HUBERT AND ASSOCIATES LTD.

1660 Evergreen Hill SW. Calgary, AB T2Y 3B6
403 256 0017 403 256 1228 (fax)
e-mail: benhubert@shaw.ca

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Mr. Greg Missal
Tahera Corporation
Suite 803
121 Richmond St. West
Toronto, ON M5H 2K1

Dear Greg,

Comments regarding the issues raised by NIRB under *Wildlife and Habitat* in its Decision dated 18 August 2003 are attached. The issues are discussed in the order they appear on pages 33 and 34 of the document.

Best regards,

Ben Hubert

Provide a complete examination of the potential for bioaccumulation and biomagnification and the implications in terms of environmental protection and management.

Bioaccumulation in this context is understood to refer to the natural uptake of natural or exotic substances originating from the Jericho Project by wildlife in or near the Project area. This natural uptake may produce muscle, fat, and organ tissues in wildlife that have elevated levels of potentially harmful substances; harmful to the animal carrying the substances, and/or harmful to consumers of the contaminated tissues – usually carnivores or humans. Substances that may enter the local food chain as a direct result of the Project are green house gas emissions from the power house, natural metallic compounds in the dust released by mining and milling activities, and dissolved metallic compounds in the tailings containment area. Wildlife that may ingest these substances include:

- herbivores (mammals and birds) feeding on plants in the Project area with dust particles carrying power house emissions and, plants contaminated by mining and milling dust, or through uptake from contaminated soil;
- any wildlife that ingests contaminated water in the Project area, particularly from the tailings containment area.

Biomagnification in this context is understood to refer to the consumption of contaminated tissue(s) of wildlife that ingested the compounds from either contaminated water or plant tissue. Such secondary consumption is the pathway by which predators, scavengers, and humans become loaded with food chain contaminants. Contaminant loading in tissues of predators, scavengers, and humans can be higher than in their food species and so the concentrations of contaminants becomes greater in their tissues than in their food items.

Bioaccumulation of contaminants in Arctic ecosystems has been studied and shown to have a variety of pathways. Most studies have focused on synthetic compounds like pesticides and fallout from nuclear testing. Some studies have reported on possible pathways for heavy metals (mercury and lead) and dissolved metals. It has been shown that woodland caribou in Yukon that browse on willow that grow in soils high in cadmium show elevated cadmium levels in their tissues (B. Braune et al 1999). If soils in the Jericho Project area were to become contaminated by Project emissions or dust containing substances that could be taken up by plants, then herbivores in the Project area may show elevated levels of those substances. Herbivores potentially affected include ptarmigan, rodents, hares, muskox, and caribou.

Rodents and hare in the Project area are not migratory and so these creatures cannot escape the potential effects of contaminant bioaccumulation originating with the Project. Ptarmigan are migratory and so the birds that live around the edges of the Project in summer may ingest contaminants which may be diluted by the winter diet of buds and twigs on their forested winter range. Muskox are not migratory but have not been a common sight in the vicinity of the Project. They also range over a larger area than would be affected by the Project and so any bioaccumulation of contaminants in muskox

originating from the Jericho Project would be sporadic rather than continuous. Caribou are migratory and may be numerous in the Project area from spring migration through the summer period. The time duration for any particular caribou in the Project area over the course of a year would be measured in minutes (perhaps on infrequent occasions, hours). The opportunity for bioaccumulation of contaminants originating from the Jericho Project in individual caribou will be very limited.

Biomagnification may occur in raptors and in carnivores feeding on rodents from the Project area. The effects on raptors of metal contamination in prey is not known. Likewise the effects on carnivores of metal contamination in prey is not known. However in either case, the range over which local raptors and carnivores would hunt will be much larger than the Project area. Potentially contaminated prey would therefore make up only a portion, and a very small proportion in a low year in the microtine rodent cycle, of the overall diet of the local predators.

Environmental management practises that reduce ambient dust in the Project area will reduce the opportunity for bioaccumulation through the soil/plant/herbivore pathway. The number and variety of wildlife frequenting the tailings containment area are both expected to be very low and so the potential for bioaccumulation by way of drinking contaminated water is very low. The risk to human health from eating small or large game (ptarmigan or caribou respectively) that may frequent the Project area is minor.

Reference:

Braune, B., D. Muir, B. DeMarch, M. Gamberg, K. Poole, R. Currie, M. Dodd, J. Eamer, B. Elkin, M. Evans, S. Grundy, C. Herbert, R. Johnstone, K. Kidd, B. Koenig, L. Lockhart, H. Marshall, K. Reimer, J Sanderson, L. Shutt. 1999. Spatial and temporal trends of contaminants in Canadian Arctic freshwater and terrestrial ecosystems: a review. The Science of the Total Environment 230 (1999) 145 – 207.

Clear up the inconsistencies in the FEIS surrounding the presence of "species of concern."

"Species of concern" was used in the FEIS on Page 63 to describe barrenland grizzly and peregrine falcon in a discussion of "biodiversity".

There are currently two schedules that rate the conservation status of wildlife species in Nunavut. The Nunavut Wildlife Species Report 2000 by The Government of Nunavut Department of Sustainable Development, and the national Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Nunavut Wildlife Species Report 2000 designates peregrine falcon as "may be at risk" and barrenland grizzly as "sensitive". COSEWIC rates both the tundra peregrine falcon and grizzly bear in Nunavut as species for "special concern". None of the wildlife species in the Project area are rated as "threatened" or "endangered" in either wildlife species conservation rating scheme.

References:
Government of Nunavut. 2000. Nunavut Wildlife Species Report 2000.

COSEWIC. 2003. Species at risk in Canada. www.speciesatrisk.gc.ca

Tahera Corporation. 2003. Final Environmental Impact Statement; Jericho Diamond Project.

Undertake more rigorous waterfowl breeding and staging surveys in a variety of habitats in and around the potential project footprint and conducted at different times of the summer to capture different lifecycle stages. More detail must be provided on the impacts of the Project on waterfowl.

The camp at Carat Lake has been occupied continuously since it was established there in the late winter of 1995. Camp occupants have either been exploration crews or camp security attendants. Wildlife observation logs have been kept for the duration. Quantities of waterfowl have been observed flying overhead in both spring and fall but never have flocks of migrating waterfowl been observed staging on Carat Lake or other nearby water bodies in either spring or fall. Spring staging on Carat Lake would be unlikely because of the regularly late June or early July break-up of Carat Lake. Fall staging on tundra lakes by large flocks of waterfowl has not been observed or reported for any of the lakes in the area.

Individual birds and broods have been observed (loons on Carat Lake, a long-tail duck with a brood on the lake near the airport as reported by Hubert (2002). Similar incidental observations of waterfowl were reported by Canamera in 1997.

It is acknowledged that systematic searches for waterfowl have not been made in the Project area in all seasons that waterfowl could be present. The relative lack of birds in the Project area as observed by baseline study investigators over the years of these studies is corroborated by the anecdotal record as provided by camp attendants. Costly systematic surveys at various seasons of the year would show us what informal observations have shown since 1995; the Project area is not frequented by large numbers of breeding or staging waterfowl. As a consequence, any impacts on waterfowl generally would be minor.

References:
Canamera Geological Ltd. 1997. 1997 Spring freshet wildlife program, Jericho Diamond Project. Prepared for Lytton Minerals Ltd.

Hubert and Associates Ltd. 2002. 1999 and Y2000 Wildlife Field Studies Data Report, and Project Environmental Effects Assessment on Wildlife, Jericho Diamond Project. Revised 2002 (support document B.1.3)

Provide more detail on the mitigation of wildlife impacts especially those impacting caribou or fish. Quantifiable measures of success must be used for the mitigation of wildlife impacts.

A more comprehensive environmental effects assessment of the Project on wildlife was prepared by Hubert and Associates Ltd. (2002) than appeared in the Summary FEIS. It is included in the overall FEIS submission as support document B.2.2.

Reference:

Hubert and Associates Ltd. 2002. Environmental Effects Assessment on Wildlife,Jericho Diamonds Project. Revised 2002.

Provide further analysis of the semi-permanent loss of approximately 220 hectares of vegetated habitat as a resource for small mammals (which in turn support raptor populations on their breeding ground) or other wildlife.

A more comprehensive environmental effects assessment of the Project on wildlife habitats was prepared by Hubert and Associates Ltd. (2002) than appeared in the Summary FEIS. It is included in the overall FEIS submission as support document B.2.2.

Reference:

Hubert and Associates Ltd. 2002. Environmental Effects Assessment on Wildlife,Jericho Diamonds Project. Revised 2002.

Provide a more detailed explanation of the efforts planned to keep wildlife and waterfowl away from the PKCA and consider more stringent strategies if necessary.

A conceptual plan to reduce the potential for interactions between caribou and the PKCA was prepared by Hubert and Associates Ltd. (2002). Since caribou presence in the Project area will be transitory, the use of visual deflectors is expected to be effective in directing caribou traffic in mass movements through the Project area. In the case of waterfowl, as indicated above, waterfowl abundance in the Project area is very low and so the potential effects on waterfowl generally are minor with many alternate ponds available to individual birds that may summer in the Project area.

In the case of muskox, the barriers that are expected to be effective for caribou will also be effective for muskox. In the event that individual animals of either species are found "inside the fence" these will be herded out at "gates" that can be spaced at regular intervals along the entire barrier.

Reference:

Hubert and Associates Ltd. 2002. Environmental Effects Assessment on Wildlife,Jericho Diamond Project. Revised 2002.

Provide more complete baseline studies to determine the impacts of the proposed mine on migratory birds. Include an estimate of the density of migratory birds that may be lost or displaced in each habitat type affected by the mine footprint and buffer zone.

The baseline conditions of migratory waterfowl in the Project area has been discussed above. The other large group of migratory birds in the Project area are tundra breeding passerine bird species. Breeding bird counts for ground dwelling species were reported by Canamera (1997) and Hubert and Associates Ltd. (2002). Habitat types representing 65% of the 222 ha Project footprint (FEIS Table 3.19) were sampled for ground nesting birds in and near the Project area. Table 1 below summarises the combined results.

Table 1. Densities of territorial birds in various habitats in the Jericho Project area.

Habitat type*	# of sites sampled	# of transects 1997	2000	density range (#/ha)	average density of all values
WG/BM	4	5	4	.4 – 3.5	1.6
DRT	1	2	1	2.0 – 3.0	2.3
CRH	2	4	2	.2 - .6	.4
EKD	2	2	2	.4 – 2.0	.9

*WG/BM = Wet grass/birch meadow
DRT = Dry rocky tundra
CRH = Cliff/rocky tundra
EKD = Esker/kame delta

The two habitats not represented in the sample comprise 28.8% of the terrestrial footprint of the Project (Moist birch meadow – MBW, and Dry barrenground tundra - DBT). In order to calculate breeding bird territories at risk by site development and operations it is necessary to estimate densities for each of these habitat types. Values for the habitat type most similar will be used WG/BM for MBW, and DRT for DBT. Table 2 shows the values used to estimate the number of birds that might be "lost or displaced in each habitat type affected by the mine footprint".

Table 2. Estimate of breeding bird territories lost or displaced by mine footprint.

Habitat type	Area affected (ha)	Bird density	Total estimate lost or displaced
WG/BM	26.72	1.6	42.8
MBM	12.57	1.6	20.1
DBT	51.25	2.3	117.9
DRT	74.97	2.3	172.4
CRH	1.24	.4	.5
EKD	42.0	.9	37.8
Total estimate of lost or displaced territories			**391.5**

When conducting breeding bird counts it is not possible to know if one or two birds of each breeding pair is observed. For this reason the estimate above is based on the conservative assumption (leading to an overestimate) that each bird observed represents

an individual breeding territory. A buffer area of +15% would increase the estimate to 450 territories that may be affected.

References:

Canamera Geological Ltd. 1997. 1997 Spring freshet wildlife program, Jericho Diamond Project. Prepared for Lytton Minerals Ltd.

Hubert and Associates Ltd. 2002. 1999 and Y2000 Wildlife Field Studies Data Report, and Project Environmental Effects Assessment on Wildlife, Jericho Diamond Project. Revised 2002.

Include the following potential impacts to migratory birds: collisions between birds and aircraft or automobiles, displacement of nesting birds, and oiling resulting from birds landing in hydrocarbon contaminated water.

The potential effects of project development and operations on nesting birds in the footprint and buffer are discussed above. The operational measures that are available to mitigate the risk of additional risks are addressed in the Project Environmental Management Plan – support document B.3.1.

Implement a management plan to mitigate all potential impacts on migratory birds that conforms to the Migratory Birds Convention Act ***and*** Migratory Bird Regulations***.***

The operational measures that are available to mitigate additional risks to migratory birds are addressed in the Project Environmental Management Plan – support document B.3.1.