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PO Box 5667
St. John's NL A1C 5X1

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BAB 3990-30

April 28, 2008

Ms. Elizabeth Young
Environmental Analyst
Canada-Newfoundland and Labrador Offshore Petroleum Board
5th Floor, TD Place
140 Water Street
St. John's NL A1C 6H6

Dear Ms. Young:

**Subject: Environmental Assessment of Geophysical Surveys for Exploration
Licences 1097, 1098, 1103 and 1104 Western Newfoundland**

As requested, DFO has reviewed the document entitled, '*Environmental Assessment of Geophysical Surveys for Exploration Licences 1097, 1098, 1103 and 1104 Western Newfoundland*', dated March 2008. Based upon the project description, it is understood that NWest Energy Inc. (NWest) proposes to conduct a multi-year 3-D marine seismic survey program on its four Exploration Licences, as well as geohazard (vertical seismic profile (VSP) and wellsite) surveys over an eight-year period. The attached comments are provided for your review and consideration.

General Comments

If the report is intended to be a publicly available, scientific based document, it should be revised taking into account an adequate review of the literature as well as a more balanced approach to both literature and viewpoint. For instance, the Executive Summary contains an opinion on effects citing one particular expert. It should be noted that there are other (published) expert opinions which do not concur with this opinion. Furthermore, it is not typical to express the selective viewpoint of any one expert in a conclusion-type statement. Therefore, available literature should be reviewed more carefully, particularly with respect to providing the background for an evidence-based opinion in the Executive Summary.

The report should also provide a better appreciation of the literature in relation to the potential effects of oil spills. It appears only a few outdated references were provided, which are not sufficient from a scientific perspective.

There is significant level of uncertainty with regards to the project description, including timing, equipment/methods to be used (2-D vs. 3-D) and the geographic location to be surveyed (on an annual basis and overall). The proposed timing for conducting the surveys (May-December) is very broad, making it difficult to assess potential impacts on fisheries resources, such as conflict with fisheries, including DFO R/V surveys and sentinel fisheries research as well as cumulative effects. Clarity and certainty regarding the above elements are critically important in order for DFO staff to fully understand the scope and nature of work to be performed. The lack of detailed information also makes it difficult to determine the potential impacts on marine fisheries resources. In order to fully assess cumulative effects in the offshore, DFO needs to be advised well in advance of any changes in project information, particularly with respect to timing of seismic survey work. To this end, the Department requests that an annual project update, which outlines survey locations, timing of activities, survey type, airgun array, etc., be submitted each year within a reasonable timeframe to allow review and provision of appropriate advice. DFO also requests that it be notified once a project commences.

Geohazard surveys will acquire high resolution seismic, side scan sonar, sub bottom profiler, and multi-beam bathymetric data as needed over the proposed area. This variety of sound sources could output sound energy at frequencies and amplitudes which might impact a number of marine species. For instance, higher frequency sources are a potential concern for beaked whales, while airgun sounds are more of a concern for baleen whales. Ideally, the same types of mitigation protocols for marine mammals and sea turtles should be employed for these operations (e.g., trained Marine Mammal Observers, ramp-up/shut down, provision of sightings data to regulatory agencies, etc.).

Cumulative effects estimations are fraught with uncertainty due to the relative lack of knowledge about effects of offshore developments on marine mammal distribution and abundance. Given this uncertainty, large-scale baseline surveys need to be carried out in order to assess the abundance and distribution of marine megafauna over larger areas of the region. In an attempt to address this data gap, albeit with limited resources, DFO carried out a large-scale aerial survey for marine megafauna in Newfoundland and Labrador (NL) waters during the summer of 2007. It is recommended that, perhaps through the Environmental Studies Research Fund, this survey be enhanced in scope, and other surveys during other seasons and years be conducted to assess seasonal, annual, and geographic variation in distribution and abundance of marine megafauna. Knowledge of this type of baseline information is extremely important prior to initiating significant offshore developments, and to track the effects of current operations on various ecosystem components.

Specific Comments

Page 1, Para. 2 - In consideration of the eight-year timeframe proposed for this project, DFO requests that an annual project update outlining survey locations, timing of activities, survey type, airgun array, etc., be submitted each year within a reasonable timeframe to allow review and provision of appropriate advice,

particularly with respect to any new information regarding seismic effects that may become available during this time.

Page 31, Figure 4.1 - According to this figure, the project area with the 10 km buffer required for line change, will result in the vessel entering nearshore shallow areas where the inshore lobster fishery occurs. It will also overlap the North Head Lobster nursery area (page 96), which is presently closed to fishing for conservation purposes. Mitigations to avoid this area during sensitive time periods (June-July when larvae are most abundant in the water column), and to ensure that the seismic sound source is minimized when transiting this area, are strongly recommended.

Page 33, Table 4.3 ; Page 60, Section 5.2. Valued Environmental Component - As per the *Canadian Environmental Assessment Act (CEAA)*, the term "Valued Ecosystem Component" is used for the acronym VEC.

Page 72, Para. 5 - "*In 2002, a new zone was established in 4R to protect the spawning stock.*" A figure showing the location of this zone in relation to the project area should be provided for comparison purposes.

Page 73, Para. 4 - A reference should be provided for the information on white hake.

Page 83, Para. 6 - The reference made by fishers during consultations to the North Head lobster nursery area (LFA 13B) reinforces the need to apply mitigations to avoid this area during sensitive times and ensure that the seismic sound source is minimized when transiting this area.

Page 124, Para. 1 - There was also a moratorium during the years 1994 to 1996.

Page 124, Para. 1 - To clarify, the cod fishery in this area is nearshore, not offshore (gillnets and longlines). The stratified random surveys (DFO-R/V survey, sentinel survey) cover all depths deeper than 40 m (sentinel) and 100 m (DFO-R/V) in the Gulf.

Page 124, Figure 5.43 - The data source is missing and should be provided.

Page 124, Sentinel Surveys - These are not surveys *per se*; sampling is carried out while undertaking commercial fishing. Also, the figure number referenced in this section (Figure 5.45) is incorrect; it should be Figure 5.44.

Page 125, Research Vessel Surveys - This section is confusing as it discusses a mixture of DFO groundfish research surveys, fixed gear sentinel surveys, and mobile gear sentinel surveys. These should be separated. For clarity, DFO suggests placing the fixed gear sentinel text in section 5.3.2.1 Sentinel Surveys and renaming it: Fixed Gear Sentinel.

Page 125, Research Vessel Surveys - The DFO Groundfish Research Survey (referenced in the first two sentences of the paragraph) is completely independent of commercial activities and should not appear in the section 5.3.2 Commercial Fishery

Surveys. The information provided does not outline the purpose of this specific survey (i.e., where it is carried out, the species being studied, etc.). In fact, the information provided is insufficient to adequately evaluate the actual impacts of the project on DFO groundfish research surveys.

Page 125, Research Vessel Surveys - Please note that there is also a Fisheries Science Collaborative Program (FSCP) crab survey in 4R which is conducted jointly with industry and DFO. These are fixed-gear crab pot locations and the gear is generally set for a 24 hour period. Each management area is usually completed within 4 days. Although the survey time is variable, it generally takes place within the period Sept. 1 – Oct. 15 for any given year. Maps showing the set locations are attached for your information.

Page 126, Figure 5.45 - There may be a problem with manipulation/conversion of fishing tow data, possibly during conversion from minutes to fraction of degrees, as they appear as five separate horizontal bands in 4R. It should reflect a continuous sampling area.

Page 127, Snow Crab Survey - It would be beneficial to plot fishing positions of the snow crab survey similar to the previous map (Figure 5.45).

Page 127, Halibut Tagging - The size of juvenile fish (less than 81 cm) being tagged should be provided as well as the minimum legal size of capture. In addition, since 2007, there has also been a tagging program for commercial size halibut.

Page 127, Halibut Tagging - It would be beneficial to plot tagging position sites as well as the number of fishermen involved in the project and the number of halibut tagged at each site. The time of year when tagging activities were undertaken and the scientific rationale for the tagging program, etc., should also be provided.

Page 127, Halibut Tagging - The meaning/intent of the last sentence is uncertain. This section should be revisited and updated accordingly.

Page 127, Cod Reproductive Survey - The first sentence should be re-worded to read "*Two otter trawlers must perform fishing tows to conduct...*"

Page 127, Aquaculture - According to Figure 5.46, there are *two* blue mussel sites: one at Goose Arm in the Bay of Islands *and another at Piccadilly Head on the northern side of the Port au Port Peninsula*. This should be revisited and revised.

Page 127, Marine Traffic – It is important to note that vessels may move outside these shipping lanes when ice is present. There are also a lot of local vessels that do not travel towards the Great Lakes in the Gulf. It is worth mentioning that many small fishing boats do not have Vessel Monitoring Systems (VMS). This section should be revisited and updated accordingly.

Page 140, Para. 1 - For future surveys (between May-December until 2015), in addition to consultations with fishers, the proponent should also contact DFO in

order to establish an appropriate seismic survey window to minimize conflicts with commercial fisheries and DFO sentinel and research vessel surveys. Again, this supports the need to provide annual updates of locations, timing, seismic survey types and source, etc., to ensure a comprehensive review.

Page 141, Physical Effects – To follow are a couple of examples which reinforce the problem of apparent selective interpretation of literature and viewpoint. On Page 150, it states that in a preliminary study carried out by Christian *et al.* (2003) on the effects of seismic on snow crab eggs, a 1.6% mortality was noted. This seems somewhat trivial; however, mortality was not the important point in this instance. The omission was the concept of major differences in egg development rate, demonstrating that it could be an important endpoint to consider in a more comprehensive study. It was noted (page 146) in a study by Payne *et al.* (2007), in which some sub-lethal effects were noted in lobster, that the animals were exposed at a few meters. This may seem somewhat irrelevant for the non-expert, since in the real world, distances are known to be much greater. The important omission in this instance was not including the measured pressure levels where some sub-lethal effects were observed at levels that were relatively low but could, depending on gun size, reach hundreds of meters in the water column.

Page 146 – It is mentioned that tank exposures have constraints. Other references, which were not included, have noted that the tank approach is the only economical and practical way of obtaining an understanding of dose-exposure relationships. Perhaps unknown to the authors is the importance of tank experiments, which at a very low cost have demonstrated little effect on snow crab; the species expected to be in high abundance within the area to be surveyed. If any significant effects had been observed in the tank experiments, policy recommendations could have been markedly different.

Page 154 - Regarding monitoring for effects on fish and shellfish, a strong case cannot be made at this time for monitoring effects on snow crab or other non-commercial species which may be present in the area. An important consideration in this regard is the relatively deep water in the area. However, this could change if new information on effects become available or the surveys are extended into shallow lobster habitat. Therefore, DFO requests that the program be reviewed on an annual basis throughout the expected timeframe of the seismic program.

References:

Christian, J.R., Mathieu, A., Thompson, D.H., White, D., and Buchanan, R. 2003. Effect of seismic energy on snow crab (*Chionoecetes opilio*). Environmental Research Funds Project No.144. Calgary. 106p.

Payne, J.F., Andrews, C.A., Fancey, L.L. Cook, A.L., and Christian, J.R. 2007. Pilot study on the effect of seismic air gun noise on lobster (*Homarus americanus*). Can. Tech. Rep. Fish. Aquat. Sci. 2712: v + 46.

Page 152, Para. 1 and Page 177, Para. 3 - The statement that accidental spills will not occur because solid streamers will be used is not entirely consistent with the

statement on page 22, that a vessel using solid streamer technology is *preferred*. Please revisit and clarify.

Page 159, Bullet 4 - Reference is made to using a qualified Marine Mammal Observer; however, the last paragraph indicates that a trained Environmental Observer will watch for marine mammals. Having a single observer perform the duties of marine mammal, sea turtle, and seabird observer is unlikely to be effective or provide adequate sightings data. These biological targets are very different, and require different visual search skills and scanning protocols. Therefore, data regarding sightings of marine mammals, sea turtles, and sea birds and their apparent reactions to the seismic or vessel operations should be obtained by trained, dedicated observers. Such monitoring should be conducted using a set of consensual guidelines with the object of providing the best possible data, disseminated to the most researchers (e.g., DFO, CWS, MUN). Results of this monitoring should be made available in digital format, preferably. DFO requests that the Marine Mammal monitoring report be submitted to Jack Lawson (772-2285) upon completion of the program.

Page 159, Bullet 8 - During line changes, reduction to a single energy source is preferred over complete shut down, especially as ramp up/soft start will not be required, as stated. This is a common mitigation for marine mammals, sea turtles and fish and should be employed during this program.

Page 160, Para 1 - DFO agrees with the mitigation measure proposed during line changes that the seismic array be powered down to a single air source to warn marine mammals of the presence of the seismic vessel.

Page 176, Para. 5; Page 177, Para. 6; Page 178, Para. 4; Page 180 Table 6.6 - See previous comment regarding use of dedicated Marine Mammal Observers vs. Environmental Observers.

Page 177, Para. 6 - *"If a concentration of marine mammals is observed in a particular area, the survey can shift to another part of the survey area until the concentration has moved away."* Is this mitigation an actual commitment by the operator? If this is the case, the wording should be changed to *"will shift,"* otherwise the statement has no merit and should be removed from the text.

Page 178, Para. 1 - Although the probability of vessel collisions with endangered species is considered low, the potential for ship strikes by the seismic source, guard, or any support vessels will certainly exist. Please note there are several cases of large whale ship strikes with the ferries between Cape Breton and Port aux Basques, so not all marine mammals avoid vessels successfully. The *endangered* blue whale is sighted regularly in the proposed operations area so ship strikes remain a concern and necessitate extreme vigilance by the operators. This cannot be overstated.

Page 178, Para. 4 - The last two sentences of this paragraph should be edited to include observations of sea turtles *or marine mammals*.

Page 180, Table 6.6 - DFO requests that it be notified if dead or distressed marine mammals or sea turtles are spotted and particularly in the event that sea turtles or mammals are injured or killed by project activities.

Page 183, Para.2 - The North Head lobster nursery area is *not* well beyond the influence of physical harm to lobster larvae from the Project, as stated. The proponent should make every effort to avoid this area (which may overlap during line changes) during the most sensitive time periods for this life stage.

Page 188, Para.2; Page 190, Para. 3; Page 192, Table 6.8; Page 198, Table 9.2 - Previous coordination between offshore oil and gas operators and DFO has proved to successfully mitigate the potential for overlap between offshore oil and gas activities and DFO/Industry research surveys. To prevent gear conflicts and minimize disruption of natural fish behavior and/or distribution prior to and during research surveys, DFO-NL Region has requested that seismic operators maintain a buffer of 30-40 km around research survey set locations for 7-10 days prior to arrival of DFO research vessels. It is requested that the Department be notified of survey locations and project timing as soon as they are known.

Thank you for providing DFO the opportunity to comment on this document. Should you have any questions or comments regarding the above, please contact James Meade by phone at 772-3521 or by e-mail (meadej@dfo-mpo.gc.ca).

Yours truly,

Carole Grant
A/Section Head – Habitat Evaluation
Marine Environment and Habitat Management
Oceans and Habitat Management Branch

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attachment







