

P.R.

**Alan Ehrlich**

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**From:** Keith Rosindell [rosindell1@calgary.westerngeco.slb.com]  
**Sent:** Friday, June 13, 2003 4:21 PM  
**To:** Alan Ehrlich  
**Cc:** Derek Melton; Bob Lee White II; Dean Kennedy; Stephen Dix Whidden  
**Subject:** RE: Popper's tech report- full text

Alan.

Thank you very much for a copy of the Popper Technical Report and the Technical Reports received from GRRB and DFO.

I also appreciate the opportunity for comment on the said reports, although I understand that I only have today to submit my "views"

Popper Report:

Page 12 item b. Sound Levels.

The Author of the Popper Report states:

WesternGeco points out in the EA that the highest sound levels produced by the air guns was found at 25 m from the source. However, they had the cages at 2, 85, and 446 m from the source and the signal level at 2 m was somewhat lower than the 25 m level.

WesternGeco response:

WesternGeco addressed the confusion between the 2 m and 25 m range in IR No 2, response 1.2.6. Unfortunately, the Popper Report references the IR but chooses to ignore the explanation. This very important point needs to be addressed and clarified in the technical review process, it is also referenced in the Popper Report ( page 15 item 21 " It should be pointed out that no fish were subjected to maximum exposure" )

It must be remembered that although the 2 m value is calculated back from the 4 m measured amplitude, the 2 m range has the highest amplitude and shows the worst case scenario. Appendix II Acoustic Field Studies Report, page 31, figure 22, clearly shows a higher amplitude at 4 m than is shown at 25 m.

WesternGeco placed the 2 m cage at the point where the out-put from the air gun array is at it's highest amplitude.

Popper's argument ( page 18, item 3. An evaluation of the efficacy of the results and their usefulness as a " worst-case scenario" of what could potentially happen were there to be full-scale air gun use. " It is my view that the results presented by WesternGeco do not represent a worst-case scenario with regards to the potential effect of air guns on fish in the Mackenzie River. A more adequate analysis of worst-case would have involved far more exposure to sound than would be expected during a seismic survey.

WesternGeco response.

The title is confusing and I'm not sure where the Author of the Report was going with this.

The objective of the tests was to subject fish, found at time and location in the Mackenzie River to the worst-case scenario presented by the program. ( i.e 2 m away from the 1500 cu ins air gun array @ 2000 psi ) I see no value to subjecting fish to higher than generated exposure levels. One has to consider the political as well as operational constrains to such testing; there was absolutely no way that WesternGeco was going to start seeing if they could "blow up" fish for the good of science. I find the Authors comments irrelevant to the issues at hand.

Furthermore the Popper Report makes reference to a RL & L Environmental Services ( 1998 ) , in an unpublished report found significant damage to several species in response to air gun exposure and concluded that damage would occur within 1.8 m of the source. The Author of the Popper Report

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points out that " while comparison to the current Environmental Assessment are very hard to make since RL & L Environmental provides little information on the sound level, what is important is that they found significant effects on several walleye, northern pike and lake fish. These results, which were known to WesternGeco ( they cited this report in the Environmental Assessment ) strongly supports the argument that these species should have been included in the cage tests reviewed here, and the results may have been of great importance.

WesternGeco's response:

WesternGeco used species present at the test location at the time of the testing. I can see no strong support for the argument put forward in Popper Report for using northern pike and lake fish. We have no way of knowing what actual noise levels were used in the unpublished RL & L Environmental ( 1998 ) paper.

Popper Report, Executive Summary, point 11.

There is no way to know which species were observed in the sonar used in the behavioural tests, and it is possible that only one or two, not necessarily representative species were observed.

WesternGeco response:

It is reasonable to assume that all fish observed in the sonar used in the behavioural tests, represented all species present at the time of the testing.

The Popper Report includes section 6. ' What other kind(s) of studies should/could be done to further examine the effects of air guns on fish." WesternGeco do not understand the reasoning behind these comments, and find them irrelevant to the issues at hand.

In the final comments of the Popper Report the Author suggests that " until such studies are performed by an independant group of investigators without a stake in the outcome, the effects of air guns will not be understood."

WesternGeco Response.

Indeed, the tests were performed by an independant group of investigators, and leaders in their field, without a stake in the outcome.

WesternGeco's response to the DFO Technical Reports.

The DFO has identified various " shut down zones " locations on the River and a recommended mitigation to shut down 1 km down stream and 1 km up stream of these locations. Some of the rationale seem to be because of possible congregation of fish or known fishing locations. WesternGeco would like to propose an alternative to a compulsory shut down which was an alternative suggested by the Mackenzie Delta Environmental Impact Review Board in their final report to the NEB.

( please see extract from the NEB IR No 3 addressing the alternative mitigation )

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MACKENZIE DELTA MARINE 2D SEISMIC PROGRAM 2003

National Energy Board Information Request No. 3

WesternGeco agrees with this recommendation.

• That the lead scout boat be equipped with a broad beam fish finder and that, in the vicinity of locations identified by DFO representatives as being known concentration spots for fish (Holmes Creek and Horseshoe Bend), the lead scout boat determine whether, at the time of the seismic survey, fish have concentrated there. If a concentration of fish is detected, the air gun array should be shut down one km before the concentration and not be

ramped up until the array is one km past the concentration;

WesternGeco is in agreement with the EIRB Panel's Technical Advisor that '... given the ability of fish to swim away from a sound source and the low likelihood of having a fish encounter the airgun array, the possibility of negative impacts on the fish populations in the Mackenzie River should be very low to non-existent.' (Public Review of WesternGeco Mackenzie Delta Marine 2D Seismic Program 2003, Final Report of a Panel of the Environmental Impact Review Board May 5, 2003). There also is no clear indication that should fish aggregate in an area near a seismic acquisition operation that fish will disperse, catch rates will decrease, or that if catch rates do decrease, they will not quickly recover.

However, in the spirit of applying the precautionary principle for environmental concern, we offer options to either definitively identify sensitive areas or to minimize any potential, but unlikely, impact on aggregations of fish in an area designated as sensitive. Note that to be thought of as sensitive, there should be a strong basis for expecting high concentrations of fish at the mouth of a stream and into the Mackenzie River channel. 2003 field studies demonstrated the quick attenuation of sound up a tributary, which means that important tributaries per se are not enough of a criterion for designation in the context of this Project. We should again emphasize that given the results of the 2003 Test Program and the findings of the EIRB, attempting this extra monitoring for sensitive areas is seen as highly precautionary. To define such areas quantitatively has not been done by DFO or Inuvialuit co-management structures and will not be straightforward. Should consensus with DFO not be possible with respect to either methodology or a threshold, we strongly believe that seismic data should be acquired without break, including the two areas noted as possibly sensitive by DFO where the project plans to pass.

Option 1. Rather than using a broad beam finder, which is more influenced by background "noise", we recommend using a split beam (narrow beam) fish finder, which is more accurate. To determine fish densities within 1 km upstream and downstream of areas identified as sensitive by DFO, a BioSonics 120 KHz split-beam transducer will be aimed vertically to acquire depth, size and abundance data related to fish. The 120 KHz frequency hydroacoustic system, which was employed during the 2002 Fish Studies program on the Mackenzie River, has provided the only quantitative data for the fish community in the Mackenzie River and results in minimal interference from riverine conditions (i.e., air entrapment, debris load, etc.) which are unfavourable to hydroacoustic data acquisition. The same settings and operating conditions should be used as were used during the 2002 Test Program. The surface unit will be set to a threshold of -60 dB (range = -130 to 0 dB) and to ping (or sample) every 4 seconds for all data acquisition. Sampling at a transect(s) in designated sensitive and reference areas should be conducted prior to seismic data acquisition in that area. Data for the sampled areas can be processed, and density estimates provided, in situ by trained personnel in realtime. This will allow data to be analyzed ahead of the seismic data acquisition and will minimize operation disruption in areas where fish densities are not unusual i.e. within normal range. GPS coordinates for the start and finish of the transects in designated sensitive and reference areas will be recorded.

Under the next bullet we offer two ways to establish a threshold for determining fish densities in an area designated as sensitive that would halt the seismic data acquisition within 1 km either side of a tributary mouth.

Option 2. We suspect that designation of sensitive areas is based primarily upon Traditional Knowledge. Consequently, we suggest that an opportunity exists to augment the scientific fisheries data that we provided in 2002, with a data collection program that identifies the variability in fish density and distribution in the Mackenzie River over time. Through a data collection program, an agent (such as DFO) may confirm sensitive areas as defined by aggregations of fish. DFO may wish to explore this option because of the benefit to their mandate of managing fish and fish habitat in this

region of Canada. A data collection program would involve collecting hydroacoustic data a year before the proposed 2D Seismic Program is to proceed at areas designated as sensitive. Data would be collected during a time when there is no suspected fish migration to determine ambient fish densities. The ambient density estimates would then allow the later determination of whether fish in fact are aggregating in these areas designated as sensitive during the period proposed for the seismic project. Because DFO and the fishery are the primary beneficiaries of these data, we can offer advice as to program design, provide data from our 2002 Test Program and are willing to use their results in design of future initiatives.

• That guidelines be developed and incorporated into the instructions for monitors to effectively implement the previous recommendations. The guidelines should include a threshold which would serve to determine what is a fish concentration to avoid;

Guidelines will be developed for use by the monitors in determining whether or not concentrations of fish exist. Threshold criteria that would determine whether seismic data can be acquired in an area designated as sensitive will be developed and discussed with Fisheries and Oceans personnel. Two options are proposed, below, to aid in the development of threshold criteria:

1. Arbitrary Threshold: Our 2002 sampling was conducted during the same time as the proposed project will proceed; therefore, our 2002 estimates of fish density will be for the appropriate season. Using the mean density for fish from the 2002 ambient data, a threshold value could be developed by taking, as an example, four times the ambient fish density from the test areas of the 2002 program. An estimated fish density below this threshold i.e. say any density <4X the 2002 mean, would allow the seismic operation to acquire data in the designated sensitive area.

2. Real Time Threshold: This method would use real time estimates of fish density to develop a threshold. For example, once the data collected just in advance of the seismic survey was analyzed (estimates of density from reference and designated sensitive areas), estimates of fish density within two times (2x) the standard deviation, providing 95% confidence, would not preclude collection of seismic data in that sensitive area.

Rgds  
Keith

-----Original Message-----

From: Alan Ehrlich [mailto:AEhrlich@mveirb.nt.ca]  
Sent: Wednesday, June 11, 2003 11:43 AM  
To: Keith Rosindell (E-mail)  
Subject: Popper's tech report- full text

Hi Keith,

Yesterday I faxed out the EA technical reports we've received. I only sent out the summary of Popper's report, and asked those who want the whole thing to contact me for it. Although I haven't heard from you, I believe that as the developer, you should have the entire document, so that you have the opportunity to comment on it, should you choose to, before the public registry closes this Friday.

It is attached below. The other two technical reports were faxed in full, because they were relatively short.

Regards,

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Mackenzie Valley Environmental Impact Review Board  
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<<WG Tech rep Popper 6-8-03.pdf>>