3. Alternatives and Future Development

During project planning for the NWT Diamonds Project, various alternative methods of project development were considered. The Proponent believes that the mine development plan is environmentally, socially and economically sound and is the optimum development plan. However, alternative mining activities and tailings disposal techniques are presented for comparison. The potential for further mine development by the Proponent in the Lac de Gras area is also discussed.

3.1 Fly-In/Fly-Out Work Force Versus Permanent Mining Town

Project planning is based on developing the NWT Diamonds Project as a fly-in/fly-out operation. The alternative of constructing a permanent townsite near the mine site was deemed not feasible for the reasons discussed below.

To assess the viability of establishing a "grassroots" town for project employees and their families, it was assumed that the total townsite population would be 2,600 to 3,500 people, based on a projected 750 to 1,000 workers being employed at the mine site. A town of this size would disturb a minimum area of 60 ha of land. The model for these assumptions is the former town of Pine Point, which was built to support Cominco's former Pine Point mine operation in the NWT. The town had a maximum of 2,200 residents, of whom 640 were employed at the mine, and covered an area of approximately 40 ha.

The construction of a townsite would have obvious environmental implications. In addition to direct land surface disturbance, inherent impacts would result from the provision of services such as water supply, power supply, garbage disposal, sewage disposal and commercial and/or private transportation corridors. In addition, the surrounding area would be affected by recreation activities such as camping, hunting and fishing, which are invariably promoted as life style benefits for town residents in similar remote locations.

Past experience shows that the residents of such small, isolated townsites are subject to adverse sociological effects. As family needs arise, staff are often forced to move to obtain medical care (residents of Pine Point had to travel to Hay River for emergency and major medical and dental care) or advanced schooling such as junior college. Experience also shows that substance abuse is usually greater in communities where the opportunities for recreation or other pastime diversions are severely limited.

Major advances in air transportation and communications systems in the last three decades have essentially eliminated the need for isolated townsites near remote mines. Townsites such as Pine Point, Uranium City, Echo Bay and Cassiar were established in the past. More recent mining projects in the north, such as Lupin,

Colomac, Polaris and Red Dog, as well as Rabbit Lake and Key Lake in northern Saskatchewan, have been developed as fly-in/fly-out operations, with no local townsite required.

3.2 Open Pit and Underground Mining

The mine development plans outlined in Section 2.4 are based primarily on open pit mining methods. Over the 25-year production period, 90% of the ore will be derived from open pit mining and 10% from underground mining. It is important to note that all kimberlite pipes in production around the world started with open pits, with only a few proving viable as underground mines later in their development.

The selection of mining methods is dependent on several factors:

- location of the deposit with respect to major geomorphic features, e.g., large bodies of water, glaciers or mountains
- geometry of the deposit
- size of the deposit
- physical and mechanical properties of both the ore and the host country rock
- net unit value of the resource ($/tonne).

Open pit mining, where feasible, carries a much higher level of technical and economic certainty than underground mining and, in the case of near-surface deposits, allows for the recovery of lower grade and lower valued ores, as it is generally a less expensive mining method. Because of the high costs associated with the remote location of the NWT Diamonds Project and the value of the ore, development of the kimberlite pipes discovered to date on the property is viable only if open pit mining is the main method of recovery. As illustrated in Table 3.2-1, the average *in situ* value of the NWT Diamonds ore is considerably lower than that of ores at existing underground mines in the NWT. It is therefore planned to develop all five pipes included in the project – Panda, Misery, Koala, Fox and Leslie – as open pit mines.

At some depth of open pit mining, once waste rock removal becomes excessive, underground mining may become more economical. This can only be considered for kimberlite having a high value per tonne of ore and of sufficient ore reserves to support the capital investment. Consequently, underground mining is currently planned for Panda and Koala, where part of the underground infrastructure can be shared between the two pipes, but not for the lower grade Fox, Leslie or Misery

Table 3.2-1
***In situ* Values of Underground Mine Resources**
NWT Diamonds Project *vs.* Existing NWT Mines

NWT Diamonds Project		Grade Carat/t	Value US$/Carat	Ore Value US$/t
Panda		0.93	132	123
Misery		3.30	44	145
Koala		0.75	110	82
Fox		0.27	126	34
Leslie		0.32	89	28
Typical NWT Mines		**Grade**	**Commodity Value US$**	**Ore Value US$/t**
Mine 1	gold	9.6 g/t	11.23/g	108
Mine 2	gold	11.0 g/t	11.23/g	123
Mine 3	gold	10.6 g/t	11.23/g	119
Mine 4	lead	37 kg/t	0.93/kg	194
	zinc	134 kg/t	1.19/kg	–
Mine 5	lead	2 kg/t	0.93/kg	105
	zinc	85 kg/t	1.30/kg	–
	silver	40.0 g/t	0.17/t	–

Source: BHP/Dia Met press releases through February 1995; Canadian Mines Handbook/Annual Reports.

pipes. The depth to which an underground mine can continue is based on the geometry of the pipe (the diameter of which will continue to decrease with depth), rock mechanics characteristics, the cost of shaft sinking and hoisting and the value of the ore.

To allow either or both types of mining, the lakes overlying the pipes must be dewatered. While the need for this dewatering to permit open pit mining is obvious, experience from the underground bulk sampling program shows that lake water removal would be required for underground mining, even if no open pit were developed, because the water will drain into the workings and possibly induce ground caving conditions. The caving could become uncontrollable, and in the worst case, as realized at some South African mines, a sudden in-rush could become an extreme safety hazard.

Each of the pipes to be mined at the project is unique in terms of geometry, rock mechanics and grade. The final choice of mining method is dependent on sufficiently low cost of recovery, technical suitability and safety of operation, given the prevailing rock conditions. The considerations taken into account in

planning for both open pit and underground operations are discussed in more detail below.

3.2.1 Open Pit Mining

Open pit mining provides the necessary extraction and development rates to recover the heavy investment costs required for the project infrastructure. Open pit mining also provides the following:

- better conditions for employee safety
- higher production rates and less chance for interruption of production
- maximum resource extraction
- less dilution, allowing for the recovery of lower grade ores that would not be economically recoverable underground
- better employment opportunities for less skilled workers. Training for surface mining techniques is less sophisticated than for underground techniques.

Several areas have been investigated to optimize the open pit mine plans for the project:

Pit Slopes Angles: Steeper pit walls allow less waste rock to be removed per tonne of ore, which subsequently minimizes the area of disturbance. Geotechnical investigations indicate that the competent wall rock of the pipes has favourably oriented discontinuities. This characteristic of the wall rock, combined with a standard final wall configuration that includes double benching, will permit stable slopes to be established up to 55°.

Equipment Sizes: Where justified by production rates, the larger the mining equipment, the more efficient and cost effective will be the mining. An equipment fleet consisting of 218 tonne haul trucks and a 36 m^3 electric shovel has been determined to be most suitable. Hydraulic shovels have also been selected for loading units because of their mobility and flexibility. The equipment fleet for the Misery open pit will be smaller in size to suit the lower production rates and the tight configuration of the pit.

Ore Transport: Haul trucks have been selected over a conveyor system for out-of-pit transportation because of anticipated difficulties due to freezing conditions during the arctic winter. In-pit conveyors require a fixed location and ample operating room; neither of these features can be accommodated in the small area of the diamond pipes.

Explosives: Bulk explosives used in open pit mining are standard ammonium nitrate based products. Ammonium nitrate/fuel oil (ANFO) is best suited for dry blastholes and emulsion for wet blastholes. Most of the rock to be blasted during mining consists of frozen, low permeability granite. Although emulsion may be required under certain circumstances, ANFO is projected to be the primary explosives product.

3.2.2 Underground Mining

As noted previously, underground mining, though generally more difficult than open pit mining, especially in weaker rock masses such as kimberlite, may be economic. The information gained during the bulk sampling programs has been instrumental in formulating designs for underground mining of the Panda and Koala pipes after the exhaustion of their open pit reserves. Underground declines were driven on the Fox and Panda pipes, to vertical depths of 220 m and 90 m, respectively, proving geotechnical data and knowledge of the conditions to be expected during underground mining. Zones of weak rock were encountered, and groundwater control proved challenging. Selection of the proposed underground mining methods has been based on this work and evaluation of other technical and economic criteria.

A number of factors, including the context of the NWT operating conditions, must be considered:

- geometry of the resource in terms of size, shape, attitude and continuity
- rock mass characteristics of the waste and ore in terms of strength and competence
- major geological structures such as faults, shear zones and intrusive sills and dikes
- value distribution through the resource, especially the dilution values
- regional stress regime and mining depths
- external constraints such as protection of the surface and availability of backfill
- mining environment in terms of surface water and groundwater, rock temperatures and access from surface
- production constraints in terms of production rate, requirements for ore blending, revenue and costs

- geographic constraints such as permafrost and extremely low winter temperatures.

There are three main types of underground mining methods, caving, room-and-pillar and cut-and-fill, and variations within each:

Caving disrupts the surface and creates a depression. It requires dewatering of the surface and removal of mud. For block caving, the ore must be sufficiently weak and massive to sustain a cave without drilling and blasting. For sub-level caving, or open stoping with caving, the collapse (cave) must be sustained by drilling and blasting of the ore (a "pre-break").

In *room-and-pillar* mining, or open stoping with pillars (partial extraction), the surface is not disrupted and drainage of the surface water might not be necessary. The excavations are left empty and must be self supporting through a system of pillars.

In *cut-and-fill* mining, and open stoping with post-fill (supported methods), the surface would not be disrupted by caving and the excavations in ore would be backfilled with cemented or uncemented material to prevent collapse and caving.

These methods are listed in very approximate order of increasing operating cost as follows:

1. block caving (caving self sustained)
2. sub-level caving (caving with pre-break)
3. open stoping (either partial extraction, caving with pre-break or with backfill)
4. room-and-pillar (partial extraction)
5. cut-and-fill (backfill)
6. shrinkage (either partial extraction or caving)
7. underhand cut-and-fill (backfill forming the roof).

Costs and production rate can vary significantly between methods, but cost alone cannot be the basis of selection. Caving operations can result in ground disturbance similar in appearance to an open pit mine, but non-caving underground mining methods may not be economically viable because of lower production and extraction ratios, higher unit costs and the difficulty of supporting incompetent rock masses. Increasing costs usually reflect weaker rock conditions or less favourable geometry. Although the NWT Diamonds kimberlites have

favourable geometry, the kimberlite rock mass strength of the currently defined pipes is generally very weak.

All underground mining in kimberlite to date has been in South Africa using caving methods exclusively, varying from block caving and sub-level caving through to "glory holes" and a form of stope shrinkage unique to diamond mines. But, as stated previously, all mines were operated first as open pits. The kimberlites in South Africa tend to be much stronger than the ones considered at this site, apart from Leslie pipe, and do not have the same surface water or groundwater constraints. Therefore, underground operations in the NWT will be more technically challenging than in South Africa; however, mining can still be conducted safely.

Based on the foregoing considerations of economics, technical feasibility and safety, sub-level caving has been selected as the preferred method for underground mining of Panda and Koala. A backfill method may be technically feasible, but the costs are likely to be prohibitively high.

3.3 Backfilling of Open Pits

Once an open pit has been exhausted, it may present a suitable place to dispose of various waste materials such as open pit waste rock (granite), low grade kimberlite and overburden, coarse ore rejects and process plant tailings. Consideration will be given to backfilling with these materials when the mining sequence allows.

The potential for backfilling sites such as Panda and Koala, before underground mining has been completed, will depend on the following:

- the properties of the backfill materials as placed: sizing, water content, degradability and mix of material types
- underground mining methods: open methods such as glory-hole or caving, which may lead to dilution and waste at the draw points, or non-caving methods that would not be affected by the waste
- changes in backfill properties with time and the movement of caved material
- economics: savings on the disposal side versus costs of potential dilution.

The history of mine disasters that have resulted from the inrush of backfilled tailings, muds or other finely ground materials dictates that only coarse, clean granite can be considered for backfill while underground mining is ongoing. Even if technically possible, however, backfilling with granite would introduce an unacceptably high level of dilution if block caving, sublevel caving or glory hole

methods were used for underground mining. Thus, backfilling pits prior to the completion of underground extraction cannot be considered for these methods.

The Panda pit will be the first to be mined out, approximately five years after mine start-up. Underground mining below the pit will require that the workings remain dry until Year 20 to accommodate both Panda underground mining from Years 6 to 12 and Koala underground mining, which will be active until Year 20. Both underground operations will be accessed by a common, centrally located shaft and lateral development, which would provide conduits for moisture flow (e.g., backfilled tailings from Panda) towards the operating Koala underground mine. Although it is technically feasible to use bulkheads to prevent this flow, in the interests of safety this option has been rejected at this time.

After underground extraction from Panda/Koala is complete, backfilling the Panda pit with process plant tailings would be a logical, economic and environmentally acceptable procedure that could tie in well with the completion of the Long Lake tailings disposal basin. While backfilling pits such as Fox and Leslie where no underground mining is contemplated would appear to be possible, the distance to Misery and the concurrent development of the Fox and Leslie pits rules out such opportunities. Should other pipes be identified for mining later in the project life, further backfilling options may become viable.

3.4 Plant Site Location

Proximity to the principal ore bodies is the primary consideration in selecting the location for a processing plant. The site should be as near as possible to the ultimate pit limits so as to minimize ore transport distances, haul road lengths and haul truck fuel consumption, and should not encroach on or overlie potential ore reserves. Another major consideration is the distance to the tailings discharge area and subsequent pumping requirements. Minimizing this distance is of particular concern in the Arctic, where tailings lines must be insulated and heat-traced and where any line blockages would be difficult to clear because of the harsh climatic conditions.

In the case of the NWT Diamonds Project, where several ore bodies (kimberlite pipes) on the property are planned for development, a general area central to the kimberlite pipes and within 2.2 km of the tailings disposal impoundment was selected. Once the approximate plant location was set, based on these two main considerations, geotechnical investigations were undertaken to determine the optimum specific site in terms of three desirable ground conditions:

- an area elevated above the surrounding topography, which would minimize disruptions to low-lying wetland areas and minimize site flow through drainage

- sound stratigraphy, such as surface or near-surface bedrock, and no ice-rich lenses/till zones

- a relatively flat area so that a minimal amount of ground excavation and/or fill would be required.

Accordingly, EBA Engineering Consultants Ltd. was commissioned in early 1994 to perform a field survey including exploratory stratigraphic borehole drilling, deep trench excavation, air photo interpretation and an overall visual geotechnical review of the site. The final plant site selection was based on this work.

In deciding the arrangement of the plant site facilities with respect to each other, the first consideration was the initial ore delivery and processing steps, which dictated the sequential layout from the pit to primary crushing to coarse ore handling to main processing. Most diamond plants built to date in Africa and Australia consist of several distinct structures, each housing a different stage of the process and interconnected by outdoor conveyor galleries. While this design concept is easily executed in such temperate regions of the world, the arctic conditions at the NWT Diamonds site led to the design of a single structure to contain all the processing steps except primary crushing. This configuration minimizes process heat loss and the potential for exposure of the operations to the outdoors, as well as the overall use of land.

The overall placement of the rest of the facilities – the security control building, the truckshop/offices/warehouse complex, the permanent camp and the power plant – was then determined as follows:

- The security control building was positioned centrally at the site to control access to the principal work areas.

- The power plant was also established in a central location near the utilidors to minimize the lengths of circulating glycol pipes that will supply waste heat to the main facilities.

- The truckshop/offices/warehouse building and associated warming shed were located near the main haul road to provide direct access to one side of the facility by the haul trucks and other large vehicles. This location also permits direct access to the other side of the truckshop by smaller vehicles and supply delivery trucks. In this way a single facility can provide all vehicle servicing requirements and still minimize the interaction of small and large vehicle traffic for safety reasons.

- The permanent camp site was selected to be close to and internally connected with the main facilities, yet within a quiet and better quality air zone somewhat distant from the airstrip and mining activities.

3.5 Mineral Processing Options

The process design philosophy for the NWT Diamonds Project was based on maximizing diamond liberation and recovery by using the latest and most efficient technology available to the diamond industry worldwide.

Two main treatment routes typify operations elsewhere and were evaluated for process selection: the "Russian" recovery method, based on conventional grinding mills, X-ray sorters, jigging and flotation; and the "South African" recovery method, which uses conventional crushing, scrubbing, high pressure grinding rolls, heavy medium separation (HMS) and X-ray sorting or grease belts for final recovery.

Early in the project, it was decided to use the South African model for the bulk sampling plant. This decision was based on the availability, low cost and proven field capabilities of this type of equipment throughout North and South America, Africa, Asia and Australia. Several companies worldwide have the expertise to supply plants based on HMS processing, from sampling plants through to full sized treatment plants.

The processing method used in Russia (Siberia) is unique to that area, and very little information is available on potential suppliers of the type of facilities used there. Comparative studies concluded that the Russian approach would incur higher initial capital costs. Operating costs would be higher as well, due mainly to greater power consumption and other potentially negative aspects such as increased diamond breakage, which would result in lower revenues.

Diamonds are extremely hard, which makes them resistant to damage during scrubbing and certain types of crushing. Unfortunately, it also makes them liable to fracture upon sudden impact. High impact autogenous grinding of kimberlite in SAG mills will lead to more breakage of large diamond stones, and therefore conventional milling or impact crushing is not desirable. Instead, the NWT Diamonds Project will utilize conventional crushing for the coarse reduction of kimberlite to -75 mm and maximize the liberation of diamonds by using high pressure grinding rolls (HPGR) technology. HPGR is new in the minerals processing industry and has been successfully applied in diamond plants in South Africa and Australia. With HPGR, size reduction is based on interparticle comminution and preferential breakage along crystal interfaces, rather than on impact. The HPGR equipment requires less power and floor space than conventional milling, which obviously translates into lower capital and operating costs for the building/structures.

The flotation methods used in Siberia to recover small stones require collectors and frothers for the operation of the cells. The proposed recovery method at the NWT Diamonds operation will be as chemical-free as possible. The value added by the recovery of small stones through flotation is very low, since there is little

market demand for the very small sized material as reflected in the price per carat. The conventional heavy medium cyclone is efficient down to 1 mm, which is the normal lower treatment size for virtually all South African and Australian production plants.

Grease tables and grease belts have traditionally been used for diamond recovery for more than 100 years. Grease based methods, which are used at several South African plants, take advantage of the hydrophobic property of diamond, in that most diamonds are not wetted by water and will adhere to a grease film. Another advantage is the very low concentrate yield compared to X-ray recovery methods, which can collect luminescent non-diamond minerals along with diamond. In addition, not all diamonds are luminescent, presenting the possibility that some diamonds could be lost from the X-ray sorters. Until complete luminescence testwork has been completed on the diamonds from the NWT Diamonds Project, it cannot be determined with certainty whether X-ray sorting only or a grease plant will be required for the final recovery section.

3.6 Ore Treatment Production Rates

The ore treatment production rate is one of the most important decisions to be made in planning a mining operation. The criteria for this selection can be summarized as follows:

Technical

- What are the available ore reserves?
- What mine production rate is achievable with the selected mining method?
- How many pits, working faces or production levels can be operated efficiently at the same time at those given production rates?
- What throughput, or multiples of it, can be achieved from the major processing components?

Marketing

- How much product are the proponents able to sell?
- Will the chosen production rates affect the market place supply/demand and consequently the revenue structure?

Economic

- Are there sufficient ore reserves at the chosen production rate to sustain production long enough to amortize the investment for plant and equipment?

- What production level will create sufficient after-tax operating profit to repay the total capital investment plus interest charges for the project, generate sufficient funds to be set aside to pay for future closure and reclamation expenditures and yet achieve an acceptable rate of return for the proponents?

- How much capital are the proponents prepared to raise and risk given the investment climate at the time and for this location?

- At what level of risk, reward and assurances are the proponents comfortable?

Given the many variables involved, production rate is one of the main items addressed in a feasibility study; many iterations are required before each of these criteria is satisfied. From the investigations and analyses carried out for the project, a plant throughput rate of 9,000 t/d has been selected for the initial period when the higher grade Panda, Misery and Koala pipes will be mined. This selection takes into consideration the projected demand for diamond, including anticipated increases in market demand and decreases in potential world mine production. Independent of plant throughput, however, the high capital costs of the infrastructure necessary to construct a mining operation in this remote area dictate that a minimum level of diamond sales and cash flow must be achieved to provide the required rate of return.

It is also important to maintain a consistent diamond product, i.e., ensure that the relative number of stones in each diamond quality range does not fluctuate substantially. To this end, production from the Misery pipe, which is higher grade but expected to produce predominantly lower quality stones, has been blended with that from Panda and Koala. Misery will be mined at a lower production level of 1,500 t/d over a seven-year period to smooth the impact of this quality difference. The increase in production to 18,000 t/d in Year 10 takes account of the lower grade material from Fox and Leslie pipes while maintaining a relatively constant diamond supply to the marketplace.

Differences in the physical properties between the kimberlite pipes and even internally within some of the pipes will still result in day-to-day, month-to-month and even year-to-year variations in plant throughput. Depending upon these ore characteristics, various sections of the plant will set a limit on production rates:

- Hard ore will decrease scrubbing and recrush crushing rates.

- Kimberlite that contains higher levels of heavy minerals will produce more concentrate, and X-ray sorting may become a potential bottleneck.

- Soft kimberlite, which has potentially higher levels of clay minerals and moisture, may cause difficulties by plugging chutes and belts and freezing during the winter.

Taking account of these factors, sufficient ore resources have been identified to supply plant feed for 25 years at the selected average production rates. The establishment of a mining operation for this period of time will provide long-term employment and business opportunities for the affected communities, as well as assurance for the Proponent of the NWT Diamonds Project that the mine can continue production through many business cycles.

3.7 Alternative Tailings Disposal Site and Facility Assessment

Approximately 133 million tonnes of ore will be processed over the 25-year life of the project. Mineral processing involves crushing of the kimberlite ore to -8 mm. The coarse fraction (-8 mm +1 mm), representing about 20% of the ore mass, will be transported by truck to surface dumps after diamond recovery.

The fines and sands fraction, representing approximately 7,000 t/d initially and a total of 108 million tonnes over the project life, has a particle size of less than 1 mm with typically less than 10% of this fraction being less than 50 µm in diameter. These fines and sand tailings will be placed in the Long Lake facility immediately west of the processing plant.

The natural water level in Long Lake will be lowered initially by at least 2 m to facilitate dam and dike construction and to provide for emergency containment of excessive natural runoff, if necessary. Three perimeter dams will be constructed to allow the water level of the lake to rise temporarily to 9 m above its current elevation.

The proposed tailings deposition scheme involves the sequential in-filling of cells or impoundments within the Long Lake basin. After initially sealing the intermediate dikes with tailings, all discharge will be upstream of the dike, with a long beach in summer and a much shorter beach in winter to maintain a section of open water.

3.7.1 Factors Important to Tailings Facility Assessment

Properties of the Tailings

The specific gravity of the ore varies between about 2.0 and 2.6 t/m^3. The tailings will be discharged as a slurry of low solids density of about 45% solids by weight.

The tailings are of coarse grind, generally with more than 75% being of sand size. The clay content is variable depending on the kimberlite pipe from which the ore is derived. The clay content generally increases for each of the pipes as follows:

Lowest clay:	Leslie pipe
	Panda pipe
	Koala pipe
	Misery pipe
Highest clay:	Fox pipe

The variability of the clay content from pipe to pipe and within each pipe deposit has not been fully established. Tailings clay and silt contents in excess of 50% are anticipated on occasion. The significance of the size variation and clay content is as follows:

- The clays are fine montmorillonitic and smectite clay and are the source of the fine colloidal suspensions of solids in the tailings waters.

- Observations in the field of bulk sample tailings deposit indicate that there is extensive segregation during deposition. This results in coarse sand tailings being deposited near the discharge points and high concentrations of clays in soft compressible deposits in the pond area. Highly variable conditions of density, trafficability, permeability and settlement are anticipated between the coarse sands at the discharges and the clayey silts and sands at the pond.

- The clays result in low settled tailings densities and a low permeability where clay concentrations are high. This requires high volumes for storage, and substantial long-term settlements are anticipated.

- With the lower energy conditions associated with winter deposition, there may be some reduction in the segregation in subaqueous beaches, but this change is expected to be small.

Topography

The area is generally flat with low undulations, resulting in a low ridge and valley topography with lakes filling the low-lying regions. Elevation differences between lake levels and ridge crests are in the order of a few tens of metres.

Hydrology and Drainage

Four of the pits and the processing facilities lie within the Koala watershed, which drains into Lac de Gras and eventually into the Coppermine River. The Exeter Lake watershed lies to the north and west, draining into Yamba Lake and the

Coppermine River, and into the Paul and South watersheds to the south and east, which also drain into Lac de Gras.

Since the impact on surface water quality is one of the main concerns relating to the tailings, it is desirable that tailings be deposited within the same watershed as the rest of the project development.

Cold Winter Operating Conditions

The very severe cold of winter has the following influences on tailings operation:

- Sub-aerial deposition can result in glaciation (freezing of low solids tailings) on the beaches and consequent very low tailings deposition densities. While subsequent thawing and settlement is not a concern in this permafrost area, the reduced density does require additional storage volume for the tailings. Since small inclusions of glaciated tailings are not seen as a concern, the sub-aerial deposition can be maintained through relatively cold conditions until glaciation is observed to be occurring. Any glaciation tendencies can be minimized by concentrating tailings discharge flows and the heat input on the beach, extending the periods over which sub-aerial discharge can be maintained.

- Prevention of tailings line freezing is essential, requiring heat-tracing and other special design features to ensure that lines can be flushed and drained.

3.7.2 Alternative Sites

The options for alternative sites are very limited. The nature of the topography and foundation conditions are similar in every direction around the mine, and there are no natural topographic features that can be used to better advantage than the selected site. The selected site has the advantage of being within and close to the headwaters of the same watershed.

With the large tailings volume and low topography of the area, it is not possible to avoid watercourses and lakes. Any attempt to maximize the amount of upland underlying the tailings (thereby minimizing the lowland or lake areas) results in a large increase in the area affected by the tailings and the need for additional long-term stable dams.

The mining sequence does not permit in-pit disposal for the first 20 years. Placement of tailings prematurely in a pit would result in sterilization of the reserves remaining in pipe deposits underlying the pit.

3.7.3 Alternative Management Methods

A number of alternative methods for tailings disposal were studied.

Dewatered "Dry" Tailings

Dewatering the tailings and subsequent placement by "dry" methods would involve mechanical dewatering followed by deposition using trucks and dozers or a conveyor and stacker. The technical feasibility and cost associated with dry tailings disposal depends on the degree of dewatering that can be achieved and the resulting trafficability, handleability and stability of the dewatered tailings.

The degree of dewatering that can be achieved and the resulting engineering properties are highly dependent on the clay content of the tailings. For the very low clay content tailings the dewatering may be feasible to moisture contents (generally <12%) at which the tailings would behave as a granular mass and could be handled by conventional truck and dozer equipment. However, even moderate clay contents have a marked effect on the dewatered moisture content. It is readily apparent that the high clay content tailings are not amenable to mechanical dewatering, or would result in very high residual water contents (generally >22%) based on experience with other similar filtration testwork. Disposal by "dry" methods must therefore consider the concerns associated with such high clay content tailings.

A clayey tailings with a water content of more than 22% has the consistency of a cowpat, being sloppy and fluid. The handleability is very poor, and it is non-trafficable and unstable when placed in the field. To be able to place that material in an impoundment using trucks requires containment dikes and co-disposal with rock waste to maintain trafficability to the deposition location. Co-disposal increases the total impoundment volume required. Placement by conveyor requires a heated conveyor (extremely high cost), along with belt scraping and washing to release the sticky tailings, as well as containment dikes and a specially developed dike system to support the stacker and allow the tailings to be discharged.

The dry disposal option was rejected primarily for technical and operational reasons; however, other factors also contributed to the decision that the concept was not feasible:

- lack of suitable surface area for disposal of the large volume of tailings
- extent of surface area exposed to erosion during operations
- poor long-term terrain aesthetics and restoration options.

Paste Tailings

Paste tailings would be produced in deep cone thickeners and then be pumped to the tailings impoundment. The prime advantage of paste tailings is that it would reduce the segregation of the tailings after discharge.

A sufficient clay content is required in the tailings to ensure that tailings will behave as a paste. This may not be possible with the low clay content and coarse grind of some of the project tailings, which would behave as a granular material and cause the thickeners and pumping systems to sand up.

Paste tailings may be achievable with the high clay content tailings with solids contents potentially in the 55% to 65% range. This paste is difficult to pump over long distances, requiring the use of high energy positive displacement pumps. During power or other pumping disruptions it will be more difficult to flush or drain tailings lines. The risks of winter operations are therefore greater.

The small advantage of achieving unsegregated tailings compared with the large operational and cost disadvantages renders this option undesirable.

Sub-aerial Deposition

Sub-aerial deposition involves discharging thickened tailings above water, forming beach deposits. Tailings will fan out and eventually form a flat stable slope, at which point the discharge line can be relocated.

Sub-aerial deposition has the advantage that it is easily controlled and managed if the slope and material properties allow flow. Tailings will flow in a slurry form, filling the natural or constructed impoundment. This is the standard method of deposition in most mines of all types.

The disadvantage of this method is that severe freezing conditions can cause entrainment of ice, consuming storage volume. This can be mainly overcome by moving the discharge point to the water's edge during winter. Tailings, if allowed to dry out, can be susceptible to wind erosion if not capped with coarse material and reclaimed.

Subaqueous Deposition

An underwater disposal scheme for sequencing the filling of Long Lake basin was evaluated in considerable detail as a primary component of the tailings management plan. It was based on underwater deposition into the deepest part of Long Lake during the winter season from the beginning of operations. Subaqueous deposition under an ice cover has the advantage of eliminating the risk of ice buildup affecting the operation and consuming storage volume. It is also the lowest cost winter deposition method during early years before the deeper portions of the lake become filled.

Subaqueous deposition into the deep portions of the lake, which are near the discharge point, was removed from the tailings management plan following a detailed evaluation of tailings settling, mixing and consolidation behaviour. There is uncertainty concerning how the subaqueously deposited tailings will behave in

the water column following spring breakup. Lake mixing may occur as a result of density gradients created by summer warming. These density gradients have the potential of mixing turbid water at depth with clean water each summer. If substantial mixing were to occur during the first few years of operation, any opportunity to discharge naturally clean runoff water during the first 12 to 18 years of operation would be lost.

Subaqueous deposition remains as a contingency plan for emergency release in the event that unusually severe winter conditions affect normal operations. It may also form a component of the filling method adopted for individual cells.

3.7.4 Alternative Construction Methods

A number of alternative construction methods were examined.

Central Discharge (Robynski Method)

A central discharge, or Robynski, system would involve the discharge of the tailings from a central raised point to produce a cone of tailings flowing outwards to a low ring containment dike. As tailings accumulate in the cone the discharge point is raised. When the tailings beaching angle is such that the tailings reach the pond dike, the tailings are thickened to increase the developed beach angle, increasing the height of the cone over the same base diameter. The system is limited by the maximum beach angle that can be achieved on the base diameter of the cone. The maximum beach angle is limited by the amount of thickening that can be economically achieved with the tailings. The system is generally suited to low cost disposal systems in flat topography.

Application of this system at the project site would require an extremely large cone with a low slope angle (0.5% at the pond dike to 2% at the apex). This large cone would be subjected to extensive glaciation during winter deposition and high wind erosion and dusting during both winter and summer. A large number of containment dikes would be required at the toe of the cone, from which the control of seepage to receiving waters would be very difficult. Water management of the distributed ponds around the periphery would require a complex pumping system.

This construction method was considered to be unsuitable for this project site.

Peripheral Dikes (Ring Discharge)

A peripheral dike system could be used with a ring discharge in order to place the impoundment at a more upland location. This system has the disadvantage that an extensive dike system is required. Construction of these dikes in the severe climatic and permafrost conditions of the site is a concern. Seepage control under the dikes will be required. The ring discharge and interior conditions of the

impoundment are such that only subaerial deposition could be applied. The large beaches would suffer from glaciation during winter and wind erosion and dusting during winter and summer. It would not be possible to implement progressive reclamation, as the entire impoundment system would remain in operation until closure.

Given the disadvantages of this system compared with the selected alternative, it was rejected as an option for the project.

Valley Dam

Valley dams have the advantage that the amount of embankment construction is minimized. This results in the lowest long-term concerns with regards to stability and seepage. Because of the flat topography, however, no natural valleys exist, other than the depressions that now form lakes.

Alternative Basins

The Long Lake basin was selected after careful evaluation of regional topography and hydrology. The basin is the only site that meets the following selection criteria:

- The tailings volume can be accommodated within the basin.
- The basin is a headwater with no significant river inflow to divert.
- The distance to the mill is acceptable for winter operation of a slurry pipeline.

These technical factors were evaluated, together with the environmental impact associated with removing the lake from the ecosystem, before selecting the Long Lake basin as the primary tailings disposal option. The tailings will be transported and deposited at a solids content by weight of 45%. The management plan described was developed to minimize overall environmental impact and meet the requirements of the process plant.

Embankment Construction

Embankment construction can be performed using one of three sources of materials:

- *the coarse fraction of the tailings*: This is often done at other tailings sites where the cost of using material other than tailings is high. At this project site, this is not the case. The sand fraction of the tailings may be used for selected zones where a sand is required.

- *the waste rock from the mines*, including the coarse screened tailings (1 mm to 8 mm diameter): Since large quantities of durable waste rock are available at low cost, the maximum use will be made of this resource.

- *natural soils*: Those available in the project area are generally thin and of poor quality for construction materials.

Construction methods are generally one of three forms:

- upstream construction, where the embankment is advanced over the tailings. Stability of the embankment depends on the stability of the tailings over which construction proceeds. Given the low embankment heights (hence the relatively low dam construction costs) and high clay content of some of the tailings, it was decided to avoid upstream construction over the tailings for this project.

- centreline construction, which involves the vertical raising of the centreline of the tailings embankment with a reduced amount of construction on tailings. This method was rejected for the same reasons as those for upstream construction.

- downstream construction, in which the entire embankment is raised by advancing the toe of the embankment downstream such that the entire embankment is constructed over natural foundations soils and rock. This was concluded to be the most conservative and appropriate approach for this project.

3.8 Power Generation Options

Various methods of electrical power generation and power plant types, ranging from windmills and solar panels to conventional hydro power and diesel generators, were reviewed. Medium-speed (720 rpm to 900 rpm) diesel powered gensets were found to be the most viable option for the reasons discussed below.

The climatic conditions of the Northwest Territories are not suitable for alternative energy generation because of extreme variations in wind and sunlight availability, and no detailed study was made of such systems.

The review and follow-up of the October 1993 Hydro Study for the Lac de Gras area performed by Acres International indicate that numerous dams would be required at the proposed Snare River site to meet the power demands of the project. In addition, the available power supply would fluctuate over the year due to high seasonal variability in river flow, requiring the construction of large water reservoirs.

A hydro system would require an extensive transmission line, with the added disturbance to the environment that would result from construction and maintenance.

Hydro power would not completely eliminate the need to burn fuel oil at the mine site in any case, as fuel fired boilers would still be required to supply heat. With an on-site diesel power generating system, this heat would be readily available as a by-product. The Key Lake uranium operation in northern Saskatchewan, which converted to grid-supplied power from on-site generated power, has found that a sizeable on-site diesel power capability is still required because numerous powerline outages occur each year due to lightning strikes, etc.

Another disadvantage of hydro power is the increased risk exposure of the capital investment. The initial capital cost for a hydro power system is much greater than for a diesel power system. If the project were to cease operations earlier than planned, little of the capital investment in a hydro system would be recoverable if no other significant user were found.

As a result of these considerations, it was determined that hydro power was not feasible at this stage of the project.

A coal-fired power plant was briefly investigated, but was found to have significantly higher installation costs and greater environmental impacts than an oil-fired plant and would create an ash disposal problem; therefore this option was eliminated. A natural gas-fired power source was also briefly investigated, but the cost of running a powerline or a natural gas pipeline to the mine site is exorbitant and would incur significant environment impacts crossing the tundra. Consequently, this possibility was also eliminated from further consideration.

Having determined that diesel-powered generators would be used, four basic genset types were evaluated: low speed (200 rpm) gensets primarily targeted to burn Bunker C and liquefied coal fuels; low/medium speed (400 rpm to 600 rpm) gensets primarily targeted to burn heavy fuels (No. 6); medium speed (720 rpm to 900 rpm) gensets primarily targeted to burn No. 4 and better fuel oils; and high speed (1,200 rpm and up) gensets primarily targeted to burn No. 2 and better fuel oils.

The low speed and low/medium speed gensets were eliminated early on because the weight of certain genset components would have made them nearly impossible to ship over the winter roads, and trucking heavy fuel oils to the mine site and unloading in the middle of winter would have been extremely difficult. In addition, the heavy fuel oils are typically high in sulphur and other impurities, which would increase the amount of airborne contaminants produced unless extensive and costly stack scrubbers were installed.

High speed gensets were eliminated because an excessive number of 1.2 MW to 1.4 MW sized units would have been required to generate more than 20 MW of power, which is the estimated electrical demand in the later years of the project. High speed gensets also offer less waste heat recovery potential than medium speed gensets, as the cost to recover heat from all the heat shedding systems on so many gensets would be prohibitive.

The medium speed (720 rpm to 900 rpm) genset power plant is therefore the most viable option. It offers lower overall installation costs, reasonable component weights for shipping over the winter road, extensive vendor experience in supplying gensets with heat recovery systems in northern Canada and good vendor parts and service support capabilities in central Canada. It is also of note that suppliers of medium speed diesel genset are currently scheduling to provide units with reduced emission levels by the year 2000.

3.9 Transportation Options

The transportation plan for the NWT Diamonds Project is to move personnel and materials to the mine site from Yellowknife by regularly scheduled charter aircraft and to transport operating supplies and heavy or bulk materials annually over the existing winter road established by Echo Bay Mines Ltd. This transportation plan is best suited to the proposed mining development because of the remote location of the site and the absence of any permanent surface transportation infrastructure leading from Yellowknife. The Echo Bay winter road has operated more than 12 years without significant environmental or social impacts.

All the other transportation alternatives reviewed for the project would have significantly higher environmental impacts and costs that could not be supported by the project.

Surface Access

The primary transportation alternative that was considered, but deemed not practical, is the construction of an overland, all-weather road from Yellowknife to the site. The main drawbacks of this concept are its high capital cost and long permitting and construction time. There would be significant environmental impacts to mitigate during and after construction, and social impacts would follow once access to the interior of the NWT became available to year-round public traffic.

The impact on the terrestrial and aquatic environment along a permanent road alignment would be much greater than that along the existing winter road. Only 28% of the 337 km winter road crosses frozen land and the remaining 72% is over frozen lakes. A permanent road would have to be entirely on land and would be much longer than the winter road

A rail line to the site would also be prohibitively expensive for the project. Any rail line installation would involve much the same direct environment impacts as a permanent road into the interior of the NWT and, realistically, would have to extend down from Yellowknife to the rail head at Hay River.

Air Transport

As part of the transportation plan, air transport will be relied upon during ongoing operations to constantly supply perishable, consumable and other immediate-need materials and to meet the work force rotation requirements. Basing the entire transportation plan on aircraft support, and not using the existing winter road, is not feasible because of the size and frequency of aircraft that would be required to meet the supply demands. The costs of this airlift would be prohibitive to the project. With some 56 million litres of fuel and 15,290 tonnes of materials and equipment to be shipped to site annually over the winter road to support the operation, more than 2,051 fuel trips and 764 freight trips by L100 Hercules aircraft, or a total of eight flights every day of the year, would be required. This total does not include the freight and personnel flights planned for staff rotation and deliveries of perishable goods.

The airstrip at the project site is specifically designed to accommodate aircraft such as the Hercules C130 and Boeing 727/737 jets, which are the approximate size required for the number of personnel and type of supplies planned to be air transported. Larger aircraft such as the Boeing 747 or Antonov AN124 were considered impractical, as they are not readily available or equipped for ongoing service to a site such as this. The existing Yellowknife airstrip would need to be lengthened substantially to accommodate these aircraft.

Depending on requirements, chartered services providing smaller passenger aircraft readily available in the area will be engaged. It is particularly important that the aircraft be suitable for transporting personnel to and from outlying areas. BHP Corporate Aviation Standards govern the types of aircraft and transport companies that are acceptable, based on aircraft type safety records and routine audits of the air transport companies' operations.

Shift rotation options were also investigated. A shorter rotation period would require more frequent air trips, increasing the related impacts, including safety considerations, and creating an additional economic burden as a result of lower production efficiencies and transportation demands. A longer work schedule was considered likely to have a negative effect on employee morale and to result in many more employees having residence outside the NWT.

Marshalling Logistics

A marshalling point will be established in Yellowknife to ensure that traffic dispatch for winter road use is managed efficiently. A sizeable but temporary

marshalling site will also be established in Edmonton during the construction period. Hay River could be considered an alternative to Yellowknife, but this would adversely affect the winter road logistics because of the extended haul distance, exacerbating queuing delays and maintenance and turnaround time. With materials to be hauled to the mine site queued that much further away, the limited seasonal availability of the winter road would become a more crucial factor for timely delivery of supplies from the marshalling area before road closure.

The existing rail haulage network between Edmonton and Hay River will be used as practical, particularly in the case of fuel transportation, where more than one supplier will probably be required to provide the immediate annual quantity to the project. The mode of transport will most likely be determined by the fuel supplier's preference, which is largely driven by pricing. Certain heavy mining equipment components and other oversized items will also probably be moved by rail transport to Hay River to avoid road restrictions.

At present, fuel is barged regularly from Hay River across Great Slave Lake to Yellowknife after spring thaw. Increasing the barge traffic for project-related supplies and equipment would not be of benefit, as the timing of the operation does not coincide with the winter road availability. A substantial marshalling area would have to be constructed at Yellowknife where materials could be off-loaded and stored for winter road shipping, adding an excessive cost burden for the rehandle and storage involved.

Other forms of transport such as Hovercraft or dirigibles have been promoted at times as being capable of transporting heavy loads to isolated sites. However, such modes of transportation are still commercially unproven for the tonnages needed by the project.

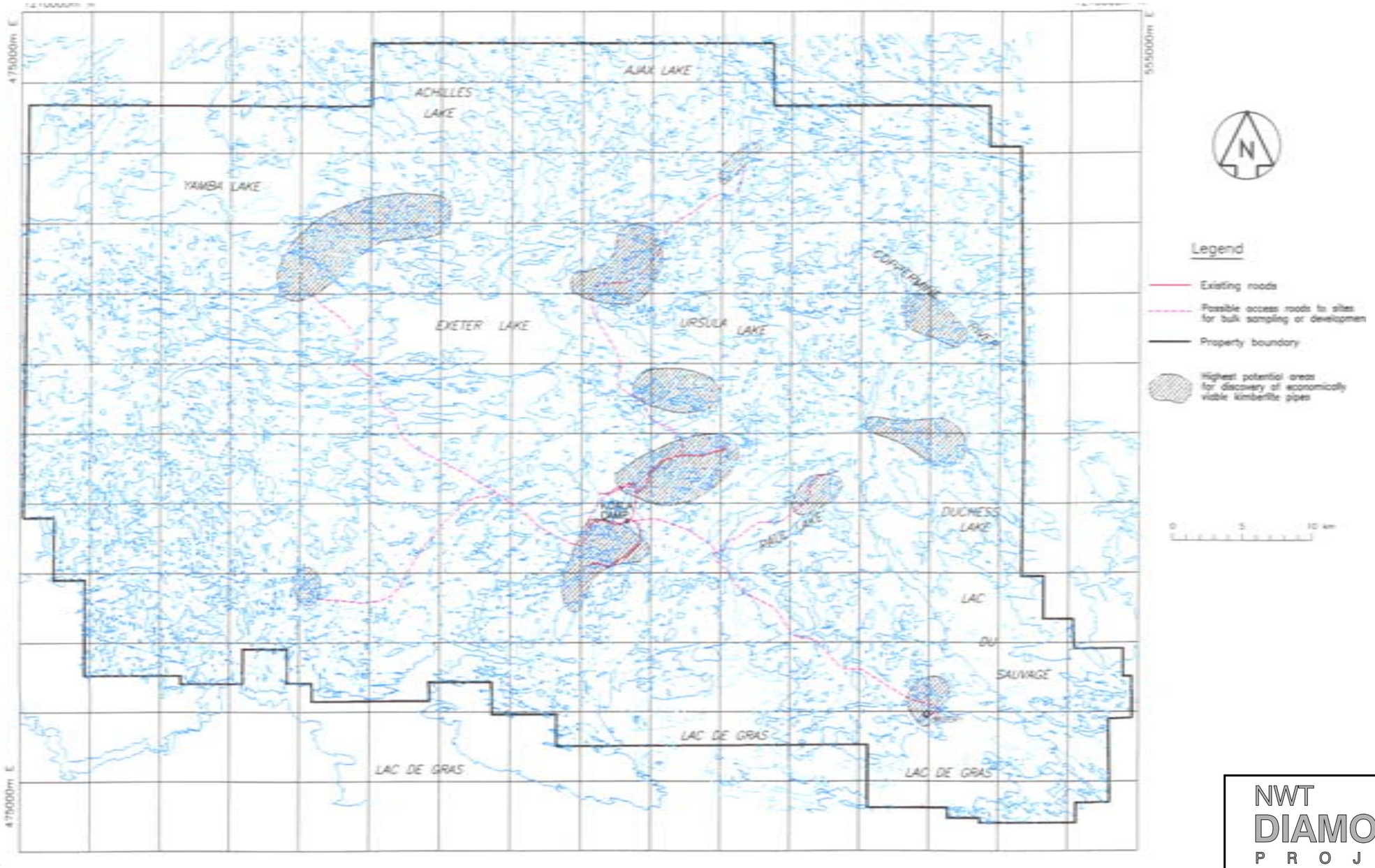
3.10 Future Development

Future development at the NWT Diamonds Project is discussed in terms of potential future development and hypothetical future development.

3.10.1 Potential Future Development

The NWT Diamonds Project covers an area of 344,000 ha. Within this property, 44 kimberlite pipes have been discovered in four years of exploration, and 39 of these pipes contain diamonds. While the best prospective areas have been tested, the other areas shown on Figure 3.10-1 are also likely to contain kimberlites.

It is uncertain how many of the pipes discovered may contain economically recoverable diamonds. Of the 5,000 known kimberlite bodies in the world, only



Scale: 1:250 000

NWT DIAMONDS PROJECT

Figure 3.10-1
Potential Access Roads and Areas of Interest

Source: Rescan

50 have contained economic diamond deposits, and of these only 15 have produced major diamond mines (Financial Post 1994). Extensive exploration will ascertain the likelihood of discovering additional economic pipes, both on and off the NWT Diamonds Project claim block.

Kimberlites tend to occur in groupings of from two to 70 occurrences per group, although a few single kimberlite occurrences are also known. Measurements in Botswana, Siberia and Australia indicate that the diameter of the groupings are in the order of 40 km. In South Africa the range is from 10 km to 135 km in maximum dimension. The most famous kimberlite grouping is that at Kimberley, South Africa, where the five main diamondiferous pipes can be fitted inside a circle with a diameter of 10 km. However, the whole district, including outlying dikes, sills, subeconomic pipes and blows (swellings on a dike) requires a circle with a diameter of about 80 km. The distances between groupings exhibit no simple pattern. Beyond the concentration of mines around Kimberley, major producers in southern Africa are spaced approximately 300 km apart.

In the NWT Diamonds Project claim block, the main pipes in the development area can be fitted inside a circle of 10 km diameter. A 40 km diameter area would enclose all but one of the confirmed kimberlite pipes on the claim block and would include the majority of geophysical anomalies that have yet to be tested. Hence, the kimberlites within this 40 km diameter area can be considered to represent a group. The number of pipes within this group that are economically viable has yet to be determined. Subject to confirmation bulk sampling, five pipes have been identified to date. Table 3.10-1 illustrates that a maximum of five payable kimberlites have been identified in any single grouping in the world.

Table 3.10-1
Ratio of Payable to Non-payable Kimberlites in the Kalahari Craton's Major Diamondiferous Group of Pipes

Group of Pipes	Payable	Non-Payable
Kimberley, S. Africa	5	15
Koffiefontein, S. Africa	1	16
Jagersfontein, S. Africa	1	9
Finsch, S. Africa	1	6
Premier, S. Africa	1	12
Venetia, S. Africa	1	17
Orapa, Botswana	3	29
Jwaneng, Botswana	1	7
Total	14	111

In addition, consideration of the future diamond-producing potential of the Slave craton must include economic factors as well as the size and abundance of diamondiferous kimberlites. Kimberlites of sufficient size and diamond content to be economically feasible in southern Africa may not be viable in the NWT given the significantly different cost structures.

As in any exploration program, the best targets are always tested first. Nonetheless, good exploration targets remain to be tested and there remains a possibility that additional economic diamondiferous kimberlite pipes will be discovered, though certainly not assured.

3.10.1.1 Project Duration

Three basic scenarios describe the future development potential of the NWT Diamonds Project:

- a 25-year mine life as per the current development plan
- a shortened mine life
- an extended mine life due to the discovery of additional reserves.

The 25-year mine life is described in detail in Section 2.4. Shortening or extending of the project life can be a result of many factors beyond the Proponent's control or current knowledge and are discussed in the following sections.

Regardless of a shorter or longer mine life, the Proponent will remain committed to such programs as reclamation, residual effect monitoring and fair and equitable treatment of employees. The commitments will be handled with the cooperation of present (or future) regulatory agencies in the prescribed manner. It must be noted that the effects described in the following sections do not materially change the conceptualization of the current development plan.

Shortened Project Duration

A shortened project duration could result from changes in economic conditions as a direct result of technical conditions or regulatory or fiscal changes. The economic viability of the project, or development of particular pipes, can be affected by major unforseeable changes to diamond prices and/or demand, operating costs and tax regime.

The project is currently economically viable under the prevailing conditions. However, a period of destabilization of the market in the future could result in a drop in prices. Over-supply, reduced demand, political change or marketing strategies by other producers are factors beyond the control of the Proponent. A

hypothetical scenario discussing the possibility is discussed in more detail in Section 3.10.2.

Increases in operating costs may reduce the project's competitive effectiveness. Such changes may result from significant cost increases for consumables, such as fuel, or major increases in wages. The necessity to change to a more expensive underground mining method, major dewatering requirements or the processing of more difficult ores are examples of other events that would have a similar effect.

Another serious concern to future development is the impact of changes in the tax or royalty regimes of the project. Such changes would affect the profitability of the mine development and be a strong disincentive for investment required to maintain the operations.

Certain technical conditions can also arise that affect the economic viability of recovering all the ore reserves currently identified. Conditions that may prove to be different than anticipated and cause this to occur could be related to geology, mining, processing or environmental factors.

Geologic or geotechnical problems not identified in the currently available data could have significant consequences, namely the inability to adequately supply ore to the plant. Slope stability problems could require shallower pit slope designs. The effect would be an increase to the waste:ore stripping ratio resulting in a shallower, short-lived pit. The higher stripping ratio would also have an impact on equipment requirements, thus inhibiting capabilities to supply the plant. A reduction in ore supply would also be realized if the geologic interpretation and/or diamond distribution should prove to be inaccurate, the kimberlite caving characteristics not suit the selected underground mining method or the pit and underground dewatering not be achievable.

The process plant design is based partially on results acquired from the Koala bulk sample plant. Although an extensive sampling program was completed, there is always the chance that ore characteristics may be different that those sampled. Metallurgical conditions that can result in a shortened mine life could be higher than design throughput rates, inadequate diamond liberation or diamond destruction.

New technology and operating improvements can be expected to increase plant throughput rates. This is desirable from an operating viewpoint but will, in fact, shorten the mine life.

Although a shortened project duration is not anticipated, the conditions mentioned previously, by themselves or in combination, could result in some of the current ore reserves becoming uneconomic to recover. Depending upon the situation, the reaction to this may be as follows:

- to continue operations as planned, with an earlier closure date
- to forego plant expansion from 9,000 t/d to 18,000 t/d in Year 10
- to place the property on a care and maintenance basis until economic or technical conditions change or are resolved
- to conduct exploration programs to discover additional ore reserves.

Lengthened Project Duration

An entirely different scenario is the extension of the project life. As for the previous section, changes in technical conditions could result in the project remaining operational for a longer period.

Favourable geologic conditions would be primarily due to additional reserves identified within the present pipes and, possibly, new pipes. Due to the high nugget effect in diamondiferous pipes, large bulk samples are needed to accurately define the grade of the different lithologies within the pipes. Under-sampled rock types, defined as waste by current sampling, may in fact become economic.

Another favourable geologic factor would be improved ground conditions. Better ground in the host granites would allow steeper pit walls and lower the overall stripping ratio. Given an economic cut-off stripping ratio, this may permit deepening of a pit to recover more ore. Better caving characteristics of the kimberlite could result in more efficient (and possibly more complete) extraction by underground methods.

Market improvements could effectively put identified non-economic pipes into production. Changes in demand or price increases could be attributed to depletion of competitors' mines. Decreased labour and fuel costs would enhance the economics of marginal pipes, perhaps sufficiently to allow for a production decision. Lower costs may also arise from technological advancement or employee innovation.

3.10.2 Hypothetical Future Development

Development of potential undiscovered pipes will vary depending on the size, grade, quality and timing of any future discoveries. These discoveries, and any hypothetical future development, may take many forms, from changing current planned production sequences to extensions or expansion of the project development. A hypothetical case has been developed to help identify cumulative environmental effects that might result. For this purpose, the discovery of three additional diamondiferous pipes might be considered. These pipes are assumed to have the following characteristics:

- within an 30 km radius of the processing plant and camp infrastructure, which will be retained and utilized
- equivalent in size and stripping rates to the Panda pipe
- mined by the same open pit methods as the five project pipes.

Development will be done in a manner that would require the construction of dual purpose ore haulage/access roads; allow for tailings disposal to be redirected into the Panda pit or other depleted mines near the process plant; and not affect concurrent reclamation activities at other sites.

Two alternative scenarios for developing the three hypothetical pipes are to maintain plant throughput at 18,000 t/d or to increase the throughput to 27,000 t/d. Maintaining plant throughput would extend the project life by six years and therefore extend employment opportunities, tax revenue and other benefits to stakeholders. The second alternative, increasing mill throughput, is linked to the assumption that the project life of 25 years will be maintained. To do so, the throughput would be increased in Year 21. The impacts of the increased processing plant throughput will be increased plant and equipment discharges, albeit over a shorter timeframe. Additional mining equipment and a larger work force will be required. Again, additional benefits can be expected for the stakeholders.

All of the potential environmental effects should be directly attributable to the mining of the three postulated ore bodies. Hypothetical locations are shown on Figure 3.10-2. For simplicity, they are identified only as North, Northeast and East. The complexity of the mine environment interactions is assumed to be similar to those of the development pipes. For analysis purposes, two of the hypothetical pipes are assumed to underlie lakes, one of which is large enough to require a diversion structure to divert control in-flow of water. The third pipe is assumed to be land-based. All of the pipes fall outside the confines of the Koala watershed. The pipes are discussed in more detail in the following sections.

3.10.2.1 Hypothetical North Pit

The hypothetical North pipe is assumed to be situated beneath a small lake that drains westward into the Yamba Lake watershed of the Coppermine drainage basin. Since this is connected to the same system as the Lac de Gras watershed, there may be some cumulative effects downstream of pit development. Impacts upon the Yamba Lake watershed should be negligible given the small size of the pit and the dilution effects of the system. This would be the only hypothetical NWT Diamonds target within this watershed.

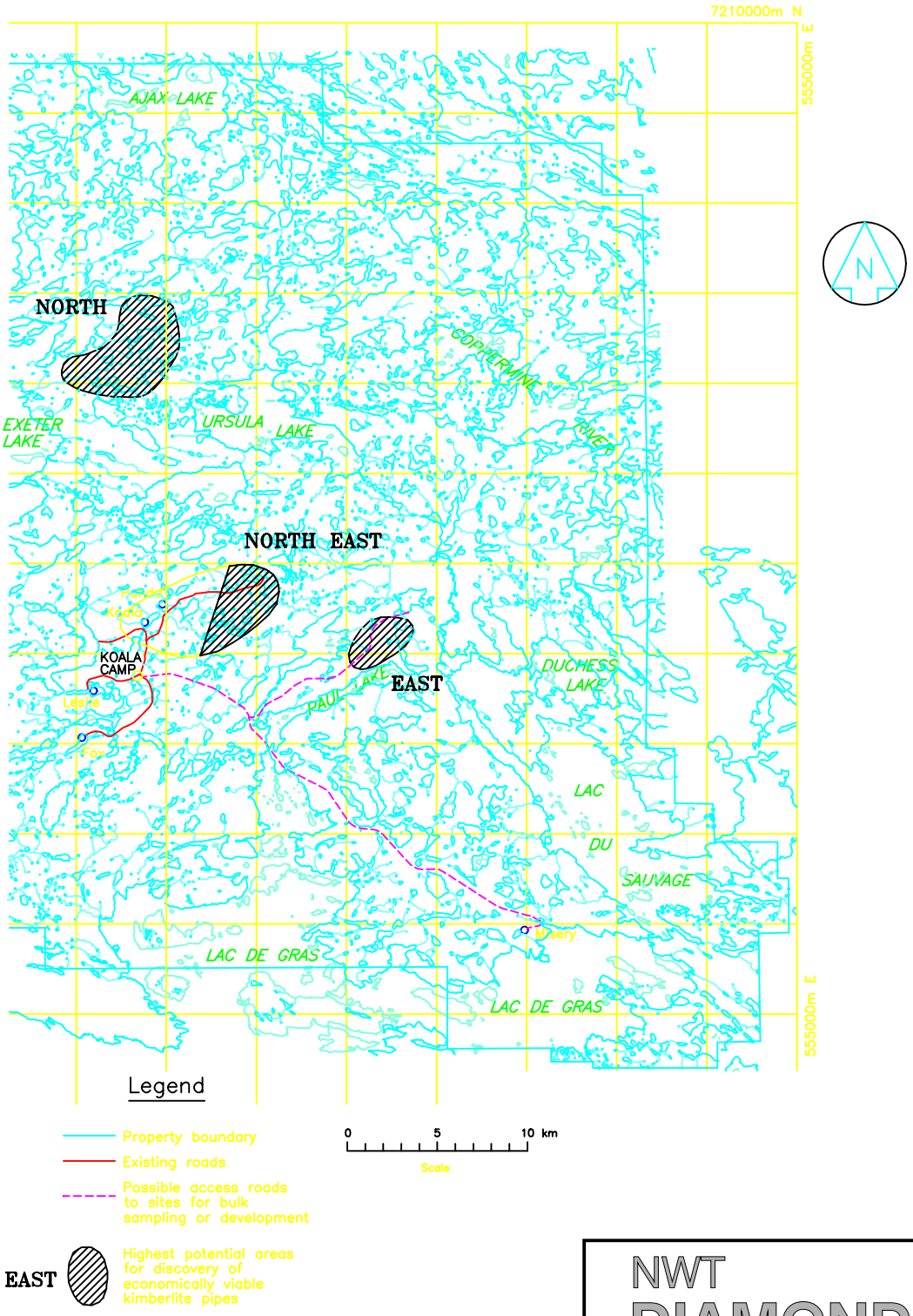


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Figure 3.10-2
Access Roads and
Hypothetical Targets

Source: Rescan

The waste dump would be built in lifts, with the completed portions being reclaimed as soon as possible. The host rocks surrounding the pipe are biotite granites to biotite granodiorites. These rocks are anticipated to have characteristics similar to the host rocks of the main development area pipes. The dump design would capitalize on the topographic lows to the southeast of the pit. Economics and logistics demand that the waste haulage distances be minimized.

Access to the pit is the greatest concern because a dual purpose ore haulage/access road would need to be constructed. The estimated road length would be approximately 20 km starting from the end of the Panda diversion ditch road. The road would be constructed of granite waste rock from the Panda pit. The road would cross three watersheds as it leaves the Koala watershed and run along the divide between the Yamba and Ursula Lake watershed. By keeping the road design to high ground, road maintenance can be minimized, as snow drifting is less likely to occur.

3.10.2.2 Hypothetical Northeast Pit

The hypothetical Northeast pipe is situated about 8 km to the northeast of the proposed process plant and permanent camp facilities, in a zone of interest within the Paul Lake watershed. The pipe underlies a lake that will require drainage. In addition, a short diversion ditch and dam would be advisable to help control water inflows to the pit and help maintain much of the natural drainage system.

The large, low-relief area to the southwest of the pit would be ideal to ensure that the waste dump also lies within the watershed. Construction of the dump to the west or northwest would straddle the divide between the Koala and Paul Lake watersheds, potentially affecting both.

Building the dump to the north and east side of the pit would impinge upon the Ursula Lake watershed. The host rock types would be a mixture of metasedimentary greywacke and shales, which also should not pose any concern for acid generation. Further work would be required for confirmation. Some sites of archaeological significance have been noted in eskers to the east. These sites would be avoided as required during mine development.

The site access road is anticipated to be a 3 km to 4 km extension of the Panda diversion ditch road. As discussed in the preceding section, road construction would comprise the granite waste rock from the Panda or Koala open pits.

3.10.2.3 Hypothetical East Pit

The third, and final, pipe speculated upon is land-based and is some 13 km east of the Koala facilities. An additional 8 km of road would be constructed adjacent to Paul Lake. It would be built with waste rock from the nearest available pit.

The East pipe is located within the boundaries of the Paul Lake watershed, which drains into Lac de Gras. The waste dump design would probably take advantage of the undulating topography north and west of the proposed pit. The dominant rock type to be discarded would be undifferentiated metasediments, which require testing to determine if any acid generating capabilities exist. As for all other dump designs, the toe would not encroach any closer than 100 m of the high water mark of the lake to the east.

3.10.2.4 Reclamation Plans

In the case of each hypothetical development, dump reclamation and access road remediation would proceed immediately upon depletion of the pits. Techniques employed for this process are described in detail elsewhere in this study.

3.10.3 Diamond Market Effects

Market conditions could play an important role in determining pipe economics. Lower prices could be caused by market saturation, change in demand, excess world stockpiles or competitors' marketing strategies. One effect of the lower prices could be reclassification of an existing development pipe from an economic to non-economic category. For the sake of argument, it is assumed that this occurs several years down the road and affects the project's low-grade Leslie pipe.

In terms of hypothetical future plans, two alternatives result from the loss of Leslie mill feed. The first would be to assume that the loss is mitigated by the development of the three hypothetical pipes previously discussed. The second is that the three hypothetical pipes do not come to fruition and project life is shortened.

The first situation would require pre-stripping of the hypothetical pipes by Year 9 so that scheduled production tonnages for the Leslie pit would be off-set. Since the three hypothetical pits have only an assumed total of approximately 40 million tonnes versus Leslie's 60 million tonnes, the project life is clearly shorter. The planned mill throughput increase to 18,000 t/d would still take place, because the low grade Fox pipe requires the "economy of scale" savings generated by the higher throughputs to be economic, and would see reserves depleted by Year 22.

The second alternative, having no supplementary ore supply, will have a dramatic impact as Leslie is approximately 50% of the total plantfeed. The obvious impact is a much shortened project life. Inspection of the current production schedule reveals that the Fox pit mining would need to be accelerated to maintain 18,000 t/d mill throughput. This would result in pit depletion by Year 15.

A greater deterioration of prices could see the loss of the other another low grade pipe, Fox. In the hypothetical worst case scenario, only the three high grade pipes

would be mined. Mill throughput would probably remain at 9,000 t/d until depletion of the underground reserves, which would be about the end of Year 13.

It must be stressed that these situations, as discussed, are strictly hypothetical. As such, there have been no rigorous analyses, although some alternative mine production schedules have been developed.

4. Corporate Policies, Procedures and Commitments

BHP has been Australia's largest private company for more than 100 years. Over the last 20 years, BHP has also become an international company, both in terms of markets served and the locations of its producing assets and investments. It is recognized that, for an Australian company, growth and sustained profitability must come from international investment. This expanded business requires the capability to operate successfully in a variety of different cultures and business environments.

To address its responsibilities as an international company, BHP has formulated corporate policies designed to meet the highest standards of operational performance and integrity. Paramount among these policies is the commitment to safety in the work place for all employees and contractors, under all circumstances. BHP is also committed to operating in an ethical manner by adhering to the laws and regulations of the countries in which it does business; to honouring and respecting the sovereign rights of those nations; to achieving a high standard of environmental care at its operations; to addressing employee needs and concerns in accordance with its mandate as an equal-opportunity employer; and to conducting its activities in a financially sound way so as to provide adequate economic returns to its shareholders.

In this section, the policies and philosophies according to which BHP conducts it business are described under the following headings:

- corporate citizenship
- responsibility to the environment
- responsibility to host nations and local communities
- responsibility to employees
- financial responsibility, and responsibility to shareholders
- site-specific programs.

These are briefly described in the following sections.

4.1 Corporate Citizenship

BHP's vision is "To be the world's best resources company" with a mission "To create wealth for the company's shareholders". These statements encompass the broad range of businesses in which BHP operates and set performance expectations at the highest level. In achieving these goals BHP aims to meet

society's needs by providing materials and products that maintain or increase people's standard of living, without compromising the responsibilities described above.

BHP's standards for dealing with governments, corporations, organizations and individuals are normally codified, but cover such topics as legal compliance, taxation, community, political and social activity. A brief summary of BHP's approach to these topics, illustrated with examples where relevant, is provided here.

BHP complies with the laws of the country in which it operates, even if these laws are not observed by other companies or impose a financial penalty upon BHP. The local conditions and legal requirements are assessed upon entering a new country and communicated to employees. Such compliance is demonstrated by BHP's trading activities in countries where corruption and under-the-counter payments are a normal part of business transactions. It is BHP's policy to avoid all such dealings and payments, at the cost of losing business, even if such payments were permitted by the host country.

The company pays taxes, royalties and duties in accordance with the requirements of the host governments. At the same time, BHP adopts the normal practices of taking advantage of legitimate taxation structures and incentives to achieve appropriate returns for its shareholders and business partners.

BHP reserves any political activity to issues key to its business and has no affiliation with any political party or organization, although employees are free to participate through mechanisms such as Political Action Committees (in the USA). In Australia, BHP's country of origin, the company contributes to political debate where appropriate, though focusing such commentary on national issues such as education and employment, for example, where BHP's position in the Australian economy makes its contribution relevant and useful. In other countries, BHP does not involve itself in political issues. An exception to this philosophy is made when a government or ministry specifically invites BHP to contribute to an apolitical issue. In all other situations, however, BHP is careful not to align itself with political organizations, but does participate in industry associations.

As part of its corporate citizenship, BHP is a contributor to charities and social issues. These contributions are often made when the activity is relevant to its employees, or where a contribution can be made to an immediate social issue. BHP has sponsored sports teams, supported cultural and educational activities and has made financial contributions to disaster relief. Under certain circumstances, BHP is also willing to contribute to community infrastructure in locations where its activities place pressure upon that infrastructure and no other funding is available (for example, in Papua New Guinea and Mali).

4.2 Environmental Responsibility

BHP adheres to a company-wide Environmental Policy, based on the principle of sustainable development, which stipulates the company's commitment to achieving a high standard of environmental care as it conducts its business. BHP's approach to environmental management seeks continuous improvement in performance by taking account of evolving scientific knowledge and community needs. The Environmental Policy statement is provided overleaf.

The BHP Environmental Policy applies to all businesses for which BHP has operating responsibility. The company also endeavours to ensure that in those businesses where it does not have operating responsibility, comparable environmental policies will be applied. Before any joint ventures, mergers, acquisitions or divestitures are effected, BHP investigates potential environmental liabilities, compliance with legislation or good industry standards and the costs and actions necessary to ensure compliance.

Accountability for environmental policies and actions is enforced at the highest level in BHP. The Environment Committee of the Board of Directors requires monthly reports. Summary reports of performance, identification of emerging issues and key plans are presented by each Business Group for the coming year. The Board also requires BHP to develop specific strategies for addressing major issues such as global climate change, the management of hazardous waste and the international transport of waste.

BHP has won a number of environmental awards in all the major industries in which it operates. Extensive steps are taken to assess the impact on the environment, if any, of company activities. Operations are designed to mitigate negative impacts and, upon completion or closure, to be reclaimed to a condition that supports the planned land use. Extensive baseline studies of fauna and flora are carried out as a normal feature of BHP projects before commencement of operations. Specific examples of BHP Minerals' mine site reclamation procedures and the environmental awards it has received are discussed in Section 1.5.

4.3 Responsibility to Host Nations and Local Communities

BHP respects and honours the sovereign rights of the nations in which it operates, protecting the rights of the local people and providing opportunities for sustainable, economic development.

Where applicable, BHP operations are conducted within agreements with traditional landowners – agreements that allow sharing of the economic benefits while preserving local culture. The relationship between BHP's New Mexico

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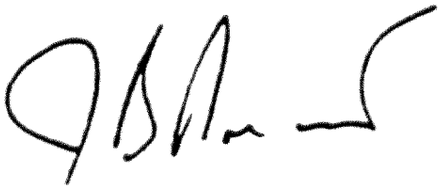
BHP ENVIRONMENTAL POLICY

It is BHP's policy to achieve a high standard of environmental care in conducting its business as a resources and industrial company contributing to society's material needs. BHP's approach to environmental management seeks continuous improvement in performance by taking account of evolving scientific knowledge and community expectations.

Specifically, it is BHP's policy to:

- comply with all applicable laws, regulations and standards; uphold the spirit of the law; and where laws do not adequately protect the environment, apply standards that minimize any adverse environmental impacts resulting from its operations, products or services;
- communicate openly with government and the community on environmental issues, and contribute to the development of policies, legislation and regulations that may affect BEP;
- ensure that its employees and suppliers of goods and services are informed about this policy and aware of their environmental responsibilities in relation to BEP business;
- ensure that it hw management systems to identify, control and monitor environmental risks arising from its operations;
- conduct research and establish programs to conserve resources. minimize wastes, improve processes and protect the environment.



J.B. Prescott
Managing Director and Chief Fxecutive Officer
July 1991

Coal operations on Navajo land and the Navajo Nation, detailed later, demonstrates the economic benefits that accrue to the Navajo Nation, including employment, tribal taxes and royalties, and the purchase of goods and services from local vendors.

Typically, more than 80% of BHP Minerals or joint venture employees come from the country in which the mine is located. BHP Minerals operations encourage the transition of management of the mines into the hands of local nationals, as soon as they are qualified and are adept with BHP's working procedures and practices. As an international operator, BHP has a pool of managers who are moved from site to site to meet project requirements, BHP needs and employee career objectives. Typically, mines have several of these managers, especially in the development phase. By the same token, qualified and experienced local employees often move internationally to BHP operations to apply their expertise and broaden their experience outside of home countries.

The company is aware of its responsibility to its work force and the local economy when operations are closed at the end of their economic life. BHP puts in place a comprehensive program of work force adjustment for the last few years of an operation. This includes transfer to other mines if possible, as well as employee assistance and training programs, educational assistance, career counselling and educational subsidies for employees. The program implemented by BHP Minerals at the Island Copper Mine on Vancouver Island is described in Section 1.5.

BHP respects local customs wherever it operates. It adapts its employment conditions where necessary to accommodate these customs. Dress standards, facilities provision, language and documentation practices often differ subtly from country to country. BHP makes no attempt to impose its own regulations on local employees, other than those required to conduct its business in a safe and financially responsible manner. BHP holds courses in cross-cultural awareness and adaptation for its employees. In these courses employees identify the differences between the local culture and the cultural background of the company, and learn how to accommodate both. This is particularly useful for expatriate employees in a new location.

4.4 Responsibility to Employees

BHP places the highest value on its reputation as an employer. BHP's policies and procedures reflect the variety of needs and concerns of a work force of nearly 50,000 employees of many different nationalities in over 50 countries. A common theme running through these policies and procedures is respect for the rights of the individual employee, no matter what his or her function, status or nationality. BHP also makes every effort to communicate with all employees on a regular basis, and to provide appropriate response to employee concerns.

BHP is an equal opportunity employer. BHP employs people on the basis of merit, regardless of gender, race, caste, religion or any other factor irrelevant to the job requirements. BHP communicates this policy, and has guidelines in place. The only variant on this occurs when specific local agreements are in place to allow preferential employment for applicants from particular groups such as indigenous peoples and nationals. Even in this case, the principles of hiring on merit are not distorted, but are applied with flexibility. BHP takes into account the different qualifications of applicants, and where equivalent skills are demonstrated, the company may relax its requirements for particular levels of achievement, such as educational levels.

BHP invests considerable financial and management resources in training and development of its employees in all locations. Training programs are both general and specific to particular environments and technologies. BHP also regularly invests in employee training and development beyond their current job requirements.

BHP offers a competitive package of employment conditions, with compensation levels reflecting market expectations and performance. Since 1985, BHP has offered most of its employees the opportunity to share in the company's success through an employee share plan (ESP). As of 1995, approximately 80%, or nearly 40,000, of its employees have become registered shareholders of the company.

World-class safety performance is the number one goal of BHP. BHP recognizes that its businesses, including mining, steelmaking, oil production and transportation, must be managed with constant attention to personal safety. BHP seeks continual improvement in its safety practices. This commitment to safety is included in the Business Plan. Senior management have made it clear that safety is paramount to commercial objectives. All major safety incidents are reported directly to the Board. All such major incidents must be reported, together with identification of cause and the actions taken to prevent reoccurrence. The BHP Occupational Health & Safety Policy statement is presented overleaf and described in Section 2.11 and Appendix I-B8.

Company-wide activities to improve safety performance have included the adoption of successful programs from companies with acknowledged world-class safety performance in different industries, comprehensive safety audits, safety professionals and performance measurement and reporting. BHP management has made its goal clear: that accidents are to be eliminated. BHP Minerals' safety activities and programs, its steady improvement in safety performance over recent years and its awards are described in Section 1.5.

BHP operates a drug- and alcohol-free business and works diligently to ensure that employees, contractors and suppliers conform to this requirement.

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BHP
OCCUPATIONAL HEALTH AND SAFETY POLICY

BHP is committed to achieving the highest performance in occupational health and safety with the aim of creating and maintaining a safe and healthy working environment throughout its businesses.

Consistent with this the Company will:

- seek continuous improvement in its occupational health and safety performance taking into account evolving community expectations, management practices, scientific knowledge and technology;
- comply with all applicable laws, regulations and standards and where adequate laws do not exist, adopt and apply standards that reflect the Company's commitment to health and safety;
- involve employees and contractors in the improvement of occupational health and safety performance;
- train and hold individual employees accountable for their area of responsibility;
- manage risk by implementing management systems to identify, assess, monitor and control hazards and by reviewing performance;
- ensure that BHP employees, contractors and visitors are informed of and understand their obligations in respect of this policy;
- communicate openly with employees, government and the community on occupational health and safety issues; and contribute to the development of relevant occupational health and safety policy, legislation and regulations; and
- support relevant occupational health and safety research.

J B Prescott
Managing Director and Chief Executive Officer 2
February 1994

4.5 Financial Responsibility, and Responsibility to Shareholders

BHP conducts investment practices and accounting in accordance with corporate law in the countries in which it operates. These policies can be regarded as a set of rules to safeguard current and potential investors in the corporation and to ensure that the appropriate income is declared for taxation purposes. BHP conforms to the US and Australian GAAP (Generally Accepted Accounting Procedures). In each country where BHP shares are listed, BHP presents financial statements to meet that country's stock exchange requirements. BHP recognizes the need for clarity in its reporting, and endeavours to keep its financial statements logical and easily understood by investors.

BHP's financial practices and philosophies are essentially conservative. BHP strives to maintain liquidity, with ample reserves to service its short-term debt, interest payment and dividend payment requirements. It has a low gearing ratio (the proportion of its capital base funded from debt), has consistently paid dividends and has maintained a single-A credit rating from Standard & Poors and Moodys.

4.6 Site-specific Programs

The Proponent has undertaken a number of actions to enhance the linkage and consultation processes with the surrounding Aboriginal and non-Aboriginal communities in the region of the NWT Diamonds Project. The Proponent's relationships with these communities involve the protection of ecosystems and the preservation of culture and way of life. Fundamental to the promotion of sustainable development is the ability of future generations to meet their own needs. This encompasses not only the renewable use of the land and ecosystems, but also the derived social and economic benefits that feed and support sustainable development.

The Proponent's commitments and application of sustainable development principles, focusing on the care of the environment, are discussed in Volumes II, III and IV. This section will briefly describe, or by reference to other sections state, the Proponent's commitments, policies and arrangements directed to the promotion of positive social and economic benefits and mitigation of negative socioeconomic impacts.

4.6.1 Commuting, Work Rotation and Northern Residency

Because of the remote location, the mine will be operated as a fly-in/fly-out operation. All employees, with the exception of a small logistics crew based in Yellowknife and the off-site facility work force, will commute to and from the Koala site once operations commence. All employees will be flown by air transport on regularly scheduled flights to coincide with work rotations.

Work rotations for the mine operations phase will be 2 weeks on/2 weeks off, with, possibly, a minimum number of staff working on a weekly rotation of 4 days on/3 days off. The work rotations will be designed to

- establish mine operations efficiency
- suit fly-in/fly-out requirements
- allow preservation of traditional lifestyles and various community origin/ traditions
- encourage northern residency and work force stability.

During the construction phase, it is expected that most contractors will normally work on a 3 weeks on/1 week off, 10 hours per day schedule. Most of the construction work force will likely commute directly from Edmonton. Given the short-term nature of the construction phase, workers will be discouraged from relocating from their permanent place of residence. This will help mitigate the boom/bust cycle usually associated with major construction work in remote areas.

To encourage Northern residency during operations, the NWT Diamonds Project will provide employees with transportation to and from the Koala site and Yellowknife as well as the communities of Snare Lake, Wha Ti, Rae Lakes, Lutsel K'e and Coppermine. Scheduling of the transport will depend on the number of employees originating from each location.

In addition, the project plans to include a "Northern allowance" as part of the compensation package to encourage local residency of it employees.

4.6.2 Recruitment/Hiring and Associated Human Resource Support Activities

For a further discussion on recruitment and hiring, with particular reference to the promotion of Aboriginal participation at the project, please refer to Sections 2.10.3 and 2.10.4 and the general human resources policy in Section 2.10.2.

4.6.3 Training and Counselling

For a further discussion on work place orientation, cross-cultural programs and personal counselling, particularly for Aboriginal workers, please refer to Sections 2.10.4 and 2.10.6.4.

4.6.4 Occupational Health and Safety

For a further discussion on occupational health and safety and work place accident response, please refer to Section 2.11.

4.6.5 Security Management

Because of the very high value and ease of concealment of diamonds, strict security measures will be an integral part of the NWT Diamonds Project. Security management is a comprehensive program based on preventing security violations, which begins with project design. Security is the function and the result of careful design that addresses minimizing the need for hands-on handling; operation and maintenance of equipment in high-risk areas; strict access control; contracting or recruitment; training of competent security personnel; and the use of state-of-the-art surveillance techniques. These measures are discussed further in Sections 2.7.14 and 2.10.2.8.

The following management policies are in place at present or will be implemented:

- signing of confidentiality agreements for all employees, visitors, etc., regarding proprietary information associated with the project
- consent to personal body and property searches as a condition of employment
- regular X-ray screening of all incoming and outgoing personal luggage
- strict access control throughout the mine site, particularly in high risk areas
- closed circuit TV monitors of all high risk areas
- random and mandatory searches upon exiting work locations, with the frequency of searches increasing in proportion to the level of risk
- pre-employment background checks
- immediate dismissal for serious security infractions.

4.6.6 Employee Assistance Program/Drugs and Alcohol Abuse

For a further discussion on mitigation of social problems on the job site resulting from work at the project, please refer to Section 2.10.2. For a discussion on the social assistance programs available in the community, please refer to Section 2.10.6.

The NWT Diamonds Project has in place a drugs and alcohol policy that bans controlled substances and alcohol from the work site. This policy will be extended to the operational phase. Dismissal will result when controlled substances and alcohol are found on site. There will be no exceptions and no second chance. This policy will be clearly outlined to all employees during orientation training.

4.6.7 Accommodation for Traditional Activities

The work rotation of 2 weeks on/2 weeks off, with the provision of sufficient blocks of time, will generally accommodate Aboriginal employees wishing to pursue harvesting and traditional activities. Scheduling of employee work rotations and vacations will be organized to strike a balance between work requirements and personal employee preferences for periods of time off. Annual vacation in combination with scheduled days off could also provide employees with periods of up to 6 weeks between work commitments.

4.6.8 Committees and Liaisons

A variety of committees will be formed to allow for consultation with employees and other interested parties. All employee committees will include representatives from a cross-section of the work force in terms of job position and ethnic background. An "open door" management philosophy will ensure that issues raised by employees are addressed adequately. Communications policies with regard to occupational health and safety issues for example, and the OH&S committee that will address health and safety issues and concerns are discussed in Section 2.11.6.

It is also intended to establish advisory and consultation committees, including an Environment Advisor/Committee, with local Aboriginal groups. As described further in Section 5.4, the composition, purpose and mandate of these advisory committees will be addressed through Benefits Agreements discussions.

4.6.9 Contracting and Procurement

BHP has in place standard contracting and purchasing procedures, which will be adopted for the NWT Diamonds Project. Generally, all contracts and purchases over an established minimum monetary amount must be competitively bid and will require various levels of management approval prior to commitment. Currently all expenditures above US$5,000 equivalent must be approved by the Project Manager, Mine Development; the Project Manager, NWT Diamonds; or the Group General Manager, New Business Development.

Compliance with these policies and procedures is verified annually through a BHP internal audit system and less frequently through external audits. Responsibility for contracting and purchasing policies and authorization limits carried through the project phase by the Project Manager would be superseded by the General Manager and Operations Manager during the operational phase.

Contracting and purchases award commitments are made based on technical and financial review of all proposals/offers. Although it is assumed that the supplier meeting all the criteria with the lowest price will receive the business, price is not the only factor. A contractor's safety performance, supplier's delivery times,

service support and other factors will all be important considerations in awarding contracts.

These policies have been adapted to include Northern and Aboriginal participation and sourcing as factors to consider in evaluating proposals.

4.6.10 Community Education and Training

For a further discussion on community education, training and career development counselling, please refer to Sections 2.10.4, 2.10.8 and 5.

4.6.11 Youth and Educational, Training and Employment Opportunities

A number of programs have been discussed previously to address socioeconomic concerns related to Aboriginal youths. These programs are intended to encourage young people to attend and stay in school through a scholarship program, career development guidance, pre-employment mine training and career mentoring. The Proponent has attended special functions within the community schools to inform the students about the project and career opportunities.

4.6.12 Environment Training and Emergency Response Plans

Training is a critical element in the protection of the environment. A series of environmental awareness training courses, including identification of environmental hazards and spill response cleanup procedures, will be developed for the NWT Diamonds Project. The training program will be similar to training at other BHP Minerals operations, with various levels of training provided, including the elements and procedures of the spill contingency and emergency response plans. Details of the spill contingency and emergency response plans are described in Volume III, Section 4.2.

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Communications Program and Public Involvement

5. Communications Program and Public Involvement

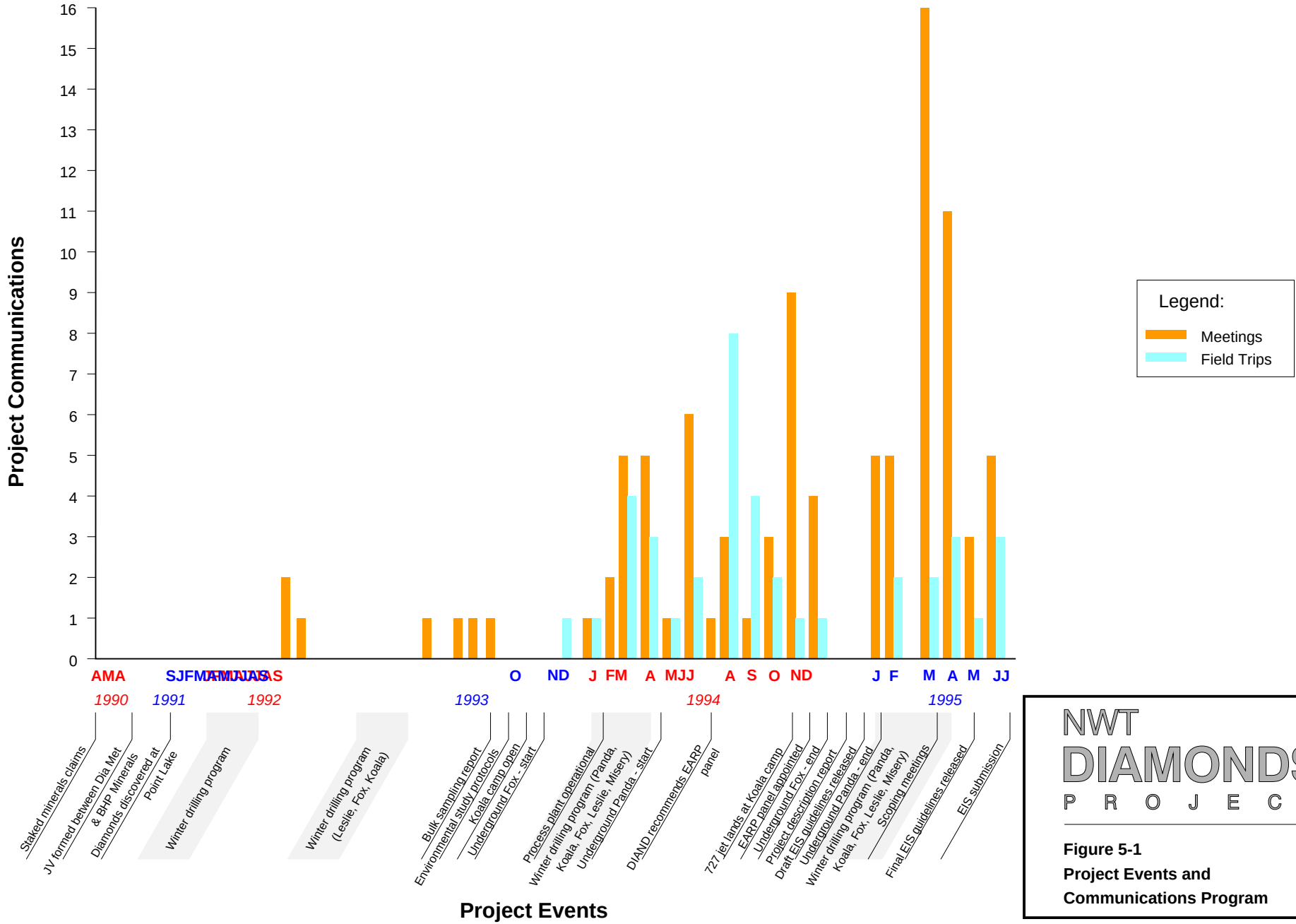
The process of informing the public about the NWT Diamonds Project commenced in 1992 and has continued throughout the preparation of the EIS. A time line showing major events for the NWT Diamonds Project along with meetings and field trips for the ongoing communications program is shown in Figure 5-1. The Proponent has continually adapted and modified its communications program as the needs for different types of information and as the needs of the different stakeholders change. After the project is approved, the communications program will continue through to the closure of the mine.

Initially, the Proponent was a relatively unknown company in the North despite BHP's (the Operator's) history of 40 years of minerals activities in Canada. The general public also had relatively little knowledge of diamond mining, which has never been practiced in Canada. Misinformation and general apprehension by the public were prevalent given that a "diamond rush" was also occurring during this time. Further complications arose due to the diversity of the local communities and the conflicting and unresolved Aboriginal land claims. Confronted with these obstacles, the Proponent embarked on a comprehensive communications program in order to disseminate a great amount of information in a short period of time; to promote public understanding of the Proponent and the NWT Diamonds Project; to identify and meet the diverse interest groups; to listen and learn from the public's feedback and establish a dialogue with each of the different interest groups; and to modify the program as required to meet the changing needs of the project and the different interest groups.

The Proponent identified the following target interest groups and tailored the initial phase of the communications program specifically for each:

- local and regional residents, particularly the Aboriginal peoples
- organizations
- resource users
- governmental entities.

The main objectives of the initial phase of the communications plan were to consult with each targeted group, to inform them of the proposed diamond mine and, more important, to afford each group an opportunity to express their unique concerns. Given the diversity of the identified groups and their specific issues, this interactive communication process is critical to the creation of an effective dialogue between the parties involved and ultimately achieving the Proponent's goal of establishing a "good neighbour" policy for the mining operation.



NWT DIAMONDS PROJECT

Figure 5-1
Project Events and Communications Program

Source: Rescan

The Proponent has used a variety of means, including presentations, public meetings, workshops and open houses, to disseminate great quantities of information. These forums have been very effective and will continue to be a cornerstone of the Proponent's future program. Field trips, cultural exchanges, joint workshops and videotapes were also employed by the Proponent to inform the public.

To increase interaction and promote Aboriginal participation, the communications program has evolved since its inception to include direct community involvement through initiatives such as Community Mobilization, School Partnerships and Educational Scholarships.

To anticipate future communication needs, the Proponent has voluntarily commenced discussions with Aboriginal people on Benefits Agreements. It is hoped that these agreements will continue to build on the existing communication framework and provide further methods to monitor future communications. Future communications with non-Aboriginal groups and organizations will continue through the methods and types of activities outlined above.

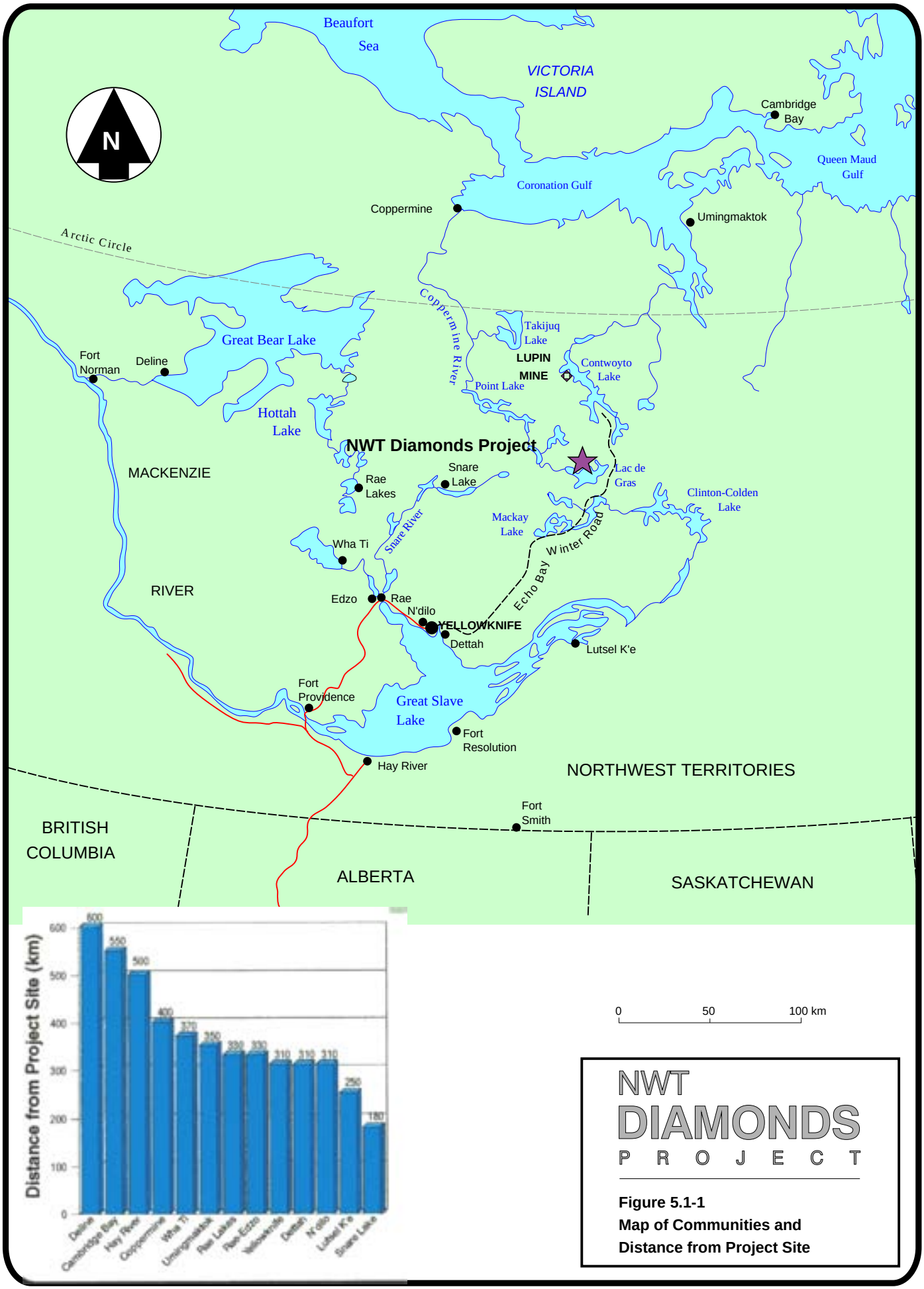
This section of the EIS documents the evolution of the Proponent's communications program and public involvement for each interest group.

5.1 Local and Regional Residents

The goal of the communications program is to create a dialogue with local and regional residents throughout the communities of the NWT. As can be seen on Figure 5.1-1, the geographical area targeted for the communications program is very large, ranging from Cambridge Bay in the north to Hay River in the south, and from Wha Ti in the west to Lutsel K'e in the east. The area encompasses over 300,000 km^2.

The residents consulted within the region include the Treaty 11 Dogrib, the Treaty 8 Dene, the Inuit, the Metis and other residents of the North.

The Proponent made numerous visits to local and regional communities that could possibly be affected by the proposed mining operations. These communities were often revisited based on the level of interest shown by the residents and the Proponent's desire to keep them informed of the status of and changes to the project. Specific communities consulted by the Proponent include Cambridge Bay, Coppermine, Umingmaktok, Rae-Edzo, Rae Lakes, Snare Lake, Wha Ti, Dettah, N'dilo, Lutsel K'e, Yellowknife and Hay River. Figure 5.1-2 graphically illustrates the number of visits made by the Proponent to each community, visits by others to the Koala camp site or elsewhere as a field trip or business trip. This process of community consultations is ongoing, and the information on the bar chart will continue to change accordingly.



NWT DIAMONDS PROJECT

Figure 5.1-1
Map of Communities and Distance from Project Site

Source: Rescan

Communications Program

Rae-Edzo	Rae Lakes	Snare Lake	Wha Ti	Yellowknife	Hay River	Dettah	N'Dilo	Lutsel K'e	Koala Campsite	Coppermine	Umingmak tok	Cambridge Bay
04/05/95			06/13-15/95	06/02/95					06/08/95			
04/04/95			05/10/95	06/01/95					06/07/95			
03/23/95			04/25/95	06/01/95		05/09/95	04/11/95		06/06/95			
06/25/94	04/26/95		03/29/95	05/03/95		04/08/95	01/24/95		05/02/95			
03/19/94	03/28/95	04/26/95	08/24/94	04/06/95	04/03/95	12/01/94	12/01/94		04/08/95	03/14/95		
05/14/93	06/21/94	04/26/94	04/26/94	04/05/95	03/23-24/95	03/21/94	06/29/94	04/07/95	04/06/95	01/18-20/95	03/15/95	
07/07/92	04/27/94	09/09/93	08/24/92	03/30/95	04/9-10/94	01/06/94	03/21/94	01/24/95	04/05/95	11/08/94	11/09/94	11/09/94
				03/27/95					03/13/95			
				03/20/95					03/07/95			
				03/08/95					02/27/95			
				03/02/95					02/18/95			
				03/01/95					12/14/94			
				02/17/95					11/10/94			
				02/16/95					10/05/94			
				02/15/95					09/27/94			
				02/13/95					09/26/94			
				02/01/95					09/22/94			
				01/14/95					09/21/94			
				01/05/95					08/31/94			
				12/15/94					08/30/94			
				12/01/94					08/28/94			
				11/30/94					08/25/94			
				11/30/94					08/19/94			
				11/30/94					08/18/94			
				11/23-25/94					08/16/94			
				11/22/94					08/10/94			
				10/14/94					06/23/94			
				10/13/94					06/08-09/94			
				09/15/94					05/16/94			
				08/25/94					04/27/94			
				07/14/94					04/19/94			
				06/21/94					04/08/94			
				06/09/94					03/26/94			
				06/09/94					03/24/94			
				05/03/94								

Lac de Gras	Toronto	Edmonton	Vancouver	New Mexico Navajo Nation	Island Copper
08/06/93	03/8-10/95 08/17/94	11/17/94	03/31/95 03/30/95 03/17/95 10/14/94	10/31-11/02/94 12/1-3/93	06/21-24/95

NWT DIAMONDS PROJECT

Figure 5.1-2
Local & Regional Communities
Date and Number of Visits

Source: BHP

Recently, the Proponent has been notified that the community of Deline (Fort Franklin) has expressed a desire to be consulted on the impacts and benefits of the proposed development. Plans are underway to visit the community in the near future.

The main emphasis of the Proponent's communications program is "informational and educational" meetings, where the Proponent and the members of the communities can learn from each other. Several different formats were employed in the meetings held to date, depending on the audience and their anticipated concerns. The meetings were always designed to promote a casual informality in order to achieve an open forum where all participants freely exchanged ideas and viewpoints. In all cases, the primary objective was to promote an interactive discussion and to address the audience's concerns.

Community meetings, open houses, public presentations and environmental workshops were considered the most effective in terms of disseminating the information as well as reaching the greatest number of residents (Plate 5.1-1). Advance notice of each meeting was given in local newspapers and radio stations, and the appropriate council members were notified. The purpose of the meetings was to inform the residents about the project and its potential effects and to solicit information from a community perspective. The meeting process was similar in most communities. The meetings were usually held in a town or community hall, hosted by the mayor or the chief and attended by the elders and other residents.

Using a translator when necessary, senior managers presented overviews of the project, provided updates on the environmental baseline work and discussed plans for future development. The permitting processes, environmental management plans, archaeological considerations and hiring policies were discussed as well. Questions were answered throughout the duration of the meetings, which lasted between three and five hours. To assist the attendees in their understanding, to make the information more accessible and to increase audience participation, technical topics were often reformatted to visual aids, usually in the form of slide presentations, posters displayed around the room, scale models, handouts with pictures depicting technical data and videotapes (Plates 5.1-2, 5.1-3, 5.1-4). The Synopsis Chart at the end of this section summarizes in detail the important aspects of each meeting, including the groups involved, communities visited, number of attendees, dates, the type of meeting, the purpose of the meeting, the issues/concerns raised and the Proponent's responses, if applicable.

5.1.1 Aboriginal Peoples

During the meetings, special consideration was given to informing the Proponent about the traditional lifestyles of Aboriginal peoples and to affirming the significance of their culture. By learning about their traditional past, it was hoped

Plate 5.1-1: *Bruce Turner, Project Manager, addresses a Public Meeting at Wha Ti, April 1994*

Plate 5.1-2: *Jaap Zwaan, Chief Mine Engineer, explains aspects of the scale model of the development site to residents of Wha Ti, April 1994*

Plate 5.1-3: *Public Meeting at N'dilo, March 30, 1994*

Plate 5.1-4: *Bruce Turner, Project Manager, with Chief Isadore Zoe at the Public Meeting at Wha Ti, April 1994*

the Proponent could avoid interfering with the Aboriginals' cultural future. The Proponent intends to put traditional concepts into practice and respect the diversity that exists between the Aboriginal peoples, and will make no attempt to homogenize their cultures.

5.1.1.1 Historical Context

At the outset, it is important to note that historical land claim conflicts exist between the Treaty 11 Dogrib and the Treaty 8 Dene. The realities of the land claims conflict often create barriers that make the communication and consultation process more complex for the Proponent. A meeting with one group as opposed to the other is often interpreted as tacit endorsement of the disputed boundary lines in their favour, despite the fact that the Proponent consistently acknowledges that responsibility for land claims issues rests jointly with the Aboriginal group in question and the federal government (Section 1.4). For this reason, the Proponent has made every effort to be impartial.

The Treaty 11 Dogrib are engaged in comprehensive land claim negotiations with the federal government for lands encompassing the NWT Diamonds Project. At the recommendation of the Department of Indian Affairs and Northern Development (DIAND), the Proponent began discussions with the Treaty 11 Dogrib communities of Rae-Edzo, Rae Lakes, Snare Lake and Wha Ti in 1992. It soon became apparent to the Proponent that the Treaty 8 Dene have overlapping land claims with the Dogrib Treaty 11 settlement area and that this disputed area includes the NWT Diamonds Project. The Proponent subsequently included the Treaty 8 Dene in the communications program, attempting to devote nearly equal time to both groups. In keeping with the Proponent's "good neighbour" policy, the consultation process has currently been expanded to include the Inuit communities of Coppermine and Umingmaktok and the Metis as well. The visits to the Aboriginal communities are set out in Figure 5.1-3. (For specific details of all the Aboriginal communications, refer to the Synopsis Chart.)

5.1.1.2 Communication Tools Used for the Aboriginal Communication Program

The communication process implemented by the Proponent to interact with the different Aboriginal groups required extensive use of translators in the conduct of its presentations. Audiotapes of the Executive Summary of the Project Description Report were translated into Dogrib, Chipewyan, Innuinaqtun, South Slavey, North Slavey and Inuktitut. Translated versions of the Executive Summary and the audio tape were provided to the following communities: Rae-Edzo, Rae Lakes, Snare Lake, Wha Ti, Dettah and N'dilo received the Dogrib versions; Dettah, N'dilo and Lutsel K'e received the Chipewyan versions; Deline received the North Slavey translations; and Coppermine, Cambridge Bay, Bathurst Inlet and Umingmaktok received the Innuinaqtun versions. The tapes remain in the communities as a permanent reference for any future meetings or

Communications Program

Rae-Edzo	Rae Lakes	Snare Lake	Wha Ti	Yellowknife	New Mexico	Koala Campsite	Vancouver
07/07/92	04/27/94	09/09/93	08/24/92	07/15/93	12/1-3/93	03/10/94	03/30/95
05/14/93	06/21/94	04/26/94	04/26/94	02/21/94		04/27/94	03/31/95
03/19/94	03/28/95	04/26/95	08/24/94	03/08/94		06/23/94	
06/25/94	04/26/95		03/29/95	05/03/94		09/26/94	
03/23/95			04/25/95	06/09/94		12/14/94	
04/04/95			05/10/95	06/21/94		04/08/95	
04/05/95			06/13-15/95	10/13/94		06/06/95	
				11/30/94		06/08/95	
				12/15/94			
				02/16/95			
				03/08/95			
				03/20/95			

Treaty 11 Dogrib

Dettah	N'dilo	Lutsel K'e	Yellowknife	New Mexico	Koala Campsite
01/06/94	03/21/94	01/24/95	02/21/94	10/31-11/02/94	05/16/94
03/21/94	06/29/94	04/07/95	06/09/94		02/18/95
12/01/94	12/01/94		08/25/94		02/27/95
04/08/95	01/24/95		10/13/94		06/07/95
05/09/95	04/11/95		06/01/95		

Treaty 8 Dene

Coppermine	Umingmaktok	Cambridge Bay	Koala Campsite
11/08/94	11/09/94	11/09/94	04/05/95
01/18-20/95	03/15/95		04/06/95
03/14/95			

Inuit

Yellowknife
07/14/94
02/01/95
05/03/95
06/01/95

Metis

NWT DIAMONDS PROJECT

Figure 5.1-3
Aboriginal Contacts
Date and Number of Visits

Source: Rescan

general questions the residents might have at a later time. In addition, videotapes were produced to provide a visual interpretation of the Project Description Report, which was submitted to the EARP Panel on December 9, 1994. The videotapes were translated into Dogrib, Chipewyan, South Slavey and Innuinaqtun and were distributed to the relevant communities so that residents could have access to this information in their own language and in the most accessible and comprehensible format (see Appendix I-C1 for complete list of video distribution).

5.1.1.3 Field Trips

In response to the amount of interest generated by the informational meetings, the Proponent hosted the leadership of the Treaty 11 Dogrib and the Treaty 8 Dene on two separate educational trips to BHP's coal mining operations on Navajo Nation lands in New Mexico. In addition to observing BHP mines in operation, the visit provided the Aboriginal leadership with an opportunity to witness firsthand the mutually cooperative relationship that has developed between BHP and the Navajo people employed there. The New Mexico operations are a working example where Aboriginal people have preserved their traditional values in co-existence with a world-scale mining operation. Exploration for and production of thermal coal on Navajo Nation lands have been ongoing since 1953. The BHP New Mexico operations have been successful both in terms of reclamation awards and in achieving a work force where more than 80% of the employees are Native Americans.

More than 35 chiefs, tribal elders and other community leaders from the Dogrib Treaty 11 and the Treaty 8 Dene were flown to Farmington to tour various mining sites in December 1993 and November 1994, respectively (Plates 5.1-5, 5.1-6 and 5.1-7). The Navajos, who share ancestral ties (Athapaskan) with the Treaty 8 and Treaty 11, are involved at every level of the New Mexico operations, including supervision and management. Navajo professionals conducted the tours of the three mines. Opportunities were afforded to the band members to ask questions about BHP, its corporate commitment to traditional knowledge, local hiring, career development, on-site training, working conditions, educational scholarships, organizations, tribal government and cultural sensitivity. The Navajo environmental programs were explained in terms of pre-mine soil surveys and reclamation techniques used in the semi-arid deserts of New Mexico.

To capture broad impressions of the Navajo mine site visit, a short 15-minute documentary video was made of the November 1994 visit by the Treaty 8 leadership. The objective of the video was to provide a larger segment of the Treaty 8 population with some exposure to the benefits that can be derived from a mutually cooperative relationship between Aboriginal peoples and a world-class mining company. This videotape has been distributed to the leaders of the Treaty 8 Dene communities.

Plate 5.1-5: *Dogrib Treaty 11 delegates visit the Upper Fruitland Community, Navajo Nation, during their tour of W.U.S.M. operations at Farmington, N.M., December 1993*

Plate 5.1-6: *Ed Raymond, Senior Tribal Affairs Representative, presents Chief Jonas Sangris, Yellowknives Treaty 8, with a traditional Navajo Rug, December1, 1994, Farmington, N.M.*

Plate 5.1-7: *Jeff Young, Environmental Coordinator, San Juan Mine, briefs members of the Treaty 8 delegation during their visit to Farmington, N.M., December 1, 1994*

After the trip to the New Mexico operations, the Dogrib indicated a desire to provide more communities with an opportunity to meet directly with BHP's Navajo employees to discuss BHP's relationship and involvement with the Navajo Nation. To facilitate this meeting, the Proponent sponsored a two-day visit by a Navajo delegation to Wha Ti on August 24, 1994. This visit was timed to allow the Navajo to attend the Dogrib Annual Assembly. Seven representatives from New Mexico, including an engineer, an environmental coordinator and specialist, an accountant , a tribal affairs representative and the BHP Manager of Tribal and Government Affairs, were able to meet with Dogrib elders, leaders, educators and school children in a casual but meaningful manner. The Navajos also participated in traditional Dogrib activities (Plate 5.1-8).

The Proponent also took this opportunity to introduce the Navajo delegation to the Treaty 8 Dene. The Proponent hosted a dinner for the Treaty 8 leadership, the Navajo delegation and senior managers of the NWT Diamonds Project at the Explorer Hotel in Yellowknife. This dinner was the precursor to the Treaty 8 trip to New Mexico in November 1994.

Secondary fact-finding tours to New Mexico by both the Treaty 11 Dogrib and the Treaty 8 Dene are scheduled for the summer of 1995. These trips will be designed to allow more time for interaction between the Navajo and the NWT bands, increasing the exchange of impressions and information regarding BHP's relationship with the Navajos.

The Proponent makes extensive use of field trips to the Koala exploration camp to allow people to witness firsthand the type of work being done at the site. Trips to the Koala camp were offered to representatives from the Treaty 11 Dogrib, the Treaty 8 Dene, the Inuit of Coppermine and Umingmaktok and a range of other interest groups. Figure 5.1-4 graphically illustrates the number of educational visits made by the different interest groups to the Koala camp. Trips to the site typically include a briefing on BHP's safety code and procedures, an update on the project and tours of the camp facilities (including lunch with the work force), the bulk sampling process plant and currently active operations. At any given time, these operational tours can range from underground bulk sampling programs, to surface drilling operations, to the operation of water clarification units, to ongoing reclamation research programs and wildlife surveys (Plate 5.1-9).

Several of the visits to the Koala camp have been designed to be "participation visits" rather than just "informational visits." Elders and other members of the communities are invited to participate in the ongoing wildlife or archaeological surveys. These participation visits are mutually beneficial for the exchange of information. The elders witness the operational activities of the Proponent and the Proponent learns from the elders about the traditional care and the history

Plate 5.1-8: *Members of the Navajo delegation who attended the Dogrib Treaty 11 Annual Assembly at Wha Ti, August 1994.*

Left to right: Phil Luna, Chief Mine Engineer, Navajo Mine; Pete Denetclaw, Environmental Specialist, Navajo Mine; Norman Benally, Supervisor, Industrial Relations, Navajo Mine; Lucille Benally, Supervisor, Accounting, Navajo Mine; Elmer Lincoln, Manager, Tribal and Governmental Affairs, W.U.S.M.; Bill Skeet, Environmental Coordinator, La Plata Mine; and Ed Raymond, Senior Tribal Affairs Representative

Communications Program

DOGRIB	YELLOWKNIVES	INUIT	MEDIA	GOV'T	ENVIRONMENT-ALISTS	OTHER
06/08/95				04/08/95		
06/06/95			03/07/95	03/13/95		
04/08/95			11/10/94	10/05/94		05/02/95
12/14/94			09/27/94	09/21/94		08/18/94
09/26/94	06/07/95		09/22/94	08/31/94		08/10/94
06/23/94	02/27/95		08/25/94	08/30/94		06/08-09/94
03/10/94	02/18/95	04/06/95	03/13/94	08/28/94	02/27/95	04/08/94
04/27/94	05/16/94	04/05/95	01/05/94	08/19/94	08/28/94	03/26/94
				08/16/94	04/19/94	
				03/26/94		
				03/24/94		

NWT DIAMONDS PROJECT

Figure 5.1-4
Koala Campsite Visits
Date and Number of Visits

Source: BHP

Plate 5.1-9: *Dogrib Treaty 11 field trip to Koala camp, including MLA Henry Zoe accompanied by BHP management. The April 27, 1994, trip was made in conjunction with meetings held in Wha Ti, Rae Lakes and Snare Lake*

of the land. Elders from each of the Treaty 11 Dogrib communities have taken part in these participation meetings, and invitations have been extended to Treaty 8 Dene for similar meetings.

The Proponent also arranged for concerned Aboriginal employees at Koala to accompany the Proponent's environmental scientists in the flyover surveys to assist with baseline wildlife studies (Plate 5.1-10). Any employees who express an interest in the environmental program are encouraged to apply for available job positions so that they can assist in incorporating traditional environmental considerations into the project (Plate 5.1-11).

The Proponent hopes to continue with these types of participation visits throughout the production and closure phases of the NWT Diamonds Project.

5.1.1.4 Traditional Knowledge Meetings, Workshops and Studies

Given the special significance of traditional knowledge and its relationship to the project, the substance and format of the typical early "informational" meeting was adapted to better suit this important but sensitive subject. In later meetings, the Proponent continued to provide brief overviews of the project; however, most of the meeting time was spent listening and learning from the Aboriginal peoples – their chiefs, elders and other concerned individuals. Questions from the Proponent about how to proceed in a manner compatible with traditional values and how to incorporate these cultural concerns into the development of the project became the central theme of discussion. The expertise of the elders made their participation critical to the success of these meetings. The Proponent learned that "traditional knowledge" is all-encompassing and permeates all aspects of Aboriginal life. As such, the Proponent was counseled to look at how traditional knowledge pertains to specific issues that relate to the project, rather than attempt to incorporate an overly broad and pervasive concept of "traditional knowledge" into the EIS (Traditional Knowledge Agreement, Appendix I-C2).

To respect the wishes of the Aboriginal peoples, the Proponent is focusing its efforts on learning about those aspects of traditional knowledge that relate to environmental issues, heritage sites and social issues.

It also came to light during the initial phase of the consultation program that Aboriginals view traditional knowledge as proprietary in nature. Both the Treaty 8 and the Treaty 11 are very concerned about protecting their traditional knowledge from commercial exploitation by third parties. They are also concerned that their traditional knowledge, which is critical for validating land claims, could be used against them in the ongoing land claims negotiations. At the same time, they feel strongly that traditional knowledge should be incorporated into any larger studies such as a Regional Review or assessments of any specific development projects such as the NWT Diamonds Project.

Plate 5.1-10: *Alphonse Apples (far right), Koala Camp employee from Rae Lakes, prepares to accompany (right to left) Mardy Semmler, Environmental Technician, BHP Diamonds Inc.; Vivian Banci, Wildlife Biologist, Rescan Environmental Services Ltd.; and the helicopter pilot on a caribou survey, July 1994*

Plate 5.1-11: *Summer students B. Francois (Treaty 8) and C. Zoe Chocolate (Treaty 11) assemble an herbarium as part of the Proponent's summer environmental program, Koala Camp, June 1994*

To balance these concerns, the Dogrib are developing protocols that will allow them to manage the flow of traditional knowledge to "project proponents" or to other third parties. Under these protocols, the Dogrib will work with a proponent to gather and interpret the appropriate traditional knowledge and will assist the proponent in considering the implications of traditional knowledge in the plan of development. The proponent will be limited to publishing only a very general review of traditional knowledge in any public documents, including an EIS.

Another consideration discussed by the Dogrib is that traditional knowledge should not be limited to just the development phase of a project. Traditional knowledge should also be a necessary component of monitoring during the operations and closure phases (Section 5.4). Throughout these discussions Aboriginal people have expressed a consistent desire that the integrity of traditional knowledge be preserved. The Dogrib stress that it is important that the gathering and application of traditional knowledge be managed by the Dogrib in cooperation with the Proponent.

Several significant meetings, documented in the Synopsis Chart at the end of this section, addressed the understanding and application of traditional knowledge to the areas of the environment, heritage sites, traditional lifestyles and social issues. With regard to heritage sites, the primary concerns are the locations of these various sites, their traditional significance and the avoidance of the sites during the development and operational phases of the project. The Proponent has shared its archaeological surveys of the project site and invited elders to the site to participate in several flyovers to assist the Proponent in its policy to respect significant archaeological heritage sites.

Workshops were held to present the Proponent's environmental baseline work and to verify and adapt this work based on traditional knowledge. Where applicable, the Proponent has readily incorporated the traditional knowledge obtained through these initial meetings and ongoing studies into its plan of development. One example is Aboriginal knowledge of the behavioural responses of caribou to certain stimuli, such as inukshuks, which have been used traditionally to divert caribou movements for purposes of hunting. Applying this knowledge, inukshuks or rock piles will be placed along the Panda diversion channel to divert caribou away from this structure. These rock piles will also provide cover and may attract other wildlife such as ground squirrels and nesting birds. Another example of incorporating traditional knowledge is the use of specific plants to ward off bears.

In addition to the workshops held at various communities to discuss traditional knowledge, the meetings between the Navajo and the Dogrib and Treaty 8 Dene provided a unique opportunity for the exchange of traditional culture among Aboriginals. The Aboriginals of the NWT were able to explore the ways in which

Navajo culture and traditional values have been preserved and incorporated into BHP's mining operations in New Mexico.

To further expand the Proponent's understanding of traditional knowledge, the Proponent is funding a two-phase study with the Treaty 11 Dogrib, the Treaty 8 Dene, the Inuit and the Metis. This program is designed to identify concerns, to address those concerns and to prepare a traditional knowledge baseline for use in future monitoring of environmental and socioeconomic impacts. A coordinator/ facilitator has been appointed for the program. Phase One, which is ongoing, consists of defining the roles of the participating parties and initiating consultations/workshops in the communities to document the environmental and socioeconomic concerns of the Aboriginal people with respect to the project. (The Proponent's main objective is to document concerns so it can attempt to address them.)

Phase Two will be designed on the basis of the information collected during Phase One and is offered to the parties to assist them in preparing a baseline of traditional knowledge. (The roles of Aboriginal institutions such as the Dene Cultural Institute and the Inuit Cultural Institute will be determined by the parties involved.) Assuming that both phases are completed satisfactorily, these groups will be considered for participation in contracts for future environmental monitoring work. To respect the wishes of the Aboriginal peoples, the information obtained from Phase Two will be considered confidential and will not be disclosed. Also, each Aboriginal group will maintain ownership and control of the information they supply to the program. Additional information on this program can be found in Section 1.2.

5.1.1.5 Community Involvement

Throughout the communications program, the exchange of dialogue with the Aboriginal communities indicated that the Proponent's involvement with the communities would be more successful by working in partnership to create both short- and long-term solutions to local concerns. Providing funding alone or implementing various programs without the direct involvement of the community and its role models is a futile endeavour. Based on the feedback received at earlier meetings, the Proponent learned that the most successful method of addressing concerns involves working with community members, who are respected, who will share their skills and strengths and who understand the local customs and traditions. The Proponent has created or joined certain programs to implement this evolved method of communication through community involvement.

Scholarship Program

A joint Dogrib/BHP/Dia Met scholarship committee was formed prior to any formal Benefits Agreement being negotiated. The committee comprises two

representatives from both BHP/Dia Met and the Dogrib Nation Development Authority Inc. representing the communities of Rae-Edzo, Wha Ti, Rae Lakes and Snare Lake. The committee will administer the scholarship programs, review all applications, determine guidelines and select applicants (see Appendix I-C3 for Scholarship Application Form).

The original scholarship program proposed by BHP/Dia Met consisted of one university scholarship to be awarded annually to a university undergraduate for $5,000 up to a maximum amount of $20,000 for four years; and two scholarships of $2,500 to Grade 10 students who intended to graduate from Grade 12. Up to $5,000 could be received by each student. After consultation with the chiefs and elders, the program was revised to reflect their wishes and include more recipients. The current scholarship program consists of one university scholarship of $5,000 up to a maximum of $20,000 and 10 high school scholarships of $500 each up to a maximum of $1,000. These students also will be eligible for summer employment with BHP/Dia Met in the NWT. Presentations to the successful applicants will be made at the Annual Dogrib Treaty 11 Assembly. Preliminary discussions are also in progress with the Treaty 8 Dene to address this educational concern as part of Proponent's community involvement plans.

In November 1994, the Dogrib Divisional Board of Education approached the Proponent to enter into a formal School/Business Partnership. The Dogrib Divisional Board of Education was established in 1989 and administers Treaty 11 schools in Wha Ti, Rae-Edzo, Rae Lakes and Snare Lake and Treaty 8 schools in Dettah. Once the proposed agreement is in place, it provides educational assistance to individual schools (the Jimmy Bruneau High School and two elementary schools), career development programs and profiles for specific career paths. Through this type of joint effort, the parties hope to encourage more students to complete a Grade 12 education, to develop a coordinated involvement in the region's school activities and to develop a greater community awareness of the Proponent's activities and operations, and that the Proponent will gain a greater understanding of the community culture. Although the agreement has not been formalized, the Proponent is working with the Board by providing videotapes to the schools on general mining practices and on the history of BHP and its worldwide operations. The Proponent is also in the process of preparing informational literature packages to address students' questions about mining in general. The Proponent sponsored a booth on mining operations during the school's Career Day in April 1995. Field trips to Koala were organized for interested teachers, students and parents (Plates 5.1-12, 5.1-13). These visits took place on June 6, Snare Lake School community; June 7, Dettah School community; and June 8, Rae Lakes School community. Approximately 14 teachers and students were in each group.

Community Mobilization

Increased wages in the community have the potential to compound existing social problems such as alcohol and drugs. This is of particular concern in the

Plate 5.1-12: *Students from Snare Lake School arrive for their first Koala Camp visit, June 6,1995*

Plate 5.1-13: *Snare Lake students pose in front of some crushed kimberlite during their tour of Koala Camp, June 6, 1995*

Aboriginal communities, where the average earned income could increase by as much as 40%. Recognizing that the solutions to social problems can only be effective if they are initiated by the communities themselves, the Proponent has offered to assist and participate in Community Mobilization programs. With this objective in mind, the Proponent engaged Mrs. Barbara Brown, the Director of Community Development Associates, to advise both the Proponent and local communities on how to implement a Community Mobilization process (Plates 5.1-14, 5.1-15, 5.1-16, 5.1-17). These partnership programs help communities to build on existing strengths to solve social problems (Volume IV, Section 4.10).

At the request of Chief Charlie Jeremick'a, initial mobilization meetings were held in Wha Ti in May of 1995. Meetings in the other interested communities are scheduled to follow in the summer of 1995.

Aboriginal Community Events

The Proponent has also welcomed opportunities to participate in Aboriginal community events. Senior managers of the NWT Diamonds Project accepted invitations to attend the graduation ceremonies at the Chief Jimmy Bruneau School at Rae-Edzo in June 1994, the Dogrib Treaty 11 General Assembly in Wha Ti in August 1994 and the Christmas Pageant at the Chief Jimmy Bruneau School in December 1994. One senior manager was invited to be a judge at the March 1995 Science Fair at the Chief Jimmy Bruneau School. The Proponent views this type of community involvement as an excellent way to build better communications, understanding, trust and friendship with the Aboriginal communities. These activities lay the groundwork for the Proponent's goal of maintaining a "good neighbour" policy during the working life of the mine.

5.1.2 Other Northerners

In order to inform other residents of Yellowknife and outlying communities about the NWT Diamonds Project, the Proponent has hosted two open houses in Yellowknife. The first, attended by more than 400 people, was held in the Scotia Centre on March 30, 1994, and the second, which attracted approximately 200 people was held at the Scotia Centre on November 30, 1994. Both events were advertised in northern newspapers and on the radio. Attendees included local government representatives, NWT Ministers, government employees, government representatives from the city of Yellowknife, local business people, media representatives, professionals, geologists, job hunters and other interested citizens (Plates 5.1-18, 5.1-19).

The open houses were designed to be informal and to encourage one-on-one discussions between senior managers of the project and interested citizens. Poster photos displayed on the walls provided information on diamond exploration, bulk

Plate 5.1-14: *Mrs. Barbara Brown, Director, Community Development Associates, leads the first session of the Community Mobilization workshop May 10, 1995, Wha Ti*

Plate 5.1-15: *Mrs. Barbara Brown with Christine Simpson, Community Mobilization program May 10, 1995, Wha Ti*

Plate 5.1-16: *Youth discussion group, Community Mobilization workshop, Wha Ti, May 1995*

Plate 5.1-17: *Elders and young people with Mrs. Barbara Brown during the Community Mobilization workshop, Wha Ti, May 1995*

Plate 5.1-18: *Members of the Yellowknife community attend the Open House, March 30, 1994. Terry Janes, Senior Project Engineer, answers questions using maps and core samples*

Plate 5.1-19: *Jaap Zwaan, Chief Mine Engineer (centre), discusses the project with an interested Yellowknife resident at the Open House, March 30, 1994*

sampling facilities, the camp, camp life, socioeconomic studies, Aboriginal information, heritage resources and archaeology, and environmental management. An informational video and scale models were also available. Questionnaires (Appendix I-C4) regarding the effectiveness of the open houses and inviting the attendees to request additional information were distributed (55 requests were received and answered).

To provide Northerners and the Inuit with a more formal presentation and update on the NWT Diamonds Project, the Proponent held public meetings in the communities of Coppermine, Umingmaktok and Cambridge Bay in November 1994 (Plates 5.1-20, 5.1-21) and also in Yellowknife in March 1995 and Hay River in April 1995 (Plates 5.1-22, 5.1-23). The public meetings were advertised in local newspapers and on the radio. The Yellowknife meeting was posted in the band offices in Dettah and N'dilo. Personal invitations were extended to select interest groups such as the Guide Outfitters. The purpose of these meetings was to provide Northerners with an update on the status of the project and to discuss Northern concerns such as the diamond mining process, the environment, the employment situation, the Proponent's preference for business opportunities in the NWT and the EARP approval process. Senior management gave formal presentations on each of these key issues. The presentations were augmented with 35 mm slides and a videotape on the Project Description. These three-hour long public meetings were well attended, with 170 people present in Yellowknife, 50 people in Hay River, 80 people at Coppermine, 30 people at Umingmaktok and over 50 people at Cambridge Bay.

On May 3, 1995, the Metis Nation of the NWT hosted a luncheon where the Proponent discussed the NWT Diamonds Project in detail and listened to Metis concerns, which included environmental issues, jobs, training and education for the Metis, and business opportunities (see Synopsis Chart).

5.1.2.1 Field Trips

Community meetings in Cambridge Bay, Coppermine and Umingmaktok in October of 1994 prompted such interest that an invitation was extended by the Proponent for a group of community leaders, Inuit elders and citizens to visit the proposed mine site. Representatives from these communities visited the project site in February 1995. In addition to these communities and the Aboriginal groups mentioned above, several other educational trips to the Koala exploration camp were hosted by the Proponent. The groups visiting the camp included GNWT employees, the Regional Environmental Review Council (RERC), the media, environmental organizations and mining association members (see Synopsis Chart for complete listings).

Plate 5.1-20: *Vivian Banci, Wildlife Biologist for Rescan Environmental Services Ltd., discusses wildlife surveys with two Coppermine residents at the Public Meeting held November 8, 1994*

Plate 5.1-21: *Vivian Banci, Wildlife Biologist of Rescan Environmental Services Ltd., delivers her presentation on wildlife surveys in the Lac de Gras area at the Public Meeting in Umingmaktok, November 9, 1994*

Plate 5.1-22: *The Public Meeting held at the Explorer Hotel in Yellowknife, March 27, 1995. Approximately 170 people attended the three-hour meeting*

Plate 5.1-23: *Jim Eccott, President of Dia Met, addresses the Public Meeting held at the Explorer Hotel in Yellowknife March 27, 1995 (Photo: Jake Ootes)*

5.1.2.2 Media Communications

To inform the general public about the project, media reporters and publishers such as CBC TV Yellowknife, *News North, the Yellowknifer, Native News Journal, Outcrop, Northern Miner, Above & Beyond*, CBC Radio, *Reuters,* the *Globe & Mail* and *The Wall Street Journal* have periodically been given tours of the site and briefings on the project. Public interest in the "diamond rush", e.g., various companies staking claims in 1992/1993 in and around the region known as the "Corridor of Hope", is such that more than 65 articles on the NWT Diamonds Project were published in Canadian newspapers in just the first three months of 1995 (Appendix I-C5). These news broadcasts and published articles have helped the Proponent communicate with a wider audience in the Northwest Territories and across Canada.

Radio and TV coverage allows the project to be explained and discussed in a format that is very comprehensible and widely accessible to the people of the North. Two examples of this are the 40-minute "Focus North" program aired by CBC Yellowknife in October 1994 (broadcast across the North) and the 30-minute "Le Point" program aired by CBC (French) Edmonton in April 1995 (broadcast across Canada). Both programs focused on the NWT Diamonds Project, showing pictures of the site and interviews with the BHP Project Manager as well as representatives of the GNWT, the Dogrib and Ecology North. Such programs provide a visual explanation of the project and a forum for the different interest groups.

As another means of regional/community-oriented communication, the Proponent has sponsored informational inserts and advertisements in Northern magazines and newspapers. The Proponent sponsored a full-colour, 16-page insert entitled "Finding Common Ground" in the November/December 1994 edition of *Uphere* magazine (Appendix I-C6). With a circulation of 50,000 copies across the NWT, this insert features interviews with people, particularly Northerners, who will be directly or indirectly affected by the NWT Diamonds Project. In addition, a two-page advertisement providing highlights of the Project Description was placed in the March 1995 edition of *News North*, a newspaper with a circulation of over 10,000 across the NWT (Figure 5.1-5). The Proponent will be sponsoring another insert with *Above & Beyond* magazine (circulation of 30,000 across the NWT). Scheduled for publication in July 1995, this insert will focus on responses to issues of water quality, wildlife and employment and training raised by Northerners in the EARP scoping meetings.

In addition to informational inserts, the Proponent has made extensive use of local and regional newspapers and radio stations to advertise the public meetings and open houses (Appendix I-C7). The objective of this advertising is to inform the general public about the project, to respond to issues raised by the public and to invite the public to have an open dialogue with the Proponent.

DIA MET

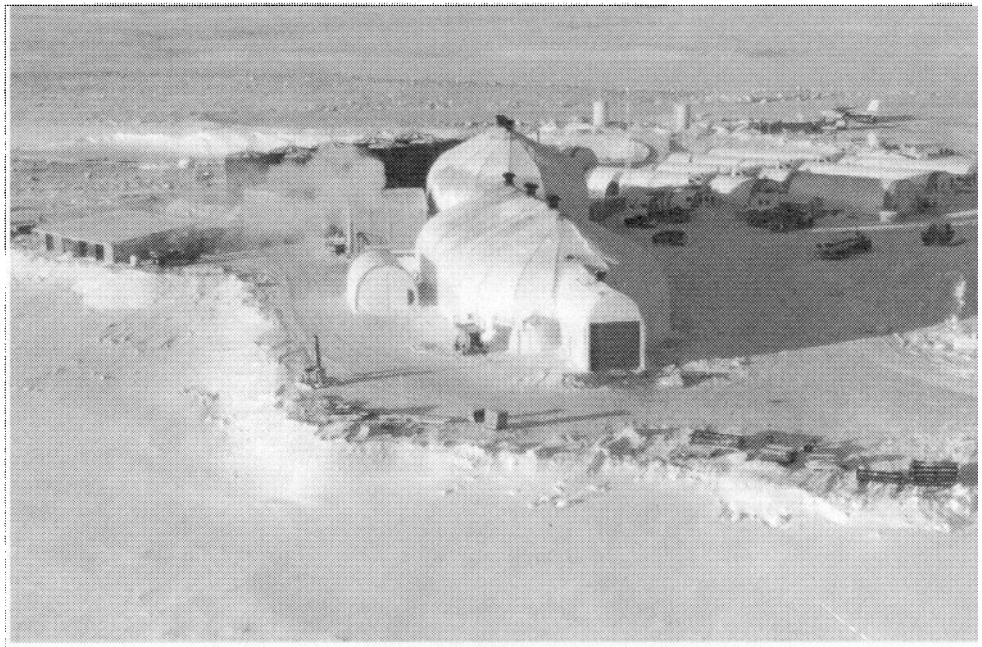
BHP

NWT Diamonds Project

The Owners

The **NWT Diamonds Projects** has been organized to explore and develop claims near Lac de Gras, in the Coppermine River Basin, approximately 300 kilometres north-east of Yellowknife. The operator, **BHP Diamonds Inc.** has earned a 51% interest in the joint venture. The remaining 49% interest is held by a Canadian joint venture party, the Blackwater Group, consisting of Dia Met Minerals Limited, Charles E. Fipke and Dr. Stewart L. Blusson. The joint venture partners believe that the project will become Canada's first diamond mine.

The NWT Diamonds Project can meet present regulatory requirements and appears to be economically feasible at today's prices and tax and royalty provisions.



The Permitting Process

The project will be reviewed by a **Federal Environmental Review Office (FEARO) Panel,** which was appointed by the Minister of the Environment in December, 1994. The panel review process is the highest of three levels of screening for project proposals under Canada's Environmental Assessment Review Process (EARP), and is known in the North as the EARP Panel Review.

Project Description

A BHP/Dia Met NWT Diamonds Project Description Report, available at the Yellowknife Public Library, and at the YellowKnife office of BHP Diamonds Inc., describes the project. The report contains a preliminary assessment of the potential environmental and socio-economic impacts arising from the project. It was submitted to the EARP Panel December 9,1994.

HIGHLIGHTS OF THE PROJECT

Mining Development Plan

Kimberlite Pipes

The mining development plan involves five pipes, named Panda, Misery, Koala, Fox and Leslie.

Location

Four of five pipes are within a few kilometres of each other. The fifth pipe is 28 kilometres south-east.

Mining Method

After draining the small lake which overlies each kimberlite pipe, the conventional open pit mining method will be used, followed by underground development of at least two pipes.

Excavated Materials

These materials have little potential for acid generation. The mined rock will be collected for processing or transported to waste rock deposits near each pit.

Production and Processing

The Plant

A single, centralized plant will process the kimberlite to recover diamonds.

Chemicals

No chemicals are used in the separation process.

Water

The plant will function almost entirely on a recycle basis.

Rejects or Tailings

The discarded kimberlite rock will be deposited in a medium sized lake next to the plant.

Site Access and Facilities

Access by Ground

This will be possible for only three months of the year. A 28-kilometre road will connect the mine facilities to the Misery pipe area and to the existing Echo Bay Lupin winter road.

Access by Air

The runway has been extended for Hercules and jet aircraft.

Facilities

Minesite facilities will include the processing plant, a permanent camp for the rotating workforce, a truck shop, service complex and power generation.

Socio-Economic Impacts

The key impacts of this development are expected to be socio-economic. They are expected to be largely positive. Employment and other significant benefits will be generated in the NWT, both in Yellowknife, the closest major centre, and nearby Dene communities.

Point of hire

The point of hire will be Yellowknife.

Hiring

Preference will be given to Dene and Northerners.

Shift Rotation

Employees will fly in/fly out to the worksite. Yellowknife will be the major departure point for flights.

Employment

Approximately 1000 employees will be required during construction and 650 employees during operations.

Stability

With an expected 25 year mine life, the project represents a long-term, stable industry for the North.

Environmental Management

BHP/Dia Met is committed to sustainable development. It will undertake its mining development operation with concern for the long term effects on th environment and the people of the NWT.

Environmental management

A detailed plan is being developed and will be presented in BHP's Environmental Impact Statement. The plan will include management of tailings, mined out pits, waste, and reclamation, as well as minimizing surface disturbance during construction and operations.

Reclamation

Preliminary reclamation plans allow the five open pits to refill naturally with run-off water and precipitation to become lakes again. The waste rock deposits will be contoured and revegetated to blend into the landscape. Environmental research and monitoring programs to support the reclamation effort have already begun.

BHP

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Figure 5.1-5

5.2 Organizations and Resource Users

Every effort was made to involve community leaders, chambers of commerce, town administrators, councillors, members of the RCMP, professional organizations, business owners, teachers/educators and students during the informational consultations. Open houses, breakfast meetings, dinners, field trips to the project site, workshops and general presentations were the most common methods used to convey the Proponent's plan of development to the business communities at large and to the resource users (see Synopsis Chart).

Most business concerns were voiced directly to the Proponent by business people or through the various Chambers of Commerce. The Proponent's efforts were extensive in updating and consulting the NWT, the Yellowknife and the Hay River Chambers of Commerce (Plate 5.2-1). For example, the NWT Chamber of Commerce attended four presentations by the Proponent, toured the project site and invited the Proponent to two separate organizational meetings. Similar efforts were made and presentations given to the Yellowknife Chamber of Commerce, (more than 150 people attended one breakfast presentation) and the Hay River Chamber of Commerce. The Proponent also gave presentations on the project to the Yellowknife Business and Professional Women's Association and to the Status of Women Council of the NWT. The Proponent had several discussions with the Council about increasing the number of women in the mining work force.

Resource users who could be affected by the project contacted the Proponent or were sought out for special presentations to address their specific concerns. The Proponent has held separate meetings with representatives of the Hunters and Trappers Association, the Guide Outfitters and the Barren Ground Caribou Outfitters Association (Plate 5.2-2). The members of these organizations make their living by hunting, trapping, fishing and selling "wilderness experiences." Some individuals feel they have already been directly affected by the "diamond rush." In response to their concerns, the Proponent has had several independent meetings with the different organizations. The presentations at these meetings concentrated on environmental concerns such as caribou migration, water quality and fishing practices of the proposed mine. Consultation with these groups is ongoing.

The Proponent has taken an open and consultative approach to working with the concerned Canadian environmental organizations. The Operator, BHP, adheres to a company-wide Environmental Policy, which stipulates BHP's commitment to achieving a high standard of environmental care as it conducts its business (Section 4.2). In the spirit of this policy, the Proponent has met with representatives of several organizations to give them an overview of the project and to address their environmental concerns:

Plate 5.2-1: *Dan Johnson, Manager, Mine Development, addresses the Yellowknife Chamber of Commerce at a breakfast meeting held at the Explorer Hotel, March 1, 1995. Approximately 150 members of the local business community attended the early morning meeting (Photo: Jake Ootes)*

Plate 5.2-2: *Jim Peterson of the Northwest Territories Barren Ground Caribou Outfitters Association asks questions and states his views at the Public Meeting held at the Explorer Hotel, March 27, 1995 (Photo: Jake Ootes)*

- The Proponent hosted the President and CEO of the Canadian World Wildlife Fund (WWF) and the Executive Director of the Canadian Arctic Resources Committee (CARC) to a tour of the project site in August 1994.

- Representatives from the Nature Conservancy toured the Koala camp in September 1994.

- Representatives of the Sierra Legal Defense Fund and Ecology North toured the site in February 1995.

- Members of CARC and the Sierra Legal Defense Fund attended the Proponent's Open House in Yellowknife in November 1994.

- A senior manager for the NWT Diamonds Project accepted Ecology North's invitation to make a presentation at its Public Forum on "Mineral Development in the Slave Geologic Province," which was held in Yellowknife in March 1995.

The fact that the Proponent was the first representative from industry to actively participate in and make a financial commitment to the Regional Review of the Slave Geological Province underscores the Proponent's commitment to the concept of sustainable development in the NWT.

The Proponent has also had several meetings with local officers of the RCMP. These meetings have been designed to brief them on the status of the project and to consult them on the social issues of the different communities. The Proponent hopes to involve the RCMP in the Community Mobilization process. As described earlier, this partnership process is designed to help the communities to help themselves to build on their strengths and resolve their social problems. This approach has been very well received by both the RCMP and the Aboriginal communities. Consultation with the RCMP is ongoing.

5.3 Governmental Entities

In parallel with its extensive communications program described earlier, the Proponent has maintained a thorough consultation process with the various levels of the federal, territorial and local governments. This process was initially required by the statutory/regulatory requirements of doing business in Canada, which mandated that approval of the Bulk Sampling Program and the associated infrastructure be obtained from the Regional Environmental Review Committee (RERC). The RERC consists of federal, territorial and Aboriginal representatives and assists the federal government in making environmental screening decisions (Level II Environmental Review). This review also required land use and water permits for all work done on site.

The Proponent's government consultation process provides briefs and updates on the project and requests information and advice on key issues from government officials. This interchange of information between the Proponent and the different levels of government deals with the following issues:

- land claims and settlement issues
- Aboriginal rights
- environmental issues
- fisheries policies
- licences, permits for land and water use, regulatory requirements
- existing royalty and tax regimes
- education and training
- employment policies.

The Proponent has been proactive in consulting and working with both the federal government and the GNWT with regard to these significant issues. One of the best examples of this is the Baseline Environmental Study Protocols document, which was submitted to the RERC in October 1993. This is the first time such an approach has been taken on environmental studies in the Northwest Territories. The document outlines protocols for the requisite biophysical sampling program as well as baseline cultural and the socioeconomic studies. These baselines are required to assess the potential environmental impacts of the proposed diamond mine. The Proponent's initial work plan was presented and discussed in detail with the RERC, and their comments and concerns were incorporated into the final protocol document. This protocol approach is designed to maximize the efficiency and the completeness of the data gathering exercise and to avoid surprises in the final analysis for both the Proponent and government agencies.

5.3.1 Federal

The Proponent continues to consult with the Prime Minister's Office (PMO) and the Privy Council Office (PCO); the Department of Indian Affairs and Northern Development (DIAND); Natural Resources Canada (NRCan); Environment Canada (EC); Fisheries and Oceans (DFO); Finance Canada; Revenue Canada; Industry Canada; Transport Canada; the Office of the Secretary of State for Youth and Training; and the Canadian Environmental Assessment Agency (CEAA), formerly known as the Federal Environmental Assessment Review Office (FEARO). As appropriate, consultations have been held at the regional level in the NWT as well as in Ottawa. The Proponent has also hosted

representatives from PMO, DIAND, DOE, DFO, NRCan and FEARO to tour the facilities and operations at the project site.

As an example of the Proponent's cooperation with the federal government, the Proponent and DFO have mutually participated in the study of fish and aquatic life in the Lac de Gras area. In the summer of 1994, the Freshwater Institute established fisheries and freshwater control areas adjacent to the NWT Diamonds Project. The Proponent assisted DFO by providing maps of the area, taking bathymetry measurements in the research lakes and running laboratory analysis on some of the samples. DFO and the Proponent shared research facilities and exchanged data for the adjacent areas. The Proponent is also assisting the Freshwater Institute with its independent study of tailings and toxicity testing on fish. This type of scientific cooperation is beneficial to both the Proponent and the government agencies.

Another example of cooperation between the Proponent and a government agency is consultation with Transport Canada on the design of the airstrip at the Koala camp. The objective was to design a runway and air support facilities that could service the exploration effort and also provide an emergency landing for planes in the area. The airstrip is considered to be one of the best in the region, and the RCMP are including the airstrip and the camp facilities in their plans for handling disasters in the North.

5.3.2 Territorial

The Proponent has held briefings and consultations with the offices of the Premier of the GNWT, members of the Legislative Assembly, Department of Energy, Mines and Petroleum Resources, Department of Finance, Department of Renewable Resources, Department of Transportation and the Workers' Compensation Board. The NWT Power Corporation was also contacted. The Proponent has hosted the Premier, deputy ministers and directors of various departments in the GNWT and members of the Legislative Assembly to tours of the facilities and operations at the project site (Plate 5.3-1).

Cooperative environmental research efforts have been undertaken with territorial government entities. For example, the Proponent has provided logistical and financial assistance for the GNWT Department of Renewable Resources' environmental research station at Darieng Lake (tundra esker systems and denning by grizzly bears, wolves, foxes and ground squirrels in the Central Arctic, NWT). This program studies the denning capacity of eskers in the area. The Department of Renewable Resources and the Proponent have exchanged research data on the eskers and on wildlife surveys in the area. This exchange enriches the studies of both parties without incurring additional cost.

Plate 5.3-1: *Premier Nellie Cournoyea, accompanied by Grant Farrows, Senior Process Engineer, BHP Diamonds Inc., during a tour of the bulk sample process plant at Koala Camp, April 8, 1995*

The Proponent has also worked with the GNWT Department of Renewable Resources to obtain assistance and advice on grizzly bear avoidance and mitigation practices. Mr. Andy McMullan, the Conservation Education/Resource Development Officer, provided specifications and advice on ordering and installing the bear fence at the Koala camp and has also conducted bear safety classes for more than 200 employees and contractors at the camp. Training on bear avoidance and safety practices will continue over the life of the mine.

5.3.3 Local Government

The City of Yellowknife has been designated by the Proponent as the "point of hire" for the NWT Diamonds Project. To facilitate two-way communication with the citizens and the city government, the Proponent opened an office in Yellowknife in December 1993. Several meetings have been held with the Mayor of Yellowknife and members of the city administration to provide briefings on the project and to discuss local socioeconomic issues that may be affected by the proposed mine operation.

Members of the city administration have toured the project site and attended the Proponent's open house and public meetings in Yellowknife. On June 22, 1995, the Mayor of Yellowknife, city administrators and several representatives of the Yellowknife business community visited Port Hardy, B.C., to observe what impact a large company has when it establishes operations in a community (Appendix I-C9). BHP Minerals Canada Ltd. has been the Operator of the Island Copper Mine at Port Hardy for the last 25 years. Consultation with the city government is ongoing to ensure that the lines of communication remain open at the local level as well as the territorial and federal levels.

5.4 Methods of Addressing Future Concerns

Throughout the entire consultative process, the Proponent has attempted to note and address the specific concerns of the different communities and to respect traditional views and implement solutions to some of the issues surrounding the project. This has been done through an evolving communications program that has been adapted in format and focus as required to fit the needs of the various interest groups, particularly the Aboriginal communities.

To recap, the concerns of the communities have been acknowledged and addressed in the following ways:

Meetings and Information Dissemination – At commencement, the communications program focused on meeting the people and disseminating information. This was accomplished via presentations, open houses, workshops, general question-and-answer sessions, field trips, cultural exchanges and translated audio and videotapes. The initial program also included research

meetings held in the Aboriginal communities to learn more about environmental, traditional and archaeological concerns.

Direct Community Involvement – To increase Aboriginal participation, the communication plan evolved into direct community involvement during preparation of the EIS. While continuing with information exchange activities such as meetings and workshops, the Proponent has undertaken Community Mobilization programs, School Partnerships, Scholarship programs, "participation meetings" and direct involvement with individuals on a case-by-case basis.

Environmental Surveillance – The Proponent proposes to establish an independent environmental advisory group, consisting of academic, Aboriginal and community members, to review the environmental program of the project on an ongoing basis (Volume IV, Section 10). It is intended that the group will include four members with individual expertise in environmental engineering, wildlife, aquatics and ecology; two members from the Aboriginal community to provide traditional ecological knowledge; and one member from the general public (northern community). The group will provide an overview report to accompany an annual environmental assessment report produced by the Operator. Both reports will be submitted to the appropriate regulatory agencies. These reports will be available to the public through the regulatory agencies.

Benefits Agreements – In the future, the concerns of all the targeted groups will continue to be addressed through the interactive methods used in the past or those currently being implemented. To address the unique concerns of the Aboriginal groups, the Proponent has voluntarily commenced discussions and/or negotiations of Benefits Agreements with the Aboriginal groups. The confidential negotiations with both the Dogrib Treaty 11 and the Treaty 8 Dene are currently at different stages, with similar provisions and arrangements anticipated to be part of the final agreements. The Inuit and Metis will also be contacted to start discussions in order to address their concerns.

Benefits Agreements are necessitated wherever Aboriginal peoples have land claims within the immediate area of a project that could be affected by current or future development of a project, in this case the NWT Diamonds Project. The objectives of the agreements are to ensure that the Aboriginals derive direct and indirect social and economic benefits as well as providing consultation and input during the developmental and operational phases of the project. As not all social and economic impacts can be foreseen, such agreements are perhaps the best means of addressing future concerns. The agreements create long-term mechanisms for an ongoing working relationship.

The mechanism proposed by the Proponent to ensure Aboriginal involvement and participation is the creation of several joint advisory committees, which will assist in monitoring impacts that may go beyond those initially anticipated. Four committees are envisioned at present: an employment and jobs training

committee; a business opportunities committee; a culture and education committee; and a joint implementation committee. All groups affected by the project will be represented on each committee as appropriate to ensure their needs and concerns are addressed. As such, the composition and purpose of each committee will vary depending on each group's needs, the degree to which each group is affected and the willingness of each group to assume responsibility for the committee's effectiveness.

Each committee will be responsible for setting up its own procedures, standards of review and monitoring approaches and timetables for meeting. As currently foreseen, the purpose and activities of each committee may be as follows:

- *Employment and Training Committee (ETC)* – to assist the Proponent in defining the parameters of preferential hiring, job upgrading and apprenticeship. The ETC will meet as often as necessary and be responsible for monitoring the training and employment policies. The committee will also review and evaluate BHP's progress in career development, employee turnover, cross-cultural education, innovative employment practices and available government programs. The ETC will submit periodic reports on the status of its progress. An Aboriginal employment coordinator will be hired to assist in the employment programs, facilitate communication and help in monitoring procedures.

- *Business Opportunities Committee (BOC)* – to assist the Proponent in its evaluation of potential business needs and Aboriginal participation therein. The BOC will meet as often as necessary and will identify opportunities to supply goods and services to the project. The committee will monitor these opportunities and ensure they are made available to Aboriginal peoples and their businesses. The BOC will review and analyze BHP's requirements for goods and services for the development and operation of the mine, and will review awarded contracts with local businesses to help them improve their future methods of bidding. Periodic reports will be submitted.

- *Culture and Education Committee (CEC)* – to assist the Proponent in the administration of educational grants provided by BHP/Dia Met and to ensure that traditional knowledge and culture are treated with dignity and respect. The CEC will review and monitor the qualifications for scholarships and criteria and recruitment procedures, and will report annually on the number, type and amount of scholarships. The committee will ensure that traditional knowledge and values are factors in selecting the potential candidates. Where cross-cultural sensitivity training is required or guidance is needed by the Operator, the committee will provide the necessary information. Heritage sites and preservation will also be monitored by this committee.

- *Joint Implementation Committee (JIC)* – to assist the Proponent in ensuring that all the programs are being implemented and provide for dispute resolution and non-compliance difficulties. The JIC will clarify areas of responsibility of all the committees, review submitted reports, monitor the implementation of all the programs contemplated in the Benefits Agreement and integrate the monitoring results. The committee will meet regularly and will supervise the preparation and implementation of a program of consultation and communication with the indigenous peoples on an ongoing basis to ascertain current concerns. The JIC will also determine the means of assessing the effectiveness of the monitoring procedures implemented by all the committees.

Other programs to be implemented under a Benefits Agreement might include drug and alcohol rehabilitation programs, money management, reasonable and safe use of the mine airstrip and roads, and traditional environmental rehabilitation.