

Presentation for the Public Hearings  
regarding the DeBeers Canada  
Gahcho Kué Diamond Mine Proposal



Presented by:  
The Deninu K'ue First Nation  
PO Box 1899, Fort Resolution, NT X0E 0M0

Mackenzie Valley Environmental Impact Review Board  
December 3-7, 2012

Introduction

*"As long as the sun shines, rivers flow and grass grows"* based on our Treaty with the crown, future generations should be also be able to practice their inherent right to hunt, fish, trap and gather in our Traditional Territory, which encompasses all of the Gahcho Kue area.

## Introduction

### ***DKFN Team***

- Patrick Simon (DKFN Environmental Manager) and Robert Sayine (DKFN Councilor)
- Marc d'Entremont and Elmar Plate (Technical Advisors from LGL Limited)
- Linda Vanden Berg (Technical Advisor from Vanden Berg & Associates)
- Chief Louis Balsillie

### ***Presentation Outline***

- Summary of fisheries concerns
- Summary of Ethno-History report

## Presentation for the Public Hearings regarding the DeBeers Canada Gahcho Kué Diamond Mine Proposal

Submitted to:  
Chuck Hubert

Senior Environmental Assessment Officer  
Mackenzie Valley Environmental Impact Review Board  
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Submitted by:  
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On Behalf of The Deninu K'ue First Nation  
PO Box 1899, Fort Resolution, NT X0E 0M0

### Reason for Presentation

- The fish population of Kennady Lake has not been properly enumerated
- Therefore accurate baseline fish population data has not been provided

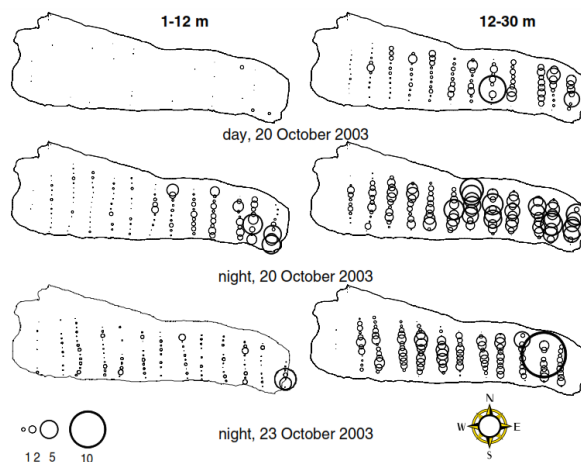
### Hydroacoustics Settings

- Source: Addendum JJ, JJ3.4-1, p.JJ3-21 Table of Parameters
- Ping Rate: 5 pings/s at a speed of 1.5 m/s
  - Distance travelled between pings = 0.3 m
  - Therefore only at a depths >7 m one would reliably have three pings from one fish (formula:  
 $=2 * A8 * \text{TAN}(\text{RADIANS}(8)/2)$ )
- Pulse Width: 0.4 ms
  - Minimum separation between individual fish = 0.4 m or 40 cm

### Hydroacoustics : Night-Time versus Day-Time 1

Guillard, J. and C. Vergés. 2007. The repeatability of fish biomass and size distribution estimates obtained by hydroacoustic surveys using various sampling strategies and statistical analysis. *International Review of Hydrobiology*, 92 (6): 605-617.

Figure 3. Density histograms ( $S_a$ ,  $m^2 \cdot ha^{-1}$ ), an example of a day and night survey conducted on 20 October 2003.



### Hydroacoustics: Night-Time versus Day-Time 2

| Lake/Reservoir      | Day-time Density | Night-time Density | Source                |
|---------------------|------------------|--------------------|-----------------------|
| Coquitlam - clear   | 20 fish/ha       | 103 fish/ha        | Bussanich et al. 2006 |
| Coquitlam – clear   | 12 fish/ha       | 60 fish/ha         | Plate et al. 2011     |
| Coquitlam - clear   | 13 fish/ha       | 85 fish/ha         | Plate et al. 2012     |
| Powell Lake – clear | 116 fish/ha      | 289 fish/ha        | Plate et al. 2012     |

MacLellan, S.G. and J.M.B. Hume. 2010. (34 years of hydroacoustics experience):  
 “...meant that all hydroacoustic sampling and trawling for estimating abundance was done at night after fish schools had dispersed and fish tended to be closer to the surface, and more accessible to both hydroacoustics and trawling (Burczynski and Johnson 1986; Narver 1970). “

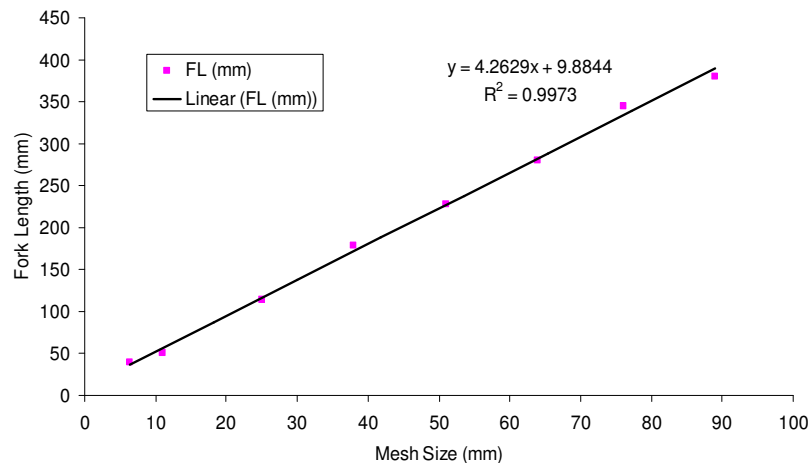
and further “even suggested against partial moonlight during surveys”

### Hydroacoustics: Night-Time versus Day-Time 3

In the response to the IR 2, Golder and Associates referred to a peer-reviewed paper (Hartman and Margraf 2007) to justify that the daylight hydroacoustic surveys are suitable to describe a fish population in high latitude lakes. Hole Lake is small (approximately 50 ha or 1 km x 0.5 km) and has very high fish densities of up to 9,834 fish/ha (Hartman and Margraf 2003). Comparisons with the conditions in, much larger, and likely much lower fish density Kennady Lake should therefore not be made.

When a large body of literature is showing that day-time hydroacoustic surveys are only detecting a fraction of fish in a lake when compared with night-time hydroacoustic surveys and it is easily technically feasible to conduct such night-time surveys than they should simply be carried out.

### Gillnetting 1



Data combined from: Hamley 1972, Plate et al. 2007, Plate et al. 2010, Plate et al. 2011a and b, Plate et al. 2012a and b, Plate et al. unpublished

- Addendum JJ, JJ3.4.1.12 Gill Netting. P.JJ3-22
- Gillnetting used in 2010 to verify species composition of hydroacoustic targets:
  - Minimum mesh size 38 mm (fish > 180 mm)
- Inventory Gillnetting 2007: one net in one location of Kennady Lake
  - Minimum mesh size 38 mm (fish > 180 mm)
- Mark-Recapture and Telemetry Gillnetting 2004:
  - Minimum mesh size 38 mm (fish > 180 mm)
- Inventory Gillnetting 1996:
  - Minimum mesh size 25 mm (fish > 130 mm)

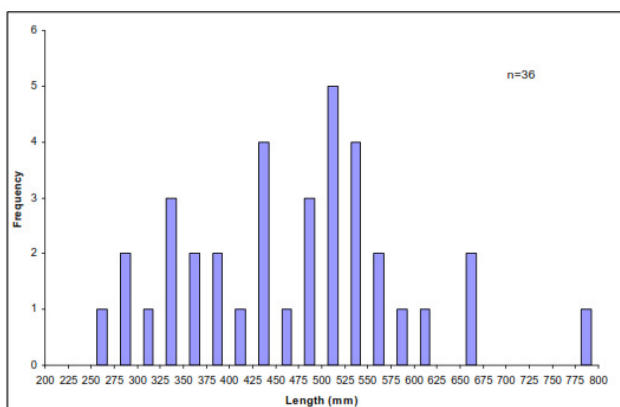
## Gillnetting 2



Comment: Small mesh nets catch small fish in the pelagic zone, in the study above we caught Three Spine Stickleback (min. FL=38mm), Age 1+ Kokanee (min. FL=60mm) and Redside Shiners (min. FL=60mm)

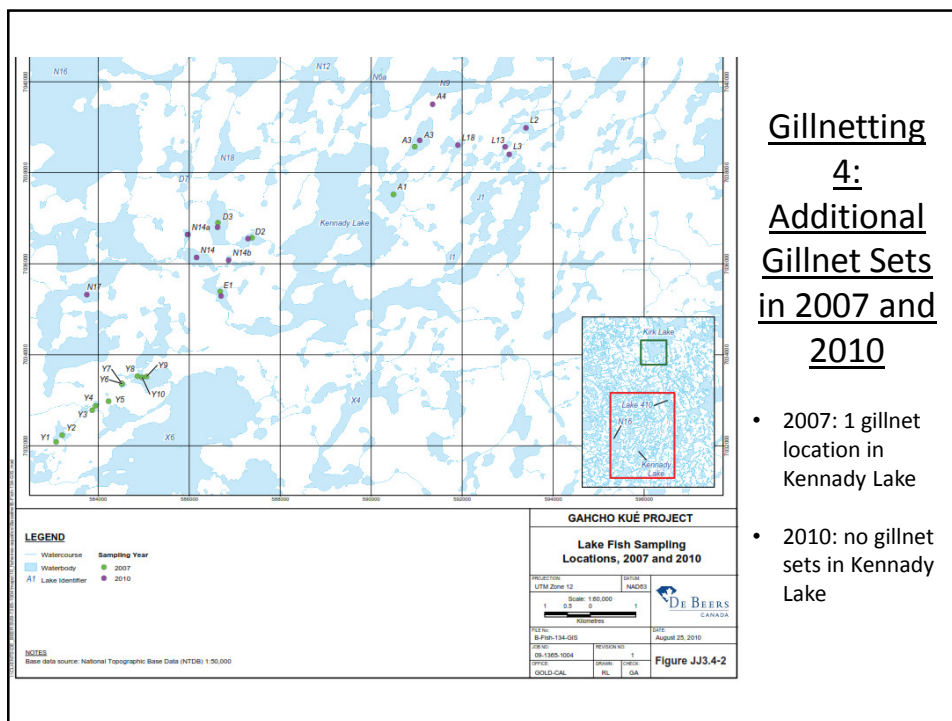
## Gillnetting 3

Figure J4.4-10 Length-Frequency Distribution for Lake Trout Gillnetted in Kennady Lake, Summer 1999



n = number of fish; mm = millimetre.

De Beers Canada Inc.



### Gillnetting 4: Additional Gillnet Sets in 2007 and 2010

- 2007: 1 gillnet location in Kennady Lake
- 2010: no gillnet sets in Kennady Lake

## J4.4.5 Population Estimates Mark and Recapture 1: EIS Document

### J4.4.5.1 Previous Studies Addendum J Assumptions

Population estimates were not possible in 2000 and 2001 due to the limited number of tagged fish recaptured in both years. Although 143 Arctic grayling, 13 lake trout, 7 northern pike, and 1 burbot were tagged in spring 2000, only 1 lake trout was recaptured in summer (EBA and Jacques Whitford 2001). The 2001

**Table J4.4-17 Summary of Tagged and Recaptured Fish, by Species, Used for Population Estimates in Kennady Lake, 2004**

|  | Species         |            |               |                 |
|--|-----------------|------------|---------------|-----------------|
|  | Arctic Grayling | Lake Trout | Northern Pike | Round Whitefish |
| Number of fish tagged in summer 2004     | 9               | 72         | 28            | 27              |
| Number of fish examined for tags in fall | 10              | 101        | 17            | 183             |
| Number of recaptured fish in fall        | 0               | 2          | 3             | 0               |

Gahcho Kué Project  
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Annex J

J4-114

December 2010

Basin K3 or K4. This information, combined with the results from radio-tagged northern pike (see Section J4.4.6), suggests that northern pike move very little during summer and fall. As a result, the minimum population estimate calculated from the mark/recapture experiment is more likely an estimate of the northern pike population in Basins K3 and K4 rather than for Kennady Lake as a whole.

## Overall Verification Assumptions by Golder- DeBeers

Addendum JJ: JJ3.4.1.2.2, p. JJ3-24:

*“It was concluded that if the distribution of fish lengths from gill netting differed from that of hydroacoustics, either the target strength equations were inaccurate or the techniques sampled different components of the fish assemblage.”*

Our concluding comment: To conform to this verification assumption one can only sample the larger fish through hydroacoustics and gillnetting as was done by Golder and Associates.

The only problem is that the question remains:  
**How many fish are in Kennady Lake?**

## Conclusions

In Kennady Lake:

1. Hydroacoustics should be carried out at night.
2. Settings of the echosounder and transducer should be changed.
3. Gillnetting should be carried out in the pelagic fish layer (based on hydroacoustic results) with small mesh nets.
4. A reliable fish population estimate can be produced as a baseline.

Summary of the Deninu K'ue Ethno-History  
Report  
Deninu Kue Use of the Gahcho Kué Area

Submitted to:  
Chuck Hubert  
Senior Environmental Assessment Officer  
Mackenzie Valley Environmental Impact Review Board  
Suite 200, 5102 – 50<sup>th</sup> Avenue, PO Box 938, Yellowknife  
NT X1A 2N7

Submitted by:  
The Deninu K'ue First Nation

Ethno-History Report

- Begins at the time of contact in 1768
- Records from:
  - North West Company
  - Hudson's Bay Company
  - Indian Affairs
  - Churches
  - Explorers
  - Academics

### Ethno-History Report

- Interviews with community members
- Evidence of ongoing and present-day hunting activities

### DKFN's Use of the Gahcho Kué Area

Eddy Lafferty has described what the Barren Lands, and specifically Gahcho Kué, mean to him.

DKFN's Use of the Gahcho Kué Area

- Hunting caribou
- Fishing
- Spiritual gatherings
- Trapping

DKFN's Use of the Gahcho Kué Area

Raymond Giroux has used the entirety of Great Slave Lake for subsistence fishing, including the far East Arm beyond Lutsel K'e.

DKFN's Use of the Gahcho Kué Area

Paul Boucher, Jr., a young man from the DKFN community, has referenced a sacred site on the Barren Lands located just south of Gahcho Kué

DKFN's Use of the Gahcho Kué Area

Mary Pierot and her son Dave Pierot describe the frequency of the DKFN's caribou hunt and list the individuals who participate.

DKFN's Use of the Gahcho Kué Area

Kevin Giroux has provided a case example of the present day caribou hunt through the Kennady Lake/Gahcho Kué region.

Observed environmental impacts

Don Balsillie is concerned that the mines provide access to the region to hunters of all ethnic backgrounds

Observed environmental impacts

Don Balsillie and Kevin Giroux comment on the amount of truck activity on the ice road and its effect on hunting.

Observed environmental impacts

Raymond Giroux has noted that even if the caribou were to cross when the roads were inactive, the basic construction of the ice roads presents an obstacle in itself.

Lessons Learned

Kevin Giroux has described the effect that the diamond mines have had on the region's caribou population

Lessons Learned

Gordon Beaulieu further cites the environmental impact that the Ekati Diamond mine has had on the caribou population in the region

Lessons Learned

Eddy Lafferty has discussed the effects that Snap Lake has had on the caribou population and the DKFN's sources of fresh water.

Lessons Learned

Frank "Rocky" Lafferty has connected the impacts of the mines, the movement of the caribou, and the 2010 barren-ground caribou hunt ban.

### Lessons Learned

George Kenneth Larocque, discussed the impact which both the mines and the ban have had on the subsistence patterns of the DKFN.

### Summary

- The Ethno-history report demonstrates:
  - The historic use of the Barrenland and the Gahcho Kué mine site by ancestors of the DKFN
  - The DKFN's continued use of this same territory
  - Highlights concerns about impacts to the environment (caribou, fish and water quality and cumulative effects).