to petroleum resources <i>in accordance with this Accord.</i>” Thus, the Board is obligated under the Accord Act to act in accordance with the goal of actively pursuing the goal of oil and gas production.

⁶ International Centre for Environmental Management. 2014. Introduction to Strategic Environmental Assessment: Purpose, Principles and Process. <https://www.slideshare.net/ICEM-Centre-Environmental-Management/sea-introduction>

⁷ For example, see: Organization for Economic Cooperation and Development. 2006. *Applying Strategic Environmental Assessment: Good practice guidance for development cooperation*. Paris. See additional resources in section 4.7 below.

⁸ <https://www.cnsopb.ns.ca/sites/default/files/resource/accord.pdf>

	<ul style="list-style-type: none"> In this context, we believe the Board may be in a perceived or real conflict of interest or even experiencing regulatory capture given their mandate to both actively “pursue the goal of commercial oil and gas production” while also ensuring safety and environmental protection. As such, in the past some community groups have perceived the Board as existing to support oil activity rather than to promote environmental protection.⁹ Representatives from the fishing industry and local communities have also expressed concern that the Board has been “partly co-opted by the petroleum industry.”¹⁰
Recommendation/ Request	Investigations into previous offshore accidents, such as the BP Deepwater Horizon disaster in 2010 and the Piper Alpha explosion in 1988, have highlighted the critical importance of clearly separating under different agencies the responsibility to help enable oil production from the need to manage safety and protect the environment. ^{11,12}

WWF-Canada	Review Comment #3
Subject/Topic	Accident Risk
References	None
Summary	The SEA makes no attempt to assess or quantify the risk of oil spills or major accidents, nor does it indicate what the potential consequences of a major oil spill on the regional environment might be.
Importance of the issue to the SEA process	Given the extreme consequences involved with a spill event in the North Atlantic, the risk profile of offshore drilling will be necessary to ensure effective and efficient spill response.
Specific Comments	<ul style="list-style-type: none"> Although the likelihood of a major spill in the region would be low, the high magnitude impact of such an event, were it to occur, makes the overall risk profile medium to high. Past experience shows that the CNSOPB cannot leave it up to oil companies to assess the risk of their own operations. For example, in its drilling proposal for the Scotian Basin Exploration Drilling Project, the oil giant BP significantly downplayed the likelihood of an uncontrolled blowout, according to independent expert analysis.¹³ “Contrary to the CEAA’s Environmental Impact Statement Preparation Guidelines, the risks of accidents and malfunctions have not been properly assessed, documented and validated. BP’s assessment of the likelihood of an uncontrolled blowout is much too low, based on the Nova Scotia exploratory drilling conditions. BP’s assessment of the consequences of an uncontrolled blowout are based on

⁹ Fusco, Leah. "The Invisible Movement: The Response of the Newfoundland Environmental Movement to the Offshore Oil Industry." Memorial University, 2007, p. 87-97.

¹⁰ Shrimpton, Mark, Boris de Jonge, Lucia McIsaac, and Sean Cadigan. "Atlantic Canada Offshore Petroleum Exploration Rights Permitting Study." St. John's: Atlantic Canada Petroleum Institute, 2003, p. 20.

¹¹ <https://www.cbc.ca/news/canada/newfoundland-labrador/deepwater-horizon-commissioner-comparisons-to-nl-1.5253251>

¹² <https://www.govinfo.gov/content/pkg/GPO-OILCOMMISSION/pdf/GPO-OILCOMMISSION.pdf>

¹³ <https://www.halifaxexaminer.ca/featured/the-worlds-top-expert-on-deep-sea-drilling-disasters-worries-about-the-relatively-high-likelihoods-of-a-blowout-at-bps-scotian-shelf-operation/>

	<p>unsubstantiated assessments of the times required for successful mobilization of blowout preventer capping stack, and if required, drilling a relief well. Both the short and long-term ‘consequences’ of the oil and gas released to the environment have been significantly underestimated.”</p> <ul style="list-style-type: none"> • Finally, it is possible that exploration drilling in the project area could be taking place in deep water, far offshore and may entail drilling ‘high pressure, high temperature’ (HPHT) wells. The severity of the kick (which precedes a blowout scenario) will depend on the porosity and the permeability of the formation. If HPHT drilling wells are required, the blowout risk tends to be much higher.
Recommendation/ Request	<p>It would be useful for the SEA to provide a numeric estimate of the potential likelihood of a well blowout or major spill in the North Atlantic should oil and gas activity proceed in the offshore and what the potential consequences would be. The SEA Report should have acknowledged the medium-high risk level of offshore oil and gas operations due to the high magnitude consequences of such an event.</p> <p>When assessing the risk of a deep water well blowout, the CNSOPB must consider the possible <i>consequences</i> of an accident along with its potential <i>likelihood</i>. While it may be true that the likelihood of a blowout is very small, the <i>consequences</i> of such an event would be more devastating in the Atlantic offshore than elsewhere, due to the difficulty of ensuring adequate oil spill response in remote offshore locations (hundreds of kilometers from shore) under sometimes extreme weather conditions and exceptionally cold water.</p>

WWF-Canada	Review Comment #4
Subject/Topic	Oil Spill Response Capacity
References	Section 2.2.2
Summary	Spill response capabilities in deep water offshore not assessed
Importance of the issue to the SEA process	Due to the risk profile of offshore oil and gas in the north Atlantic and the extreme consequences involved with a spill event, effective and efficient spill response will be of critical importance
Specific Comments	<ul style="list-style-type: none"> • As noted on page 14, “The CNSOPB requires each offshore operator to prepare a spill response plan to address spill prevention and response for accidental spills of hydrocarbons and unauthorized discharges. These plans include contingency measures to address extreme weather scenarios, potential health effects on responders, and interactions with other ocean users. Each operator is also expected to take preventative steps to avoid spills, leaks and discharges and contain any that occur.”

	<ul style="list-style-type: none"> • Page 17 notes the required procedures and practices but does not state that some standard response devices and equipment are not required on drilling sites by the CNSOPB. These include blowout preventers (BOPs) and relief drilling rigs. • Page 302: “Based on the available information regarding commercial marine fisheries likely to occur in the Study Area, particular consideration should be given to intensively fished areas and times to help avoid or reduce potential interactions between the oil and gas and fishing sectors within the Study Area. A variety of commercial fisheries occur within and throughout the Study Area and adjacent regions.” • Thus, the consequences of a major spill in the region could be serious, yet the SEA does not assess the actual capability of industry or government in responding to a spill hundreds of kilometers offshore in potentially severe weather conditions. • Currently, the CNSOPB does not require that operators keep any subsea containment resources (capping stacks, domes or relief drilling rigs) on or near the project sites during drilling operations, nor are containment devices kept on standby in Halifax or even anywhere on the Atlantic seaboard for that matter. Instead, in the event of a subsea well blowout, the Board allows operators to mobilize capping stacks from either Norway or Brazil by sea, which can take a month to arrive. An uncontrolled well blowout for this length of time, however unlikely, would be devastating to the marine environment and fishery resources within the region as most of the oil would likely never be cleaned up. • It should be noted that in Alaska, operators are required to have a capping stack be onsite within 24 hours of a well blowout.¹⁴ Should the capping stack fail as it did in the Deepwater Horizon blowout, it could take up to 4 months for a relief drilling rig to plug an out-of-control well, an unacceptably long period of time. Every additional day required to cap a blowout corresponds with potentially hundreds of thousands of liters of oil being released into the marine environment.
<p>Recommendation/ Request</p>	<p>The CNSOPB must consider what additional accident prevention measures unique to the Nova Scotian offshore should be put in place before any exploration drilling programs are approved.</p> <p>The CNSOPB will also need to consider the most effective spill response tactics including mechanical containment, natural degradation, chemical dispersion and in situ burning. All of these have drawbacks and limited effectiveness depending on the environmental conditions at the time. In the event of a major spill, it is likely that much of the oil would never be recovered given the remote location of the project area and the probability of adverse weather conditions.</p>

¹⁴ <https://www.federalregister.gov/documents/2016/07/15/2016-15699/oil-and-gas-and-sulfur-operations-on-the-outer-continental-shelfrequirements-for-exploratory>

WWF-Canada	Review Comment #5
Subject/Topic	Seismic Testing Impacts
References	Various page references in the SEA
Summary	Treatment of seismic is incomplete, sometimes incorrect and contains scientifically unsubstantiated conclusions and misleading statements, which all tend in the direction of downplaying the harm and risk seismic surveys pose to marine life. Assessment of seismic mitigation measures is also sometimes incorrect or unproven and tends to overstate the effectiveness of proposed mitigation measures, which have largely been developed by industry and regulators and are not necessarily supported by evidence.
Importance of the issue to the SEA process	Research indicates that seismic blasting can harm marine wildlife. To date 130 species have been documented to be impacted by human-caused underwater noise pollution, including plankton, benthic organisms, whales, invertebrates, some fish species, narwhals, harbour porpoises, squid and shrimp. ¹⁵
Specific Comments	<ul style="list-style-type: none"> • Seismic surveys typically consist of 18-48 airguns, all firing simultaneously every 10 seconds, around the clock. • Underwater sounds can travel thousands of kilometers under the right conditions, meaning that effects would not be limited to within “50 km” as stated on page 240 of the SEA or necessarily “return to baseline after the sound source is removed”.¹⁶ • In fact, Weilgart reviewed 115 primary studies showing over 100 species have been documented to be impacted by human-caused underwater noise pollution, including plankton, benthic organisms, whales, invertebrates, some fish species, narwhals, harbour porpoises, squid and shrimp. The SEA final report must clarify why the impacts and negative effects demonstrated in these 115 primary studies do not apply in this case. • The “standard” mitigation measures listed on page 235 of the SEA have largely been developed by industry and regulators; they are not always supported by research; and they are in some cases unproven in their effectiveness. Spawning grounds and eggs are not easily detected, and not enough is known about the location of many spawning grounds in the north Atlantic. It is unknown what a truly “safe distance” is for seismic programs, and negative effects beyond the horizon, such as masking, cannot be easily mitigated. • For mammal monitoring from a seismic vessel, most whales are rarely visible at the surface, especially the deep divers (Northern bottlenose whales) and especially in anything but perfect visibility. Quantitative analysis has

¹⁵ Weilgart, L., 2018. The impact of ocean noise pollution on fish and invertebrates. *Report for OceanCare, Switzerland*. https://www.oceancare.org/wp-content/uploads/2017/10/OceanNoise_FishInvertebrates_May2018.pdf

¹⁶ Holles, S., Simpson, S.D., Radford, A.N., Berten, L. and Lecchini, D., 2013. Boat noise disrupts orientation behaviour in a coral reef fish. *Marine Ecology Progress Series*, 485, pp.295-300.

	<p>shown that mitigation monitoring detects fewer than 2 per cent of beaked whales (e.g. Northern bottlenose whale) even if the animals are directly in the path of the ship (see below: Barlow 2006).</p> <ul style="list-style-type: none"> • The safety radius is dependent on the sound transmission conditions which change with bathymetry, nature of the seafloor, salinity, and the sound speed profile which can change between seasons. A 500m safety zone is an arbitrary radius that has no basis in research to be effective. • Ramp ups or soft starts don't necessarily cause avoidance and can't be counted on to clear an area of marine life. • We may not know the exact details of which organisms will be harmed by seismic airgun noise and to what degree, but this does not mean that the negative effects will be limited to the immediate area, will stop once oil and gas activities cease, and that the effects will be reversible. More research is needed, and the precautionary approach should be applied for those species in which seismic impacts are unknown or uncertain.
<p>Recommendation/ Request</p>	<p>WWF-Canada recommends that the CNSOPB review the additional studies provided in this section, in addition to the ones provided below. Thorough, long-term studies will also need to be carried out to get robust baseline biological information on the distribution and abundance of valued ecosystem components such as belugas, right whales, bowhead whales, fin whales, Northern bottlenose whales, harbour porpoises, cod, Greenland halibut, clams, mussels, squid, and shrimp, all of which are present in the area. The long-term impacts of seismic airgun noise, together with threats such as climate change and ocean acidification, on the ecosystem and population biology should be thoroughly studied.</p> <p>Aguilar de Soto, N., N. Delorme, J. Atkins, S. Howard, J. Williams, and M. Johnson. 2013. Anthropogenic noise causes body malformations and delays development in marine larvae. <i>Scientific Reports</i> 3, Article number: 2831.</p> <p>André, M., Solé, M., Lenoir, M., Durfort, M., Quero, C., Mas, A., Lombarte, A., Van der Schaar, M., López-Bejar, M., Morell, M. and Zaugg, S., 2011. Low-frequency sounds induce acoustic trauma in cephalopods. <i>Frontiers in Ecology and the Environment</i>, 9(9), pp.489-493.</p> <p>Barlow, J. and Gisiner, R., 2006. Mitigating, monitoring and assessing the effects of anthropogenic sound on beaked whales. <i>Journal of Cetacean Research and Management</i>, 7(3), pp.239-249.</p> <p>Cosens, S.E. and Dueck, L.P., 1993. Icebreaker noise in Lancaster Sound, NWT, Canada: Implications for marine mammal behavior. <i>Marine Mammal Science</i>, 9(3), pp.285-300.</p> <p>Day, R.D., McCauley, R.D., Fitzgibbon, Q.P., Hartmann, K. and Semmens, J.M., 2017. Exposure to seismic air gun signals causes physiological harm and alters behavior in the scallop <i>Pecten fumatus</i>. <i>Proceedings of the National Academy of Sciences</i>, 114(40), pp. E8537-E8546.</p> <p>Finley, K.J., Miller, G.W., Davis, R.A., and Greene, C.R., 1990. Reactions of belugas, <i>Delphinapterus leucas</i>, and narwhals, <i>Monodon monoceros</i>, to ice-breaking ships in the Canadian high arctic. <i>Canadian Bulletin of Fisheries and Aquatic Sciences</i>, 224, pp.97-117.</p>

	<p>Götz, T. and Janik, V.M., 2011. Repeated elicitation of the acoustic startle reflex leads to sensitization in subsequent avoidance behaviour and induces fear conditioning. <i>BMC neuroscience</i>, 12(1), p.30.</p> <p>McCauley, R.D., Day, R.D., Swadlow, K.M., Fitzgibbon, Q.P., Watson, R.A. and Semmens, J.M., 2017. Widely used marine seismic survey air gun operations negatively impact zooplankton. <i>Nature Ecology & Evolution</i>, 1(7), pp.1-8.</p> <p>Simpson, S.D., Munday, P.L., Wittenrich, M.L., Manassa, R., Dixon, D.L., Gagliano, M. and Yan, H.Y., 2011. Ocean acidification erodes crucial auditory behaviour in a marine fish. <i>Biology Letters</i>, 7(6), pp.917-920.</p> <p>Solé, M., Lenoir, M., Fortuño, J.M., Durfort, M., Van der Schaar, M. and André, M., 2016. Evidence of Cnidarians sensitivity to sound after exposure to low frequency underwater sources. <i>Scientific reports</i>, 6, p.37979.</p> <p>Solé, M., Sigray, P., Lenoir, M., Van Der Schaar, M., Lalander, E. and André, M., 2017. Offshore exposure experiments on cuttlefish indicate received sound pressure and particle motion levels associated with acoustic trauma. <i>Scientific reports</i>, 7, p.45899.</p>
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WWF-Canada	Review Comment #6
Subject/Topic	Well Blowouts and Major Spills
References	Section 2.3
Summary	The SEA notes two blowouts in Canadian waters but neglects to mention other accidents in the Atlantic offshore
Importance of the issue to the SEA process	The impact of a well blowout or major spill in the north Atlantic could be catastrophic due to heightened sensitivity of the marine environment to pollution and the difficulty of ensuring adequate oil spill response in remote locations under extreme weather conditions with potential sea ice.
Specific Comments	<p>Page 15 identified two blowouts and other accidental events in Atlantic Canada but neglects to mention the following:</p> <ul style="list-style-type: none"> • In June 2018, BP Canada reported an accident in which 136,000 liters of toxic drilling mud was spilled from its West Aquarius platform off the cost of Halifax. The incident occurred less than four months after Environment and Climate Change Canada approved the drilling project after concluding that it was unlikely to cause significant environmental damage. • In November 2018, the Husky Sea Rose drilling platform off the coast of Newfoundland spilled at least 225,000 liters of crude oil into the North Atlantic, the largest spill in the province’s history, after Husky attempted to re-start operations during an extremely violent storm, which led to a flowline being disconnected. Currently in Canada, offshore oil and gas regulators do not have the authority to tell companies when it’s safe to restart operations; rather it’s left up to operators to decide for themselves.

	<ul style="list-style-type: none"> • Some experts have estimated that a “horrendous” number of sea birds, possibly over 100,000, may have been killed as a result of the Sea Rose spill.¹⁷ This was the second serious incident by Husky Energy’s SeaRose FPSO in the last few years. In May 2017, a huge iceberg came within 180 meters of the same vessel, so close that the crew were told to “brace for impact,” yet oil production was not halted.¹⁸ • That three serious incidents could occur over such a short time span indicates the hazards common in the North Atlantic and highlights the need for adequate preventative measures to ensure that a major spill never takes place and for an extremely effective oil spill response strategy on the part of the operator. Oil spill response in the North Atlantic is challenging because of extreme weather, sea ice and environmental conditions, logistical challenges and significant distances. Remote locations mean response times for large-scale cleanup and storage equipment can be much longer than in more southern locations. Cold air and water temperatures persist for much of the year in the region with rain, blowing snow, fog, gale-force winds and periods of darkness limiting visibility.
Recommendation/ Request	Future research is needed to assess the capacity and infrastructure required to deal with a well blowout or major spill in the north Atlantic and to determine whether an effective response can be mounted in remote locations under harsh weather conditions. The report should also acknowledge the accidents listed above and indicate that there have been many other extremely serious blowouts and offshore accidents over the last 40 years around the world.

WWF-Canada	Review Comment #7
Subject/Topic	Chronic pollution from oil platforms
References	<i>Section 2.2.1 and chapter 5</i>
Summary	Some impacts from chronic pollution may be more significant than indicated in the SEA
Importance of the issue to the SEA process	While the environmental impacts of a single small spill, leak or intentional discharge are likely to be minimal, the cumulative impacts of many small spills or ongoing, chronic pollution can be significant. These impacts may persist in the offshore environment for many years.
Specific Comments	<ul style="list-style-type: none"> • Page 239 states that environmental effects of offshore oil and gas operations can include “Possible contamination of marine wildlife and their habitats or feed sources as a result of environmental discharges due to planned project activities and/or accidental events (such as drill wastes, deck drainage, large spills);” and “Possible alteration of benthic habitats due to the discharge and deposition of drill cuttings, placement of other infrastructure or equipment or other activities, as well as possible accidental spills.”

¹⁷ Stokes, C. Think few reported oiled seabirds is good news? Not so fast, says MUN biologist. *CBC News*.

<https://www.cbc.ca/news/canada/newfoundland-labrador/searose-spill-seabird-threat-1.4914730>

¹⁸ <https://www.cbc.ca/news/canada/newfoundland-labrador/husky-energy-searose-production-federal-court-application-1.4658934>

	<ul style="list-style-type: none"> • Experiments into the impacts of sediments from offshore drilling activities, including large amounts of drilling cuttings have shown a significant reduction in number of taxa, abundance, biomass and diversity when cuttings were added to natural sedimentation thresholds.¹⁹ • The disturbance caused by drilling has been shown to have an impact on deep-water megafaunal density and diversity, for example, with recovery and recolonization being only partial after 3 years, and the effects of such activities being still visible after a decade.²⁰ • Discharges of water-based and low-toxicity oil-based drilling muds and produced water can extend over 2 km, while the ecological impacts at the population and community levels on the seafloor are most commonly about 200–300 m from their source. These impacts may persist in the deep sea for many years and likely longer for its more fragile cold-water ecosystems that recover very slowly from disturbance. Cold water benthic corals and sponges play a critical primary productivity role for many marine organisms.
Recommendation/ Request	<p>We recommend that the CNSOPB consult the sources noted in this section to better understand the potential cumulative impacts of ongoing chronic pollution from oil platforms, in addition to: Cordes, Erik E. et al. Environmental Impacts of the Deep-Water Oil and Gas Industry. Environmental Science. September 2016. https://www.frontiersin.org/articles/10.3389/fenvs.2016.00058/full</p>

WWF-Canada	Review Comment #8
Subject/Topic	Greenhouse gas (GHG) emissions from shipping traffic (cumulative effects)
References	<i>5.2.1</i>
Summary	Air emissions from shipping vessels are noted in the SEA as a potential environmental disturbance that should be mitigated but the SEA does not give sufficient treatment to the contribution of shipping to the climate crisis.
Importance of the issue to the SEA process	As the number of vessel voyages rises due to offshore development so do greenhouse gas emissions.
Specific Comments	<ul style="list-style-type: none"> • Recent findings from the Intergovernmental Panel on Climate Change (IPCC) special report on the impacts of global warming finds that limiting warming to 1.5°C would require “rapid and far-reaching” transitions in land, energy, industry, buildings, transport, and cities. Global net human-caused emissions of carbon dioxide would need to fall by about 45 per cent from 2010 levels by 2030, reaching ‘net zero’ around 2050.²¹

¹⁹ Schaanning, M. T., H. C. Trannum, S. Øxnevad, J. Carroll & T. Bakke, 2008. Effects of drill cuttings on biochemical fluxes and macrobenthos of marine sediments. *Journal of Experimental Marine Biology and Ecology* 361: 49–57.

²⁰ Jones, D. O. B., A. R. Gates & B. Lausen, 2012. Recovery of deep-water megafaunal assemblages from hydrocarbon drilling disturbance in the Faroe-Shetland channel. *Marine Ecology Progress Series* 461: 71–82.

²¹ <https://www.ipcc.ch/report/sixth-assessment-report-working-group-i/>

	<ul style="list-style-type: none"> • For the shipping sector, the International Maritime Organization (IMO) framework agreement on GHG reductions has committed ‘...to peak GHG emissions from international shipping as soon as possible and to reduce the total annual GHG emissions by at least 50% by 2050 compared to 2008...’.²² Specifically, international shipping's carbon budget under a 2°C global warming scenario is 33 Gt of CO₂, a 1.5°C scenario allows for only 18 Gt. Given this reality, ‘rapid and far reaching’ transformation within the shipping sector is imperative to reach these goals.
Recommendation/ Request	Consideration should be given to project specific GHG reduction targets for offshore support vessels.

WWF-Canada	Review Comment #9
Subject/Topic	Cumulative Effects
References	Section 7.2
Summary	As industrial activity in the North Atlantic rises so do the pressures on and risks to marine life through cumulative effects, many of which are not well understood. The SEA should have indicated where more research is required before any oil and gas activities take place.
Importance of the issue to the SEA process	Describing and evaluating cumulative effects was identified by the CNSOPB as one of the key purposes and objectives of the SEA. Oil and gas activities would be introduced into an environment that is already under pressure from the effects of climate change and related ocean acidification, species migrations northward, discharge of wastewater, increasing ship traffic and related pollution, and the risk of invasive species
Specific Comments	<ul style="list-style-type: none"> • Section 7.2 acknowledges the possibility for cumulative effects and identifies several important impacts that may arise. It also correctly states that project-specific analyses would be required to understand the nature, magnitude and spatial and temporal distribution of any environmental effects from future oil and gas projects. • The report indicates that cumulative effects to marine habitat can be understood through “approaches and methods that allow for an analysis and consideration of the effects of past, present and reasonably foreseeable future projects and activities” (pg. 291-2). However, direct studies of natural recovery from drilling in deep water are lacking and the cumulative effects of multiple drilling wells have not been well-studied.²³
Recommendation/ Request	The SEA identified many possible cumulative effects but declined to evaluate precisely how future oil and gas activities would or could exacerbate impacts on marine wildlife and ecosystems. More research is needed on the cumulative effects of multiple drillings wells on the north Atlantic marine environments.

²² <https://www.imo.org/en/MediaCentre/HotTopics/Pages/Reducing-greenhouse-gas-emissions-from-ships.aspx>

²³ Cordes, E. et al. September 2016. ‘Environmental Impacts of the Deepwater Oil and Gas Industry: A Review to Guide Management Strategies. *Frontiers in Environmental Science*. <https://doi.org/10.3389/fenvs.2016.00058>

WWF-Canada	Review Comment #10
Subject/Topic	Chemical spill dispersants
References	5.1.3.1.4
Summary	The potential ecological consequences of adding dispersants to an oil spill are not well understood
Importance of the issue to the SEA process	The application of chemical dispersants must be proven to have a net environmental benefit before they are used.
Specific Comments	<ul style="list-style-type: none"> • Page 245 correctly identifies some of the risks and deleterious impacts of applying chemical dispersants such as Corexit to “break down oil into small droplets, creating a larger surface area for accelerated microbial degradation of spilled oil.” The potential ecological consequences of the physical and toxicological properties of dispersed oil are far from fully understood. Broadcasting dispersants can sometimes compound the ecological damage of oil spills. The impacts to plankton communities, which are the foundation of marine food webs and the impacts to the seabed are detrimental.²⁴ • Paris et al. (2018) found that, given the potential for toxic chemical dispersants to cause environmental damage by increasing oil bioavailability and toxicity while suppressing its biodegradation, unrestricted dispersant application in response to deep-sea blowout is highly questionable and more research is required to inform response plans in future oil spills
Recommendation/Request	<p>Given the serious health consequences to marine life, the application of chemical dispersants to oil spills must only take place where a net environmental benefit has been proven. Please review the following additional studies for inclusion:</p> <p>Buskey, E., H. White, and A.J. Esbaugh. 2016. <i>Impact of Oil Spills on Marine Life in the Gulf of Mexico: Effects on Plankton, Nekton, and Deep-Sea Benthos</i>. <i>Oceanography</i> 29(3): 174-181.</p> <p>Paris, C. B. et al. 2018. BP Gulf Science Data Reveals Ineffectual Subsea Dispersant Injection for the Macondo Blowout. <i>Frontiers in Marine Science</i>. November 2018.</p>

WWF-Canada	Review Comment #11
Subject/Topic	Economic benefits of offshore oil and gas to local communities
References	None

²⁴ Buskey, E., H. White, and A.J. Esbaugh. 2016. *Impact of Oil Spills on Marine Life in the Gulf of Mexico: Effects on Plankton, Nekton, and Deep-Sea Benthos*. *Oceanography* 29(3): 174-181.

Summary	While local communities will bear the majority of the risks and will be affected by impacts of offshore oil and gas development, the potential economic benefits for these communities of offshore oil and gas remain unclear.
Importance of the issue to the SEA process	One of the fundamental objectives of any SEA is to give stakeholders an overview of the potential benefits and risks of a possible development program in comparison with other options.
Specific Comments	<ul style="list-style-type: none"> • The SEA process has not attempted to assess the possible economic benefits to local communities in sufficient detail at various scales of oil and gas development. • Without having at least some idea of the potential benefits in relation to the risks, it is difficult for communities to make an informed assessment about offshore oil and gas.
Recommendation/ Request	A balanced assessment of the true costs, benefits and risks of offshore oil and gas is critical for local communities to understand what is at stake. A future cost-benefit analysis must consider the impacts at the local level in order for communities to be able to make informed assessments.

WWF-Canada	Review Comment #12
Subject/Topic	Economic Alternatives to Oil and Gas
References	N/A
Summary	There are a number of promising economic development alternatives to offshore oil and gas in Nova Scotia, including sustainable fisheries, eco-tourism, and renewable energy opportunities, which are likely less risky and more sustainable over the long term.
Importance of the issue to the SEA process	According to standard international practice, a critical piece of any comprehensive SEA is the consideration of potential economic alternatives to the proposed activity, in this case oil and gas. The SEA cannot be considered complete without consideration of such alternatives.
Specific Comments	<ul style="list-style-type: none"> • The OECD's 2006 report '<i>Applying Strategic Environmental Assessment: Good practice guidance for development cooperation</i>' recommends the inclusion of economic alternatives.²⁵ • The Arctic Council's 'Arctic Offshore Oil and Gas Guidelines' specifies in section 3.5 (Environmental Impact Assessment) that "<i>This discussion should include an evaluation of the different alternatives and the reasons for choosing the selected activity.</i>"²⁶

²⁵ https://read.oecd-ilibrary.org/development/applying-strategic-environmental-assessment_9789264026582-en#page1

²⁶ <https://oaarchive.arctic-council.org/bitstream/handle/11374/63/Arctic-Guidelines-2009-13th-Mar2009.pdf?sequence=1&isAllowed=y>

	<ul style="list-style-type: none"> • Canada’s Cabinet Directive on SEA practice also includes a discussion on the need for economic alternatives as part of SEA practice.²⁷ “A critical aspect of any strategic environmental assessment is the opportunity to evaluate and compare the environmental effects of alternatives in the development of a new policy, plan or program.” • Offshore oil and gas is only one of a number of possible development options. An SEA limited only to considering the impacts/benefits of oil and gas may lead to the misleading conclusion that there are no other viable ways to meet the development needs of Nova Scotians.
Recommendation/ Request	Before any decision is made on the future of offshore oil and gas in Nova Scotia, robust and reasonable development alternatives to oil and gas, such as the ones discussed in Section 9, must be analyzed for future consideration.

WWF-Canada	Review Comment #13
Subject/Topic	Downstream greenhouse gas emissions
References	N/A
Summary	Downstream emissions were not considered in the SEA
Importance of the issue to the SEA process	Consideration of greenhouse gas emissions can alter the balance of costs and benefits of offshore oil and gas projects, which can thereby influence the views of stakeholders, as well as the ability of the governments and regulators to justify approving a project in light of that balance.
Specific Comments	<ul style="list-style-type: none"> • Canada’s greenhouse gas footprint roughly doubles with inclusion of emissions associated with the foreign combustion of oil produced in Canada. Development of oil and gas resources in the north Atlantic appear to be incompatible with efforts to limit average global warming to 2°C, let alone the safer aspirational target of 1.5°C.²⁸ <ul style="list-style-type: none"> • In a much-publicized report in May of this year, the International Energy Agency (IEA) analyzed what meeting this net zero pathway means in terms of new fossil fuel development. The Agency concluded that “There is no need for investment in new fossil fuel supply in our net zero pathway.” • The CNSOPB continues to pursue a course that, if successful, would only exacerbate the climate crisis and is directly at odds with what the IEA, the IPCC and climate science say is required if we are to have any hope of averting the worst consequences of catastrophic climate change. • To reach targets set under the Paris Agreement, scientific studies indicate that 68-80 per cent of existing global fossil fuel reserves must stay in the ground.²⁹ A transition to renewable energy is incompatible with development of the undiscovered and relatively expensive resources in the offshore north Atlantic.

²⁷https://www.canada.ca/content/dam/iaac-acei/documents/strategic-environmental-assessment/cabinet-directive-environmental-assessment-policy-plan-program-proposals/cabinet_directive_on_environmental_assessment_of_policy_plan_and_program_proposals.pdf

²⁸ McGlade, C. and Ekins, P., The geographical distribution of fossil fuels unused when limiting global warming to 2° C, 517 Nature 187 (2015).

²⁹ <https://www.nature.com/articles/s41586-021-03821-8>

Recommendation/ Request	The CNSOPB should analyze the downstream greenhouse gas (GHG) emissions at various possible <i>scales</i> of offshore oil and activity to determine if and to what extent offshore oil can be developed within national and international carbon reduction targets.
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WWF-Canada	Review Comment #14
Subject/Topic	Upstream greenhouse gas emissions
References	N/A
Summary	The SEA did not provide any estimates of greenhouse gas emissions associated with offshore oil and gas activity.
Importance of the issue to the SEA process	Consideration of greenhouse gas emissions can alter the balance of costs and benefits of offshore oil and gas projects, which can thereby influence the views of stakeholders, as well as the ability of the governments and regulators to justify approving a project in light of that balance.
Specific Comments	Cumulative greenhouse gas emissions under various feasible <u>scales</u> of development in Nova Scotia will be an important factor for many citizens and concerned groups. Even one offshore platform will produce an additional half megaton (500,000 tons) of GHGs annually according to Nunami Stantec, ³⁰ which is roughly equivalent to putting an additional 100,000 passenger vehicles on Canadian roads. This comes at a time when Canada (and the world) is not on track to meet its Paris commitments and must decrease emissions substantially.
Recommendation/ Request	Potential greenhouse gas emissions from an offshore and gas industry in Nova Scotia must be analyzed at various scales of development. There is a vast difference in emissions between one drilling platform and many dozens. The CNSOPB must consider to what extent large- and small-scale offshore development would impact GHG emissions targets provincially and federally.

WWF-Canada	Review Comment #15
Subject/Topic	Stranded Assets
References	N/A
Summary	The oil market is incredibly volatile at the moment, and the SEA did not consider the impact of the ‘Net Zero Pathway’ (International Energy Agency, World Energy Outlook) on the viability of north Atlantic offshore oil. If the global community acts to radically reduce greenhouse gas emissions in the coming years (as demanded by climate science), it is likely that relatively expensive north Atlantic offshore oil and gas will not be economically viable.

³⁰
<https://www.nirb.ca/publications/strategic%20environmental%20assessment/180601-17SN034-Environmental%20Setting%20and%20Review%20of%20Potential%20Effects%20Report-IEDE.pdf>

Importance of the issue to the SEA process	All the expense and environmental risks of oil and gas exploration could leave Nova Scotia and Canada with stranded oil & gas assets that cannot be used and have negatively impacted existing industries that rely on an intact environment (e.g., fisheries, tourism).
Specific Comments	<ul style="list-style-type: none"> • Cost thresholds of the breakeven profitability point for offshore oil and gas operations in the region are not considered in the SEA. The context of global energy supply and demand is also not adequately represented. The World Energy Outlook 2018 notes that:³¹ <ul style="list-style-type: none"> • Oil prices will be volatile for the foreseeable future • Under the “Sustainable Development Scenario”, both demand and production of oil drop precipitously • It is also noted in the report that 70 per cent of future investments in oil and gas production are government policy dependent, so government policy will strongly influence the business case for oil and gas moving forward.
Recommendation/Request	Include the various scenarios for world energy. Include the time-dependence of oil and gas development, understanding that no revenues will come from these projects, if they are undertaken, for 20 years.

WWF-Canada	Review Comment #16
Subject/Topic	External Events impacting oil and gas development
References	N/A
Summary	The SEA did not consider policies and regulations that may impact future oil and gas development in Nova Scotia.
Importance of the issue to the SEA process	Existing and future climate policies may have a huge impact on the viability of oil and gas projects.
Specific Comments	References to major pieces of climate policy are not included in the SEA.
Recommendation/Request	<p>The following items must be considered as external policies that could influence the viability of offshore oil and gas in Nova Scotia:</p> <ul style="list-style-type: none"> • The Pan-Canadian Framework for Clean Growth and Climate Change³² • The Canadian Carbon Tax, and other pollution taxes/disincentives that may come (e.g., ban on single-use plastics) • International commitments on GHG emissions as a result of the IPCC

³¹ <https://www.iea.org/weo2018/fuels/>

³² <https://www.canada.ca/en/services/environment/weather/climatechange/pan-canadian-framework/climate-change-plan.html>

WWF-Canada	Review Comment #17
Subject/Topic	Underwater noise from shipping traffic (cumulative effects)
References	<i>5.2.3 Residual Environmental Effects</i>
Summary	The SEA did not fully consider how underwater shipping noise as a result of oil and gas activity can be mitigated.
Importance of the issue to the SEA process	The development of offshore oil and gas related activities results in an increase in offshore support vessels, which will turn up the volume of underwater noise in Baffin Bay and Davis Strait to which marine mammals are exposed.
Specific Comments	<ul style="list-style-type: none"> • Many marine species, including most mammals, many fish, and perhaps even some invertebrates rely on sound for sensing their environment, finding prey, avoiding predators, communicating with other members of their species, and facilitating mating. • Ship noise is generated primarily from propeller cavitation, propeller singing, and propulsion or other reciprocating machinery. This noise can have short- and long-term effects on marine mammals, including changes in behavior, masking of important sounds, temporary or permanent hearing loss, physiological stress, and changes in prey availability. Displacement could result in negative consequences, such as changes in food availability, which would likely affect energy budget and fitness. The possible increase in animal density caused by displacement could also result in increased competition and predation.
Recommendation/Request	Underwater shipping noise can be decoupled from shipping traffic growth by investing in quiet ship technology (e.g., silent propellers) and operational measures (speed reduction). A precautionary approach is needed to “hold the noise” at current levels until safe noise levels can be determined for the region.