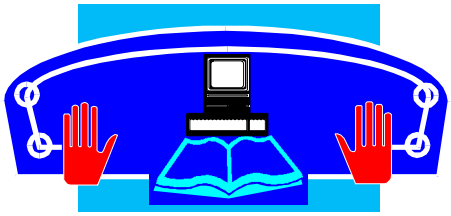

Grizzly Bears And Wildlife/human Conflicts - Bhp Diamond Mine Emvironmental Assessment Panel Catalogue Number: 6-3-104

GRIZZLY BEARS AND WILDLIFE/HUMAN CONFLICTS

Submission to the Wildlife Technical Session
BHP Diamond Mine Environmental Assessment Panel

Yellowknife, NT

Prepared by

Government of the Northwest Territories

Department of Renewable Resources

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EXECUTIVE SUMMARY

Grizzly bears are vulnerable to human activity. The healthy populations in North America largely occur in remote areas. Grizzly bears reproduce slowly and populations are more vulnerable if female bears die. The effects of industrial activity on grizzly bears are not well documented. Any increase in the number of problem bears killed; destruction, alteration, or displacement of habitat; increased energy use or social disruption can result in population declines. These effects are cumulative over time.

The Government of the Northwest Territories wishes to ensure that potential impacts from the proposed NWT Diamonds Project on grizzly bears are identified, mitigated and monitored. We have proposed mitigation and monitoring plans to minimize project effects on grizzly bears. For example, a collaborative effort has been suggested to deal with potential wildlife problems on the project site which includes electric fencing, education, training and prohibition of feeding of wildlife.

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1.0 INTRODUCTION

The Sustainable Development Policy of the Government of the Northwest Territories' (GNWT) requires that the interdependence between conservation and development be recognized through the application of the concept of sustainable development. Under this policy the GNWT must combine and equally weigh conservation and development factors in making decisions. The Department of Renewable Resources has the mandate to manage, regulate and encourage the sustainable development of renewable **resources, including wildlife.**

One of the goals of the wildlife Management Division is to maintain viable populations of all wildlife species as part of normally functioning ecosystems. To achieve this goal the Division determines the current abundance, distribution, productivity and habitat requirements of wildlife populations, identifies important wildlife habitats or areas **requiring special management, estimates the potential abundance, distribution, and productivity of wildlife populations under various management approaches, and ensures that the natural capabilities of ecosystems to support wildlife are not impaired by human activities.**

The purpose of this submission is to provide the Panel with information on grizzly bear ecology and help the Panel develop recommendations for monitoring and mitigating the Project's effects on grizzly bears. The presentation will consist of two parts: i) grizzly bear ecology, possible impacts, mitigation and monitoring, and ii) wildlife/human conflicts.

2.0 GRIZZLY BEARS - IMPACTS, MITIGATION AND MONITORING

2.1 Statement of Concerns

Grizzly bear (*Ursus arctos*) **populations are vulnerable to human activity. Previously ranging throughout** North America, **grizzly bears are now classified as a "threatened"** species in the contiguous United States and as "vulnerable" by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Most viable grizzly bear populations remaining in North America are in areas secluded from human activities or only recently experiencing human encroachment. The barrenlands of the low Arctic have, until recently, experienced limited industrial development due to the lack of transportation infrastructure. The NWT Diamonds Project is the largest development ever contemplated for this wilderness area.

The decline in the range of the grizzly bear elsewhere in North America can be attributed to three factors: 1) destruction of bear habitat and the habitat of prey species; **2)** bear's avoidance of areas used by man and areas adjacent to human activities or infrastructures and; 3) bears being killed by man, as problem bears, for the protection of domestic animals or property, or out of fear of this large carnivore. We believe that the last factor may be most important for bears in the vicinity of the NWT Diamonds Project.

The population dynamics and reproductive strategies of grizzly bears make them particularly sensitive to human encroachment. Grizzly bears have low reproductive rates. This is a function of late age of first reproduction (4 -7 years) and a 3-4 year period between litters (here termed *birth interval*) (Bunnell and Tait 1981). Only by **living a long time,** up to about 20-25 years, are female bears able to replace themselves and possibly increase the population. Grizzly bear populations are therefore very sensitive to adult female deaths. Any factors decreasing reproductive rates will magnify the effects on the population.

The GNWT would like to ensure that any potential negative impacts the proposed NWT Diamonds Project may have on the grizzly bear population in the low Arctic, either through human-caused kills, or other factors which may reduce the health of the population, are understood, mitigated, and appropriately monitored. Unfortunately, the effects of industrial activities on bear populations have received little study, with only a few comprehensive studies being conducted. McLellan (1989a, 1989b, 1989c) looked at the effects **of logging and petroleum exploration** in mountainous terrain. Schoen and Beier (1 990) looked at both logging and mining impacts, but again the study was in forested mountain terrain. Ballard et al. (1991) studied the demography of grizzly bears in the vicinity of the Red Dog mine in western Alaska. This lack of research has been an impediment to the assessment of the potential impacts of the NWT Diamonds Project on grizzly bears. There are, however, some aspects of grizzly bear ecology in the area that are known and generally accepted and there are studies in other areas of the north which can be used to aid in the assessment of the Project.

In **order to provide the Panel with** a more detailed assessment of the potential effects of the Project, and to provide the Panel with an assessment of the Proponent's plans for research, mitigation and monitoring, this portion of the paper will attempt to address the following questions:

- What are the possible impacts of the NWT Diamonds Project on grizzly bears in the low Arctic?
- What information is needed to understand and mitigate these impacts, and is the information available?
- If the information is not available, is it being obtained through current or proposed research and monitoring?
- How will the information be used to mitigate impacts?
- Does the Project recognize the cumulative nature of the impacts? If not, what changes are needed?

2.2 Assessment of Possible Impacts

McLellan (1990) identified 5 general ways that humans can negatively effect grizzly bear populations: 1) increased kills; 2) habitat destruction or alteration; 3) displacement; 4) increased energy expenditures; and 5) social disruption.

Increased Kills

Human activities on grizzly bear range can result in conflict situations resulting in the death of bears. The details of why these conflicts occur and how they can be reduced are dealt with in part 3 of this submission on Human/Wildlife Conflicts. As a result of the efforts of the Proponent, there have been in no problem bear kills to date, although during an early phase of exploration one bear had to be captured and relocated. This bear has since been killed as a problem bear at another camp.

Other mines within the Northwest Territories' grizzly bear range have all experienced bear problems. Grizzly bears were regular visitors to Tungsten in the Mackenzie Mountains and several bears had to be destroyed. Bear problems were also a common occurrence at the Salmita and Tundra mines north of MacKay Lake. At the Lupin mine near Contwoyto Lake, 8 problem bears have been killed during the past 9 years (5 adults: 2 female and 3 male, 2 cubs, and 1 subadult) (Department of Renewable Resources files). All of these mines put effort into reducing problem bear incidents, but were unable to eliminate problem kills completely.

To evaluate the population effect of problem kills, data are needed to define population boundaries, density, age at first breeding, litter size, birth interval, cub survival, adult female survival, and other human-caused deaths. Unfortunately, of these, only data on human-caused deaths are available for the low Arctic and these are incomplete (Appendix 2). There are, however, several things that suggest that grizzly bears occur at low-density and have low productivity. Home range size is a function of both habitat quality and population density (Nagy and Haroldson 1990). Preliminary results from a satellite telemetry study initiated in 1995 indicate that bears in the Lac de Gras area have very large home ranges. This in turn indicates poor habitat, low densities, or likely both. A study of reproductive characteristics of grizzly bears in the Coppermine area (Case and Buckland. In press) found that age at first breeding was delayed relative to more southern populations and that this could result in the average female producing one less litter during her lifetime.

Based on documented reproductive characteristics and density of bears similar to other arctic coastal areas, Case and Buckland (in press) concluded that the bear population in the Coppermine area (18,000 km^2) could only sustain one adult female death per year. With the apparent similar low density and likely low productivity of bears in the Lac de Gras

area, any bear deaths at the NWT Diamonds Project could be the total annual **allowable harvest** for an area many times the size of the BHP property.

Any kills of bears will have a negative impact on the population. Insufficient information is available to assess the significance of this impact.

Habitat Destruction or Alteration (Direct Habitat Loss)

Habitats felt to be most important to grizzly bears include those used for feeding, security (hiding/sleeping) and denning.

Grizzly bears are opportunistic feeders, taking advantage of the most highly digestible and nutritious food sources available. This results in a variety of habitats being used in different seasons. Studies by the Proponent and by the GNWT revealed that, in early spring, bears used eskers and ridgetop areas blown clear of snow, and were feeding on old berries and caribou. In June and July, the bears were eating mostly sedges and grasses, and occasionally spawning fish. In late summer and fall, bears were using eskers and ridgetop areas. During this time of year these upland habitats supported the richest berry production.

The abundance and availability of security cover is an important variable in determining habitats used for feeding. This has been documented by the Proponent and the GNWT during studies conducted in 1995. While feeding in sedge meadows during the summer, grizzly bears were almost always in close proximity to hiding/sleeping cover which consisted of tall shrubs, primarily willows, 1-2 m in height. In areas where there is human activity, access to cover is even more important.

Grizzly bear dens have been found in eskers, other glacial till, and occasionally in snow and rock crevasses. Dens are typically not reused. Fidelity to denning areas is unknown. It is likely that bears will relocate and den in other suitable areas provided they are available. Thus, in order to assess potential impacts we need to know the amount of suitable denning habitat available. In order to determine this we first need to understand what constitutes a suitable denning site. Clearly many bears den in glacial till, but it is not clear which till areas are important.

The Project, as described in the EIS, will result in approximately 14 km^2 of direct habitat loss due to roads, pits, tailings areas, waste rock dumps, the plant site and the airstrip (i.e. tundra and lake areas excavated or covered with rock or tailings). The amount of habitat suitable for grizzly bears (i.e. habitats containing forage species, providing cover, or suitable for denning) which will be destroyed, has not been calculated from the habitat maps. The Proponent maintains there are no important habitats for foraging or cover within the development area (Volume IV, Section 3.3.5. 1). Whether this is correct or not may be irrelevant, as any important habitats being destroyed “within development areas”

are likely to be available elsewhere in the region. So, at least for feeding or cover habitats, direct habitat loss may not be significant. Preliminary analyses of satellite tracking data from 1995 suggest that adult female bears in the Lac de Gras area **have home ranges around 1000 km^2.** The direct loss, therefore, of 14 km^2 from this single point source is unlikely to be detrimental.

Although destruction of feeding and cover habitats is unlikely to be significant, the potential exists for significant loss of denning habitat. Information on den site characteristics and locations of dens on the property needs to be analysed. Observations that dens are not evenly distributed along eskers suggests that there are specific characteristics that bears use for denning (Mueller 1994). These characteristics need to be determined.

Direct habitat loss from the Project is unlikely to have a negative impact on the grizzly bear population, with the possible exception of the loss of denning habitats. Information on denning habitats is incomplete.

Displacement (Indirect Habitat Loss)

The distance bears are displaced from human activities or mining infrastructure will depend on the type of activity, the location, the amount of cover available, the bear's past experiences, inherited tolerance, and sex/age class (McLellan 1990).

In a study conducted in a forested area McLellan and Shackleton (1988) found grizzly bears avoided habitats within 100 m of roads. It is likely that there would be a larger displacement distance on the tundra where there is little cover. McLellan and Shackleton (1989) found that bears in open alpine habitats almost always fled from vehicles. Bears also tended to use habitats near roads under the cover of darkness, a very short period during the arctic summer. Bears can however become accustomed to human activities and can be expected to react less to predictable, innocuous human activities, e.g. aircraft overflights and road traffic. This may serve to reduce the displacement distance. A potential draw back of this is that it may increase the chance that a bear will investigate a camp or person on the tundra and thereby be more likely to become, or be perceived as, a problem and be killed.

McLellan (1990) reviewed a number of studies conducted to assess displacement from roads and logging activities. Bears typically avoided the areas during construction or while trucks were hauling, but returned when the activity ceased. It is important to recognize that impacts on open tundra with little, if any, darkness may be different. Another consideration specific to the NWT Diamonds Project is that truck and heavy equipment will be operating on the top of waste rock piles 45 to 55 m high. This will greatly expand the area in which the vehicles can be seen and heard. In addition, roads between the pits and the central plant will be elevated and truck traffic will be almost constant.

While little is known about the possible effects of noise associated with industrial activities on denning bears, Reynolds et al. (1986) showed that the increase in heart rates of denning grizzly bears was related to seismic surveys and fixed wing aircraft overflights. They also cite circumstantial evidence that a bear may have abandoned a den 200 **m** from a seismic line; however, activities in the vicinity of dens did not cause abandonment of dens. Hardy and Nagy (1980) found grizzly bears abandoning den sites as a result of industrial activities. They recommended that in winter, denning habitat be avoided by 1000 m and known den sites of collared bears be avoided by the same distance. These data suggest that industrial activities can have an adverse effect on denning **grizzly bears, although the exact nature and possible long term effects of this disturbance remain unknown.**

Activities along the roads and around the plant, pits, and waste rock piles will displace bears from potential feeding and denning sites. Information on displacement distances in tundra habitats are not known. The displacement distance will likely be greater for roads and infrastructure associated with diamond mining on the tundra than those observed for bears in mountainous or forested terrain. This could result in a very large area of habitat being abandoned, and therefore have a negative impact on the population.

Increased Energy Use

Although it seems intuitive that forcing bears to move away from a disturbance would increase their **energy requirements, satellite telemetry studies in 1995 showed that during most of the summer, bears regularly** moved great distances, up to 50 km a day. In these cases, moving another 5-10 km due to disturbance may not be a large additional cost. **Any disruption of energy balance** may be more related to reduced energy intake due to displacement from choice feeding locations or reductions in feeding time rather than increased energy use from avoiding disturbances.

Increased energy use resulting from disturbances related to the Project will most likely not have a negative impact on the population.

Social Disruption

Females with cubs are more security conscious and, therefore, likely to be displaced by human activities. This may force bears to leave familiar places to move to less known locations. If these habitats are already occupied this will result in increased contact, aggression, and perhaps mortality. This is felt to be a significant problem in high density populations (McLellan 1990). The potential for interactions between displaced and resident bears depends on many factors including the distribution of important habitats and the occurrence of concentrated food sources. For example, if berries are concentrated in an area it is more likely that bears will encounter each other there.

The effect of displacing bears into areas occupied by other bears is unknown, but under certain circumstances could result in negative impacts to the population.

Cumulative Effects

Increased kills, habitat loss, displacement, disturbance and social disruption are cumulative and can result in negative impacts to the population.

Effects of other mines/human activities are also cumulative. For example.5 to 1 bear killed per year per mine could add up if 6-10 mines are developed in the low Arctic. These deaths could effectively eliminate any opportunity **for aboriginal hunting or** outfitting. We do not know **if the current human-caused mortality is sustainable.** An extensive network of roads joining 6-10 mines and pits could eliminate grizzly bear use of a large portion of their range. All-weather roads developed from the south would introduce the access problems of greatest concern with logging activity in the south (McLellan 1990).

The cumulative effects on bears resulting from all current and possible future human activities could have a significant negative impact on the population.

2.3 Mitigation and Monitoring

The above analysis identifies a number of potential effects and information gaps. This section will evaluate the current and proposed studies, mitigation and monitoring to determine **if information** necessary for mitigation is being, or will be obtained.

Population Parameters

Population parameters are needed to assess the impact of increased kills. Data are needed to define population boundaries, density, age at first breeding, litter size, birth interval, cub survival, and adult female survival.

Identification of populations is being addressed by the satellite telemetry study conducted by the GNWT and the University of Saskatchewan (U of S). This study will also provide home range information for bears in the Lac de Gras area and enable the identification of the population(s) at risk from the mine. Some information on age at first breeding will also be obtained from this study, but a larger sample size will be needed. Studies to obtain density estimates have been proposed to follow the population definition study. These studies will provide the necessary sample size to evaluate age of first parturition.

Data on productivity, litter size, birth interval, cub survival, and adult female survival will be addressed by the Proponent's monitoring of radio collared females in the BHP **claim block and surrounding areas and by the** GNWT/U **of S study.**

Habitat Use

Habitat use information and habitat mapping are needed to evaluate effects of habitat destruction and displacement. The monitoring program conducted in 1995 provided some of the necessary data on grizzly bear activity in the vicinity of the proposed mine. Continuation of the 1995 monitoring program for at least two more years will provide additional data on which habitats bears are using, how they are using them and how important the habitats are. This monitoring should ensure that it addresses all the bears' activities throughout the day and night.

Continuation of the 1995 monitoring program will also provide additional information on food habits through observations and scat collections. Analysis of the 1995 data is still required. **Many** of the den sites located on the BHP property have been located, mapped and described. The monitoring program should continue to map den sites, conduct investigations of den sites from collared bears (after abandonment) and locate den sites of collared bears to ensure that they are not disturbed during the winter.

An important aspect of evaluating and mitigating impacts will be the accurate mapping of habitats. This mapping needs to be done in a way relevant to grizzly bear ecology. The current mapping program appears to be suitable for grizzly bear habitat use evaluation however, revisions to habitat maps will be needed as additional information on habitat use is obtained.

The Proponent indicates that "important habitats will be identified for reasons of human safety and to prevent disturbance to grizzly bears. Seasonally important habitats will not be disturbed, where possible, by human activity when they are in use by grizzles." (Volume IV, Section 3.3.5.3). Important habitats have not yet been mapped and there is no indication how this information would be used.

Displacement Distances

Data on bear movements in relation to activity is needed to minimize displacement distances. Similar types of studies have been conducted in relation to logging roads (McLellan and Shackleton 1988, Archibald et al 1987) and roads in parks (Mattson et al 1987). By intensively monitoring the location and activity of collared grizzly bears in the vicinity of the mine, it will be possible to evaluate the displacement distances and habitat loss from disturbances.

The Proponent proposes to restrict helicopter traffic to 150 m away from known important bear habitats (Volume Ill, Section 7.4.2). This will be impossible to do for feeding and cover habitats as they are too widely distributed and patch-worked to avoid effectively. It may be possible to avoid den sites and important denning habitats during den construction and denning however, 150 m is insufficient to prevent disturbance to the bears.

Should the monitoring indicate a large displacement area, consideration **would need to be** given to other mitigation measures. For example, if bears appear to be avoiding a large area around waste **rock dumps, if feasible, a berm** could be constructed along the edge of them to reduce the distance from which trucks can be heard and seen. If bears are avoiding areas of helicopter traffic, higher flight elevations should be implemented. If road traffic is causing large displacement distances, measures to reduce this distance could be investigated.

2.4 Cumulative Effects

Cumulative effects modelling is needed to evaluate the combined effects of increased kills, habitat destruction, and displacement. The Proponent does not address or recognize that the Project's impacts on grizzly bears are cumulative on impacts already affecting the grizzly bear population in the area. Cumulative effects models have been developed for grizzly bears in mountainous areas and focus on the impacts of logging (e.g. USDA Forest Service). These models could be adapted to the situation on the tundra.

2.5 Recommendations to the Panel

- **The** Proponent should make every possible effort to avoid bear deaths. Stringent and innovative mitigation will be required.

- The Proponent should establish a monitoring program to detect and evaluate impacts on grizzly bears. This program will require information on bear displacement distance from roads, plants, camps, the airstrip and possibly air traffic, effects of activities on den site selection or disturbance, and how impacts on other species affect grizzly bears (e.g. caribou or ground squirrel distribution and abundance).

- The Proponent should analyse habitat use information and use habitat maps to identify critical habitats for grizzly bears and their prey.

- The Proponent should describe how they will avoid habitats important to grizzly bears.

- The Proponent should work with the Department of Renewable Resources to develop a cumulative effects model for grizzly bears.

- The Proponent should continue to participate in cooperative research programs designed to provide information needed to understand and mitigate the potential impacts of the mine on grizzly bears.

3.0 WILDLIFE/HUMAN CONFLICTS

3.1 Statement of Concerns

The **October 1991 announcement** of the discovery of diamond bearing kimberlite pipes in the Slave Geological Province (SGP) set off the largest staking rush in North American history. This significant increase in human activity in the low Arctic threatened the barren-ground grizzly with the same human-caused mortalities that extirpated **grizzly bears from much of their former** North American and world range.

The vastness of the tundra proved to be the greatest obstacle in the prevention of problem bear kills. During the staking rush, there was little information on how many people were spread over this huge area of approximately 275,000 km^2 In addition, the majority of the people conducting exploration and staking activities were from southern **climes, with no knowledge or experience on the barrens. Given** our limited knowledge of barren-ground grizzly bear range and populations, it was difficult to predict where conflicts might arise. In an effort to address the above problems, an extensive education/enforcement program was developed and implemented by the North Slave Regional Office of the Department of Renewable Resources.

The foundation of this program was the establishment of an extensive network of contacts throughout all user groups in the SGP. Mining and exploration companies have cooperated fully with the Department of Renewable Resources in the Safety in Bear Country Program. The Proponent has been a leader in this regard. Polices and programs implemented during the exploration phase of their development have set the standard by which all others will be judged.

The Proponent's support and cooperation extends beyond human/bear conflicts. They have also taken proactive steps to reduce problems with other wildlife, such as fox, wolf and wolverine. Although some problems have arisen, they have been few and have been dealt with effectively. The Government of the Northwest Territories would like to see this commitment continue into the next phase of the Project.

The Proponent's statement that practices which have proven to be successful in preventing bear-human conflicts during the exploration phase will be implemented at the proposed permanent camp, is an indication that we can expect their continued cooperation. Although statements pertaining to the prevention of conflicts with wildlife are scattered throughout the Environmental Impact Statement (EIS), there are very few details on the specific measures proposed.

The purpose of this section is to provide a summary of the actions the Proponent has proposed to prevent wildlife-human conflicts as they pertain to bears and furbearers. We will provide comments on these actions and make specific recommendations. This paper

focuses on four areas of concern: 1) electric bear fencing; 2) education programs; 3) personnel trained in wildlife control and 4) prohibition on feeding of wildlife.

3.2 **Electric Bear Fencing**

EIS Volume III - Environmental Management
1.1.2 Environmental Communication and Training

"The introduction of bear safety courses is an example of the Proponent's efforts to provide employees with environmental training. In an effort to ensure that current exploration and proposed mine development cause minimal disturbance to local wildlife, and to avoid potentially dangerous encounters with bears, GNWT Renewable Resources officers have provided educational programs on bear safety measures for workers. Over 200 employees and contractors have been trained on operating practices that will minimize encounters with bears, such as proper waste disposal and the installation of a bear fence at the exploration camp. "

EIS Volume III - Environmental Management
7.4.2 Avoidance of Disturbance

"Efforts to prevent bear-human conflicts were successful at the exploration camp and will be implemented at the permanent camp. These include providing education to all personnel and eliminating all attractions from the camp. All food wastes and garbage will be incinerated on site. Sewage will be treated and discharged with the tailings."

In Volume III, Section 1.1.2 of the EIS, the Proponent lists the installation of a bear fence at the exploration camp as an example of the effort they have made to ensure that the current exploration and proposed mine development causes minimal disturbance to local wildlife yet bear fencing is not listed in Section **7.4.2 on "Avoidance of Disturbance"**

The eight-wire high tensile electric bear fencing system that was installed at the Proponent's Koala Camp has in the past, proven to be a very effective grizzly and black bear deterrent throughout the Northwest Territories, British Columbia, Alberta and the Yukon Territory. There are currently six of these **type of fences in use in the NWT, with commitments from at least three other exploration companies to install fences during the 1996** field season. This system has proven to be an effective deterrent, yet the Proponent has chosen not to include it as an effort to be implemented at the permanent camp.

Recommendation

- **The BHP Environmental Assessment Panel should make the installation of the eight-wire high tensile** electric bear fencing system at the permanent camp and at the Misery camp a condition of Project approval.

3.3 Education Programs

EIS Volume III - Environmental Management
7.4.2 Avoidance of Disturbance

"Education has been shown to be a significant component in preventing negative bear-human encounters (Banci 1991). All personnel, including contractors, associated with the NWT Diamonds Project will be required to take a bear safety course. Education will be through videos, slide shows and presentations."

EIS Volume IV - Impacts and Mitigation
3.3.6.3 Mitigation

"Employee awareness and education are important means of avoiding vehicle collisions with furbearers. The policy of prohibiting the feeding of wildlife will be supported by educational efforts."

EIS Volume IV - Impacts and Mitigation
3.3.5.3 Mitigation

"Education has proven to be a significant component in preventing negative bear/human encounters (Banci 1991). Personnel working on the NWT Diamonds Project will be required to take a bear safety course. Bear awareness programs for camp residents will bean ongoing process through slide shows, presentations and informational brochures."

EIS Volume III
7.5 Furbearers

"In all cases, feeding of furbearers and other wildlife will be banned; this will be supported by educational efforts."

The Proponent should work closely with the Department of Renewable Resources when developing and implementing educational programs dealing with wildlife issues.

The Resource Development/Conservation Education Division develops a wide range of printed and audio-visual materials as well as educational programs to increase public

understanding and support of the conservation ethic. The Safety in Bear Country Program Reference Manual (Appendix 3) is one example of the products produced by the Conservation Education and Resource Development Division, and is considered by many wildlife experts to be the best available. However, it is important to note that there have **been many developments in deterrent systems since the book was written. The Department of Renewable Resources will continue to provide the Proponent with the latest information available.**

Recommendations

- The NWT Safety in Bear Country Reference Manual should be the teaching guide used in the Proponent's NWT Diamonds Project bear safety programs.

- Educational programs dealing with the prevention of wildlife-human conflicts should be undertaken in partnership with the Department of Renewable Resources.

- Any educational programs dealing with wildlife, that **the** Proponent plans to implement, should be developed in collaboration with the Department of Renewable Resources prior to implementation.

- Wherever possible, wildlife educational programs should be delivered by staff from the Department of Renewable Resources.

3.4 Personnel Trained in Wildlife Control

EIS Volume III - Environmental Management
7.4.2 Avoidance of Disturbance

"The procedure in the event that a bear does approach the camp has been recommended by the Department of Renewable Resources. Attempts will be made to deter the bear by the person trained in the use of deterrents. If the bear is not deterred, a conservation officer will be called from Yellowknife to immobilize and remove the bear. "

"Two personnel trained in wildlife control will be designated to deal with wildlife issues. At least one person will always be present on site. These individuals will be trained in firearm use, in deterring wildlife and in humane wildlife captures."

EIS Volume IV - Impacts and Mitigation
3.3.5.4 Residual Effects

"Grizzly bears are individuals and differ in their approach to development. If problems occur, each situation will be handled on a case by case basis. Wildlife conflict persons

trained in methods of deterring wildlife will deal with wildlife problems. If bears cannot be deterred, the assistance of the Department of Renewable Resources to tranquilize and move the bear will be requested."

It is not clear if the **trained persons are going to be doing this work in addition to normal day to day activities or whether they will be doing wildlife** work **full** time. These positions could easily be full time **if deterrent activities were combined with wildlife and environmental monitoring.** These persons should also be trained in the monitoring and maintenance of eight-wire high tensile electric bear fencing to ensure the system is working **properly.**

Having personnel trained in wildlife control is an excellent idea, but they should be responsible for more than deterrence of wildlife and dealing with wildlife problems. They should also have a significant role in prevention of wildlife problems such as:

- Education
- Monitoring of waste disposal at all sites
- Monitoring of all **work sites and travel corridors**
- **Maintenance of bear** fences
- Maintenance of systems implemented to **divert caribou**
- **Ensuring minimization of disturbance during spring caribou migration**

It is very **important that these persons spend the majority of their time on prevention, as actions** such as calling the Department of Renewable Resources to immobilize and move a bear are not very practical solutions. Moving bears has proven to be very expensive and has not worked in the vast majority of cases. Moved bears normally return to where they were moved from or become a problem somewhere else. As **an example, a bear** drugged and moved from the Proponent's Marks Camp in July 1993 wandered into a Inuit outpost camp in the spring of 1994 and was shot.

If properly trained, these persons will be a great asset to the Department of Renewable Resources as they will be able to communicate wildlife problems more clearly allowing the Department to better determine what assistance might be required.

Recommendations

- The Department of Renewable Resources and the Proponent should work closely to develop a job description for Wildlife Monitors. The job description should clearly set out what responsibilities these individuals will have as well as set out reporting procedures.

- The Department of Renewable Resources and the Proponent should work cooperatively to develop a training program for Wildlife Monitors.

- Wildlife monitors should provide detailed **reports of their activities to the Department of Renewable Resources and the proposed Environmental Advisory Group on a monthly basis.**

- The Department of Renewable Resources should assist the Proponent in the establishment of a Problem Wildlife Procedure Plan which will clearly specify what actions are to be taken when wildlife is on or in close proximity to the site.

- No wildlife captures should be conducted without prior approval and consultation with the Department of Renewable Resources. Chemical immobilization of bears should only be conducted by qualified biologists from the Department of Renewable Resources.

3.5 Policy Prohibiting the Feeding of Wildlife

EIS Volume ill - Environmental Management
7.5 Furbearers

"In all cases, feeding of furbearers and other wildlife will be banned; this will be supported by educational efforts."

EIS Volume IV - Impacts and Mitigation
3.3.6.4 Mitigation

"The policy prohibiting the feeding of wildlife will be supported by educational efforts."

This is an excellent step in preventing wildlife problems. The Proponent has had past experience with this problem at their Koala and Falcon camps and has taken steps to rectify the problem. The Proponent developed a policy strictly prohibiting the feeding of wildlife. The development of this policy is an example of how quickly the Proponent has responded to concerns raised by the Department of Renewable Resources.

Recommendation

- A copy of the NWT Diamonds Project policy in regards to feeding of wildlife should be provided to the Panel and the policy should be strictly enforced.

4.0 REFERENCES

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LIST OF APPENDICES

APPENDIX 1

Summary of Recommendations to the Panel

Grizzly Bears - Impacts, Mitigation and Monitoring

1. **The Proponent should make every possible effort to avoid bear deaths. Stringent and innovative mitigation will be required.**

2. **The Proponent should establish a monitoring program to detect and evaluate impacts on grizzly bears. This program will require information on bear displacement distance from roads, plants, camps, the airstrip and possibly air traffic, effects of activities on** den site selection or disturbance, and how impacts on other species affect grizzly **bears (e.g. caribou or ground squirrel distribution and abundance).**

3. The Proponent should analyse habitat use information and use habitat maps to identify critical habitats for grizzly bears and their prey.

4. The Proponent should describe their mechanism for including bear habitat use and behaviour to avoid habitats important to grizzly bear nutrition, denning areas, and known denning bears in winter. Information on habitat use and bear behaviour is required to identify methods of reducing the displacement distance from various activities.

5. The Proponent should work with the Department of Renewable Resources to develop a cumulative effects model for grizzly bears.

6. The Proponent should continue to participate in cooperative research programs designed to provide information needed to understand and mitigate the potential impacts of the mine on grizzly bears.

Wildlife/Human Conflicts

Electric Bear Fencing

1. The BHP Environmental Assessment Panel should make the installation of the eight-wire high tensile electric bear fencing system at the permanent camp and at the Misery camp a condition of Project approval.

Education Programs

1. The NWT Safety in Bear Country Reference Manual should be the teaching guide used in the Proponent's NWT Diamonds Project bear safety programs.

2. **Educational programs dealing with the prevention of wildlife-human conflicts should be undertaken** in partnership with the Department of Renewable Resources.

3. **Any educational programs dealing with wildlife, that the Proponent plans to implement, should be developed in collaboration with the Department of Renewable Resources prior to implementation.**

4. Wherever possible, wildlife educational programs should be delivered by staff from the Department of Renewable Resources.

Personnel Trained in Wildlife Control

1. **The Department of Renewable Resources and the Proponent should work closely to develop a job description for Wildlife Monitors. The job description should clearly set out what responsibilities these individuals will have as well as set out reporting procedures.**

2. The Department of Renewable Resources and the Proponent should work cooperatively to develop a training program for Wildlife Monitors.

3. **Wildlife monitors should provide detailed** reports of their activities to the Department of Renewable Resources and the proposed Environmental Advisory Group on a monthly basis.

4. The Department of Renewable Resources should assist the Proponent in the establishment of a Problem Wildlife Procedure Plan which will clearly specify what actions are to be taken when wildlife is on or in close proximity to the site.

5. **No wildlife captures** should be conducted without prior approval and consultation with the Department of Renewable Resources. Chemical immobilization of bears should only be conducted by qualified biologists from the Department of Renewable Resources.

Policy Prohibiting the Feedina of Wildlife

1. A copy of the NWT Diamonds Project policy in regards to feeding of wildlife should be provided to the Panel and the policy should be strictly enforced.

APPENDIX 2

Reported Grizzly Bear Kills* in the Coppermine and Slave Geological Province Area -1985 to 1995

YEAR	QUOTA / SUBSIST	SECTOR			TOTAL
		INUIT/DENE	INDUSTRY	OUTFITTING	
1985	3	5	0	0	8
1986	11	0	3	2	16
1987	13	6	1	5	25
1988	10	4	1	0	15
1989	6	1	0	0	7
1990	4	0	0	1	5
1991	7	0	4	1	12
1992	9	1	1	2	13
1993	11	4	1	5	21
1994	8	4	3	3	18
1995	1	2	1	2	6

• Data from **before 1992 is still considered incomplete.**

APPENDIX 3

Safety in Bear Country - A Reference Manual (134 pp)

- Available through the Department of Renewable Resources -

APPENDIX 4

Curriculum Vitae - Raymond L. Case

ADDRESS:

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E-mail: rcase@inukshuk. gov.nt.ca

ACADEMIC CREDENTIALS:

Ph. D., University of Alberta, 1994, Wildlife Productivity and Management.

My research investigated adaptations to low nitrogen intake in wapiti, reindeer and barren-ground caribou by manipulating diets of captive wapiti and reindeer and by assessing body composition and physiological status in caribou harvested during different seasons.

B.Sc., University of Alberta, 1981, Zoology.

The emphasis of this program was on wildlife management, ecology of large mammals, and boreal ecology. Additional courses were taken in computer science, biostatistics, botany, economics and northern geography.

EXPERIENCE:

Wildlife Management Biologist II - Department of Renewable Resources, Government of the Northwest Territories, Yellowknife, NWT. August 1990 to present.

Duties include: Developing and implementing a management and research program for grizzly bears; review of management and research projects for all Northwest Territories wildlife; coordinating the development of wildlife species management plans; researching and writing option papers and decision papers to provide administrators with appropriate background information on wildlife management issues; coordinating land claim implementation for the Wildlife Management Division; developing and reviewing proposals for legislation changes; responding to requests for information from the public, press and government officials; and assuming the duties of the Assistant Director, Wildlife Management and Director, Wildlife Management in an acting capacity as requested.

Wildlife Management Biologist I - Department of Renewable Resources, Government of the Northwest Territories, Yellowknife, NWT. July 1984 to August 1990.

Duties included: designing and conducting management studies for muskox, moose, Dall's sheep, barren-ground grizzly bears and to a lesser extent wood bison and caribou; developing computer models of wildlife populations; recommending appropriate survey techniques for muskox, moose and Dall's sheep; investigating the use of remote sensing technology for use in moose surveys; coordinating the development of wildlife species management plans; researching and writing option papers and decision papers to provide administrators with appropriate background information on wildlife management issues; reviewing and developing proposals for legislation changes; administering the Wildlife Research Permit system and responding to requests for information from the public, press and government officials.

Wildlife Management Technician - Department of Renewable Resources, Government of the Northwest Territories, Yellowknife, NWT. March 1982 to July 1984.

Duties included: developing and implementing a harvest data collection system for resident hunters; developing computer models for wildlife population analysis; reviewing research proposals; maintaining the Wildlife Research Permit system; maintaining harvest data records; reviewing legislation proposals; assisting with wildlife studies; and responding to public requests for information.

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APPENDIX 5

Curriculum Vitae - Andy McMullen

Completed Arctic College Renewable Resources Technology program

Lived and worked entire life in bear country. Approximately 21 years working with bears:

- 7 years baiting bears in NW Ontario.
- 7 years GNWT Renewable Resources Polar bears/Grizzly bears.
- 7 years tourist industry preventing wildlife problems.

Knowledge built on sound base of Traditional Knowledge