*Amicus Curiae Brief* submitted by
The Environmental Law Alliance Worldwide (ELAW)

in the case

Greenpeace Nordic Association and Natur og Ungdom (Nature & Youth)
v.
The Government of Norway represented by the Ministry of Petroleum and Energy

Case No: 16-166674TVI-OTIR/06
Oslo District Court

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| Plaintiff 1: | Foreningen Greenpeace Norden<br>BOX 15164<br>SE 104 65 Stockholm<br>County of Stockholm | Defendant: | The Government of Norway represented by the Ministry of Petroleum and Energy<br>PO Box 8148<br>NO-0033 OSLO |
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Greenpeace Nordic Association and Natur og ungdom (Nature & Youth) (the plaintiffs) are challenging oil and gas production licenses awarded in the 23rd licensing round (the Licensing Decision) in part for the failure to adequately consider the impacts on the environment in violation of Norway's obligations under international law and the right to a healthy environment guaranteed by the Constitution of Norway.

The U.S. Office of the Environmental Law Alliance Worldwide (ELAW) respectfully submits this *amicus curiae* brief in support of the plaintiffs under §15-8 of the Norwegian Act on Civil procedure of 17th June 2005. ELAW is a nonprofit, nongovernmental organization registered in the U.S. state of Oregon. For more than 25 years, ELAW has assisted lawyers around the world who are working to protect communities and the environment. Through this work, ELAW is in a unique position to monitor globally significant legal developments. The purpose of this brief is twofold. First, ELAW intends to share with the Court important jurisprudence from foreign courts and tribunals that have ruled on issues similar to those raised by the plaintiffs. Second, this brief highlights important deficiencies in the information provided to the decision makers as part of the environmental impact assessment that formed the basis for the Licensing Decision.

## I. Government Decisionmakers Should Weigh Proposed Projects in Light of the Constitutional Right to a Healthy Environment

The plaintiffs clearly articulate the need for government decision makers to consider the impact of proposed projects on the right to a healthy environment, which is guaranteed under Article 112 of the Norwegian Constitution. The Government contends that although the constitutional right is legally binding, it does not grant petitioners a right to challenge administrative action such as the Ministry of Petroleum and Energy's Licensing Decision.

Courts and human rights commissions in other countries have determined that a citizen's fundamental right to a healthy environment may not be infringed by government action – including action by the executive branch.

In a case very similar to the one currently before this Court, the Supreme Court of the Philippines rebuffed the Philippine government's efforts to dismiss a case challenging the constitutionality of timber harvesting licenses issued by the government. Not only are the facts in the case similar, so is the law.

In 1993, a group of young people and their parents brought a case alleging that the Philippine Department of Environment and Natural Resources (DENR) abused its discretion when it issued timber license agreements (TLAs) in contravention of the right to a balanced and healthful ecology. DENR questioned the justiciability of the citizens' claim, arguing the environmental right contained within the Philippine Constitution is not subject to protection by the state. The Supreme Court disagreed. It acknowledged that although the right to a balanced and healthful ecology is found outside the Bill of Rights, "it does not follow that it is less important than any of the civil and political rights enumerated in the [Bill of Rights]. . . . As a matter of fact, these basic rights need not even be written in the Constitution for they are assumed to exist from the

inception of humankind." *Minors Oposa v. Factoran*, Supreme Court of the Philippines, G.R. No. 101083, 224 S.C.R.A. 792 (July 30, 1993).[1]

The Supreme Court of the Philippines also addressed the same concern that the Government has raised here – that courts do not have the jurisdiction to consider whether the executive branch has acted contrary to the constitutional right. The Supreme Court found that a constitutional provision declaring "Judicial power includes the duty of the courts of justice to . . . determine whether or not there has been a grave abuse of discretion amounting to lack or excess of jurisdiction on the part of any branch or instrumentality of the Government," granted Philippine courts jurisdiction to review the constitutionality of action taken by the DENR to authorize timber harvesting.[2]

In Africa, the African Charter on Human and Peoples' Rights protects the right of citizens to "a general satisfactory environment favourable to their development," as well as the right to physical and mental health.[3] In 1996, two human rights organizations complained to the African Commission on Human and Peoples' Rights that the Nigerian National Petroleum Company (NNPC, the State oil company) "exploited oil reserves in Oganiland with no regard for the health or environment of the local communities[.]" *Social and Economic Rights Action Center (SERAC) and Center for Economic and Social Rights (CESR) v. Nigeria*, African Commission on Human and Peoples' Rights (Communication No. 155/96) (27 October 2001) [hereinafter SERAC].[4] The Commission recognized that Nigeria incorporated all of the rights protected by the African Charter into domestic law, but that it was not possible for citizens to seek redress in Nigerian courts because of restrictions imposed by the then military government.[5] Finding no domestic remedies available to the petitioners, the Commission accepted the petition and considered the merits.

The issue before the Commission was whether the government of Nigeria, through its involvement with the NNPC and Shell Petroleum Development Corporation, violated the Ogoni people's rights to health and a healthy environment through the exploitation of oil resources in Ogoniland that caused widespread contamination of the environment. The Commission explained that "[t]he right to a general satisfactory environment, as guaranteed under Article 24 of the African Charter or ***the right to a healthy environment***, as it is widely known, . . . ***imposes clear obligations upon a government***. It requires the state to take reasonable . . . measures ***to prevent pollution and ecological degradation***, to promote conservation, and ***to secure an ecologically sustainable development*** and use of natural resources."[6] In addition to the African

[1] *Minors Oposa v. Factoran*, Supreme Court of the Philippines, G.R. No. 101083, 224 S.C.R.A. 792 (July 30, 1993), available at: http://www.lawphil.net/judjuris/juri1993/jul1993/gr_101083_1993.html.
[2] *Id.*
[3] Article 24 of the African Charter on Human and Peoples' Rights guarantees "All people shall have the right to a general satisfactory environment favourable to their development;" and Article 16 guarantees "Every individual shall have the right to enjoy the best attainable state of physical and mental health," and requires State Parties to "take the necessary measures to protect the health of their people and to ensure that they receive medical attention when they are sick."
[4] *Social and Economic Rights Action Center (SERAC) and Center for Economic and Social Rights (CESR) v. Nigeria*, African Commission on Human and Peoples' Rights (Communication No. 155/96) (27 October 2001), at para. 2, available at: http://www.achpr.org/files/sessions/30th/comunications/155.96/achpr30_155_96_eng.pdf.
[5] *Id.* at para. 41.
[6] *Id.* at para. 52 (emphasis added).

Charter, the Commission recognized that "Article 12 of the International Covenant on Economic, Social and Cultural Rights . . . requires governments to take necessary steps for the improvement of all aspects of environmental and industrial hygiene. The right to enjoy the best attainable state of physical and mental health enunciated in Article 16(1) of the African Charter and the right to a general satisfactory environment favourable to development . . . obligate governments . . . [not to] tolerat[e] any practice, policy or legal measures violating the integrity of the individual."[7]

## II. Decisionmakers Should Balance the Constitutional Right to a Healthy Environment with other Rights

Courts have clearly articulated the need to protect environmental rights over economic rights in several cases. For example, Colombian citizens presented constitutional claims against several provisions of laws approving multi-year national development plans. *Sentencia C-035/16*, Corte Constitucional de Colombia (8 de febrero de 2016).[8] The Constitutional Court nullified a provision that would have allowed existing license holders to extract minerals, oil, and gas in *páramos* (high-elevation wetlands), notwithstanding a general moratorium on mining activities in these ecologically important areas. The *páramos* provide vital environmental services in regulating the hydrological cycle and sequestering carbon; therefore, according to the Court, the government of Colombia must protect *páramos* as part of its duty to fulfill the constitutional rights to a healthy environment and to water. The Court explained: "***[E]nvironmental protection prevails over economic rights acquired by private persons by means of environmental permits and concession contracts*** when it is proven that the activity produces harm, or when there is reason to apply the precautionary principle to avoid harm to non-renewable natural resources or to human health."[9] The Court emphasized how the concept of sustainable development is intended to harmonize and reconcile the tension between the constitutional rights to a healthy environment and to economic freedom.[10] The Court concluded that environmental sustainability is a "determinative factor in the analysis of constitutionality" and explained that courts must act as a counterbalance to the short-term interests represented and promoted by the legislative and executive branches.[11] The Court also highlighted the strategic importance of preserving *páramos* for climate change mitigation.[12]

Similarly, in *Earthlife Africa Johannesburg v. Minister of Environmental Affairs*, the Gauteng Division of the High Court of South Africa, examined the Department of Environmental Affairs (DEA) granting of an environmental authorization for a coal-fired power plant, and the review of that decision by the Minister of Environmental Affairs. *Earthlife Africa Johannesburg v. Minister of Environmental Affairs and others*, Gauteng Division of the High Court of South

[7] *Id.* at para. 52 (internal citation omitted).
[8] *Sentencia C-035/16*, Corte Constitucional de Colombia (8 de febrero de 2016), available at: http://www.corteconstitucional.gov.co/relatoria/2016/c-035-16.htm.
[9] *Id.* at para. 128 (emphasis added). Unofficial translation of the original: "la protección del ambiente prevalece frente a los derechos económicos adquiridos por particulares mediante licencias ambientales y contratos de concesión en las circunstancias en que esté probado que la actividad produce un daño, o cuando exista mérito para aplicar el principio de precaución para evitar un daño a los recursos naturales no renovables y a la salud humana."
[10] *Id.* at paras. 129-130.
[11] *Id.* at para. 176.
[12] *Id.* at paras. 150, 156 & 171.

Africa, Case no. 65662/16 (2017).[13]

Interpreting section 24 of South Africa's constitution, which establishes the right to a healthy environment, the High Court declared:

> Section 24 recognises the interrelationship between the environment and development. ***Environmental considerations are balanced with socio-economic considerations through the ideal of sustainable development***. . . . ***Climate change poses a substantial risk to sustainable development*** in South Africa. The effects of climate change, in the form of rising temperatures, greater water scarcity, and the increasing frequency of natural disasters pose substantial risks. Sustainable development is at the same time integrally linked with the principle of intergenerational justice requiring the state to take reasonable measures [to] protect the environment 'for the benefit of present and future generations' and hence adequate consideration of climate change. ***Short-term needs must be evaluated and weighed against long-term consequences***."[14]

The Court ultimately set aside part of the Minister's decision, remitted "the matter of climate change impacts to her for reconsideration on the basis of the new evidence in the climate change report" that was submitted after the original authorization, and suspended the environmental authorization pending the Minister's review of the decision.[15]

## III. The Ministry Cannot Determine whether it is Protecting the Right to a Healthy Environment without Adequate Information about the Likely Impacts

As the plaintiffs argue, the Ministry could not have appropriately considered the impact of the Licensing Decision on the fundamental right to a healthy environment, because the environmental impact assessment documents did not include all of the information necessary for informed decision making. As explained further below, the Ministry had inadequate information to evaluate the true impact of the Licensing Decision related to the impact on the climate, the environment, air quality, human health, and the marine environment.

At least one tribunal has considered this exact issue, and found that protecting the fundamental right to a healthy environment requires a proper evaluation of the likely impact of proposed projects. In the SERAC case described in Part I, the African Commission declared that the duty to protect fundamental rights to health and a healthy environment "must . . . include . . . requiring and publicising environmental and social impact studies prior to any major industrial development . . . and providing meaningful opportunities for individuals to be heard and to participate in the development decision affecting their communities."[16]

Courts in the United States (U.S.) have recognized that decisions based on an environmental

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[13] *Earthlife Africa Johannesburg v. Minister of Environmental Affairs and others*, Gauteng Division of the High Court of South Africa, Case no. 65662/16 (2017), available at: http://home.elaw.org/system/files/attachments/publicresource/za.earthlife.Earthlife.6.march_.2017.pdf.
[14] *Id.* at para. 82 (internal citation omitted and emphasis added).
[15] *Id.* at paras. at 119-121.
[16] *SERAC* at para. 53.

impact assessment (EIA) that is legally inadequate cause more than procedural harm, but harm to the environment, as well. This perspective has prompted courts to enjoin activities until EIA requirements are fulfilled. For example, the U.S. Court of Appeals for the First Circuit described the importance of ensuring that all of the information required by the U.S. environmental impact assessment law, known as the National Environmental Policy Act (NEPA), is made available to the public and to the government decision makers *before* a decision is made. *Sierra Club v. Marsh,* 872 F. 2d 497 (1st Cir. 1989). The Court also clearly articulated the harm that comes from violations of the EIA process. The Court referred back to an earlier decision, endorsing its ruling. In that case, environmental organizations challenged decisions related to offshore oil leasing:

> [W]hen a decision to which NEPA obligations attach is made without the informed environmental consideration that NEPA requires, the harm that NEPA intends to prevent has been suffered. . . .
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> Moreover, to set aside the agency's action at a later date will not necessarily undo the harm. The agency as well as private parties may well have become committed to the previously chosen course of action, and new information--a new EIS--may bring about a new decision, but it is that much less likely to bring about a different one. It is far easier to influence an initial choice than to change a mind already made up.
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> It is appropriate for the courts to recognize this type of injury in a NEPA case, for it reflects the very theory upon which NEPA is based--a theory aimed at presenting governmental decision-makers with relevant environmental data before they commit themselves to a course of action. This is not to say that a likely NEPA violation automatically calls for an injunction; the balance of harms may point the other way. . . .
>
> [T]he harm at stake is a harm to the *environment*, but the harm consists of the added *risk* to the environment that takes place when governmental decisionmakers make up their minds without having before them an analysis (with prior public comment) of the likely effects of their decision upon the environment. NEPA's object is to minimize that risk, the risk of uninformed choice, a risk that arises in part from the practical fact that bureaucratic decision makers (when the law permits) are less likely to tear down a nearly completed project than a barely started project.[17]

Following this reasoning, the Court succinctly summarized:

> [T]he harm at stake in a NEPA violation *is* a harm to the *environment*, not merely to a legalistic "procedure," nor, for that matter, merely to psychological well-being. . . . But the risk implied by a violation of NEPA is that real environmental harm will occur through inadequate foresight and deliberation. The difficulty of stopping a bureaucratic steam roller, once started, still seems to us . . . a perfectly proper factor for a district court to take into account in assessing that risk, on a motion for a preliminary injunction.[18]

[17] *Sierra Club v. Marsh,* 872 F. 2d 497, 500-501 (1st Cir. 1989) (emphasis in original), available at: https://www.leagle.com/decision/19891369872f2d49711260.
[18] *Id.* at 504 (emphasis in original).

Courts in at least the U.S., Australia, and South Africa have required decision makers to consider the climate impacts of projects during the environmental impact assessment process.

In a case concerning offshore oil drilling in the Chukchi Sea off the coast of Alaska, a U.S. Court of Appeals explained that the Bureau of Ocean Energy Management "is required to take into account the ***full environmental effects*** of its actions when deciding whether and in what manner to pursue the lease sale. . . . ***It is only at the lease sale stage that the agency can adequately consider cumulative effects of the lease sale on the environment, including the overall risk of oil spills and the effect of the sale on climate change.***"[19]

In a recent case, the U.S. Court of Appeals for the Tenth Circuit strongly criticized the incomplete climate impact analysis prepared for the proposed expansion of a coal mine. A coalition of environmental organizations challenged the analysis, alleging the Bureau of Land Management (BLM) discounted the significance of greenhouse gas (GHG) emissions associated with a proposed coal mining project on the basis that if the coal was not mined in the particular project, the same amount would simply be mined somewhere else and used for electricity production. The Court of Appeals rejected this approach and declared that the "BLM's assumption that there was no real world difference between issuing [the leases] and declining to issue them because third party sources of coal would perfectly substitute for any volume lost on the open market should the BLM decline to issue the leases was arbitrary and capricious." *WildEarth Guardians v. U.S.*, D. C. No. 2:13-CV-00042-ABJ (10th Cir. 2017).[20] The Court remanded the decision to the lower court for further proceedings.

In 2006, the Australian New South Wales Land and Environment Court declared that the impact of burning coal at a power plant should be studied as an indirect impact of coal mining. In *Gray v. The Minister for Planning*,[21] petitioner Peter Gray challenged a decision by the Director-General of the Department of Planning approving the EIA for a proposed coal mine. Gray asserted, among other things, that the EIA should have considered the impact to the climate of burning the mined coal at a coal-fired power plant.

The Court agreed, explaining:

> Climate change/global warming is widely recognised as a significant environmental impact to which there are many contributors worldwide . . . . The fact there are many contributors globally does not mean the contribution from a single large source . . . should be ignored in the environmental assessment process. . . .
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> I consider ***there is a sufficiently proximate link between the mining of a very substantial reserve of thermal coal*** in NSW, the only purpose of which is for use as fuel in power

[19] *Native Vill. of Point Hope v. Jewel*, 740 F.3d 489, 504 (9th Cir. 2014) (emphasis added), available at https://www.leagle.com/decision/infco20140122128.
[20] *WildEarth Guardians v. U.S.*, D. C. No. 2:13-CV-00042-ABJ (10th Cir. 2017) at pg. 17, available at: http://www.elaw.org/system/files/attachments/publicresource/US_WildEarthGuardians_Sept2017.pdf.
[21] *Gray v. Minister for Planning* [2006] NSWLEC 720, available at: http://www.elaw.org/AU_Gray_2006.

> stations, ***and the emission of GHG*** which contribute to climate change/global warming, which is impacting now and likely to continue to do so on the Australian and consequently NSW environment, ***to require assessment of that GHG contribution of the coal when burnt in an environmental assessment***[.]
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> * * *
>
> While the Court has a limited role in judicial review proceedings in that it is not to intrude on the merits of the administrative decision under challenge . . . it is apparent that ***there is a failure to take the principle of intergenerational equity into account by a requirement for a detailed GHG assessment*** in the [environmental assessment] ***if the major component of GHG which results from the use of the coal . . . is not required to be assessed***. That is a failure of a legal requirement to take into account the principle of intergenerational equity.
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> * * *
>
> Environmental assessment is intended to enable decision makers to be properly informed about the future environmental consequences of the project before them. The environmental assessment is a prediction of what the impacts might be given that the project is yet to be built. It is not appropriate to limit the scope of the environmental assessment on the basis that GHG emissions may or may not be subject to regulation in the future whether in NSW or overseas. ***The fact that it is difficult to quantify an impact with precision does not mean it should not be done***.[22]

As described above in Section II, in *Earthlife Africa Johannesburg v. Minister of Environmental Affairs*, the High Court of South Africa reviewed executive decisions authorizing construction of a coal-fired power plant. South African law requires an environmental assessment for the approval of coal-fired power plants. The Department of Environmental Affairs granted an application for environmental authorization even though the underlying environmental impact assessment report (EIR) did not address the proposed power plant's impact on the climate, how it will aggravate climate impacts that will be felt in the region, such as water scarcity, or the project's resiliency to climate change. Rejecting the government's argument that the law does not specifically require a climate impact assessment, the Court said:

> The ***absence of express provision in the statute requiring a climate change impact assessment does not entail that there is no legal duty to consider climate change*** as a relevant consideration . . . . [T]he climate change impacts are undoubtedly a relevant consideration as contemplated [in the EIA law][.][23]

The High Court also dismissed the government's argument that a climate impact assessment cannot be required because no explicit guidelines exist for preparing one. The Court explained that "an environmental impact assessment is inherently open-ended and context specific. The scoping process that precedes an environmental impact assessment provides opportunity for

[22] *Id.* at paras. 98, 100, 126 & 138 (emphasis added).
[23] *Earthlife Africa Johannesburg v. Minister of Environmental Affairs and others*, at para. 87 (emphasis added).

delineating the exercise and guidance on the nature of the climate change impacts that must be assessed and considered."[24]

After reviewing South Africa's relevant legislation, the Court determined that "climate change impacts of coal-fired power stations are relevant factors that must be considered before granting environmental authorisation."[25] The Court found the one-paragraph discussion of climate change in the environmental impact report to be "wholly insufficient."[26] The Court acknowledged its authority to set aside the environmental authorization; however, while the case was pending, officials completed a revised climate change impact analysis. For that reason, the Court remanded the decision for reconsideration.

Finally, in addition to these internationally significant court decisions, the International Association for Impact Assessment (IAIA) published *Climate Change in Impact Assessment: International Best Practice Principles*, a set of international best practice principles for climate change and environmental impact assessment.[27] The document recommends that an impact assessment should explicitly address whether a proposal will, directly or indirectly, increase or decrease GHG emissions.

Moreover, the Ministry should have considered whether the Licensing Decision would impact Norway's ability to meet its national GHG emission targets and its international obligations to reduce GHG emissions.

Looking again to the *Earthlife Africa Johannesburg* decision from South Africa, the High Court determined that a climate impact assessment was required to ensure the country meets the commitments it made as a Party to the United Nations Framework Convention on Climate Change (UNFCCC). The Court declared: "[a] climate change impact assessment is necessary and relevant to ensuring that the proposed coal-fired power station fits South Africa's peak, plateau and decline trajectory as outlined in the [Nationally Determined Contribution (NDC)][.]"[28]

Similarly, a Dutch court found that commitments made under the international climate regime create a framework under which governments should make decisions. In *Urgenda Foundation v. The State of the Netherlands*, a case brought by an environmental organization and Dutch citizens, the Hague District Court in the Netherlands reviewed that country's responsibilities under the UNFCCC legal regime and recognized that these international commitments create "the framework for and the manner in which the State exercises its powers" to protect citizens against the imminent danger caused by climate change.[29] After reviewing international and domestic law, the Court found that "[d]ue to the severity of the consequences of climate change . . . ***the State has a duty of care to take mitigation measures***."[30] The Court ultimately concluded

[24] *Id*. at para. 89.
[25] *Id.* at para. 91.
[26] *Id.* at para. 94.
[27] *Climate Change in Impact Assessment: International Best Practice Principles*, Special Publication Series No. 8., April 2012, available at http://www.iaia.org/uploads/pdf/SP8.pdf.
[28] *Earthlife Africa Johannesburg v. Minister of Environmental Affairs,* at para. 90.
[29] *Urgenda Foundation v. The State of the Netherlands*, C/09/456689/HA ZA 13-1396 (24 June 2015) (para. 4.63) [The decision is on appeal], available at: https://elaw.org/system/files/urgenda_0.pdf.
[30] *Id.* at para. 4.83 (emphasis added).

that the government of the Netherlands must further reduce greenhouse gas emissions to meet its obligations to the plaintiffs.

The Norwegian government appears to argue that it is not obligated to consider the impact of GHG emissions from the Licensing Decision because the UNFCCC attributes the emissions to downstream users. Even if the Court agrees that the UNFCCC framework means that future emissions coming from the Licensing Decision will be counted against another country (or countries), that does not remove any obligations to assess the climate impact that the Court may find under domestic law. Impacts on the climate of burning fossil fuels are one of the most substantial impacts of producing oil and gas -- for no other purpose than to sell it to be burned.

## IV. Courts around the World Incorporate the Precautionary Principle into Cases concerning the Right to a Healthy Environment

Finally, we note that courts around the world have found that the precautionary principle should be applied to protect the right to a healthy environment. For example, in 2013, in a case considering the potential impacts of trial crops of genetically-modified eggplant, the Philippines Court of Appeals recognized there is no scientific certainty about the impacts of such crops and invoked the precautionary principle to safeguard Filipinos' constitutional right to a balanced and healthful ecology from the threat posed by approved field trials of the genetically-modified crops.

The Court of Appeals explained, "[t]his is where the precautionary principle sets in which states that, when human activities may lead to threats of serious and irreversible damage to the environment that is scientifically plausible but uncertain, action shall be taken to avoid or diminish that threat." *Greenpeace Southeast Asia (Philippines) v. Environmental Management Bureau of the Department of Environment and Natural Resources,* Court of Appeals (Manila) (17 May 2013).[31]

In a subsequent decision resolving motions for reconsideration, the Court reiterated that "***the testing or introduction of* bt talong *into the Philippines, by its nature and intent, is a grave and present danger to (and an assault on) the Filipinos' constitutional right to a balanced ecology*** because, in any book and by any yardstick, it is an ecologically imbalancing event or phenomenon. . . . the *bt talong*'s threat to the human health of the Filipinos as of now remains uncertain. . . . That is why we, in deciding this case, applied the precautionary principle in granting the petition in the case at bench."[32]

In a case addressing impacts of climate change in Pakistan, the Lahore High Court Green Bench concluded that fundamental rights interpreted in conjunction with constitutional principles of

[31] *Greenpeace Southeast Asia (Philippines) v. Environmental Management Bureau of the Department of Environment and Natural Resources*, Court of Appeals (Manila) (Special 13th Div), CA-G.R. SP No. 00013 (17 May 2013) at pgs. 19-20 (omitting a footnote to the Rules of Procedure for Environmental Cases), available at: http://elaw.org/system/files/ph.greenpeacese.pdf.

[32] *Greenpeace Southeast Asia (Philippines) v. Environmental Management Bureau of the Department of Environment and Natural Resources,* Court of Appeals (Manila) (Special 13th Div), CA-G.R. SP No. 00013 (20 September 2013) at pgs. 9-10 (emphasis in original), available at: http://elaw.org/system/files/ph.eggplantsept2014_0.pdf.

democracy and justice incorporate the precautionary principle:

> ***Fundamental rights, like the right to life (article 9) which includes the right to a healthy and clean environment*** and right to human dignity (article 14) read with constitutional principles of democracy, equality, social, economic and political justice ***include within their ambit and commitment, the international environmental principles of sustainable development, precautionary principle, environmental impact assessment, inter and intra-generational equity and public trust doctrine***.

*Asghar Leghari v. Federation of Pakistan*, Lahore High Court Green Bench (4 September 2015).[33]

## V. The Ministry had Inadequate Information about Air Pollutant Emissions Associated with the Leasing Decision and its Impact on Climate

Scientific literature contains robust evidence that the Arctic is warming at a much faster rate than the rest of the earth *and* that localized emissions of short-lived air pollutants (including black carbon, methane, and ozone precursors) make a substantial contribution to the amount of excess warming experienced in the Arctic. In 2008, a consortium of 10 scientists from the Unites States, Canada and Norway, published a path-breaking study noting disproportionate warming of the Artic with respect to the rest of the world:

> ***Arctic temperatures have increased at almost twice the global average rate over the past 100 years (IPCC, 2007)***. Warming in the Arctic has been accompanied by an earlier onset of spring melt, a lengthening of the melt season, and changes in the mass balance of the Greenland ice sheet (Stroeve et al., 2006; Zwally et al., 2002). In addition, Arctic sea ice extent has decreased from 1979 to 2006 in every month (Serreze et al., 2007). During the 2007 melt season, Arctic sea ice dropped to the lowest levels observed since satellite measurements began in 1979, resulting in the first recorded complete opening of the Northwest Passage (NSIDC, 2007). Impacts of ice loss include reduction of the Earth's albedo, a positive feedback which leads to further warming.[34]

The study further showed how short-lived pollutants (black carbon, methane, and ozone) make a significant contribution to warming that is occurring in the Arctic.

> Here, we present a summary of the short-lived pollutants that impact Arctic climate including methane, tropospheric ozone, and tropospheric aerosols. For each pollutant, we provide a description of the major sources and the mechanism of forcing. We also provide the first seasonally averaged forcing and corresponding temperature response estimates focused specifically on the Arctic. The calculations indicate that the ***forcings due to black carbon, methane, and tropospheric ozone lead to a positive surface***

[33] *Asghar Leghari v. Federation of Pakistan*, Lahore High Court Green Bench (W.P. No. 25501/2015) (4 September 2015) at para. 7 (emphasis added), available at: https://elaw.org/system/files/pk.leghari.090415_0.pdf.
[34] Quinn, P. K., Bates, T. S., Baum, E., Doubleday, N., Fiore, A. M., Flanner, M., ... & Shindell, D. (2008). Short-lived pollutants in the Arctic: their climate impact and possible mitigation strategies. Atmospheric Chemistry and Physics, 8(6), 1723-1735 (emphasis added).

> ***temperature response indicating the need to reduce emissions of these species within and outside the Arctic.***[35]

In 2013, after the minister's decision, scientists principally with the Department of Geosciences at the University of Oslo published a study with evidence about how emissions of black carbon within the Arctic exert a disproportionate impact of Arctic warming. Their study states:

> In this study, we address the question of how sensitive the Arctic climate is to black carbon (BC) emitted within the Arctic compared to BC emitted at midlatitudes. We consider the emission-climate response spectrum and present a set of experiments using a global climate model. A new emission data set including BC emissions from flaring and a seasonal variation in the domestic sector has been used. The climate model includes a snow model to simulate the climate effect of BC deposited on snow. ***We find that BC emitted within the Arctic has an almost five times larger Arctic surface temperature response (per unit of emitted mass) compared to emissions at midlatitudes***.[36]

There is also robust evidence in the scientific literature that oil and gas activities emit short-lived air pollutants that contribute to warming of the Arctic. In 2012, Norwegian scientists funded by the Norwegian Research Council calculated the climate impact of expected future emissions of short-lived air pollutants shipping and petroleum activities in the Arctic, finding that emissions associated with petroleum activities (but not shipping activities) would add to global warming in the Arctic. Their study states:

> ***The Arctic is now experiencing some of the most rapid climate changes on earth: on average, temperature has risen approximately twice the rate of the rest of the world (ACIA, 2005)***. Repercussions of a warmer Arctic are melting glaciers, reduction in extent and thickness of sea ice, thawing permafrost and rising sea levels (Serreze et al., 2007; Stroeve et al., 2011). Warming also leads to an earlier onset of spring melt, lengthening the melting season. ….
>
> Petroleum and shipping activities emit a broad mix of gases and aerosols: long-lived greenhouse gases (GHGs), primary particles, such as organic- and black carbon (OC and BC), sulphur dioxide ($SO_2$), and the ozone ($O_3$) precursors nitrogen oxides ($NO_x$), carbon monoxide (CO) and non-methane hydrocarbons (NMHCs). The emissions affect the chemistry and climate of the atmosphere through several mechanisms: by direct global warming from the GHGs, direct- and indirect effects from aerosols, and by formation of radiatively active $O_3$. ….
>
> The Arctic is a region characterized by high solar angle, high surface albedo, low temperatures and long periods of darkness in the winter and sunlight in summer. ***These factors result in a different sensitivity to emissions compared to lower latitudes***. ….

---

[35] *Id.* (emphasis added).

[36] Sand, M., Berntsen, T. K., Seland, Ø., & Kristjánsson, J. E. (2013). Arctic surface temperature change to emissions of black carbon within Arctic or midlatitudes. Journal of Geophysical Research: Atmospheres, 118(14), 7788-7798 (emphasis added).

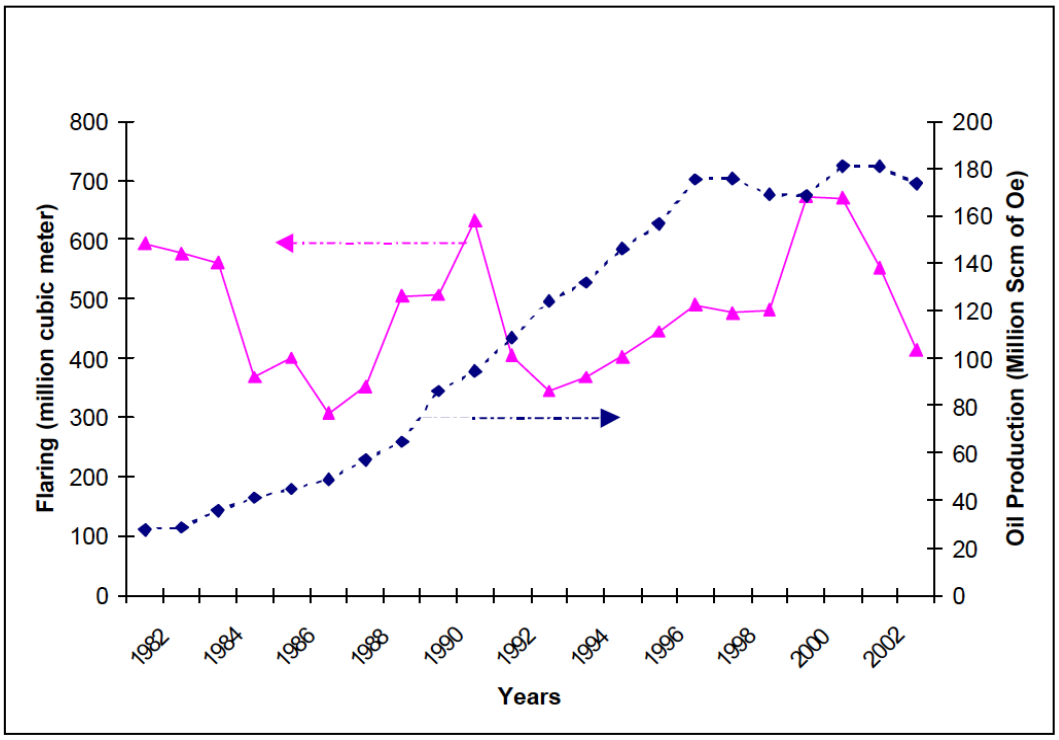
> Emissions of short-lived compounds from shipping and petroleum activities in the Arctic have effects on concentration levels of several gases and aerosols and lead directly and indirectly to radiative forcing. The composition, annual cycle and geographical distribution of the emissions leads to pronounced differences between the two sectors. For shipping, high emissions of $SO_2$, and the maximum in emissions during summer, means that the radiative forcing is dominated by the direct effect of sulphate aerosols and the first indirect aerosol effect. For petroleum emissions sulphur emissions are much lower while the BC emissions are higher, and the emissions are evenly distributed annually. ***For this sector the BC deposited on snow, predominately within the Arctic region, exerts the largest radiative forcing, followed by the direct aerosol effect of BC***. …. Future emissions could potentially have a significant effect on Arctic environment, regional air pollution levels and radiative budget.[37]

It is important to emphasize that emissions of short-lived air pollutants would occur from petroleum activities even though routine flaring by offshore oil and gas facilities is a practice banned by Norwegian law. First, other activities of offshore oil and gas facilities are sources of short-lived air pollutants, such as fuel consumption by captive energy sources and on- and off-loading of tankers. Second, although routine flaring is banned, flaring for purpose of insuring safe operation of offshore oil and gas facilities is still permitted and occurs at a substantial level. For example, despite the ban by Norway of routine flaring by offshore oil and gas facilities, the total amount of flaring remained relatively constant from 1980 to 2002 because reduced flaring intensity was offset by increased overall oil and gas activity in Norway, as seen in the following data.[38]

[37] Ødemark, K., Dalsøren, S. B., Samset, B. H., Berntsen, T. K., Fuglestvedt, J. S., & Myhre, G. (2012). Short-lived climate forcers from current shipping and petroleum activities in the Arctic. Atmospheric Chemistry and Physics, 12(4), 1979-1993 (emphasis added).

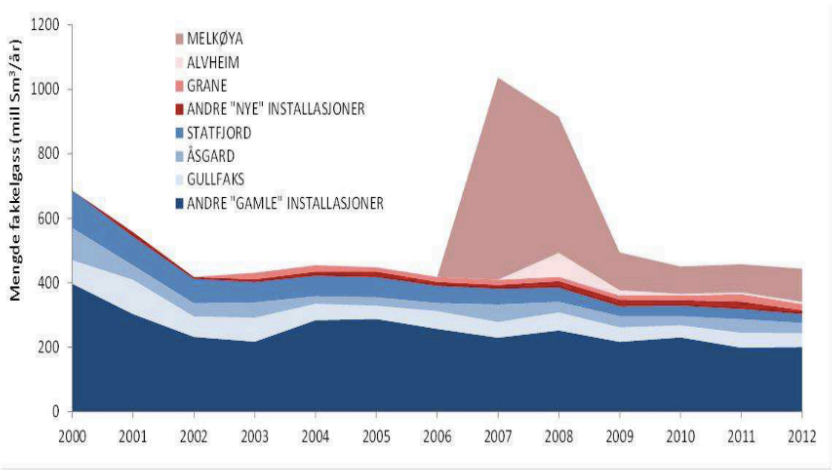
[38] World Bank Regulation of Associated Gas Flaring and Venting: A Global Overview and Lessons from International Experience. A2 – Norway, available at: http://siteresources.worldbank.org/INTGGFR/Resources/norway.pdf

*Figure A.4 Flaring and Oil Production Volumes in Norway, 1980 and 2002*




Aside from a spike in flaring when the Snøhvit/Melkøya plant/facility was put into production, as well as a smaller spike from the "Alvheim" field went into production, flaring at Norwegian oil and gas production facilities has remained relatively constant for the further period of 2002 to 2012.[39]

[39] Miljødirektoratet (December 2013) "Foreløpig Sektorrapport Underlagsrapport til Forslag til handlingsplan for norske utslipp av kortlevde klimadrivere" Sektorrapport M90/2013, at Figure 4.




***Figur 4: Faklet gassmengde i $Sm^3$ per år i petroleumssektoren i perioden 2000-2012 (Kilde: Oljedirektoratet)***

The following information was presented to the Ministry about the climate affects of emissions from the proposed oil and gas licenses:

> Vi har ikke foretatt beregninger av klimaeffekten (gjennom endret strålingsbalanse) fra petroleumsutslippene i denne rapporten. Med de små endringene i partikler (og ozon) som petroleumskildene er beregnet å gi, er det ikke hensiktsmessig å gjøre beregninger med strålingsmodeller. Slike beregninger, som er ganske ressurskrevende, ville være beheftet med stor usikkerhet, og i lys av de små tilleggene som er tema i denne rapporten vil resultatene ha liten informasjonsverdi. Effekten av for eksempel BC-avsetning avhenger av snøens/isens beskaffenhet, krystallstørrelser, smeltevann, etc. (Skeie et al., 2011).
>
> I en studie av Ødemark et al. (2012) er det brukt ulike modeller for å beregne endret strålingspådriv knyttet til dagens olje- og skipsaktivitet i Arktis. De konkluderer med at de høye sulfatutslippene, spesielt fra skipsfart, bidrar til et netto negativt strålingspådriv hvis alle kilder tas med. Petroleumsaktiviteten alene, dvs. når skipstrafikken utelates, gir derimot et positivt strålingspådriv. Det skyldes hovedsakelig BC-avsetning på is/snø. De store sulfatutslippene fra skipstrafikken har en avkjølende klimaeffekt og vil således oppveie en oppvarming knyttet til BC.
>
> Utslippene fra de planlagte aktivitetene ved Jan Mayen og Barentshavet har en tilsvarende sammensetning som dagens utslipp i Arktis. Sett i lys av publikasjonen fra Ødemark et al. (2012) er det derfor nærliggende å konkludere med at klimaeffektene knyttet til de nye installasjonene vil bli svært liten. Dersom framtidens utslipp fra skipstrafikk og petroleumsaktivitet endrer sammensetning, for eksempel ved reduserte svovelutslipp, kan imidlertid den totale klimaeffekten endres.[40]

The quality of information presented to the Ministry about the climate effects of emissions from

[40] Norwegian Institute for Air Research (2012) "Åpning av havområdene vest for delelinjen i Barentshavet Sør for petroleumsvirksomhet. Konsekvenser av regulære utslipp til luft" at pgs. 42-43

the proposed oil and gas licenses is sub-standard in several respects. First, the information does not adequately take into account emissions of short-lived, climate-forcing air pollutants associated with petroleum activities that are not associated with routine flaring, such as fuel consumption by captive energy sources, on- and off-loading of tankers, and flaring for the purpose of insuring safe operation of offshore oil and gas facilities. Second, while presently the climate effect of emissions from shipping associated with oil and gas activities in the Barents Sea might be neutral because the negative impacts of black carbon emissions may be offset by positive impacts of sulfate emissions, sulfate emissions will decrease dramatically in the near future because of international legislation limiting the sulfur content of shipping fuel to 0.5%, a decrease of 80%.[41]

It should also be noted that if an accident or system failure led to a catastrophic release of oil, and if *in situ* burning of oil were chosen as the oil spill response, then the *in situ* burning of oil would result in copious emissions of black carbon, information that has also not been presented to the Ministry.

## VI. The Ministry had Inadequate Information about the Impact of Air Pollutant Emissions from the Leasing Decision on Human Health and Ecology

Evidence in the scientific literature shows that air pollutant emissions from shipping related to oil and gas activities has caused deleterious impacts to air quality and ecology that would worsen under scenarios where there is more shipping and oil and gas activities in the Arctic. A study published in 2007 by Norwegian scientists states:

> Statistics show that current Norwegian coastal ship emissions are responsible for about 40% of the national NOx [nitrogen oxides] emissions, 17% of $SO_2$ [sulfur dioxide], 9% of $CO_2$ [carbon dioxide] and roughly 1% of CO [carbon monoxide], NMVOCs [non-methane volatile organic compounds] and PM [particulate matter]. …
>
> In 2015 the expected oil and gas transport by ships from Norway and northwest Russia, NSR [Northern Sea Route], and new Norwegian coastal gas power plants are likely to have regional effects. Ship engines have relatively large NOx emissions and the shipping sector is one of few sectors with increasing sulfur emissions. A result of the increasing ship emissions of these components could be an extended period where the critical loads for acidification in coastal areas are exceeded. New coastal activities and sea transportation in 2015 increase the sulfur (and nitrate) deposition by about 4% in the region. As noted in section 4.4 future pollutant levels need to be reduced to obtain recovery in the area. New activity and resulting ship traffic in northern and Arctic areas may also have significant regional effects in coastal areas with low background pollution levels. We find increased particle amounts in the northern areas, and the contribution

[41] "According to data published by DNV (Det Norske Veritas, 2005), the current average sulphur content is 2.46%. After 1 January 2020 the sulphur content should be no more than 0.5%, or 20% of the current average." Peters, G. P., Nilssen, T. B., Lindholt, L., Eide, M. S., Glomsrød, S., Eide, L. I., & Fuglestvedt, J. S. (2011). Future emissions from shipping and petroleum activities in the Arctic. Atmospheric Chemistry and Physics, 11(11), 5305-5320. Supporting information.

from ship traffic to Arctic haze could be increasing.[42]

A more recent study by Canadian scientists focused on the impact of ship emissions on air quality at monitoring stations in the Arctic. The scientists found that pollutant emissions specifically from shipping increased levels of ozone ($O_3$) and very-fine particulate matter ($PM_{2.5}$) in ambient air of two communities in a manner that was small but of public health significance. The study states:

> In an effort to characterize air quality in two communities of the Canadian Arctic during the high shipping season, we have measured surface concentrations of $NO_x$, $O_3$ [ozone], $SO_2$, and $PM_{2.5}$ [very fine particulate matter] in Cape Dorset and Resolute, Nunavut, for the complete 2013 shipping season. A particular focus of the study was the relative impact of pollution due to shipping vs. other sources, near high shipping traffic zones adjacent to the Arctic Bridge and the Northwest Passage.
>
> Overall, the influence of shipping on $O_3$ mixing ratios was that of enhancement by up to 4.6–4.7 ppb in Cape Dorset and 2.5–2.7 ppb in Resolute, persistent for ship plumes up to 72 h of age. $PM_{2.5}$ concentrations were consistently higher for ship-influenced air masses by up to 1.8–1.9 μg/m3 in Cape Dorset and 0.5–0.6 μg/m3 in Resolute. ….
>
> The high-resolution AQHI [Air Quality Health Index] primarily followed seasonal $O_3$ levels and was higher for Cape Dorset than Resolute. Ship influenced air masses consistently exhibited an increase of 0.1–0.3 in AQHI compared to no ship-influenced air masses. This difference is small with existing low levels of shipping traffic in the Arctic, but it can be expected to intensify with increasing traffic.[43]

The following information was presented to the decision makers about air quality impacts of the proposed oil and gas licenses:

> Beregnet bakgrunnsnivå av N120-verdi for ozon viser at det er 0-10 dager med 8-timers middel over 120 μg O3/m3 i Nord-Norge, og tilsvarende 0-6 dager på Svalbard. Beregningene viser at fremtidig petroleumsaktivitet kan bidra til 1 ekstra dag for noen svært begrensede områder både på fastland og på Svalbard.
>
> Også for sotpartikler (EC), PM10 og sulfatpartikler gir modellberegningene små tilleggsbidrag på Svalbard fra den framtidige petroleumsaktiviteten. Beregningene gir en økning på mindre enn 0,5 % i forhold til dagens situasjon.[44]

It is not enough to show that resultant pollutant levels would be below or only a fraction of air

[42] Dalsøren, S. B., Endresen, Ø., Isaksen, I. S., Gravir, G., & Sørgård, E. (2007). Environmental impacts of the expected increase in sea transportation, with a particular focus on oil and gas scenarios for Norway and northwest Russia. Journal of Geophysical Research: Atmospheres, 112(D2).
[43] Aliabadi, A. A., Staebler, R. M., & Sharma, S. (2015). Air quality monitoring in communities of the Canadian Arctic during the high shipping season with a focus on local and marine pollution. Atmospheric Chemistry and Physics, 15(5), 2651-2673.
[44] Norwegian Institute for Air Research (2012) "Åpning av havområdene vest for delelinjen i Barentshavet Sør for petroleumsvirksomhet. Konsekvenser av regulære utslipp til luft" at pgs. 42-43

quality standards. Pollutants cause health impacts at levels below air quality standards because there is no threshold below which health impacts do not occur. The *impact to human health* of pollutant level increases needs to be *quantified.*

For example, Health Canada provides the following Air Quality Benefits Assessment Tool (AQBAT):

| **Air Pollutants** (CRF units) | **CRF coefficient** (concentration)$^{-1}$ **(acute premature mortality)**[4] | **CRF coefficient** (concentration)$^{-1}$ **(chronic premature mortality)** |
|---|---|---|
| $NO_2$ ($ppb^{-1}$) | $7.48 \times 10^{-4}$ | |
| $PM_{2.5}$ ($\mu g/m^3)^{-1}$ | | $6.76 \times 10^{-3}$ |
| Ozone ($ppb^{-1}$) | $8.39 \times 10^{-4}$ | |
| CO ($ppm^{-1}$) | $1.90 \times 10^{-3}$ | |
| $SO_2$ ($ppb^{-1}$) | $4.59 \times 10^{-4}$ | |

[4] While the CRFs for $NO_2$, CO, $PM_{2.5}$, and $SO_2$ are based on 24-hour averaging times, the CRF for $O_3$ is based on a 1-hour averaging time

As indicated in the table above, each 1 part per billion increase of ozone in ambient air results in an increased risk of premature death from acute exposure of 0.00839%. Each 1 $\mu g/m^3$ increase in $PM_{2.5}$ results in an increased risk of premature death from chronic exposure of 0.0676%.

Svalbard is a Norwegian archipelago with a population of more than 2600 persons. No quantitative information was provided to the Ministry about the increased risk of premature death from acute exposure to increased levels of ozone of persons living in Svalbard. Similarly, no quantitative information was provided to the Ministry about the increased risk of premature death from chronic exposure to increased levels of $PM_{2.5}$ of persons living in Svalbard.

## VII. The Ministry had Inadequate Information about the Impact of the Leasing Decision on the Marine Environment from Routine and Reasonably Expected Operations

Impacts to the marine environment from offshore oil and gas activities can be divided into two categories: 1) impacts associated with routine and reasonably expected offshore oil and gas activities, which includes small but relatively frequent spills; and 2) impacts associated with accidental spills that are catastrophic in size but infrequent. Both impacts need to be assessed to provide a rational basis for the approval of offshore oil and gas activities.

The scientific literature contains ample evidence that routine and reasonably expected offshore oil and gas activities cause deleterious impacts to marine life. A recent publication[45] by 21 scientists affiliated with academic institutions in 9 countries states:

[45] Cordes, E. E., Jones, D. O., Schlacher, T. A., Amon, D. J., Bernardino, A. F., Brooke, S., ... & Gates, A. R. (2016). Environmental impacts of the deep-water oil and gas industry: a review to guide management strategies. Frontiers in Environmental Science.

## EFFECTS OF ROUTINE ACTIVITIES

Routine oil and gas activities can have detrimental environmental effects during each of the main phases of exploration, production, and decommissioning (Figure 3). During the exploration phase, impacts can result from indirect (sound and traffic) and direct physical (anchor chains, drill cuttings, and drilling fluids) disturbance. Additional direct physical impacts occur in the production phase as pipelines are laid and the volume of discharged produced water increases. Lastly, decommissioning can result in a series of direct impacts on the sea floor and can re-introduce contaminants to the environment. It is critical that all of the potential impacts of routine operations are accounted for when designing management strategies, whether local or regional, for offshore oil and gas activities. … Once the installation of infrastructure commences, direct impacts on habitats and associated fauna increase (Table 2).

**TABLE 2 | Types of impacts from offshore oil and gas activities.**

| | Concern | Nature | Extent | Environmental issues | References |
|---|---|---|---|---|---|
| Routine | Drilling discharges (cuttings, drilling fluids, cement, chemicals) | Physical (excess sedimentation); Chemical (toxic effects; enrichment effects) | 100–500 m (solids) "Local" | Smothering; clogging of feeding and gas exchange structures; direct toxicity; altered electrochemical environment; changes in nutrient availability, decreased species abundance, altered community structure | Reed and Hetland, 2002; Breuer et al., 2004; Jones et al., 2007; Netto et al., 2009; Pivel et al., 2009; Jones and Gates, 2010; Bakke et al., 2013; Larsson et al., 2013 |
| | Produced water | Chemical (toxic effect) | 1–2 km (produced water and dissolved components) "Widespread" | Direct toxicity; food-web contamination; potential food-chain; and trophic amplification | Bakke et al., 2013 |
| | Anchors | Physical (direct damage; hard substratum) | "Local" | Direct physical impact at emplacement, potentially continuing impact through tidally induced motions; provision of hard substratum for colonization by sessile epifauna and associates | |
| | Flow and control lines, umbilicals | Physical (direct damage; hard substratum) | "Local" | Direct physical impact at emplacement; increased sedimentation; provision of hard substratum for colonization by sessile epifauna and associates | |
| | Export pipelines | Physical (direct damage; hard substratum) | "Widespread" | Potentially extensive direct physical impact at emplacement; provision of hard substratum for colonization by sessile epifauna and associates | |
| | Risers | Physical (hard substratum in water column) | "Local" | Provision of hard substratum for colonization by sessile epifauna and associates | |
| | Anchors and pipelines | Direct physical disturbance | 15 m (direct impacts), 50–100 m (indirect impacts) | Mortality and burial of benthic fauna; fragmentation of corals; increased sedimentation; pipelines can corrode; and increase toxicity | Ulfsnes et al., 2013 |
| | Surface structures and vessels | Restricted movement of vessels | Right-of-way for working vessels; 1–2 km for surface infrastructure | Restricted industrial and scientific activity | |
| | Seabed infrastructure | Artificial habitat | Direct for sessile species, ~500 m for pelagic species, potentially altering distribution over large areas | Altered distribution; may increase species connectivity (including invasive species) | Doray et al., 2006; Gass and Roberts, 2006; Atchison et al., 2008; Larcom et al., 2014 |
| | Artificial light | Physical (energy, electromagnetic spectrum) | 100s of m | Surface light attracts some mobile species and repels others; subsurface light impacts are largely unknown | Herring et al., 1999 |

These impacts of routine operations of offshore oil and gas operations in Norway were noted as early as 1995 in a publication by scientists with the University of Oslo. The impacts were observed in the benthic layer of the North Sea area of the Norwegian Continental Shelf at a time when oil-based drilling muds were in use, but the findings are nonetheless relevant to the

Licensing Decision because the impacts observed were associated with barium and toxic metals in drill cuttings, not only total hydrocarbons. The study states:

> Multivariate statistical analyses of data on environmental variables and benthic fauna from 14 oil and gasfields obtained from 24 surveys collected between 1985 and 1993 are presented. At all fields oil-based drilling mud was used. The purpose of this study was to investigate contamination gradients, assess effects on benthic fauna both spatially and temporally and to evaluate measures such as diversity indices, indicator species and multivariate analysis techniques in assessment of pollution. …. Initial contamination of the outermost areas at most fields was shown as elevated levels of barium and total hydrocarbons (THC) and sometimes also by elevated levels of zinc, copper, cadmium and lead. Three fields were studied in particular and showed contaminated areas of over 100 km2 (Valhall), over 15 km2 (Gyda) and over 10 km2 (Veslefrikk). After a period of 6 to 9 yr contamination had spread, so that nearly all of the outermost stations 2 to 6 km away from the platforms showed evidence of contamination. …. Analyses linking fauna and environmental variables indicated that the effects were mainly related to THC, ***barium and strontium, but also to metals like zinc, copper, cadmium and lead, which are all discharged in drill-cuttings***. Effects on the fauna closely followed the patterns of contamination with only a few stations at each field that were contaminated not showing effects. Thus the areas showing effects were only slightly less than the areas contaminated. Subsequent to cessation of discharges biodegradation of oil and reduced concentrations of THC were observed. Yet there was an extension of areas where the fauna was affected several years after cessation of drill-cutting discharges. ***This may indicate that barite and related compounds associated with the discharges also have an environmental impact***. However, preliminary results from fields using only water-based mud clearly indicate a reduction in environmental contamination and biological impact, compared to effects reported here, for oil-based drill-cuttings … Finally, the initial effects of pollution included severe reductions in organisms that are key components of the benthic communities and also food for bottom-living fish, and are thus ecologically important. The new fauna which establishes in the contaminated sediments close to platforms, often with high abundance, will probably be less valuable as a food source for fish populations since it is of small size and lives sub-surface.[46]

The following information was presented to the decision makers about the impacts to the marine environment from routine and reasonably expected operations associated with the proposed oil and gas licenses:

> Kunnskapen om effekter av regulære utslipp i Arktis er begrenset. Det har foregått leteboring i Barentshavet i flere tiår, men så langt er det kun Snøhvitfeltet som er i vanlig produksjon. Gass fra dette feltet utvinnes på landanlegget Melkøya og utslippene herfra er i all hovedsak kjølevann (se kapittel 3.4.4). Det er utført en rekke studier, blant annet gjennom forskningsprogrammet SAARP (Statoil-Arctos Research Programme) og PROOFNY, der potensiell effekt av olje på arktiske organismer er undersøkt. Camus og

[46] Olsgard, F., & Gray, J. S. (1995). A comprehensive analysis of the effects of offshore oil and gas exploration and production on the benthic communities of the Norwegian continental shelf. *Marine Ecology Progress Series*, 277-306 (emphasis added).

Olsen (2012) har gjennomgått tilgjengelige forskningspublikasjoner som omhandler biologiske effekter av petroleumsrelaterte komponenter på arktiske marine organismer. De fleste studiene er gjort med tanke på å undersøke effekter av akutte oljeutslipp, og forfatterne har ikke funnet studier som undersøker effekter av produsert vann og kun én studie som omhandler potensielle effekter av boreutslipp. Camus og Olsen (2012) etterlyser en standardprotokoll for å undersøke effekter av olje på arktiske organismer. Av studiene de har oppsummert, benyttes det ulike oljetyper, oljekomponenter, eksponeringstid og konsentrasjoner. Dette gjør det vanskelig å gjøre direkte sammenlikninger mellom studier. Spørsmålet om arktiske organismer er mer sensitive for oljepåvirkning kan ikke besvares entydig og svært få studier har gjort slike sammenlikninger. Resultatene fra de oppsummerte studiene viser at i noen tilfeller er arktiske arter mer sensitive, andre ganger mindre sensitive, enn temperere arter (Camus og Olsen, 2012). Dette er i tråd med konklusjonene i PROOFNY programmet, der forskjellen i sensitivitet for oljerelatert forurensing mellom arktiske og temperere arter er liten og kan gi seg utslag begge veier (Bakke et al. 2012). Videre peker Bakke et al. (2012) på at andre forskjeller enn organismenes sensitivitet mellom Arktis og temperere strøk kan gi ulike responser på oljerelatert forurensing. Her nevnes sesongvariasjon, fordeling av bestander i tid og rom, lysforhold, temperatur, klimaendringer og forskjeller i bunnfauna-sammensetning (Bakke et al. 2012). Ved en opptrapping av petroleumsvirksomhet i kalde områder bør det settes av betydelig midler til å øke kunnskapsstatus på potensielle effekter av regulære utslipp i slike områder (se kapittel 7).
…

5.2.5 Samlede effekter for økosystemet

De modellerte lete- og produksjonsbrønnene vil trolig ikke gi effekter på bestander i det viktige økosystemet i utredningsområdet i Barentshavet sørøst, men det er en viss usikkerhet assosiert til effekter på visse nøkkelarter. De pelagiske artene som ikke har egenbevegelse; plankton og egg og yngel av fisk, er potensielt mest utsatt for produsert vann. Det er fortsatt et stor behov for kunnskap om effekter av produsert vann. Sårbare bentiske arter som svamp er de artene som er mest utsatt for borekaks og nedslamming av havbunn. Områdene rundt et letefelt vil bli nedslammet av borekaks og eksponeringen til sedimentert kaks vil være vedvarende til kakset enten eroderes og føres videre, blandes ned i det naturlige sedimentet ved bioturbasjon eller dekkes av nytt sediment. I praksis utgjør tilslammingen derfor en kronisk belastning der PNEC på 10 millimeter kaks er gyldig.

Det komplekse økosystemet som befinner seg i utredningsområdet er avhengig av svært mange viktige komponenter for å kunne opprettholdes og være i balanse. Om dette unike økosystemet kommer i ubalanse kan det få store følger for det marine liv og næringene som er tilknyttet dette. Dette diskuteres videre i kapittel 6.2. Det er med en viss usikkerhet at en kan konkludere at de modellerte scenarier ikke vil få noen effekt på økosystemet som en helhet.[47]

[47] Akvaplan-niva AS (September 2012) "Konsekvensutredning (KU) som en del av prosessen med åpning av det tidligere omstridte området vest for avgrensningslinjen i Barentshavet Sør. Regulære utslipp til sjø," at pgs. 21-22.

Although the material presented to the Ministry admits to an ecosystem imbalance that could have major consequences for marine life and dependent industries, no information is provided to decision makers about the spatial and temporal extent of such major consequences. The material also omits information about an entire category of impacts: direct physical disturbance from anchor chains, drill cuttings, drilling fluids, and pipelines. The lack of this information is compounded by the fact that the productivity of the benthic layer of the Barents Sea is greatest in its southern portion and is expected to increase because of climate change.[48]

## VIII. The Ministry had Inadequate Information about the Reasonably Foreseeable Impacts of the Leasing Decision on the Marine Environment Associated with Accidents and System Failures

The Licensing Decision would allow oil and gas activities in a region where the likelihood of an accident or system failure leading to a catastrophic release of oil is heightened because of conditions of enhanced sea ice and low temperatures beyond which no offshore oil and gas facility has yet encountered. According to DNV-GL:

> New concept designs for production, drilling, well operations as well as marine operations are needed for the Barents Sea. The concepts need to address the challenges of operating in the arctic and site-specific environmental conditions and far from established onshore infrastructure:
>
> > The concept designs for both locations need to be capable of operating in the sea ice conditions with hulls designed to withstand the loads from impact with sea ice and potentially drifting icebergs (INTSOK, 2014a, 2014b). The extent of hull strengthening depends on the amount of ice, but also to which extent ice handling is used.
> > Vessel concepts for marine operations should reflect the lack of existing offshore infrastructure and the long distance to established onshore infrastructure. New vessels should be able operate in ice covered waters and perform multiple functions (INTSOK, 2014c, 2014a, 2014d). ….
>
> Moorings and appendages need to be designed for withstanding the environmental loads in the Barents Sea or need to be protected from them. The following challenges for moorings and appendages have been emphasized:
>
> > Only first-year ice loads (~20' MT, light ice conditions) on moorings can be handled, while multiyear ice loads (~75'-100' MT) cannot be dealt with economically (IMVPA, 2008).
> > Currently, ice-breaking thrusters on production facilities cannot be fully serviced or replaced in the field (INTSOK, 2014a).
> > The hull has to be designed such that it prevents ice from flowing under the hull

[48] Cochrane, S. K., Denisenko, S. G., Renaud, P. E., Emblow, C. S., Ambrose, W. G., Ellingsen, I. H., & Skarðhamar, J. (2009). Benthic macrofauna and productivity regimes in the Barents Sea—ecological implications in a changing Arctic. *Journal of Sea Research*, 61(4), 222-233.

> of a floating production platform with risers underneath (INTSOK, 2014a). … [49]

Not only is the likelihood of an accident or system failure higher in the region covered by the Licensing Decision, but the magnitude of the impact of a catastrophic release of oil would be higher because of specific limitations that would impair the efficacy of an oil spill response. According to DNV-GL:

> Technology for oil spill response (OSR)
>
> There is currently no single oil spill response technology that can be applied under all conditions in the Arctic. This is also reflected by the following issues:
>
> > Arctic challenges such as low temperatures, sea ice, icing, etc., affect ability to combat oil spills (ACE, 2014).
> > More investigation of different alternatives and combinations of the different OSR measures is needed. Mechanical recovery has been the preferred option, whereas in-situ burning is not currently in use (INTSOK, 2014e).
> > The effectiveness of mechanical recovery, use of dispersants and in situ burning needs to be improved further (INTSOK, 2014e).
> > OSR technologies need to be improved to reduce the negative effects of sea ice, waves and remoteness (INTSOK, 2014e; Bjørnbom, 2015).
>
> Sufficient oil spill response capabilities are a requirement for operating in the Barents Sea. Multiple OSR technologies should be present on-site to provide the operator with the flexibility to choose the technologies that will have the highest success rates under the prevailing environmental conditions (DNV GL, 2014b).[50]

Scientists with the Arctic University of Norway published a study relevant to the response of a keystone species (Boreogadus saida) to ongoing releases of oil that would occur if oil were trapped beneath ice in the marginal ice zone. Their study states:

> Past experience has shown that releases of crude oil can have important long-term ecosystem effects at the regional level (Peterson et al., 2003), leading to significant economic consequences through the loss of ecosystem services (Cohen, 1995; Garza-Gil et al., 2006; Ocean Studies Board, 2013).
>
> Recently, Norway modified the definition of the Arctic marginal ice zone in preparation for a new round of oil and gas licensing, enabling the oil and gas industry to operate further north in the Barents Sea. As the accessibility to the Arctic increases, the threat of accidental oil spills increases greatly. This will further be exacerbated by changes in sea ice structure and behavior in combination with expected increases in extreme weather events resulting from climate change (Harsem et al., 2011).

[49] DNV-GL (November 2015) "Technology challenges for year-round oil and gas production at 74°N in the Barents Sea."
[50] *Id.*

In ice-covered environments, oil recovery is considered exceptionally challenging because the remoteness of the Arctic renders detection and access to the impacted area difficult, especially during the polar night. Spilled oil can easily become encapsulated into the ice and released in the following melt seasons when it may be widely distributed over larger areas (Dickins et al., 2008; Fingas and Hollebone, 2003); this will potentially affect ecosystems during periods of high productivity (Leu et al., 2015) and at biological hotspots (Kuletz et al., 2015). In addition, our increasing understanding of ecosystem processes during the polar night shows a system with high activity levels and biological interactions across most trophic levels (Berge et al., 2015b,c) that may be more vulnerable than previously assumed. Weathering processes in the Arctic, and in particular those of crude oil encapsulated in sea ice, are significantly prolonged, thereby also increasing the time of exposure to marine organisms (Brandvik and Faksness, 2009). Water-soluble hydrocarbons within brine channels in the sea ice can also reach concentrations that are toxic to ice-associated organisms and they can be released over several months, potentially contaminating food webs (Faksness and Brandvik, 2008).

Polar cod (Boreogadus saida) is the most abundant pan-arctic fish species, and it sustains the majority of other species that comprise higher trophic levels (Hop and Gjøsæter, 2013; Mueter et al., 2016). Populations of this small gadid are at risk of experiencing significant changes in ecosystem interactions (Renaud et al., 2012) and alterations in their life cycle strategies (Nahrgang et al., 2014) in regions of enhanced warming. Additional impacts from anthropogenic pollution, and in particular accidental oil spills, may accelerate the decline of this key species and thereby its central role in the Arctic food web. …

***Our study shows significant sub-lethal effects on polar cod larvae when exposed to low levels of hydrocarbons in the WSF of crude oil. Our study is an environmentally realistic representation of potential oil spill scenarios occurring in ice-covered regions during the polar night, when epipelagic eggs from polar cod will aggregate under the ice***. Polar cod populations may already be jeopardized as a result of climate warming impacts with fecundity levels reduced by one order of magnitude in regions influenced by warm water masses (Nahrgang et al., 2014). These additional stresses can only further impede their success of a complete life cycle. Additional work should evaluate the consequences of these observed effects on later developmental stages, as well as overall population sensitivity under various oil spill and climate scenarios. The risk of accidental oil spills in the Arctic Ocean increases concomitantly with the opening of circumpolar shipping routes and exploration for new oil resources. Exploration of these resources in ice-covered regions of the Arctic is already occurring. In the Barents Sea, the Goliat oil field has started production in April 2016. In the USA, the Bureau of Ocean Energy Management (BOEM) approved a five-year offshore oil and gas-leasing program for 2012-2017 including Arctic regions. As a keystone species in arctic ecosystems, the high sensitivity of polar cod to crude oil exposure during its early life stages is therefore likely to have important and cascading effects on the entire food chain, not just limited to a single-species phenomenon.[51]

[51] Nahrgang, J., Dubourg, P., Frantzen, M., Storch, D., Dahlke, F., & Meador, J. P. (2016). Early life stages of an arctic keystone species (Boreogadus saida) show high sensitivity to a water-soluble fraction of crude oil.

The following information was presented to the decision makers about the impacts to the marine environment of accidents and system failures of operations associated with the proposed oil and gas licenses.

> Denne rapporten ser på to av disse elementene: hvilke effekter vil et stort akutt oljeutslipp av et gitt omfang trolig ha for henholdsvis samfunns- og næringsliv? Vi understreker trolig, for svarene på spørsmål om en mulig fremtidig hendelse er beheftet med stor usikkerhet. Alvorlighetsgraden av et akutt oljeutslipp vil også variere etter hvem det er et problem for. Et utslipp kan være svært alvorlig for hushold, lokalsamfunn og enkeltbedrifter, uten at det nødvendigvis er et stort problem for næringssektorer, regioner eller befolkningen mer allment. Spørsmålet om vektingen av en risiko for de få vs. nytten for de mange er et politisk spørsmål som ikke omhandles her.
>
> Til tross for usikkerheten rundt et hypotetisk spørsmål om et mulig fremtidig akutt oljeutslipp, finnes det flere historiske utslippshendelser som bidrar med kunnskap om effekter, deres varighet og konsekvenser for næringer og lokalsamfunn. Summen av disse faglige analysene er ikke alltid entydige, og det finnes dermed også ulike svar på disse problemstillingene.
>
> Vår oppsummering er at et oljeutslipp av forutsatt størrelse og karakter som i ODs scenario vil ha negative og lokale/regionale effekter, men at det er lite grunnlag for å hevde at det – med de forutsetninger som ligger til grunn for studien - vil utgjøre store og langvarige problemer for næringsliv eller lokalsamfunn, gitt at myndigheter og ansvarlige operatørselskaper har effektive og troverdige strategier for å bidra til nødvendig tilpasning. Denne konklusjonen må ses i sammenheng med områdets beliggenhet i forhold til de viktigste områdene for norsk fiske, og strømforholdene i utredningsområdet. De dominerende strømforholdene i utredningsområdet medfører at utslipp fra store deler av utredningsområdet ikke ventes å nå viktige fiskeriområder nær kysten, viktige både for den havgående flåten og for lokalt kystfiske. Det er i hovedsak bare utslipp fra den sørligste lokaliteten som kan berøre slike områder. …
>
> Å drive fiske i et område som er berørt av et oljeutslipp vil ikke være aktuelt. Selv om fisken skulle stå så dypt at den ikke påvirkes av olje på havoverflaten, vil fortsatt fiske i slike områder medføre en risiko for tilgrising av fiskeredskapene, samt begrunnet eller ubegrunnet mistanke om kvalitetsforringelse. Dette vil i seg selv være nok til å holde fiskerne borte. For den fiskeflåten som driver fiske i et område som berøres av et akutt oljesøl, vil sølet i praksis bety et avbrudd i fisket. Vi ser da bort fra eventuelle langsiktigebiologiske virkninger på fiskeressursene.
>
> I tillegg til virkninger i form av fangsttap og markedsmessige reaksjoner kan et akutt oljeutslipp føre til tilgrising av faststående redskaper som garn og line som sto i sjøen når utslippet startet. Ved fiske med ringnot, trål, autoline og snurrevad vil en kunne unngå de oljeinfiserte områder. Det samme gjelder ved utsetting av faststående redskaper i områder

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Environmental Pollution, 218, 605-614 (emphasis added).

> som kan bli berørt av oljens videre drift. …
>
> Opprensking vil suksessivt fjerne olje fra havet, enten ved mekanisk oppsamling, eller alternativt ved kjemisk dispergering, dersom oljetypen ligger til rette for dette. Det er i spredningsberegningene ikke inkludert effekt av bekjempelsestiltak. Olje vil kunne være synlig i miljøet og langs strendene I betydelig lengre tid, men olje på strand vil i seg selv ikke være til hinder for utøvelse av fiske.[52]

The quality of information presented above is substandard in several aspects.

First, there are no historical events that could allow for adequate knowledge of the consequences of an oil spill in the region covered by the Licensing Decision because enhanced sea ice and low temperatures in the region are beyond that which any offshore oil and gas facility has ever encountered.

Second, there is no information about the impact of a major oil spill in the region on an Arctic key species - Polar cod (*Boreogadus saida*) or key Arctic fisheries - Arctic cod (*Gadus morhua)*, Barents Sea capelin (*Mallotus villosus)*, and Norwegian spring-spawning herring (*Clupea harengus*).

Third, it was improper to conduct an assessment of a major oil spill that ignores any long-term biological effects on fishery resources. It is precisely these long-term biological effects on fishery resources that would constitute the highest consequence of a major oil spill.

Fourth, it is improper to assume that purification will successfully remove oil from the sea, either by mechanical collection, or alternatively by chemical dispersion, if the oil type is suitable for this. If a major oil spill occurs in the region covered by the Licensing Decision, then conditions in the area are precisely those that could render successful remove of oil from the sea impossible.

Because the quality of information about the consequences of a major oil spill is substandard in these critical ways, the decision of the MPE to approve the oil and gas licenses should be set aside as irrational.

**Conclusion**

ELAW shares this legal and scientific information with the Oslo District Court in hopes that it is helpful as the Court considers the important issues before it.

Submitted on behalf of the U.S. office of the Environmental Law Alliance Worldwide (ELAW) by:

Bern Johnson
Executive Director

30 October 2017
Date

[52] Norut Tromsø (September 2012) "Konsekvenser av akuttutslipp for samfunn og næringsliv. Konsekvensutredning for Barentshavet sørøst Utarbeidet på oppdrag fra Olje- og energidepartementet," at pgs. xi., 49 and 50.