Attachment 1

Environmental, Socio-Economic and Heritage Resources Overview for the 2005 Winter Field Geotechnical Investigation Program

Inuvialuit Settlement Region

1.0 ENVIRONMENTAL, SOCIO-ECONOMIC AND HERITAGE RESOURCES OVERVIEW

1.1 Environmental Overview

This environmental setting describes generally the biophysical conditions at the locations of the borrow source and facility sites planned for the Program in the ISR. Climate, physiography and soils, permafrost, vegetation, wildlife, hydrology fish and fish habitat are addressed.

The sites are situated in the Tuktoyaktuk Coastal Plain Ecoregion of the Southern Arctic Ecozone (Ecological Stratification Working Group 1995). This zone includes the outer Mackenzie Delta area and adjacent mainland from the Beaufort Sea south to the Inuvik area.

1.1.1 Climate

The area of the Program is classified as a high subarctic ecoclimate and is marked by very cold winters and cool summers. Mean temperatures range from -27.6°C in January to 14.2°C in July. The mean annual precipitation is 249 mm (Environment Canada 2002). Average daily temperatures during the proposed activity period (January to March) historically range from -31.9°C to -17°C. The mean precipitation for the proposed activity period is 36.4 mm.

1.1.2 Physiography and Soils

The topography in the Tuktoyaktuk Coastal Plain Ecoregion is generally level, with elevations ranging from sea level in the delta to 150 metres above sea level toward Parsons Lake.

The area south and west of Big Lake is characterized by wetlands, lakes, active alluvial channels and estuarine deposits. The surficial geology within this area comprises recent level alluvial deposits from the Mackenzie Delta area with much of the elevation being less than 15 metres. Much of the surface sediments are expected to be silty sand and fine to medium-grained sand deposited by the Mackenzie River, with some silt sediments deposited during storm tides near the Beaufort Sea. These areas are low-lying, very poorly drained and subject to flooding near the arms of the Mackenzie River. Thermokarst ponds and lakes show signs of active thawing and numerous retrogressive flow slides contribute to the expansion of the lakes. Ice wedges are well represented and appear as part of low or high centred polygonal peatlands. Massive ice bodies are also present in pingos.

West of the East Channel, the mainland topography is rolling and consists of morainal deposits overlying older fluvial and deltaic sandy sediments. East of the East Channel, the topography is hummocky to rolling with elevations up to 150 metres above sea level near the Parsons Lake lease. Surficial sediments consist predominantly of hummocky glacial till. The till is fine-grained, poorly drained and ice-rich. Thermokarst lakes and ponds cover up to 32% of the land surface. Glaciofluvial sand and gravel deposits contain less ice. The North Caribou Hills, west of Parsons Lake, have a veneer of till or colluvium over the poorly lithified bedrock.

Organic and Turbic Cryosols are the dominant soils in the ecoregion with Regosol static Cryosols predominating in the active delta portion of the Program area.

1.1.3 Permafrost

Historically, both the outer Mackenzie Delta area and mainland portions of the proposed investigation area are within the zone of continuous permafrost (>90% permafrost soils), containing a high ice content in the form of ground ice, ice layers, ice wedges and pingos (Ecological Stratification Working Group 1995). Recent reclassifications (Heginbottom 1998) describe the outer delta area (Niglintgak, Taglu and portions of Richards Island near to the seacoast) as being discontinuous permafrost (with only 35-65% permafrost beneath land areas). Permafrost thickness of more than 600 metres has been documented under Richards Island and of more than 400 metres near Inuvik. However, in the Mackenzie Delta area, permafrost thickness is significantly less, generally between 74 metres and 90 metres, where present.

The depth of the active layer generally ranges from 30-100 cm but is largely a function of ground surface insulation and thermal conditions (vegetation cover, aspect, level of ground disturbance and winter snow cover). In some cases, deeper unfrozen zones called taliks exist (unfrozen zones adjacent to or beneath water bodies), in the order of tens of metres thick, below or near large lakes and rivers. In the delta area, the presence and extent of the taliks is related primarily to the age, size and depth of the lake or river channel. The presence of the unfrozen zones under lakes and the Mackenzie River arms may affect the potential for frost heave, water table changes and groundwater flow conditions.

Low ice content is expected in well-drained, coarse-grained sediments that are often clast supported, and above the local groundwater table, such as gravel and gravelly sand in glacial deposits such as eskers. Ice-rich permafrost is more commonly associated with sand and gravel below the local water table (alluvial sand and gravel in the delta areas), silt clay and fine sand deposits, such as fine-textured moraine, glaciolacustrine and lacustrine sediments as well as organic soils. The ice content may be very high if the deposits are located in poorly drained areas. Ice veins, lenses and massive ground ice are common.

1.1.4 Vegetation

The Program takes place within the Tundra Ecological Zone, which stretches from the Arctic coastline in the Mackenzie Delta area, south to Inuvik and the boundary between the Inuvialuit Settlement Region and the Gwich'in Settlement area. Topography is fairly level, rising from sea level in the delta to 150 m in elevation near Parsons Lake. Vegetation grows on a veneer of unfrozen organic or granular substrate overlying the permafrost boundary. In wetter areas, sedges, cotton-grasses and sphagnum moss dominate high-centred and low-centred polygons. Drier areas support ericaceous shrubs. Riparian communities include wet sedge communities and taller shrubs. Holmes Creek and Hans Creek support outliers of black spruce. On the floodplain of the Mackenzie River, shrub communities and wet sedge – cotton-grass meadows predominate.

Borrow sources or gravel deposits tend to be terrain features such as eskers, kames, outwash, gravel till deposits and fluvial gravel-dominated sediments. These represent a small portion of the overall landscape. They exhibit different permafrost dynamics; the well-drained and dry areas of eskers have a deeper active layer over the permafrost than their surroundings and recent fluvial deposits can still be saturated and affected by flowing water. Till deposited gravel, usually present on eroded morainal hills, can also be well-drained. The vegetation cover includes ground birch, locoweed species, red bearberry, black crowberry, bog bilberry, mountain cranberry and willow species. The indicator species for this vegetation type are alpine holy grass and prickly saxifrage. Hair-cap moss is the most common bryophyte, and *Cetraria*, *Alectoria* and *Cladina* are frequent lichens. Other plants frequently found, but with low cover values are Yukon stitchwort – a rare species, blunt sedge, prostrate willow, and *Cladonia*, *Thamnolia* and *Stereocaulon* lichens.

1.1.5 Uncommon Vegetation Communities

Uncommon vegetation communities are usually smaller in area than vegetation type map units. They are often too small to accurately quantify their extent on the landscape. Uncommon communities were identified as point locations and described during reconnaissance surveys for rare plants. Uncommon vegetation communities of concern were identified in each ecological zone using five criteria:

- small area
- slow recovery time
- large number of plant species unique to the plant community
- rare plant species associated with the plant community
- potential for disproportionate project effects relative to the vegetation's extent on the landscape

Uncommon communities of concern were defined by a combination of small area, slow recovery time and at least one of the last three criteria.

1.1.6 Rare Plants

Rare plants are species that occur in a limited area or in low numbers in a geographic region, or globally. Rare plants contribute to species diversity of an ecosystem. Plant species might be rare because:

- they are at the edge of their range
- they occur only on uncommon soils or terrain conditions
- they are controlled by insects or disease
- of historical site development factors that are not understood

Many rare plants reflect the presence of rare habitats (Kershaw et al. 2001; Lancaster 2000; Talbot et al. 1999). Occurrences of rare plants are difficult to predict.

Rare plants are particularly vulnerable to disturbance because of their limited extent. They are best protected through conservation of their habitat. Direct impacts on rare plants or their habitat might occur during project construction. Changes in biotic factors such as the introduction of aggressive non-native species, and changes in abiotic factors such as thaw settlement, alteration of drainage patterns, air emissions or inputs of dust, can directly and indirectly contribute to species rarity by altering the current habitat (Kershaw et al. 2001).

Rare plant reconnaissance surveys were conducted in the ISR druing July and 2002, 2003 and 2004. This time frame coincides with the season in which most plant species would be in the flowering or reproductive stages of development and are selected to allow for accuracy in species identification. Within the ISR, 132 sites were surveyed for rare plant species. The goal of the rare plant reconnaissance survey was to achieve broad coverage of the variety of habitats present within each ecological zone.

Based on geographic distribution, four rarity types can be distinguished:

- peripheral – species at the edge of their range in the territory but widespread, with secure populations in other regions
- disjunct – species common elsewhere but with an isolated population more than 500 km from the main population
- widespread and rare – species with low numbers of widely scattered populations
- endemic – species with restricted geographic ranges

Widespread and rare, and endemic species are the two categories of most concern for conservation. Peripheral species are the least concern for conservation, though they are often genetically different from plants at the centre of their range.

Peripheral populations can be important in adapting to change (Kershaw et al. 2001). Most of the rare vascular plants in the Northwest Territories are in the peripheral category.

With the exception of Nunavut and the Northwest Territories, all territories, provinces, regions and states in North America have conservation data centres for storing and managing data on biodiversity elements of special concern within their boundaries. Information on rare plants, native biodiversity and elements of special concern is collected, evaluated and made available by conservation data centres. The list, and ranking, of rare species in the database changes as new information becomes available or as the status of a population changes.

Five rare plant species were found:

- Alternate-flowered water milfoil (*Myriophyllum alterniflorum*)
- Chamisso's willow (*Salix chamissionis*)
- Arctic seashore willow (*Salix ovalifolia* Var. *arctolitoralis)*
- Wedgeleaf willow (*Salix sphenophylla*)
- Yukon stitchwort (*Minuartia yukonensis*)

Yukon stitchwort was found in 10 locations, whereas the others were each found only once. Table 1 presents the variety of habitats surveyed in 2002 and 2003 and the habitats where rare plants were found. Table 2 presents a summary of the status of rare plant species.

Table 1: Habitats Surveyed and Rare Plants Found – Inuvialuit Settlement Region

Vegetation Map Label	Vegetation Type, Plant Community or Terrain Feature	No. of Sites Surveyed	No. of Sites With Rare Plants	Rare Plant Species Confirmed
1	Dry saxifrage tundra	14	10	*Minuartia yukonensis* (10 sites)
2	Dwarf shrub heath	8	0	None
3	Upland shrub	5	0	None
4	Cotton-grass tussock	5	0	None
5	High-centred polygons	6	0	None
6	Low-centred polygons	6	0	None
7	Riparian shrub	23	0	None

Vegetation Map Label	Vegetation Type, Plant Community or Terrain Feature	No. of Sites Surveyed	No. of Sites With Rare Plants	Rare Plant Species Confirmed
8	Riparian sedge – cotton-grass	13	1	*Myriophyllum alterniflorum*
9	Delta shrub	3	1	*Salix ovalifolia* var. *arctolitoralis*
10	Delta sedge – cotton-grass	3	0	None
12	Delta low-centred polygons	2	1	*Salix sphenophylla*
13	Riparian black spruce/shrub	5	0	None
z24	Balsam poplar stand	1	0	None
z1	Snowmelt patches	3	1	*Salix chamissonis*
z3	Frost boils	3	0	None
z2	Pingos	4	0	None
z4	Exposed fluvial sediment	1	0	None
z6	Fluvial mid seral communities	1	0	None
z8	Beaches	6	0	None
z26	Eroding slopes	6	0	None
z19	Slumps	5	0	None
z21	Anthropogenic	2	0	None
Total		**236**	**14**	

Of the five observed rare plant species, Arctic seashore willow and Chamisso's willow are ranked *critically imperilled* (S1) for the Northwest Territories because of their extreme rarity. Arctic seashore willow is a nationally rare species that is endemic to Canada (McJannet et al. 1995). The other three species are *reported* (SR) in the Northwest Territories (NatureServe 2004).

Table 2: Status of Rare Plant Species Observed in the Inuvialuit Settlement Region

Species Latin Name	Common Name	Northwest Territories	Canada	Other Ranks
Minuartia yukonensis	Yukon stitchwort	SR	N2N4	British Columbia: S1S3 Global: G4
Myriophyllum alterniflorum	Alternate-flowered water milfoil	SR	N?	Saskatchewan: S1
Salix chamissionis	Chamisso's willow	S1	N2[1]	Yukon: S Alaska: S3S4
Salix ovalifolia var. artolitoralis	Arctic seashore willow	S1	N2[2]	Alaska: SR
Salix sphenopylla	Wedgeleaf willow	SR	NR	Alaska: SR
NOTES: [1] 'Nationally Rare' McJannet et al. (1995) [2] 'Endemic' to the Northwest Territories and 'Nationally Rare' McJannet et al. (1995) N? - unranked – global, national or sub-national [1] ranked not yet assessed.				
SOURCE: NatureServe (2004)				

Project activities are unlikely to affect rare species in this area of the NWT (S1 rank) since all occur on lowland or wetland sites and access will be primarily via existing winter roads and the Dempster Highway.

1.1.7 Birds and Wildlife

The Mackenzie Delta area provides important habitat for many different species of migratory birds. Numerous waterfowl and waterbirds use the delta annually for staging, nesting, breeding and moulting. Waterfowl and waterbirds include ducks, swans, geese, loons, cranes, shorebirds, seabirds and gulls. Many of the waterfowl species and some waterbirds are important food sources for local residents. Several species of raptor, passerine and ground-dwelling birds are also present in the area. Of the birds found in the Mackenzie Delta area, Eskimo curlew, short-eared owl, Ross' gull and two subspecies of peregrine falcon are considered to be at risk by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Since the vast majority of birds that are found in and around the Mackenzie Delta area are migratory, they are not expected to be present at the time of the Program activities.

Terrestrial mammals present in the area include a variety of ungulates, bears, and furbearers. These species include caribou, polar bear, barren-ground grizzly bear, black bear, moose, muskrat, beaver, fox (red and Arctic), wolf, marten, lynx, wolverine, snowshoe hare and several species of small rodents. Caribou and muskox may be found anywhere in the region, whereas most of the other species can be found in shrub and treed communities along channels in the Mackenzie Delta area and the riparian areas across the upland portion of the ISR. Polar bear are typically restricted to areas with sea ice. However, maternity dens and secondary winter habitat occur along the coastline of the Mackenzie Delta area, Richards Island and the Tuktoyaktuk Peninsula. The outer Mackenzie Delta area, particularly Richards Island, provides excellent habitat for Arctic fox.

Several of these species are economically important to the surrounding communities. Caribou are an important food source for all of the communities within the area, while smaller mammals such as marten, lynx and muskrat, are trapped for their fur. Grizzly bear and wolverine are currently the only terrestrial mammal species that are considered to be at risk by COSEWIC. However, information on some species, such as the grey wolf and polar bear, is insufficient to make an accurate determination.

Granular deposits in the ISR provide important habitat for wildlife throughout the year. The loose strata of gravel and sand provides prime denning sites for various animals. Other important denning habitats are southerly facing embankments above lakes and streams.

In addition to providing denning habitat, granular deposits act as transportation corridors in an otherwise wet or frozen landscape. They can also be important food sources, providing a profusion of berries and other edible plants in locations and at times of the year when other food sources are not available.

During the period of Program activities (January to mid-April), wildlife activities will be limited. Wildlife that may be present at this time includes non-migratory birds (such as ptarmigan), over-wintering caribou, arctic fox, some furbearers (such as lynx and wolverine) and denning grizzly or polar bears.

1.1.8 Aquatics

- *Hydrology*

The Mackenzie River generally exhibits a spring snowmelt-dominated, mean-monthly flow pattern classified as a subarctic, nival flow regime. The maximum mean monthly discharge occurs in the May to July period, mainly due to snowmelt.

In the open-water season, water in the Mackenzie River takes 15-20 days to flow from the outlet of Great Slave Lake to the Beaufort Sea, at an average flow rate ranging from 3.5-4.7 km/h.

Freeze-up progresses fairly regularly upstream from the mouth of the Mackenzie River to Great Slave Lake and appears to be more orderly than break-up. The Athabasca, Great Slave and Great Bear Lakes have important roles in the hydrologic system of the Mackenzie Basin. Lake storage is a main source of streamflow over the winter months and directly contributes to groundwater recharge.

The Middle Channel flows approximately 180-280 km north to large distributary channels around Ellice Island and west of Richards Island, before entering the Mackenzie Bay. In addition to the three main channels in the delta, there are numerous smaller channels. The sizes and shapes of the delta channels are proportional to the discharge carried. The Middle Channel carries the highest percentage of delta inflow, while the East Channel typically carries between 25-35% of the total. In contrast, the channel that extends northwest from Tununuk Point carries only about 1% of total delta inflow (HIMS 1999). Channels are fairly symmetrical in straight reaches and asymmetrical in bends.

Fish and Fish Habitat

Many fish species utilize the Mackenzie River and its tributaries to fulfill various life-cycle requirements (e.g., for migration, spawning, rearing, etc.). Fish species likely to be present in the Mackenzie Delta area (see Table 3) were identified using historical and technical references. Species listed in bold have been identified in the Inuvialuit Community Conservation Plans as species important to local communities for subsistence, spiritual and cultural values (The Community of Inuvik *et al* 2000; The Community of Tuktoyaktuk *et al* 2000).

Table 3: Fish Species Likely to be Present in the Mackenzie Delta Area

Family	Common Name	Scientific Name
Cyprinidae - Carps and Minnows	Flathead chub	*Platygobio gracilis* (Richardson)
	Lake chub	*Couesius plumbeus* (Agassiz)
Gadidae – Cods	**Burbot**	***Lota lota* (Linnaeus)**
	Saffron cod[(a)]	*Eleginus gracilis (Tilesius)*
Clupeidae – Herring	Pacific herring[(a)]	*Clupea harengus* (Linnaeus)
Petromyzontidae - Lampreys	Arctic lamprey[(b)]	*Lampetra japonica* (Martens)
Hiodontidae - Mooneyes	Goldeye	*Hiodon alosoides* (Rafinesque)
Percidae – Perches	Walleye	*Stizostedion vitreum* (Mitchill)
Esocidae – Pikes	**Northern pike**	***Esox lucius* (Linnaeus)**
Cottidae – Sculpins	Fourhorn sculpin[(a)]	*Myoxocephalus quadricornis* (Linnaeus)
	Slimy sculpin	*Cottus cognatus* (Richardons)
	Spoonhead sculpin	*Cottus ricei* (Nelson)
Osmeridae – Smelts	Pond smelt	*Hypomesus olidus* (Pallas)
	Rainbow smelt[(b)]	*Osmerus mordax* (Mitchill)
	Boreal smelt[(a,b)]	*Osmerus eperlanus* (Linnaeus)
Gasterosteidae - Sticklebacks	Brook stickleback	*Culaea inconstans* (Kirtland)
	Ninespine stickleback[(b)]	*Pungitius pungitius* (Linnaeus)
Catostomidae - Suckers	Longnose sucker	*Catostomus catostomus* (Forster)
Salmonidae - Trouts	Arctic cisco[(c)]	*Coregonus autumnalis* (Pallas)
	Arctic grayling	***Thymallus arcticus* (Pallas)**
	Broad whitefish[(b)]	***Coregonus nasus* (Pallas)**
	Chum salmon[(c)]	*Oncorhynchus keta* (Walbaum)
	Dolly Varden[(b)]	***Salvelinus malma* (Walbaum)**
	Inconnu[(c)]	***Stenodus leucichthys* (Güldenstadt)**
	Lake herring/Cisco	*Coregonus artedii* (Lesueur)
	Lake trout	***Salvelinus namaycush* (Walbaum)**
	Lake whitefish[(b)]	***Coregonus clupeaformis* (Mitchill)**
	Least cisco[(b)]	***Coregonus sardindla* (Valenciennes)**
	Round whitefish	*Prosopium cylindraceum* (Pallas)
Percopsidae - Trout-Perches	Trout-perch	*Percopsis omiscomaycus* (Walbaum)

Note: Species listed in bold have been identified in the Inuvik Inuvialuit Community Conservation Plan as species important to local communities for subsistence, spiritual and cultural values (The Community of Inuvik *et al.* 2000).
[(a)]Marine/brackish water species
[(b)]Anadromous and freshwater populations
[(c)]Anadromous species

Most fish species select shallow water habitats to spawn in spring or fall when water temperatures are relatively cool (Richardson et al. 2001). Therefore the channels of the Mackenzie River are unlikely to provide significant spawning habitat. However, the Mackenzie River provides important migration routes for many fish species, including seasonal migrations to spawning areas. The shoreline habitat of the Mackenzie River provides juvenile rearing and adult resting habitat, with the presence of slack water areas and cover components (e.g., shoreline vegetation). Due to the flow and depth, the channels of the Mackenzie River have been identified as an important overwintering area for least cisco, broad whitefish, burbot and longnose sucker.

Niglintgak Channel

Detailed assessments were conducted of the Niglintgak Channel of the Mackenzie River at two locations in July 2002. Similar habitat was present at the two sites and the surveys encompassed the proposed Program location. In this area, the Niglintgak Channel has near laminar flow and high channel uniformity. Wetted widths ranged from approximately 300-900 metres, with maximum depths ranging from 11-20 metres. The substrate was comprised entirely of silt. Cover for fish is provided primarily by depth/turbulence (including turbidity). Banks were vegetated with sedges (0-3 metres from the shoreline), and were stable for the majority of the reach. The riparian vegetation (3-25 metres from bank) is open tundra.

Summer sampling at these sites captured inconnu, northern pike, longnose sucker and trout-perch. The channel is considered to provide good habitat for rearing, feeding/holding, and overwintering habitat due to the slow-moving run habitat, but is unlikely to provide suitable spawning habitat for sport fish species due to the silt substrate. Water temperature during summer sampling was ~17°C, with dissolved oxygen concentrations being suitable for fish (7.7-8.6 mg/L).

Harry Channel

A detailed assessment of Harry Channel was conducted on July 28, 2002. In this area, the channel has near laminar flow and high channel uniformity. Bankfull widths were approximately 130-175 metres, with corresponding wetted widths from 120-170 metres. Maximum depth was approximately 6.5 metres. Substrate was comprised entirely of silt. Cover for fish is provided primarily by depth/turbulence (including turbidity). Banks were partially to fully vegetate with grasses (0-3 metres from the shoreline), with some instability observed throughout the reach. Riparian vegetation (3-25 metres from bank) is open tundra, with bare areas present.

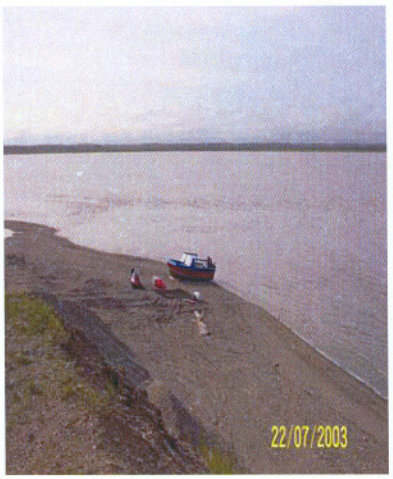
Summer sampling at this site captured inconnu. Harry Channel is considered to provide good habitat for rearing, feeding/holding, and overwintering habitat due to the slow-moving run habitat, but is unlikely to provide suitable spawning habitat for sportfish species due to the silt substrate. Water temperature during summer sampling was ~14°C, with dissolved oxygen concentrations being suitable for fish (~9.0 mg/L). Turbidity was quite high at 250 NTU.

Harry Channel Looking North

East Channel

A detailed assessment of the East Channel of the Mackenzie River was conducted on July 30, 2002, next to Holmes Creek and Swimming Point Camp, at the approximate location of the East Channel B Program location. In this area, the East Channel has near laminar flow and high channel uniformity. The wetted width was approximately 920 metres, with maximum depths ranging from 12-22 metres within this reach. Substrate was comprised entirely of silt. Cover for fish is provided primarily by depth/turbulence (including turbidity). Banks were partially vegetated with some instability observed throughout the reach. Shoreline vegetation (0-3 metres from the shoreline) was composed of shrubs/grasses on the left downstream bank, but was generally bare on the right downstream bank. Riparian vegetation (3-25 metres from bank) is open tundra.

No fish were captured in a short-set (~3 hours) gill net at this site. However, the East Channel is considered to provide good habitat for rearing, feeding/holding, and overwintering habitat due to the slow-moving run habitat, but is unlikely to provide suitable spawning habitat for sportfish species due to the silt substrate. Water temperature during summer sampling was 12 to 16°C, with dissolved oxygen concentrations being suitable for fish (9.1 to 9.6 mg/L). Turbidity was quite high at 284 NTU.



Looking downstream from Swimming Point

Looking upstream from Swimming Point

Water Quality

Waters in the Mackenzie drainage basin flow through varied lithology and receive drainage waters from subdrainage basins (e.g., Mackenzie, Athabasca, Peace, Liard, Hay, Great Bear and Great Slave river basins) in the Western Cordillera and the Precambrian Shield. The waters of the Mackenzie River sub-basin typically have higher levels of turbidity and moderately low total dissolved solids (TDS) concentrations and conductivity. These parameters are influenced by the discharge regime. For example, values of turbidity and colour are low over the winter, highly variable in spring and peak over the summer. Conversely, conductivity and TDS levels are highest in the winter and decline in the open water period. Concentrations of metals in the Mackenzie River Basin are mainly associated with suspended sediments so that levels of metals show seasonal variations in response to discharge and suspended sediment regimes. Water quality parameters for the middle channel of the Mackenzie River are summarized in Table 4. Water quality for other delta channels is expected to be similar. The channels and lakes of the delta are well supplied with nutrients; however, the productivity of these waterbodies appears to be controlled by turbidity, substrate stability, abrasion and climate, rather than by nutrients (Brunskill et al. 1973).

Table 4: Summary of Mackenzie River Middle Channel Water Quality

Parameter	Units	Value
Field Measured		
pH		7.85-8.2[a,b]
Specific Conductance	µS/cm	279-298[b]
Temperature	°C	0-1[c]
Dissolved Oxygen	mg/L	10.2-13[c]
Conventional Parameters		
Total Alkalinity	mg/L	98-125[a,b]
Total Organic Carbon	mg/L	6-16[a,b]
Total Suspended Solids	mg/L	1.6-4.4[b]
Major Ions		
Bicarbonate	mg/L	109-130[c]
Calcium	mg/L	26-42[c]
Chloride	mg/L	12-19[c]
Magnesium	mg/L	7-20[c]
Potassium	mg/L	7-12[c]
Sodium	mg/L	7-12[c]
Sulphate	mg/L	29-35[c]

[a] Based on information collected for the period of January to April 1974 (F.F. Slaney 1974a).
[b] Based on information collected August 20, 1973 (F.F. Slaney 1974b).
[c] Based on information collected April 1973 (McCart *et al.* 1974).

1.2 Heritage Resources Overview

Within the ISR, a total of six (6) sites will be investigated as part of the Program. Activities at each of these sites are limited to drilling/excavating a specific number of boreholes/test pits. Each borehole will require a maximum disturbed area of 10 metres x 10 metres (0.01 ha) to permit safe drilling operations. It is proposed to excavate test pits at four (4) of the sites and each test pit location will require a maximum disturbed area of 25 metres x 25 metres (0.06 ha). This includes 5 metres x 5 metres for the actual test pit where the surface vegetation and overburden will be removed, and a peripheral area to provide temporary storage for the excavated materials. All of this work will be completed under frozen, winter conditions.

The archaeological assessment of the Program involved a number of activities, which are documented in the attached Heritage Resources Protection Plan (see Attachment 3). Each of the sites was investigated on the ground during the summer of 2004 and based on these surveys; the archaeological potential of each proposed geotechnical investigation site for the Program has been determined. This information, as well as any heritage resource concerns, is provided in Table 5.

Table 5: Heritage Resource Potential at the Program Locations

Site ID	Activity	Heritage Resource Potential	Heritage Resource Concerns
1.002	Borrow Site	Moderate	No known concerns
1.004	Borrow Site	Moderate	No known concerns
Storm Hills Pigging Facility	Facility	Limited	No known concerns
2.029PB	Borrow Site	Moderate to High	No known concerns
2.029P	Borrow Site	Moderate to High	No known concerns
2.038P	Borrow Site	Limited	No known concerns

1.3 Socio-Economic Overview

The ISR includes the communities of Tuktoyaktuk, Aklavik, Sachs Harbour, Holman and Paulatuk within its boundaries. The population within the ISR totals approximately 2,700 people and, with the exception of Aklavik, the population in the communities is almost entirely Inuvialuit. Although Inuvik is not within the boundaries of the ISR, a number of Inuvialuit businesses and administrative bodies are located there, along with federal and territorial government offices.

It is anticipated that the Program will require a crew of up to 45 people. The 45-person crew will include heavy equipment operators involved in the construction of access, site clearing and pit excavation, land and geophysical surveyors, borehole drilling operators and helpers, environmental inspectors, safety advisors, local environmental and wildlife monitors and the camp and catering staff. In addition, there will be a field office in Inuvik with an estimated staff of 3-4 people. The number of local people to be hired for the Program will depend on the contractors, subcontractors or business entities awarded the contract work and the capabilities of their labour force. The contracts have not yet been awarded.

The Program will generate seven separate contracts with a potential estimated total value in excess of $3 million. The Program and associated activities is proposed to occur over a 50 to 70 day period from January to mid-April in 2005. The work schedule will likely be 12-hour workdays, 7 days per week throughout this period. Workers will probably be on a 21-day-in and 7-day-out work rotation schedule. The final work schedule will be determined following award of contracts.

2.0 PROPOSED MITIGATION AND ANTICIPATED ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACTS

2.1 Environmental Impacts and Mitigation

This section outlines potential environmental impacts that may arise due to the Program, as well as proposed mitigation to prevent or minimize these impacts. These are provided in Table 6. These mitigation measures are also included in the Environmental Protection Plan (see Attachment 1) that has been written for the Program.

Table 6: Potential Environmental Impacts and Proposed Mitigation

Potential Impact	Mitigation
Physiography and Soils	
Clearing and use of tracked vehicles: • Possible disruption of ground cover vegetation could trigger long-term permafrost degradation; surface subsidence and sediment transfer into streams or ponds.	• Hand clear minimum amounts of vegetation without disturbing ground cover vegetation to reduce potential permafrost degradation. • Activities will be carried out only when the ground is frozen to minimize surface disturbance. • A minimum of 0.15 m of snow and or ice cover is required to protect the ground surface.
Clearing and other activities on steep slopes: • Possible disturbance of ice-rich sediments on steep slopes could trigger erosion, unstable slopes and increased sediment load in streams. • Soil contamination by fluids/fuel/waste	• Access on steep slopes will be avoided. • Sites will be hand cleared if required. The vegetation mat will not be disturbed. • Safe handling and disposal of waste from drill rigs will be used to avoid soil contamination. • An emergency spill contingency plan will be in place to respond to any fuel leaks/ losses to the surface.
Excavation at granular site test pits: • Disturbance of ground cover vegetation and preservation of permafrost in areas surrounding granular sites	• Surface material will be salvaged and replaced following completion of excavation at the site.

Vegetation	
Potential Impact	**Mitigation**
• Loss of rare or uncommon vegetation	• Avoid known rare plant sites (S1 rank) by restricting disturbance within a 30 m radius around each of the locations • Minimize clearing of shrubs and ground cover vegetation on existing cutlines or new access.
• Damage to surface vegetation and exposing of organic soils	• Activities will be carried out only when the ground is frozen to help minimize surface disturbance. • A minimum of 0.15 m of snow and or ice cover is required to protect the ground surface.
Wildlife	
• Disruption of active den sites of grizzly bear, fox and wolverine	• Potential denning habitat will be identified prior to the initiation of activities at each site. If identified, the site will be avoided.
• Disturbance of sensitive lichen communities, which are critical winter feeding areas for caribou.	• Areas showing evidence of frequent caribou activity will be avoided, if possible.
• Disturbance of important wildlife habitat during access construction	• New clearing will be minimized by using existing cutlines and cleared areas to the greatest extent possible.
Aquatic Resources	
• Increased total suspended sediment concentrations during boring	• Casing and/or hollow stem augers will be used to prevent cuttings and fluids from entering the water column. • No cuttings or debris will be left on the ice.

• Disturbance of overwintering fish	• Casing and/or hollow stem augers will be used to prevent fluids and cuttings from entering the watercourse.
• Introduction of deleterious substances to watercourse	• Casing and/or hollow stem augers will be used to prevent fluids and cuttings from entering the water column when boring into the riverbed. • Appropriate measures will be taken during refueling operations, *i.e.* refueling 100 m back from watercourses, use of refueling mats and carrying a spill kit with all equipment and the fuel truck at all times. • A spill contingency plan will be in place for the Program. • Ice thickness and strength will be checked at watercourse crossings to ensure it is appropriate for machinery; if any equipment falls through the ice, it will be removed as quickly as possible. • Only ice and snow will be used to construct ice bridges; the use of debris will not be allowed.
• Damage to riparian vegetation, bank stability	• Existing access will be used wherever possible. • Gently sloping banks will be used for access; approaches of snow and ice will be of sufficient thickness to protect riverbanks; and banks will not be cut to improve access. • Removal of riparian vegetation will be minimized.
• The potential for silt-laden surface runoff as a result of surficial disturbance.	• Erosion control measures will be implemented where there is a risk of silt entering a waterbody.
Heritage Resources	
• Disturbance of heritage resources	• Should unexpected heritage resources be encountered during activities, all work in the immediate area will cease until an archaeologist is able to examine the find and develop an appropriate site management plan.

2.2 Heritage Resource Impacts

There are no known heritage resource sites within two kilometres of any of the investigation sites in the Program. Heritage resource surveys were undertaken at each site by a licensed archaeologist during the summer of 2004. Prior to the commencement of the Program, the Prince of Wales Northern Heritage Centre will be consulted to identify if any additional locations of known heritage resources are in the vicinity of proposed activities.

In addition, consistent with the intent of the *Northwest Territories Act* and the *Archaeological Sites Regulations*, should unexpected heritage resources be encountered during activities, all work in the immediate area will cease until an archaeologist is able to examine the find and develop an appropriate site management plan. These and other mitigation measures to protect heritage resources are contained in the attached Heritage Resources Protection Plan (see Attachment 3).

2.3 Socio-Economic Impacts

In terms of Program-related economic effects, it is estimated that in excess of $3 million in subcontracts will be awarded for the Program in the ISR. It is anticipated most of the successful subcontractors will make Program-related purchases in the region (fuel and lubricants, vehicle rentals, food, beverage, toiletries and cleaning supplies). These purchases would benefit a number of other local businesses. Although the increased revenues and employment generated would be modest and temporary, it should stimulate further rounds of spending in local communities.

Modest and temporary increase in consumer business revenues would be generated through the spending of disposable income by the workers hired from within the ISR. If these people were unemployed or underemployed prior to their involvement in the Program, the earned income could improve the quality of life of the worker and their families over the short-term.

Work-imposed isolation of northern workers from their families could temporarily detract from family relationships and parenting responsibilities. However, with communications that will be available at the Swimming Point Camp and the proposed worker rotation schedule, the adverse effects should be minimal.

An undetermined number of the Program borehole and test pit excavation sites may be located within designated trapping areas and the work will be scheduled during the winter trapping season. As a result, there is potential for adverse effects on the resource harvesters in the form of temporary dispersion of furbearers, reduced trapping revenues and inadvertent destruction or loss of traps and other equipment. These potential impacts need to be examined further during the consultation and land use permitting process. Communications with the Hunters and Trappers Committees and the affected hunters and trappers will help to minimize or eliminate potential adverse effects.

3.0 CUMULATIVE EFFECTS

Cumulative effects can be described as those changes to the environment that are caused by an action in combination with other past, present and future human actions. The effect of a project on the environment may not be fully reflected by the individual project activities and their interaction with environmental and socio-economic components. In many cases, individual projects and/or project activities produce environmental and socio-economic effects that are not significant. However, when combined with the effects of other project activities or other unrelated projects and activities, these insignificant effects may become important. The basis for considering which cumulative environmental and socio-economic affects that undergo examination are provided in the Responsible Authority's Guide (Canadian Environmental Assessment Agency, 1994). For the Program, the term "cumulative environmental and socio-economic effect" used in this Application is defined as:

The effect on the environment, which results from the effects of project activities when combined with those of other past, existing, and likely future projects and activities.

The assessment of cumulative effects is based on previous cumulative effects assessment experience, and knowledge of recent similar projects. The objective of the cumulative effects assessment is to consider the nature of potential cumulative effects resulting from the relationship between project-related effects and those of other activities, including general land uses, and identified past, present, and future projects. Economic issue. Assessment focuses on the extent to which the footprint of the project will add to past/existing and projected future disturbance in the project area and the acceptability of that level of cumulative effect. The assessment is not extended to the larger regional study area because the incremental disturbance to that area would be proportionately smaller.

Based on recent discussions with the Inuvialuit Environmental Impact Screening Committee (EISC), as of the time of filing there are no industrial activities or development applications approved on the EISC public registry within the eastern Mackenzie Delta area. However, an application has recently been filed with the EISC for a Winter 2005 Geotechnical Field Program at the Taglu Field Development site. There is also the potential for additional projects to be filed with the EISC later this summer for screening in September and October 2004. The primary project-specific effects that could potentially occur as a result of the proposed Program are:

- environmental impacts as a result of Program activities;
- sensory disturbance to wildlife from aircraft and human activity on the ground; and
- intrusion on important cultural or spiritual sites.

While there is small potential for wildlife mortality resulting from human protection from problem animals, training of all staff and operational procedures will be used to minimize this potential.

Interactions with potential projects and activities could result in cumulative effects such as:

- increased sensory disturbance of wildlife within the Program area due to aircraft overflights and landings, human activities on the ground (e.g., vehicles, camps), seismic and drilling activity and other activities. This could result in energetic stress to wildlife, displacement or, in a worst case, seasonal abandonment of habitat;

- interference with traditional activities as a result of aircraft overflights and human activities on the ground; and

- intrusion on important cultural or spiritual sites as a result of aircraft overflights and human activities.

To minimize the potential for these cumulative effects to occur, the following measures will be employed

- *Use of Appropriate Mitigation Measures and Procedures:* An Environmental Protection Plan (Attachment 1) has been developed that provides mitigation measures to minimize and prevent adverse environmental impacts during all stages of the Program. The Environmental Protection Plan will be applied throughout the Program and has been included in the mitigation measures section of this document.

- *Scheduling of Activities:* The schedule for the Program will be designed to minimize impacts to other industrial activities and investigations in the region. This will include programs for which details are not currently available (e.g., applications for research programs or industry projects which have been submitted for the upcoming meeting of the Environmental Impact Screening Committee).

- *Avoidance of Traditional Harvesting, Cultural and Spiritual Areas:* Prior to the start of the Program, the Inuvik, Aklavik and Tuktoyaktuk Hunters and Trappers Committees will be contacted to reconfirm whether any harvesting activities are ongoing or will be started within the area during the proposed investigation period. Locations of sensitive cultural and spiritual sites will also be confirmed. Methods to avoid these areas (e.g., avoidance of specific sites or portions of specific sites) will be discussed with the Hunters and Trappers Committees.

With these measures in place, and due to the short duration of the proposed Program, it is predicted that any disturbance effects caused to wildlife or traditional users will be short-term (i.e., hours to several days within any specific geographic region of the investigation area) and localized to the vicinity of the investigations. Avoidance of important harvesting areas and cultural sites by changes in the Program will minimize effects on traditional activities and cultural sites. As a result, no significant cumulative effects are anticipated.

4.0 EMERGENCY RESPONSE PLANS

Please refer to Emergency Response Plan (Attachment 2).

5.0 CLEANUP, RECLAMATION, DISPOSAL, AND/OR DECOMMISSIONING PLAN

Please refer to Environmental Protection Plan (Attachment 1).

6.0 OTHER ENVIRONMENTAL ASSESSMENT

There is no other environmental assessment.

7.0 LITERATURE CITED

Argus, G.W. 2001. A guide to the identification of willows in Alaska, the Yukon Territory and adjacent regions.

Brunskill, G.J., D.M. Rosenberg, N.B. Snow and R. Wagemann. 1973. Ecological studies of aquatic systems in the Mackenzie-Porcupine drainages in relation to proposed pipeline and highways developments. Vol. 2. Environment Canada Fisheries Research Board Freshwater Institute and the Environmental-Social Program. Northern Pipelines.

Cody, W.J. 1996. Additions and range extensions to the vascular plant flora of the Northwest Territories, Canada. Canadian Field-Naturalist 110(2): 260-270.

Cody, W.J. 2000. Flora of the Yukon Territory: second edition. National Research Council of Canada. NRC Research Council. Ottawa, ON.

Community of Aklavik, The, the Wildlife Management Advisory Council (NWT) and the Joint Secretariat. 2000. Aklavik Inuvialuit Community Conservation plan: A plan for the conservation and management of renewable resources and lands within the Inuvialuit Settlement Region in the vicinity of Aklavik, Northwest Territories.

Community of Inuvik, The, the Wildlife Management Advisory Council (NWT) and the Joint Secretariat. 2000. Inuvik Inuvialuit Community Conservation plan: A plan to provide guidance regarding the conservation and management of renewable resources and lands within the Inuvialuit Settlement Region in the vicinity of Inuvik, Northwest Territories.

Community of Tuktoyaktuk, The, the Wildlife Management Advisory Council (NWT) and the Joint Secretariat. 2000. Tuktoyaktuk Inuvialuit Community Conservation plan: A plan for the conservation and management of renewable resources and lands within the Inuvialuit Settlement Region in the vicinity of Tuktoyaktuk, Northwest Territories.

Environment Canada. 2002. Canadian Climate Normals 1931-2000 for Inuvik A, Northwest Territories. Website: www.msc-smc.ec.gc.ca/climate

F.F. Slaney & Company Ltd. 1974a. Environmental Program, Mackenzie Delta, N.W.T. Vol. 3-Environmental Quality.

F.F. Slaney and Company Ltd. 1974b. Base data volume 3: fish study 1932-33 Mackenzie Highway Mile 300 to 550. Part 2. Prepared by Department of Public Works, Edmonton, Canada.

Government of the Northwest Territories (GNWT). 2000a. NWT Species Infobase. Department of Resources, Wildlife and Economic Development, Government of the Northwest Territories, Yellowknife, NT (Summary of Plant section - accessed 15 June 2001). Available at: http://www.nwtwildlife.rwed.gov.nt.ca/

Government of the Northwest Territories (GNWT). 2000b. NWT Species 2000. General status ranks of wild species in the Northwest Territories. Accessed May, 2002. Available at: http://www.nwtwildlife.rwed.gov.nt.ca/

Haber, E. 1986. Flora of the Circumpolar Arctic. In B Sage (ed.). The Arctic and Its Wildlife. Croom Helm Ltd. Beckenham, England.

Heginbottom, J.A., 1998. Permafrost distribution and ground ice in surficial materials. In the Physical Environment of the Mackenzie Valley: a baseline for the assessment of environmental change. Geological Survey of Canada, (eds.) L.D. Dyke and G.R. Brooks. (HIMS) Mackenzie River Hydrologic Information Map Series. 1999. Water Resource Division DIAND, Yellowknife, NWT. March 1999.

Kershaw, L., J. Gould, D. Johnson and J. Lancaster. 2001. Rare Vascular Plants of Alberta. University of Alberta Press, Edmonton and Natural Resources Canada, Canadian Forest Service, Northern Forestry Centre. Edmonton, AB.

Lancaster, J. (ed.). 2000. Guidelines for Rare Plant Surveys. Alberta Native Plant Council. Edmonton, Alberta.

McCart, P., W. Griffiths, C. Gossen, H. Bain and D. Tripp. 1974. Catalogue of Lakes and Streams in Canada Along Routes of the Proposed Arctic Gas Pipeline from the Alaskan/Canadian Border to the 60th Parallel. Biological Report Series, Vol. 16.

McJannet, C.L., G.W. Argus, W.J. Cody. 1995. Rare Vascular Plants in the Northwest Territories. Canadian Museum of Nature. Syllogeus 33.

Nature Serve 2004, Http://www.Natureserve.org/get Data/plantData.jsp

Porsild, A.E. and W.J Cody. 1980. Vascular Plants of Continental Northwest Territories, Canada. National Museums of Canada. Ottawa, ON.

Richardson, E.S., J.D. Reist and C.K. Minns. 2001. Life history characteristics of freshwater fishes occurring in the Northwest Territories and Nunavut, with major emphasis on lake habitat requirements. Can. Man. Rep. Fish. and Aquat. Sci. 2569.

Talbot, S.S., D.F. Yurtsev, D.F. Murray, G.W. Argus, C. Bay and A. Elvebakk. 1999. Atlas of Rare Endemic Plants of the Arctic. Conservation of Arctic Flora and Fauna (CAFF) Technical Report No. 3 U.S. Fish and Wildlife Service, Anchorage, AK.

Attachment 2

Environmental Protection Plan for the 2005 Winter Field Geotechnical Investigation Program

Inuvialuit Settlement Region

TABLE OF CONTENTS

1.0 INTRODUCTION

This Environmental Protection Plan (EPP) describes the environmental protection measures to be used during the Winter 2005 Field Geotechnical Investigation Program (the Program) to be conducted by ColtKBR in the Inuvialuit Settlement Region (ISR). The protection measures provided in the EPP shall minimize the potential environmental impacts that have been identified. The ColtKBR Field Superintendent, ColtKBR Environmental Coordinator and Environmental Inspection staff including local Environmental Monitors and Wildlife Monitors assigned to each construction section shall be responsible for ensuring the protection measures described in the EPP are adhered to during the Program.

Information contained in this EPP will:

1. Summarize environmental protection measures related to Program activities that shall minimize environmental impacts;

2. Provide ColtKBR construction personnel and contractors with guidelines for carrying out Program activities in such a manner as to minimize environmental effects;

3. Form part of the contract documents to be used as the principal guidelines for specific environmental protection measures contained in Program contract documents; and

4. Be used to supplement existing information and documentation for contractor orientations and ColtKBR staff training.

2.0 ENVIRONMENTAL PROTECTION MEASURES

2.1 Pre-Job Preparation

Objective:

To ensure that all construction personnel are fully briefed on the scope of work, that all permits are in place and that the construction personnel, regulators and Imperial Oil Resources Ventures Limited (Imperial) representatives are given an opportunity to interact and discuss the Program prior to commencing the Program.

EPP and Contract	1.	The EPP shall form part of the contract documents with the subcontractors for the Winter 2005 Field Geotechnical Investigation Program.
Construction Documents	2.	All ColtKBR supervisory staff shall be provided with the EPP, ERP, the Spill Contingency Plan and copies of all permits and approvals, including any recent updates and revisions.
Licences and Permits	3.	All necessary licences and permits shall be obtained prior to the commencement of the Program.
Trap lines	4.	Prior to initiation of the Program, existing trap lines shall be identified in consultation with Resources, Wildlife and Economic Development (RWED), Hunters and Trappers committees and local Elders.
Bear Dens	5.	Prior to initiation of the Program, possible bear denning sites shall be identified in consultation with RWED, Hunters and Trappers committees and local Elders.
Archaeology and Heritage Resources	6.	Prior to initiation of the Program, any known archaeology and heritage resources along the secondary access and at the investigation sites shall be identified in consultation with the archaeologist approved for the Program Identification of heritage resources will be ground-truthed through the Summer reconnaissance program.
Vegetation	7.	Prior to initiation of the Program, any known rare plants at the investigation sites shall be identified in consultation with the botanist approved for the Program.
"Kick-Off" Meeting	8.	Prior to initiating field activities, a "*kick-off*" meeting shall be held with representatives from Imperial, ColtKBR construction, engineering and environmental personnel, construction contractors and interested government environmental and regulatory personnel to review Program specifications and to detail required procedures.
Environmental Orientation	9.	All field personnel shall receive an environmental orientation prior to commencing work on the Program.

2.2 Notification of Concerned Parties

Objective:

Notification prior to the commencement of the Program ensures that interference with other industrial or traditional land uses is minimized and that relevant communities and government personnel are kept informed of all industrial activities occurring within their jurisdiction.

Measures:

Regulatory Authorities	10. Notification shall be made to the appropriate regulatory agencies a minimum of 48 hours prior to the commencement of the Program. 11. Notification shall be made to the appropriate regulatory agencies a minimum 10 working days prior to completion of the land use operations.
Communities	12. Notification shall be made to local communities a minimum of 48 hours prior to the commencement of the Program.
Road Use	13. Notification shall be made to appropriate communities, companies or regulatory agencies, if required, of road use agreements.

2.3 Environmental Compliance

Objective:

To provide the highest level of environmental compliance to assure that all permit and approval conditions are met or exceeded during the Program (see Environmental Compliance Plan, Section 3.0).

Measures:

Environmental Compliance	14. The Program shall be conducted in accordance with ColtKBR's Environmental Compliance Plan.
Environmental Inspection	15. ColtKBR's Environmental Inspector shall be onsite throughout the Program. 16. ColtKBR's Environmental Inspector shall prepare daily environmental inspection reports.
Liaison	17. ColtKBR's Environmental Inspector shall liaise with government and regulatory agencies during the Program. 18. ColtKBR's Environmental Inspector shall liaise with local community groups and stakeholders during the Program.
Reporting	19. ColtKBR's Environmental Inspector shall provide regular environmental summary reports to management personnel, Imperial, regulators and other designated stakeholders.

2.4 Clearing and Access

Objective:

Disturbance to vegetation, watercourses and the ground mat shall be kept to a minimum. Shrubs and ground vegetation shall be protected, as required to facilitate access, drilling and test pit excavation activities.

Measures:

Access Limits	20. Equipment access shall extend only to the designated limits as defined in permit documents. The site limits shall be flagged or staked prior to site access. Marked limits shall be inspected on a regular basis to ensure the stakes are visible and clearly identified.
Roads and Access	21. Primary access for the Program shall include the Department of Transportation (DOT) maintained Mackenzie River ice road from Inuvik to Tuktoyaktuk and the privately constructed and maintained ice road from Tununuk Point to Taglu Pad, via YaYa Lake and Harry Channel. 22. Secondary access to the drill sites shall be constructed according to the approved access plans. Deviations from planned overland routes require prior approval of the Land Use Inspector. 23. Traffic shall be restricted to the primary ice roads and approved new overland access trails to the investigation sites. Any existing roads damaged by vehicles and equipment required for the Program shall be repaired to similar conditions that existed prior to the commencement of the activities. All traffic safety and road closure regulations shall be followed. 24. All primary and secondary access shall be maintained on a regular basis to allow the movement of temporary camps and equipment. If required, additional snow and water shall be added to reinforce the integrity of the road surface and to ensure protection of the terrain as required by permits (see Section 2.6, Water Supplies).
Watercourse Crossings	25. Access routes shall be selected to avoid watercourse crossings where possible. 26. Any temporary watercourse crossings shall be constructed according to Department of Fisheries and Oceans (DFO) Protocol for Temporary Winter Access Water Crossings for Oil and Gas Activities in the Northwest Territories (NWT). 27. ColtKBR's Supervisory and Environmental staff shall assess stream crossings prior to the commencement of clearing access trails. Appropriate locations (i.e. gently sloping banks) and protection measures for stream crossings shall be decided upon in the field. 28. No grading of stream banks shall be permitted.

Watercourse Crossings (con't)	29. The removal of riparian zone vegetation (i.e. streamside vegetation) shall be avoided to the extent possible. 30. Snow/ice bridges shall be constructed, if stream crossings are necessary, on access trails or where operations on river ice shall occur. Ice bridges shall be constructed of clean snow and ice only. Rig mats or logs may be placed on top to reinforce ice bridges. These shall be removed prior to the spring thaw. 31. Ice thickness and strength shall be checked at watercourse crossings to ensure it is appropriate for the equipment crossing. 32. All snow and ice bridges shall be V-notched prior to spring break-up or upon completion of the land use operation. 33. Locations, lengths and before and after photographs of the snow and ice bridges shall be documented and made available to regulatory agencies after Program completion.
Vegetation Clearing	34. Avoid known potential rare plant sites previously identified by the botanist approved for the Program. 35. Clearing of vegetation, if necessary shall be minimized by using existing access. 36. Low impact construction/clearing techniques will be utilized where new clearing is required. 37. Vegetation in the immediate vicinity of watercourses shall be walked-down or hand cleared to minimize riparian and slope disturbance. 38. All access roads paralleling watercourses shall be located at least 20 m from banks to ensure riparian integrity.

2.5 Fuel, Hazardous Materials and Garbage

Objective:

To ensure the proper storage, handling and disposal of fuel, hazardous materials and garbage, as well as spill prevention and reporting.

Measures:

Storage	39. Fuel shall be stored in a double walled container located within a bermed area or other secondary containment with a holding capacity of 110% of the largest volume of fuel to be stored at the site. 40. Fuel, oil or hazardous material storage shall not be allowed within 100 m of a watercourse or waterbody.

Equipment Refueling and Servicing	41.	Maintenance, oil changes, refueling and lubricating of mobile equipment shall be conducted a minimum of 100 m from waterbodies and watercourses (lakes and streams) to minimize the potential for water pollution.
	42.	Special measures (i.e. placement of drip pads) shall be taken if refueling or servicing of immobile equipment is required within 100 m of a waterbody or watercourse to ensure that accidental spills are contained.
	43.	Spent oils, lubricants and filters, etc., shall be collected, stored and removed from the area at the end of the Program.
	44.	Hydraulic, fuel and lubricating systems shall be kept in good repair to avoid leakage of deleterious substances.
	45.	The Contractor shall inspect all equipment and ancillary vehicles on a regular basis to ensure they are clean and free of leaks.
Spill Prevention and Reporting	46.	Operators, foremen and responsible supervisory personnel shall be trained to contain spills or leakage from equipment.
	47.	All service vehicles used for refueling must be equipped with automatic shut-off valves that shall be inspected on a regular basis to ensure they are in good working order.
	48.	A spill mat, drip tray or tarpaulin, which is impervious to all liquids, shall be used under all vehicles or equipment that is being serviced or which shall be parked for more than 4 hours.
	49.	To ensure an immediate response capability in the event of a fuel spill, all fuel and service vehicles shall carry a spill kit that contains suitable commercial absorbent materials for ground spills.
	50.	Each subcontractor shall ensure that during the course of the Program fuel, lubricating fluids, hydraulic fluids, methanol, antifreeze, or other hazardous materials are not dumped or discharged on the ground or into or onto any watercourse.
	51.	In the event of a spill, procedures shall be implemented as outlined in ColtKBR's Spill Contingency Plan (see the Emergency Response Plan, Section 3).
	52.	All leaks and spills shall be reported to the Environmental Inspector and ColtKBR's Construction Superintendent to initiate immediate clean-up. The Environmental Inspector shall detail the nature, location (with GPS coordinates) and extent of each spill along with corrective actions taken to minimize impacts. A ColtKBR spill report shall be prepared for each spill and copies sent to the appropriate regulatory agencies. In addition, an Imperial "Supervisor's Investigation Report" will also be filed as part of the spill reporting protocols.

Spill Prevention and Reporting (con't)	53.	In the event that the spill exceeds the NWT threshold quantities of 100 litres, ColtKBR shall immediately report to the NWT 24-hour Spill Report Line (867) 920-8130.
	54.	The spill area shall be restored to the satisfaction of the Environmental Inspector, ColtKBR Construction Superintendent, and the local Environmental Monitor.
Garbage	55.	Construction waste, debris, garbage and other non-hazardous materials shall not be allowed to accumulate at the camp locations.
	56.	All combustible garbage shall be continuously collected and with the exception of plastics, incinerated at the camp in an enclosed container. All plastics and hazardous materials (i.e. spent oil filters, contaminated soil) shall be hauled to Inuvik for disposal in the sanitary landfill site.
	57.	The Contractor shall be responsible for the regular collection and disposal of all such materials generated by employees and subcontractors.
Hazardous Materials	58.	Hazardous material shall have the appropriate Material Safety Data Sheet (MSDS) identification. These MSDSs will be available at the field sites.
	59.	All hazardous materials stored at the camp shall be contained, labeled, handled and used according to TDG (Transportation of Dangerous Goods) and WHMIS (Workplace Hazardous Materials Information System) regulations.
	60.	Spent oils, lubricants, filters, grease canisters, hydraulic fluid containers, and other products of regular maintenance shall be collected and disposed of in accordance with NWT Waste Management Guidelines.
Contaminated Soils	61.	Remediate any areas of contamination onsite, if feasible, or remove contaminated soil and dispose it at a suitable location in consultation with the appropriate regulatory authorities.

2.6 Water Supplies

Objective:

To ensure that all water withdrawals conform to permit conditions as set out by DFO and the Northwest Territories Water Board.

Measures:

Water Withdrawal	62. Only water sources designated for water withdrawal shall be used. Additional water sources may be identified and surveyed during field operations and approval for water withdrawal sought from appropriate regulatory agencies at that time. 63. Water withdrawals shall be less than 300 cubic meters per day/source over the duration of the Program as outlined in the Class B Water Licence. 64. All pump intakes shall be properly screened with fine mesh of 2.54 mm to prevent the entrainment of fish, in accordance with DFO Protocol for Water Withdrawal for Oil and Gas Activities in the NWT.

2.7 Drilling and Test Pit Excavation

Objective:

Measures shall be implemented to minimize disturbance at all drill and test pit sites.

Measures:

Drilling	65. The maximum disturbed area for a drill site including the drill and drilling support equipment shall be 100 m^2. 66. Drill cuttings shall be backfilled into the test holes and any surplus material will be hauled to the contractor's yard for disposal.
Test Pits	67. The maximum area cleared for a test pit site shall be 25 m x 25 m. 68. Test pit holes shall be a maximum of 5 x 5 x 5m. 69. Salvage stripped surface materials (organic material and the upper layer of mineral soil), if present, to a maximum depth of 15 cm at all test pit holes. Store stripped material at the edge of the allocated workspace for the test pit. Replace stripped material evenly over all disturbed areas once the test pit has been backfilled.
Heritage Resource Site Discovery	70. During the course of drilling and test pit activities, the Environmental Inspector and Environmental Monitor shall monitor for heritage resources. In the event that a heritage resource site is encountered during drilling or test pit excavation, the subcontractor shall immediately cease work and shall contact the Field Superintendent who will in turn contact the approved archaeologist for the Program. Drilling/excavation shall not be allowed to resume until the archaeologist and the appropriate regulatory agency gives approval to proceed.

2.8 Wildlife

Objective:

Measures shall be implemented to minimize wildlife disturbance at all drill and test pit sites, camps, access routes and storage areas.

Measures:

Wildlife Habitat	71. The Wildlife Monitor shall identify any bear dens prior to the initiation of activities at each investigation site. 72. Drilling/excavation shall not be allowed within 1 km of an active bear den unless otherwise approved by RWED. 73. Prior to the initiation of activities at a site, the Environmental Monitor and/or Wildlife Monitor shall check for caribou and wolverine activity and/or habitat. Areas showing evidence of these species shall be avoided.
Wildlife Contact	74. Wildlife shall not be harassed or fed. With the exception of Wildlife Monitors, personnel shall not be permitted to have firearms on the site. The recreational use of all terrain vehicles and snowmobiles by personnel is prohibited. Any incidents with wildlife or collisions with wildlife shall be reported to the appropriate regulatory agency and the local RCMP detachment. 75. Aircraft involved in the Program shall fly at sufficient altitudes to avoid disturbing wildlife.

2.9 General

Objective:

Other general measures for environmental protection.

Measures:

Documentation	76. Field investigation locations and the camp shall have copies of all permits, licences, approvals and Material Safety Data Sheets.
Noise	77. Equipment shall be well maintained to minimize air pollution and unnecessary noise.
Cleanliness	78. The work area will be kept clean and tidy at all times.
Erosion and Siltation	79. Soil erosion and water siltation shall be prevented or controlled by using appropriate measures. ColtKBR shall provide personnel and equipment to control erosion, when warranted.

2.10 Temporary Camps, Clean-up and Disposal of Waste

Objective:

To ensure the proper location, operation and clean up of temporary camps.

Measures:

Temporary Camps	80. The camp shall be located on an existing pad that is a minimum 100 m away from any watercourse or waterbodies. 81. The camp shall be able to accommodate all personnel required for the Program.
Sewage and Grey Water Disposal - Sumps	82. No sumps shall be constructed as part of the Program. 83. All sewage and grey water generated from camps shall be hauled to the Inuvik sewage lagoons for disposal or will utilize existing approved facilities at the Swimming Point Camp location.
Debris	84. Non-hazardous combustible material will be incinerated on a daily basis. 85. All remaining waste material and debris shall be removed from the campsite and transferred to the Inuvik landfill site for disposal. 86. All excess cuttings, shall be removed and hauled to Inuvik for disposal.

2.11 Scheduling and End of Job

Objective:

To ensure that work does not continue during adverse weather or ground conditions and to ensure proper clean up of the work at the end of the Program.

Measures:

Scheduling	87. The drilling/excavation subcontractor shall conduct all activities during frozen conditions to minimize ground disturbance. 88. All activity and clean up of the sites shall be completed and equipment mobilized out of the area prior to spring break-up. 89. Notification shall be made to the appropriate regulatory agencies a minimum of 10 working days prior to completion of the land use operations.

Wet/Warm Conditions	90. In order to minimize terrain disturbance and soil structure damage, equipment travel shall be suspended in the event of wet or thawed soils until conditions improve (i.e., refreeze), except when required to transport field workers back to camp. 91. The decision to postpone activities due to wet/warm conditions may be made by ColtKBR's Supervisory staff or by the Land Use Inspector for that area. Factors influencing a decision to postpone or suspend activities include: the weather forecast, availability of suitable frozen ground, or lack of minimum snow and ice cover on the access roads.
Clean up	92. Clean up shall commence immediately following the completion of activities at each site to ensure that clean up at all locations is complete prior to spring break-up.
Follow up Monitoring	93. During the summer of 2005, a post-construction assessment shall be conducted to identify any issues related to erosion, bank stabilization, slumping and melting of permafrost, and also to identify the need for site restoration.
Reclamation	94. Reclamation procedures such as bank stabilization and revegetation shall be determined through discussion with regulatory agencies, local communities and the Project Management Team.

3.0 ENVIRONMENTAL COMPLIANCE PLAN

As part of ColtKBR's overall Environmental Compliance Plan (ECP), a ColtKBR Environmental Inspector shall be assigned to the Program. In addition, a local environmental monitor and wildlife monitor shall be assigned to each work area.

The Environmental Inspector, by carrying out daily environmental inspection for the Program, shall be responsible for assuring the effective field implementation of the environmental measures outlined in this EPP and all relevant permits and licences. The Environmental Inspector shall be responsible for documenting non-compliance with permits and approvals and for addressing site-specific environmental issues as they arise during the Program. With respect to environmental non-compliances and issues, the Environmental Inspector shall be responsible for implementing corrective actions to mitigate potential impacts and to ensure compliance.

The Environmental Inspector shall liaise with the regulatory agencies and other stakeholders in the area, and shall provide environmental summary reports on a routine basis. This reporting includes a daily summary of construction and environmental activities as well as reporting on environmental issues and non-compliance incidents. Reports shall be transmitted on a routine basis to management personnel in the field and in Calgary as well as to regulators and other stakeholders where required.

The following are the primary roles and responsibilities of the Environmental Inspector, Environmental Monitor and Wildlife Monitor assigned to the Program.

Environmental Inspector	1. Shall provide on-site field environmental inspection on a daily basis throughout the duration of the Program to ensure compliance with conditions specified on approvals or permits and general regulations and policy of environmental and regulatory agencies having jurisdiction over the Program. 2. Shall make sure Program activities conform to ColtKBR's Environmental Protection Plan. 3. Brief the ColtKBR construction personnel and subcontractor(s) on site-specific environmental requirements. 4. Shall notify the ColtKBR construction superintendent if the contractor is out of compliance. 5. May recommend temporary shutdown of particular construction activities to the ColtKBR construction superintendent as warranted by deteriorating weather or terrain conditions. 6. Shall have the authority to suspend operations if unacceptable situations with serious environmental implications arise. 7. Conduct on-site training and "tailgate" environmental orientation sessions.

Environmental Inspector (cont'd)	8.	Provide on-site environmental inspection of Contractor, particularly as warranted by unanticipated or extreme environmental conditions or events (e.g. the Environmental Inspector may suggest options and possible techniques for achieving environmental compliance in the field).
	9.	Identify or "flag" sensitive areas (e.g. appropriate watercourse crossing locations, clearing boundaries) in the field, in advance of the access and drilling crews.
	10.	Report to the ColtKBR Field Superintendent on the environmental performance of the Contractor.
	11.	Prepare daily environmental and other reports summarizing construction activities and any environmental issues and/or non-compliance incidents related to construction activities.
Environmental Monitors	12.	An Environmental Monitor shall be appointed by the Hunters and Trappers committees to assist in the overall compliance management for the Program.
	13.	The Environmental Monitor shall inspect the proposed access and investigation sites and provide local knowledge and advice to mitigate any damage to environmentally sensitive areas such as: trap lines, archaeological and heritage sites, watercourses and conservation areas.
Wildlife Monitors	14.	A Wildlife Monitor shall be appointed to assist in the overall compliance management for the Program.
	15.	The Wildlife Monitor shall provide information on wildlife habitat and movements to ensure that field operations are conducted in a manner that minimizes impacts to wildlife.
	16.	The Wildlife Monitor shall specifically identify any bear dens as well as caribou and wolverine habitat and activity.
	17.	The Wildlife Monitor shall provide an added role of patrolling the work site for potential impacts with large mammals (i.e., bears) in the Program area.

Attachment 3

Emergency Response Plan for the 2005 Winter Field Geotechnical Investigation Program

Inuvialuit Settlement Region

Table of Contents

1.0 INTRODUCTION

The following is a plan of emergency response actions to be initiated when required by personnel assigned to the Winter 2005 Geotechnical Field Investigation Program (the Program) in the Inuvialuit Settlement Region (ISR). The Emergency Response Plan (ERP) will be reviewed with all workers as part of their orientation prior to commencing work. Revisions to the ERP will be made as the Program develops and will also require that the plan be updated as the work progresses from one area to another. Workers' training will be updated as changes are made to the ERP.

2.0 IMMEDIATE RESPONSE TO EMERGENCY SITUATIONS

2.1 Fire

- Secure the scene, PROTECT YOURSELF and OTHERS;
- Have all non-essential personnel clear the area;
- Notify other workers by voice or alarm;
- Immediately shut off power, engines and fuel source, if safe to do so;
- If the fire is small, extinguish it with the available fire fighting equipment;
- If you cannot safely fight the fire evacuate to a safe and secure area;
- Do a head count to account for all workers; and
- Notify Supervisors and Management in accordance with the emergency contact list in Appendix A.

2.2 Vehicle or Mobile Equipment Incident

- Secure the scene, PROTECT YOURSELF and OTHERS;
- Shut off equipment and fuel source, if safe to do so;
- Provide assistance to injured persons;
- Call the spread medic to the site;
- If injured persons are in imminent danger, then remove injured persons and secure the incident scene;
- Control any spill or environmental hazard;
- Notify Supervisors and Management in accordance with the emergency contact list in Appendix A and;

- Record third-party names, addresses, contact numbers, driver license numbers, vehicle and license information.

2.3 Serious Medical Incident

- Secure the scene, PROTECT YOURSELF and OTHERS;
- Attend to the injured worker;
- Call the spread medic to assist the injured worker;
- The medic will arrange for transportation of injured worker to the camp;
- The medic will notify the nearest medical facility that evacuation is required; and
- Notify Supervisors and Management in accordance with the emergency contact list in Appendix A.

2.4 Camp Evacuation

- If a camp evacuation is required follow the posted procedures;
- Collect your winter clothing and report to the muster point;
- Check in with the supervisor;
- Supervisor to conduct a head count; and
- Do not leave the muster point until instructed to do so.

2.5 Wildlife Encounters

- All workers will avoid situations that could create a wildlife encounter;
- All food items and domestic garbage should be secured;
- Garbage will be disposed of at approved sites only;
- Record all sightings of bears or dens to the Environmental Inspector or Wildlife Monitor;
- Arctic or Red fox may approach the camp or personnel to scavenge food. Avoid all contact as they may carry the rabies virus and exposure is through bites or saliva.
- The operation is in an area where bears may be encountered. Proper food handling and garbage disposal procedures will lessen the likelihood of bears being attracted to the operation. Information about the latest bear detection and deterrent techniques can be obtained from the Department of Resources, Wildlife and Economic Development (RWED) at (867) 777-7201 or (867) 777-7230.

3.0 SPILL CONTINGENCY PLAN

The primary goal is to avoid spills or the unnecessary release of materials. All personnel shall have an environmental orientation prior to starting work. This will include a review of this Spill Contingency Plan (SCP). In addition, all contractors and ColtKBR supervisors shall review ColtKBR's Environmental Protection Plan (EPP) that details specific measures to prevent spills and leaks from occurring.

In the unlikely event of a spill or release of material, quick response will become the objective. The SCP defines the responsibilities of site personnel and the required procedures for a quick response by emphasizing the need to reduce the safety hazards and minimize the impacts on the environment.

3.1 Preliminary Requirements

- A copy of this Emergency Response Plan and the Environmental Protection Plan shall be available on site during all field operations;
- Material Safety Data Sheets (MSDS) for each hazardous chemical shall be available on site during all field operations;
- All vehicles/equipment will be equipped with spill kits and shovels. Spill kits, at a minimum, will include sorbent pads or equivalent, shovels, and a means for containment of contaminated material (e.g. impermeable tarps, barrels); and
- Suitable communication equipment and all emergency numbers will be available prior to commencement of all field activities.

3.2 Initial Response

In the event of a spill or a release of material, the first person on the scene will:

- Cut off the source of the spill if possible;
- Immediately obtain the assistance of others and begin to assess and contain the spill;
- If possible, without further assistance, control danger to human life (i.e. remove ignition sources);
- Identify the material spilled, assess MSDS information and implement appropriate safety procedures, based on the nature of the hazard;
- Assess the hazards to personnel in the vicinity of the spill;
- Notify the Field Supervisor and the Environmental Inspector; and
- Gather information on the status and the nature of the situation.

When notified of a spill, the Field Supervisor and the Environmental Inspector (whomever is on the scene first) will immediately ensure that:

- Action is taken to control danger to human life;
- An on site safety supervisor is designated, if not already present;
- In the event that a spill exceeds any of the threshold quantities listed in Appendix B, the Environmental Inspector will complete the Northwest Territories (NWT) Spill Report Form (see attached form in Appendix C) and then immediately report the spill to:

  NWT 24 Hour Spill Report Line (867) 920-8130,

  Note: For fuel or hydraulic spills this threshold limit is 100 litres.
- In the event that a spill exceeds any of the threshold quantities listed in Appendix B, the Environmental Inspector shall report the spill to the appropriate regulatory agencies including the Land Use Inspector.
- The appropriate territorial disaster services and the local R.C.M.P. shall be notified if a risk to the public exists.
- The necessary equipment and personnel shall be mobilized and measures implemented to stop the source of the spill and commence clean up.

3.3 General Spill Containment Procedures

- Identify the contaminant, stop the source of the spill, and when safe, immediately implement containment measures to limit the spread of the spill and to minimize the impacts to the environment.
- If spill source is a leaking fuel truck, pump tanker dry (into appropriate containers or another tanker).
- A shallow depression will be excavated or a surface berm constructed in the path of the flowing product to stop and contain the flow. If feasible, without unduly delaying containment efforts, strippings will be salvaged and stored separately during excavations.
- Sorbent materials will be utilized to contain and recover spilled material.
- Heavily contaminated soil and vegetation, as well as used sorbent material, will be disposed of at an approved hazardous waste treatment facility.
- Traffic will be minimized on and around contaminated areas.
- Attempts will be made to restrict the movement of wildlife near the area affected by the spill.
- Remediation and final clean-up will be conducted until the spill and immediate location has been completely reclaimed to an equivalent capability prior to the incident.

3.4 Spills Adjacent to or into a Water Body

- Berms or trenches will be constructed to contain and prevent materials from entering into a water body.
- Spilled materials will be recovered as quickly as possible.
- If spilled material enters an open water body, booms, skimmers and sorbent pads will be deployed, if feasible, to contain and recover the spilled material.
- If spilled material is released onto a frozen water body, snow and sorbent pads will be used to contain and clean up the spill. A backhoe, or similar equipment, will remove all materials to prevent future release into the water body.
- Contaminated areas, including downstream shorelines (non-frozen conditions), will be cleaned up in consultation with spill response specialists and the appropriate government agencies.
- In the event that spilled materials enter a frozen water body through or under the ice to flowing or standing water, auguring will be conducted to determine the extent of the spill plume. If feasible, a vacuum truck will be brought to the site to skim off the contaminants. As well, the appropriate regulatory agencies will be contacted and a post-break-up monitoring and reclamation plan will be implemented to determine the extent of the impacts of the spill on the water body and its banks.

3.5 Spot Spills

- The Environmental Inspector will be contacted soon after a spot spill to determine appropriate methods to remove or restore contaminated soils. Since impacts from small spills can generally be minimized if immediate action is taken, all small spot spills will be cleaned up immediately.
- Activities in the immediate vicinity will be suspended until a Supervisor or an Environmental Inspector grants permission to resume.
- Heavily contaminated soil and vegetation, and/or removed contaminated materials will be incinerated, if safe to do so, or disposed of at an approved waste facility.
- Locations where spot spills have occurred will be flagged and the location GPS coordinates recorded by the Environmental Inspector. Flags will be removed once reporting is complete.
- The Environmental Inspector will document and report all details pertaining to the incident.

3.6 Spill Reporting

The size of the spill will determine how the spill is reported.

A. All leaks and spills shall be reported to the Environmental Inspector and ColtKBR's Construction Superintendent to initiate immediate clean up. The Environmental Inspector shall detail the nature, location (with GPS coordinates) and extent of each spill along with corrective actions taken to minimize impacts. A ColtKBR spill report shall be prepared for each spill and copies sent to the appropriate regulatory agencies. In addition, an Imperial Oil "*Supervisor's Investigation Report*" (SIR) will also be filed as part of the spill reporting protocols.

B. If the spill exceeds the threshold quantity listed in Appendix B.

   The Environmental Inspector will complete the Northwest Territories (NWT) Spill Report Form (see attached form in Appendix C) and then immediately report the spill to:

   NWT 24 Hour Spill Report Line (867) 920-8130,

   Note: For fuel or hydraulic spills this threshold limit is 100 litres.

   After the initial response, the Environmental Inspector will prepare a ColtKBR spill report which includes: the location of the spill (with GPS coordinates), the type of spill, cause of spill, clean-up, and reclamation procedures undertaken. This report together with the initial NWT Spill Report Form, completed immediately after the spill occurred, will be sent to ColtKBR and Imperial Oil Resources Ventures Limited management and also to local regulatory agencies.

3.7 Spill Kits

All vehicles and equipment will be equipped with a spill kit that, at a minimum, includes the following:

- Sorbent material (i.e. 10 pads, 2 socks or equivalent);
- Disposal container (tarpaulin, pail, barrel);
- Safety gloves and goggles; and
- Shovel.

All fuel and service vehicles will carry a spill kit that includes the following:

- A minimum of 10 kg of Sorbent material (i.e. 200 pads, 12 socks, 10 pillows, or equivalent);
- Sorbent booms;

- Disposal container (tarpaulin, pails, barrel);
- Safety gloves and goggles; and
- Shovel.

Extra spill kits will be stored at camp or storage locations.

APPENDIX A - EMERGENCY CONTACT LISTS

Applicant (Imperial Oil Resources Ventures Limited)

Imperial Oil Resources Ventures Limited Contacts	Name	Office	Mobile/Cell	Residence
Primary	Ken Johnson	(403) 237-3858	(403) 860-2138	(403) 285-6292
Alternate	Rob McNaughton	(403) 237-3606	(403) 815-2133	(403) 278-1317
HSE	Dieter Busse	(403) 237-2244	(403) 880-5331	(403) 232-2532

Contractor

ColtKBR Contacts	Name	Office	Mobile/Cell	Residence
Field Operations Manager	Dave Andersen	(403) 259-1802	(403) 875-5088	(403) 887-2641 (403) 245-5896
Field Superintendent	Jim Seymour	(403) 301-7033	(403) 540-6040	(403) 281-4018
Program Safety Officer	Phil Arseneau	(403) 640-3028	(403) 650-4555	(403) 256-2994
Safety Supervisor	Peter M. Wood	(403) 237-2818	(403) 804-1865	(403) 282-2441
Field Program Manager	Dale Babala	(403) 258-8677	(902) 497-8188	(403) 640-7304

Inuvialuit Settlement Region

Emergency Services	Inuvik	Tuktoyaktuk
Inuvialuit Land Administration	(867) 977-7098	(867) 777-7100
Police	(867) 777-1111	(867) 977-2351
Ambulance	(867) 777-4444	(867) 977-2321
Hospital	(867) 777-8000	(867) 977-2321
Search and Rescue	1-800-267-7270	
Fire	(867) 777-2222	(867) 977-2222

NWT Regulatory Agencies

Regulatory Agencies	
NWT OHS	(867) 678-2301
NWT OHS (Yellowknife)	1-800-661-0792
NWT Forest Fires	1-800-661-0800
24 Hour NWT Spill Report Line	Phone:(867) 920-8130 Fax: (867) 873-6924
RWED - Environmental Protection Services	(867) 873-7654
Environment Canada	(867) 669-4710
Department of Fisheries and Oceans	(867) 777-7520/7521 or (867) 669-4931
Northwest Territories Water Board	(867) 669-2772
Canadian Wildlife Service	(867) 669-4769

APPENDIX B - SPILL REPORT THRESHOLD QUANTITIES

Item No.	TDGA Class	Description of Contaminant	Amount Spilled
1	1	Explosives	Any amount
2	2.1	Compressed Gas (flammable)	Any amount of gas from containers with a capacity greater than 100 L
3	2.2	Compressed Gas (non-corrosive, non-flammable)	Any amount of gas from containers with a capacity greater than 100 L
4	2.3	Compressed Gas (toxic)	Any amount
5	2.4	Compressed gas (corrosive)	Any amount
6	3.1, 3.2, 3.3	Flammable Liquid	100 L
7	4.1	Flammable Solid	25 kg
8	4.2	Spontaneously Combustible Solids	25 kg
9	4.3	Water Reactant Solids	25 kg
10	5.1	Oxidizing Substances	50 L or 50 kg
11	5.2	Organic Peroxides	1 L or 1 kg
12	6.1	Poisonous Substances	5 L or 5 kg
13	6.2	Infectious Substances	Any amount
14	7	Radioactive	Any amount
15	8	Corrosive Substances	5 L or 5 kg
16	9.1 (in part)	Misc. Products or Substances, excluding PCB Mixtures	50 L or 50 kg
17	9.2	Environmentally Hazardous	1 L or 1 kg
18	9.3	Dangerous Wastes	5 L or 5 kg
19	9.1 (in part)	PCB Mixtures of 5 or more parts per million	0.5 L or 0.5 kg
20	None	Other Contaminants	100 L or 100 kg

Environmental Protection Act, Consolidation of Spill Contingency Planning and Reporting Regulations R.R.N.W.T. 1990, c, Schedule B

APPENDIX C - SPILL REPORT FORM

Northwest Territories

NWT SPILL REPORT

(Oil, Gas, Hazardous Chemicals or other Materials)

24 – Hour Report Line
Phone: (867) 920-8130
Fax: (867) 873-6924

A Report Date and Time	B Date and Time of spill (if known)	C ☐ Original Report ☐ Update no.____	Spill Number

D Location and map coordinates (if known) and direction (if moving)

E Partly responsible for spill

F Product(s) spilled and estimated quantities (provide metric volumes/weights if possible)

G Cause of spill

H Is spill terminated? ☐ yes ☐ no	I If spill is continuing, give estimated rate	J Is further spillage possible? ☐ yes ☐ no	K Extent of contaminated area (in square meters if possible)

L Factors effecting spill or recovery (weather conditions, terrain, snow cover, etc.)	M Containment (natural depression, dikes, etc.)

N Action, if any, taken or proposed to contain, recover, clean up or dispose of product(s) and contaminated materials

O Do you require assistance? ☐ no ☐ yes, describe:	P Possible hazards to person, property, or environment; eg: fire, drink water, fish or wildlife

Q Comments or recommendations

FOR SPILL LINE USE ONLY

Lead agency

Spill significance

Lead Agency contact and time

_____

_____

_____

Is this file now closed? ☐ yes ☐ no

Reported by	Position, Employer, Location	Telephone
Reported to	Position, Employer, Location	Telephone

APPENDIX D – NOTIFICATION PROTOCOL

Notification By	Notification To	Timing				
		Local Management Level	Level 0	Level 1	Level 2	Level 3
Worker	Decision-unit manager (e.g., foreman) or company site supervisor	Within 24 hours	Immediate	Immediate	Immediate	Immediate
Decision-unit manager	Business-unit manager (e.g., superintendent)	Within 24 hours	Immediate for potential LTIs, hazard loss; within 24 hours for all others	Immediate	Immediate	Immediate
	SHE advisor or safety leader	Next business day	Immediate	Immediate	Immediate	Immediate
Business-unit manager	Functional-unit manager (e.g., operations manager)	Next business day	Immediate for potential LTIs, hazard loss; otherwise, next business day	Immediate	Immediate	Immediate
	Government	As required	As required	As required	As required	As required
SHE advisor or safety leader	SHE manager	—	Immediate for potential LTIs, hazard loss; otherwise, next business day	Immediate	Immediate	Immediate
	*Government	As required	As required	As required	As required	As required
Functional-unit manager	VP or department manager	—	Immediate for potential LTIs, hazard loss; otherwise, next business day	Immediate for LTIs, hazard loss; otherwise, next business day	Immediate	Immediate
SHE manager	Corporate SHE management	—	Next business day for illness or injury	Next business day	Immediate	Immediate
VP or department manager	Senior company representative	—	Immediate for potential LTIs, hazard loss; otherwise, next business day	Immediate for LTIs, hazard loss; within 24 hours for all others	Immediate	Immediate
Senior company representative	Corporate management	—	Upon investigation completion, as warranted	Next business day	Immediate	Immediate

*SHE will accept responsibility for government reporting upon request by the functional-unit manager.

Timing	Method[1]	Weekend and Holidays	Awaken at Night
Immediate	Phone	Yes	Yes
Within 24 hours (during waking hours)	Phone	Yes	No
Next business day	E-mail or phone	No	No
Upon investigation completion	E-mail or phone	No	No

(1) Initial notification requirement. Formal documentation, e.g., Supervisor's Investigation Report, must follow in a timely manner.

APPENDIX E – SEVERITY MATRIX

Factors or Characteristics	Local Management Level	Severity Level 0	Severity Level 1	Severity Level 2	Severity Level 3
				Crisis manager to confirm severity assessment in consultation with public affairs; safety, health and environment; and law	
Health or Injury					
Illness or injury	First aid (log in first-aid book in B.C.), near miss	Single LTI, MTI or RWI	Multiple LTIs, MTIs or RWIs	Serious injury or fatality	Multiple serious injuries or fatalities
Material exposure	Near miss, Hazard ID	None	Minor	Significant	Widespread
Material hazard	Near miss, Hazard ID	None – low hazard	Low-medium hazard - combustible	Medium-high hazard - flammable	High hazard – toxic
Public Disruption					
Public water or food supply	—	No impact	Nearby	Potential impact	Probable impact, isolation
Public evacuation or disruption	—	None or minimal	Probably none or local roads	Nearby homes or roads or short term	Wide area or highway or long-term
Navigable water or traffic	—	None or industrial	Light use or pleasure	Substantial recreation or commercial	Major recreation or commercial
Population density	—	None in immediate area	Rural or sparse	Suburban or industrial	Urban
Environmental					
Soil or ground water or marine	—	Small immediate area	Site	Limited migration	Migration or extended remediation
Habitat or wildlife	—	No impact	Nearby or aesthetic	Sensitive species	Protected or endangered species
Livestock or crops or fisheries	—	No impact	Nearby	Potential contamination	Probable contamination
External Exposure					
Media coverage	—	None	Local	National	International
Customers or consumers	—	None	Direct and immediate	Secondary or multiple	Consumers or general public
Government	—	None **(other notifications)	Local *(CN and CN-IR)	Region (enforcement action)	National or international
Activists	—	None	Local	Region	National or international
Public concern	—	None	Minor	Significant	Widespread or outrage
Financial or Hazard Loss					
Our company's assets	Less than $50k (US)	Hazard Loss Report required, more than $50k (US)	Site or business line more than $1M (US)	Major business line	Corporate
Community and environmental claims	None	Unlikely	Limited	Possible or potentially significant	Probable and substantial
Incident duration	Brief	Less than one day	One day	Several days	Continuing
Incident or Response Operations					
Hydrocarbon liquid or produced water spills (on land)	Less than 1 bbl, site-level concern	1 to 600 bbl	More than 600 bbl	Clean-up exceeding site capability (requiring local region or area support) or spill on environmentally sensitive land	Clean-up requiring extensive company support
Hydrocarbon liquid or produced water spills (on water)	Less than 1 bbl	1 to 3 bbl	More than 3 bbl		
Hydrocarbon liquid or produced water spills (off site)	Less than 1 bbl	1 to 10 bbl	More than 10 bbl		
Chemical spills or releases	Less than 100 kg	100 to 500 kg	More than 500 L or 500 kg		
Gas or vapour releases	Less than 20 kg on site Less than 5 kg off site or in populated area	More than 20 kg on site More than 5 kg off site or in populated area	Requiring site evacuation	Requiring public evacuation	Uncontrolled vapour release
Fire or explosion	—	Minor or process-related, less than $50k (US)	Small	Significant	Major fire or explosion
Well-control event	—	Less than 24 hours	More than 24 hours		
Product recall or warning	—	Probably none	A few direct customers	Several direct and secondary customers	Widespread cost and consumers
Ownership	—	Unknown – ownership is nonissue	Unknown – ownership an issue	Third party or customer	Our company
Third-party or customer response	—	Minimal required	Adequate or on scene	Adequate or not on scene	Inadequate
Vehicle incident	Less than $1.5k (US) damage, no third party	More than $1.5k (US) damage, police reportable or third-party injury	Third-party fatality		

Notes: * See Environmental management System for CN (= Compliance Notification) and CN-IR (= Compliance Notification Inspection Report)

**Other notifications refers to any regulatory notification beyond CN and CN-IR

Attachment 4

Heritage Resources Protection Plan for the 2005 Winter Field Geotechnical Investigation Program

Inuvialuit Settlement Region

Table of Contents

1 Introduction

This section describes the recommended approach for managing potential impacts to heritage resources as a result of the Winter 2005 Geotechnical Field Program (the Program) in the Inuvialuit Settlement Region. This heritage resources management plan balances protection of the resources with recognition of the difficulties associated with conducting an impact assessment at all drilling locations across a large area during a short field season.

Through a number of methods, each geotechnical investigation site has been ranked as having high, moderate or low potential for heritage resources. Archaeological investigations during the summer 2004 field season will focus on the locations with a high potential for heritage resources within the proposed investigation sites. The goal will be to provide archaeological clearance of the entire geotechnical investigation sites within which drilling will occur. The precise locations of drilling will be selected in the field. Guidance will be provided by archaeologists such that potentially sensitive areas will be avoided.

2 Potential Impacts

Heritage resources are nonrenewable resources that may be located at, or near, the ground surface and, as such, are highly susceptible to any activities that result in disturbance to the ground. The three primary classifications of heritage resource sites include palaeontological, prehistoric archaeological and historic archaeological sites. Potential impacts to archaeological sites are of particular concern with the winter works program; no impacts to palaeontological sites are anticipated with this program. An archaeological site is defined in the Northwest Territories Archaeological Sites Regulations (GNWT 2001) as "a site where an archaeological artifact is found" and artifacts are defined as "any tangible evidence of human activity that is more than 50 years old, in respect of which an unbroken chain of possession cannot be demonstrated."

Program activities will include vehicular snow compaction during access to drilling locations, drilling of boreholes and/or excavation of test pits, spoil storage and backfilling.

At borehole locations, a layer of compacted snow and ice will protect ground cover on the site. An area not exceeding 10 m x 10 m is cleared of vegetation (if necessary) around boreholes to permit safe drilling operations. The drilling rig and a support trailer will be located in this cleared area. Drilling will be conducted through the ice and snow protective layer, through the ground cover, topsoil and subsoil. The disturbed area amounts to a hole 250 mm in diameter. Once the drilling is complete, the drill cuttings will be placed into the hole.

At test pit locations, an area not exceeding 25 m x 25 m is cleared of vegetation if necessary) for a maximum disturbed area of 625 m^2. A test pit 5 m x 5m x 5m will be excavated within this area with the top organic layer being stored separately from the underlying subsoil. The organic layer will be placed on top of the backfilled pit during site clean-up and restoration.

Drilling and excavation can result in the removal of artifacts from context, as well as the destruction of artifacts and/or cultural features (e.g., hearths). Snow pack and compression is unlikely to have other than minor effects in frozen conditions. However, in certain situations it could result in alterations to spring run off which could affect erosion and hence expose previously buried archaeological sites. Reclamation can also damage sites and artifacts and affect context.

Alteration of the landscape can result in the damage or complete destruction of all or portions of archaeological sites. These alterations often involve the displacement of artifacts resulting in the loss of valuable contextual information or may involve the destruction of the artifacts and features themselves resulting in complete information loss. Losses are permanent and irreversible. Primary, secondary and tertiary impacts are possible with any new development. The approach proposed herein is designed to mitigate any potential impacts to heritage resources that could result from the Program.

Primary impacts include those disturbances resulting immediately from activity such as the proposed Program. The primary impact zones within the proposed drilling locations include the areas cleared for drilling and/or excavation, drill holes, test pits, temporary workspace and any associated areas where activities related to the Program occur. The primary impact zones are small areas within the larger potential development areas.

Individual sites could be affected to varying degrees as a result of the Program depending on the intensity, frequency and duration of the physical impacts. The effects include, but are not limited to drilling through soils that may contain archaeological sites, preparation for vehicle traffic and reclamation activities. While the weight of the construction equipment will be sufficient to compress snow within work zones, it is unknown if there will be any effect on the context of artifacts and features. Any effects of the investigation program would likely be limited to resultant changes in erosion that affect artifact context. Artifact context is fundamental to interpretation and dating of archaeological sites. Soil removal (such as drilling) or disturbance (such as gouging at slope changes) also alters the spatial patterning of artifacts. By disturbing the context in which artifacts and features are recovered, interpretations of archaeological sites and, ultimately, past lifeways, are affected negatively.

Secondary impacts are indirect impacts that occur after the Program is complete. Since the Program is of limited duration and will not leave any facilities, there is no operation phase that will have an effect on heritage resources. Erosion of sloping terrain due to alterations in the vegetation and soils composition, or due to snow pack and/or ice road construction for winter access may affect sites.

Tertiary impacts are the results of changes in land use patterns induced by the Program. Creation of temporary access (as a supplement to existing access) may result in subsequent use by local people on a long-term basis. Intentional and unintentional impacts to heritage resources may result from increased visitation to specific areas within the region. However, the potential for this type of tertiary impacts is anticipated to be low.

The heritage resources management plan detailed here is intended to offset many of these impacts. Heritage resources impact assessment or mitigation studies may be recommended for situations where impacts cannot be avoided. These studies will manage any remaining negative effects of the Program.

3 Methods

3.1 Previous Field Investigations

The Program sites were the subject of an archaeological reconnaissance (aerial and ground-based) in 2004. While this was a limited program, data was gathered and this information coupled with data gathered as a result of studies along the pipeline corridor and for the infrastructure, was utilized to analyse the potential of the various Program components.

3.2 Desktop Analyses

A desktop analysis of the proposed drilling locations at a map scale between 1:20 000 and 1:50 000 has been done. The areas within which the drill holes will be drilled has been assigned a preliminary heritage resource potential rating on the basis of terrain analyses, known site distributions, and predicted settlement patterns.

A literature review was completed to complement the archaeological investigations associated with the Program. The Prince of Wales Northern Heritage Centre (PWNHC) sites database and associated mapping was searched for known heritage sites in the area of the Program within the Inuvialuit Settlement Region (ISR). A review of general environmental information and previous archaeological studies conducted in the ISR provides context to the field programs that are required.

3.3 Pre-Program Reconnaissance

Program drilling locations not previously visited (via air or ground) will be subject to a helicopter overflight to confirm the potential ranking. These sites will be inspected for visible above-surface features such as graves, cabins and trails as well as to determine if ground inspections are warranted.

3.4 Results

Storm Hills Pigging Facility - The area proposed for the Storm Hills Pigging Facility is not in a location that appears to be currently utilized nor is it an area that appears to have had a high use in the past for activities that would result in the presence of an archaeological site. There was no indication of disturbance by previous development in the proposed location. No cultural materials or features were observed at this investigation area. It is recommended that development be allowed to proceed in this area, as there are no recorded heritage resources in conflict with the location.

Borrow Site 1.002P - The area proposed for the borrow source location 1.002P is considered to be of moderate archaeological potential. It is not in a location that

appears to be currently utilized nor is it an area that appears to have had a high use in the past for activities that would result in the presence of an archaeological site. There was no indication of disturbance by previous development in the proposed location. No cultural materials were observed at this investigation area. This area had also been investigated in 2003 during the heritage resources study with negative results. It is recommended that development be allowed to proceed in this area, as there are no recorded heritage resources in conflict with the location.

Borrow Site 1.004P - The area proposed for the borrow source location 1.004P is considered to have areas of high archaeological potential along the river. Areas within the borrow source location are considered to have a more moderate potential. The area situated off of the river edge has been utilized in the recent past for reindeer herding, although no cultural materials that were of sufficient age to be noted or recorded were observed. Portions of the borrow source area have been previously disturbed by an existing borrow extraction operation but no cultural materials were observed. It is recommended that development be allowed to proceed in this area, as there are no recorded heritage resources in conflict with the location.

Borrow Sites 2.029P and 2.029PB – These two borrow sources are located in the same area and are considered to be of moderate to high archaeological potential. There was no indication of disturbance by previous development in either of the proposed locations. No cultural materials were observed at this investigation area. It is recommended that development be allowed to proceed in this area, as there are no recorded heritage resources in conflict with the location.

Borrow Site 2.038P - The area proposed for the borrow source location 20.038P is considered to be of limited archaeological potential. It is not in a location that appears to be currently utilized nor is it an area that appears to have had a high use in the past for activities that would result in the presence of an archaeological site. There was no indication of disturbance by previous development in the proposed location. No cultural materials were observed at this investigation area. It is recommended that development be allowed to proceed in this area, as there are no recorded heritage resources in conflict with the location.

3.5 Pre-Program Impact Assessment

A pre-disturbance heritage resources impact assessment will be completed at areas of high potential for heritage resources where sub-surface impacts may occur.

Any site that is revisited or newly recorded will be accurately mapped and the locations will be incorporated into subsequent reporting to the PWNHC. At the completion of the pre-impact assessment an interim report will be compiled and submitted to the PWNHC for their review. This document will:

- outline locations investigated;
- detail the in-field methods adopted;
- present details regarding the proximity of newly recorded and previously recorded sites to the Program;
- present a list of which locations are cleared, from an archaeological perspective, for the Program;
- define which locations must have additional archaeological investigations if they are to be impacted at any time in the future;
- recommend mitigative measures for archaeological sites found or reassessed as a result of the Program; and
- summarize the results of the work in the context of known site distribution and any implications they may have for subsequent stages of study.

3.6 Heritage Resource Site Protection Manual

All supervisory staff for the Program will be provided with maps and documentation identifying the location and nature of heritage resource sites in the vicinity of the proposed winter work area. This documentation will be created in such a way that known heritage resources (unless previously mitigated) will be avoidable by the drilling crews. The manual will also illustrate a number of different types of heritage resources that may be encountered and detailing procedures to follow should heritage resources be encountered.

3.7 Monitoring

Monitoring during the Program may be recommended in the event that archaeological sites are encountered at the proposed drilling locations or other impact zones. It may be possible to allow the Program to proceed in close proximity to known significant sites if archaeological monitoring takes place.

3.8 Post-Program Impact Assessment

This technique will primarily be used for areas of moderate potential that were not subject to examination during the 2004 archaeological field season and other areas that may be identified by the regulatory agencies. The objective will be to determine the effects of the Program on archaeological sites and to define any necessary archaeological programs required in order to provide clearances for further development. This phase of the Program will also serve as a test of the low, moderate and high potential modeling. This will allow a high level of confidence in applying the model to larger areas, such as the conditioning plant.

4 Summary

This plan provides the approach to protection of heritage resources over the large area involved. The Program is not expected to have any significant impact on archaeological sites. Heritage resources that are represented by above ground features and artifact scatters represent the highest potential for disturbance. Protection of these sites will be through avoidance. This will be accomplished utilizing a combination of pre-impact assessments, accurate mapping of heritage resources, aerial reconnaissance investigations, contractor education and supplemental snow and ice cover.

As the Program is scheduled to be completed within a large geographical area it is possible that not all of the heritage resources will be identified during the course of the assessments. In such instances it is believed that due to the low impact nature of the Program, it will have an overall low potential to disturb heritage resources. Near surface heritage resource materials, if present, will have a moderate potential for disturbance through primary impacts at drill locations. Deeply buried heritage resources, as well as disturbances relating to secondary and tertiary impacts, represent a low potential for site disturbance.

References

Clarke, G.M., D. Dalmer, and J. McKillop; 2003 *Heritage Resources Focussed Reconnaissance of the Mackenzie Gas Project. Northwest Territories Permit No. 2002-916.* Submitted to the Prince of Wales Northern Heritage Centre. Yellowknife NT.

Attachment 5

Public Consultation Report for the 2005 Winter Field Geotechnical Investigation Program

Inuvialuit Settlement Region

INTRODUCTION

This section describes the public involvement program used to gather, assess and consider input from Inuvialuit Settlement Region (ISR) communities regarding the activities proposed in this application. The Program has been designed and conducted in accordance with the Inuvialuit Land Management System (ILMS), dated April 2004 wherever possible.

Public feedback and concerns were collected during presentations held in Paulatuk, Sachs Harbor, Inuvik, Tuktoyaktuk and Aklavik in June and July, 2004. A public meeting scheduled in Holman on June 23, 2004 was cancelled due to mechanical problems with the charter aircraft. It was rescheduled for July 26, 2004; however, the aircraft was unable to land in Holman due to fog on that date. Feedback and concerns gathered during the public involvement meetings have been considered for this land use permit application.

PUBLIC INVOLVEMENT OBJECTIVES

The objectives of the public involvement program include:

- advising the community that an application is forthcoming
- introducing the geotechnical activities to key stakeholders, including ISR communities, aboriginal organizations and regulatory authorities, who might be affected by the Program
- identifying and responding, where possible, to public concerns
- incorporating concerns and traditional knowledge
- demonstrating how negative impacts will be reduced
- demonstrating the extent of public involvement

PUBLIC INVOLVEMENT PRINCIPLES

The principles underpinning the public involvement program include the following attributes:

- transparency: providing comprehensive and relevant information about the activities that is clearly understandable for non-technical people
- inclusiveness: ensuring that all local people, aboriginal groups and regulatory parties that might be affected by the activities are given the opportunity to participate in the public involvement program

- respect: ensuring that the views and opinions, the culture, language and level of education of all participants as well as the protocols and traditional communication structure are respected

- reasonableness: ensuring that the process and time required for reviewing and providing concerns and comments of the residents are reasonable

PUBLIC INVOLVEMENT PROCESS

Information regarding this application was provided to the ISR communities through open house meetings and focus group sessions. General notices were mailed to local residents advising them of the open houses. Letters were sent to Hunters and Trappers Committees, Elders Committees, Community Corporations and Band Councils inviting them to appoint representatives to attend the focus group sessions.

Table 1 lists the public involvement meetings held in the ISR, the dates, locations and communities or groups who participated in the meetings.

Table 1: - Public Involvement Meetings

Meeting Date	Location	Meeting Format	Community or Group	Time (p.m.)
June 22, 2004	Paulatuk	Open house	Public	7:00 – 9:30
June 22, 2004	Paulatuk	Focus group	Hunters and Trappers Committee Community Corporations Elders Committees	2:00 – 5:00
June 24, 2004	Sachs Harbor	Open house	Public	7:00 – 10:00
June 24, 2004	Sachs Harbor	Focus group	Hunters and Trappers Committee Community Corporations Elders Committees	2:00 – 5:00
July 05, 2004	Inuvik	Open house	Public	7:00 – 9:30
July 05, 2004	Inuvik	Focus group	Hunters and Trappers Committee Community Corporations Elders Committees	2:00 - 5:00
July 06, 2004	Tuktoyaktuk	Open house	Public	7:00 – 12:30
July 07, 2004	Aklavik	Open house	Public	6:00 – 9:45
July 07, 2004	Aklavik	Focus group	Hunters and Trappers Committee Community Corporation Elders Committees RRC Aklavik GTC Band Councils	3:00 – 6:00

PUBLIC INVOLVEMENT SUMMARY

To date, nine public involvement meetings were held in communities within the ISR, attended by approximately 176 attendees. The following information regarding the Program was provided:

- the proposed Program will consist of activities at six sites; five potential borrow sites and one potential Storm Hills Facility site
- the geotechnical activities will involve drilling approximately 36 geotechnical holes at the sites to a depth of 15 to 20 meters
- the objective of the Program is to gather information for an assessment of the soil and ground conditions
- the information obtained from the Program will be used in the engineering and construction studies for a potential pipeline in the Mackenzie Valley and for preparing subsequent regulatory applications
- the Program is proposed to commence in early January 2005 and end by mid April 2005
- environment and wildlife monitors will serve as integral members of the team
- geotechnical investigation work in ISR will begin in the south and progress to the north
- Winter Work Program personnel will be housed in Inuvik and at the existing camp at Swimming Point. The potable water, waste and sewage disposal facilities, which are already established, will be used.

PUBLIC INVOLVEMENT COMMENTS AND CONCERNS

Table 2 describes the comments and concerns raised during the ISR open house meetings and focus group sessions. It also provides Imperials' responses to those comments and concerns.

Table 2: - Summary of Public Involvement Comments and Concerns

COMMUNITY	COMMUNITY COMMENTS AND CONCERNS	RESPONSES, FOLLOW-UP AND CHANGES TO THE PROGRAM RESULTING FROM COMMUNITY INPUT
Paulatuk		
	Why are boreholes being drilled?	Boreholes are drilled to determine the condition of the area being investigated. For the facilities sites, engineers need to understand the soil property to design building supports.
Sachs Harbour		
	Has all the work already been contracted out?	No work will be contracted out until the regulatory approvals have been issued. No approvals are in place at this time.

COMMUNITY	COMMUNITY COMMENTS AND CONCERNS	RESPONSES, FOLLOW-UP AND CHANGES TO THE PROGRAM RESULTING FROM COMMUNITY INPUT
Inuvik		
	Is this seismic work?	No, this is actually drilling 15 to 20 meters deep.
	Where do you get the granular pits? Will you go to ILA?	Imperial will work with the ILA to develop granular sites on private lands.
	Will the boreholes be 30 meters deep? Will a Nodwell be used?	The boreholes will be 15 to 20 meters deep. This program will use the same equipment as Winter 2003 program.
	Will there be any wildlife monitors for the work areas described?	Local monitors for wildlife and environment protection will be hired.
Tuktoyaktuk		
	It's up to contractors to take care of equipment and manpower. How are you deciding on contractors? Are you putting contract to tender? How are contracts given out for equipment and manpower? Will it be a prime contractor concept or can any company put a bid in?	For the previous 2003 Winter Work Program a Participation and Access agreement was negotiated with the ILA and IRC. This agreement was intended to provide the Inuvialuit with the opportunity to participate. The work was bundled into eight different smaller contracts, which increased the opportunity for smaller Inuvialuit businesses to participate. A similar benefits agreement will be negotiated for the proposed 2005 Winter Geotechnical Investigation Program.
Aklavik		
	IRC keeps track of how much money was spent on each project. How much money was spent on the 2003 winter work program?	Approximately $6.7 million was spent in the ISR of which $4.6 million (70%) went to Inuvialuit businesses.