



MEMORANDUM

TO Mackenzie Valley Review Board

DATE 27 February 2012

CC Rick Schryer, John Virgl, Jen Gibson

FROM Damian Panayi, Cam Stevens

PROJECT No. 09-1373-1004.9600

REPORT OF MEETING BETWEEN GOLDER ASSOCIATES (REPRESENTING FORTUNE MINERALS LIMITED) AND THE YELLOWKNIVES DENE FIRST NATION NICO PROJECT

Attendees: Todd Slack (YKDFN)

Meeting Date: 7 February 2012

Damian Panayi (Golder)

Meeting Time: 5:00 pm

Cam Stevens (Golder)

Meeting Location Tree of Peace, Yellowknife

Summary of Discussion of Outstanding Issues from the YKDFN

The following summarizes a discussion between Golder Associates Ltd. (Golder) and Yellowknives Dene First Nation (YKDFN) regarding the Developer's Assessment Report (DAR) for the Fortune Minerals Limited (Fortune) NICO Project. Some clarifications were provided, and some undertakings were committed to by Golder on behalf of Fortune, which are described below.

a) Landscape Classification

The YKDFN asked if the Land Cover of Canada was used to classify the landscape in the caribou study area.

Golder responded by stating that the reference to the Land Cover of Canada landscape classification in Section 8.5.2.1 of the DAR was an error. The Earth Observation for Sustainable Development (EOSD) classification was used. The Land Cover of Canada classification uses 1000 metre (m) cell sizes, while the EOSD uses 25 m cell sizes.

b) Effect of Roads

The YKDFN commented that there is no explicit discussion on the potential barrier effects from the NICO Project Access Road (NPAR).

Golder responded by showing a graphic indicating that there had been no overlap between collared animals and the proposed NPAR over the last 5 years.

Undertaking #1

Fortune will provide maps showing collared caribou locations in reference to the proposed NPAR for the period from 1996 through 2010.



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c) Zone of Influence

YKDFN Comment

While the DAR applied a zone of influence (ZOI) around human developments derived from studies of barren-ground caribou in a tundra environment, the DAR asserts that this is likely an over-estimate as the ZOI for barren-ground caribou is likely less within boreal environments than in tundra environments. While Golder's assertion may well be right, it should be recognized that there is no published or grey literature to support this assertion. Golder's position is based on the assumption that the ZOI is defined by the environment rather than the caribou ecotype (i.e. that the Reindeer and Woodland Caribou research identified in Information Request YKDFN 2-6 remains valid).

Golder Response

While developing the resource selection functions for barren-ground caribou in a boreal environment, Golder did not find an effect from human disturbance in the distribution of collared Bathurst caribou (DAR Appendix 8.II). Research regarding the ZOI of caribou in both boreal and open tundra environments is provided in the Fortune response to Information Request YKDFN-2.6. This included studies on *Rangifer* showing that animals may be affected within less than 6 km from a mine, and that effects to distribution from human disturbances likely do not extend beyond 10 km (e.g., Vistnes and Nellemann 2008; Polfus et al. 2011; Weir et al. 2007). To the knowledge of the authors of the caribou assessment, there is no biological mechanism to support the hypothesis that migratory tundra caribou behave differently than sedentary woodland caribou when in close proximity to developments during winter (below the treeline). In other words, it is reasonable to expect that the behavioural response to development is similar for both caribou subspecies in the region.

References (from Response to YKDFN_2.6):

- Polfus, J.L., M. Hebblewhite, and K. Heinemeyer. 2011. Identifying indirect habitat loss and avoidance of human infrastructure by northern mountain woodland caribou. *Biological Conservation* 144:2637-2646.
- Vistnes, I., and C. Nellemann. 2008. The matter of spatial and temporal scales: a review of reindeer and caribou response to human activity. *Polar Biology* 31:399-407.
- Weir, J.N., S. P. Mahoney, B. McLaren, and S. H. Ferguson. 2007. Effects of mine development on woodland caribou *Rangifer tarandus* distribution. *Wildlife Biology* 13:66-74.

d) Disturbance Coefficients

YKDFN Comment

The ZOI and disturbance coefficients (DCs) used in the DAR are significantly different than the data derived in a recent study of Barren Ground Caribou and the existing diamond mines by Boulanger et al. (2012). The values advanced in Golder's work are not reflective of the actual observances with mining in the North because this work does not draw the appropriate conclusions.

Golder Response

Golder maintains that the ZOI and disturbance coefficients used in the DAR were representative of those identified by Boulanger et al. (2012), and that the paper fails to provide any evidence that the ZOIs and DCs



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applied in the assessment of the NICO Project were not ecologically conservative. Due to the sophisticated and complex analysis in Boulanger et al. (2012), some of their concluding statements do not appear to be completely consistent with the results, which can produce different interpretations of the study.

Golder noted that the Boulanger et al. study calculated the ZOI from the centroid of the mining complex; whereas Golder measures and applies ZOIs from the edge of development footprints in the DAR. This is an important distinction, and suggests that 14 kilometre (km) ZOI identified in Boulanger et al. (2012) is likely smaller than the conservative 15 km ZOI that Golder applies in the assessment. For example, given that the mining complex is approximately 40 square kilometres (km²), the predicted ZOI in Boulanger et al. is actually closer to 10 to 11 km in spatial extent when considering the distance from the centroid of the mining complex to the edge of the footprint.

Golder also maintains that Boulanger et al. (2012) incorrectly states that "Caribou were about 4-times more likely to select habitat at greater distances from the two-mine complex than within the zone of influence". The issue is that the odds ratio being reported here is for a continuous variable and so the odds of observing a caribou should be reported as being 4-times higher at 14 km versus the centroid of the mining complex (0 km). The authors of this study have not provided any information on the odds or probabilities within the actual zone of influence. The '4-times' statistic that is reported both in the abstract and the discussion of the paper can not be used to predict the change in the distribution of animals as a function of distance from mining developments.

Caribou Study Area

YKDFN Comment

Golder argued that development in the treeline portion of the Bathurst Caribou range was higher than the barrens. Given the YKDFN's experience with mineral development in the Chief Drygeese Territory, of which approximately half is south of the treeline, but is the focus of mineral development pressures in the NWT, YKDFN reject the assertion until adequate data can be provided.

Undertaking #2

Fortune committed to providing an analysis of the level(s) of development above and below treeline and within the annual range of the Bathurst caribou along with clear criteria for project inclusion and the dates of data compilation. Any re-analysis will consider the reasonably foreseeable future projects suggested by the YKDFN in Information Request YKDFN-2.3.

Signature of Party Representative:

Signature of Developer Representative:

Date:

[http://capws/sites/0813730017nicoProject/Phases and Tasks/Technical Session/Undertakings and Meeting Summaries/Review of Meeting_YKDFN and Golder.docx](http://capws/sites/0813730017nicoProject/Phases%20and%20Tasks/Technical%20Session/Undertakings%20and%20Meeting%20Summaries/Review%20of%20Meeting_YKDFN%20and%20Golder.docx)