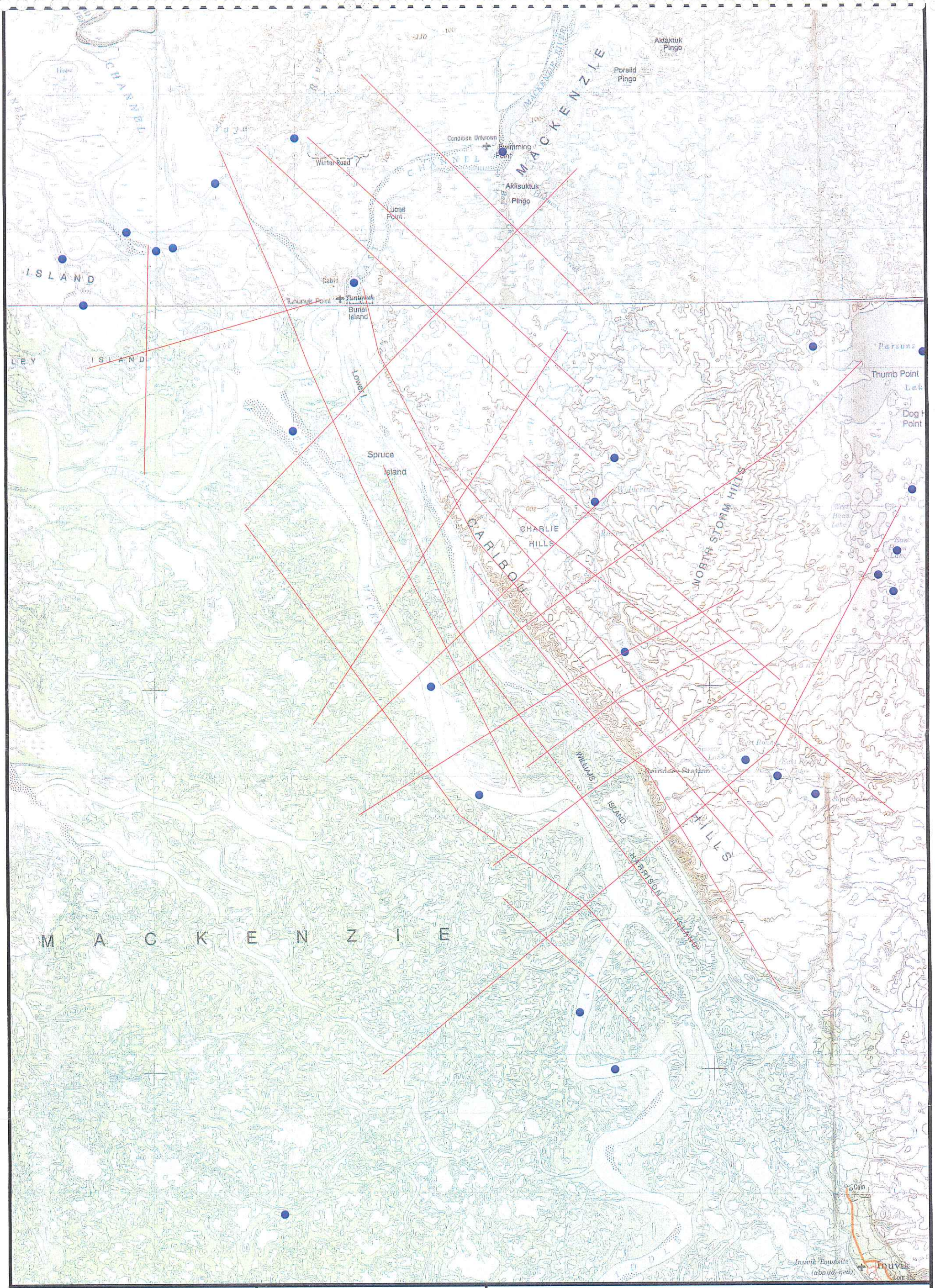


Inuvialuit Environmental Inc.

Legend

Seismic Lines

Fish Overwintering Habitat

Identified Fish Overwintering Habitat within the Vicinity of the Project

Scale 1:250,000 (0 — 5km)	700-00	October 2000	Figure 5

11.8 Cultural and Historic Resources

Cultural and heritage resources include the physical traces of culture and societies as well as the current resources utilized by local people. Heritage sites recognized by Federal agencies are also considered. These sites include archaeological sites, historic structure sites, traditional trails, campsites, berry picking areas, sacred or medicinal plant picking areas, burials, ceremonial sites, traditional hunting grounds and places associated with traditional names or legends.

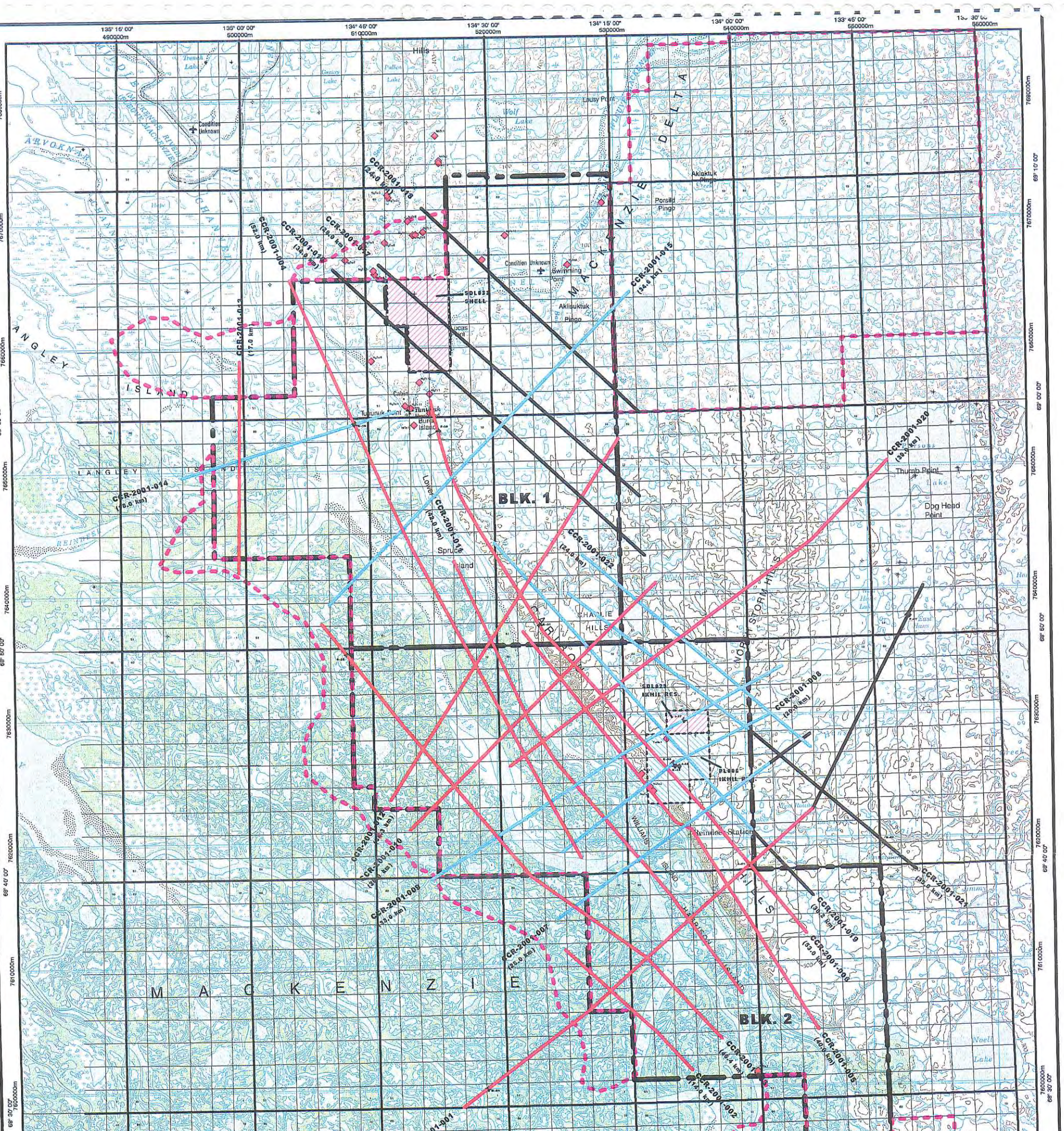
The project is situated within the Mackenzie Delta, portions of which have seen previous survey efforts. A records search was completed for mapped locations of heritage resource sites on file at the Canadian Museum of Civilisation for locations of known archaeological and historical resource sites in the project area. Palaeontological finds of Quaternary age have also been recorded in the delta and are not on file with the Canadian Museum of Civilisation but are considered a heritage resource (FMA 2000). There are 30 recorded site locations within the project area as specified in Figure 1. These recorded site locations currently on file are listed in Table 10 and are shown in Figure 6. Chevron will be sharing information on the GPS location of these sites with other operators within the region to ensure that sites within their program are accurately identified and avoided. Detailed descriptions of each site are located in Appendix C.

TABLE 10

PREVIOUSLY RECORDED HISTORICAL SITES IN THE VICINITY OF THE PROPOSED WINTER SEISMIC PROGRAM

Site	Type	N.T.S Map Reference	Location	Association	Distance To Project (Km)
NdTs 1	H Burial	107B/11E	8WMM 405 015	Bombardier Channel	3.8
NeTs 1	P Isolated Find	107B/11E	8WNM 3164 2530	Ridge	On Line # 5
NeTs 2	P Artifact Scatter / Burial	107B/11E	8WNM 3228 2420	Ridge	0.1
NeTs 3	P Campsite	107B/11E	8WNM 3256 2383	Knoll	0.1
NeTs*	P Stone Feature	107B/14E	8WNM 3363 3138	North Shore	0.3
NfTt 1	? Burial	107B/14W	8WNM 137 540	Burial Island	1.9
NgTs 1	H Burial	107C/3E	8WNM 2905 7136	East Bank	7.8
NgTt 1	TU Village	107C/3W	8WNM 150 561	Tunanuk Point	0.6
NgTt 2	P Village	107C/3W	8WNM 150 544	Nennorai Point	0.4
NgTt 4	P/H ?	107C/3E	8WNM 2603 670	Mouth/South Bank	0.3
NgTt 5	P Campsite	107C/3W	8WNM 1380 6890	Kame	2.2
NgTt 6	P Artifact Scatter	107C/3W	8WNM 1409 6893	Saddle/Kames	2
NgTt 7	H? Cairn	107C/3W	8WNM 1462 6910	Hill/Shore	1.5
NgTt 8	P Isolated Find	107C/3W	8WNM 1339 7005	Upland/Lake Shore	1.7
NgTt 9	? Burials	107C/3E	8WNM 2623 6636	Knolls	4.6
NgTt 10	? Artifact Scatter	107C/3E	8WNM 2121 6881	Knoll	3
NgTt 11	P Artifact Scatter	107C/3W	8WNM 1345 5494	Left Bank	1.3
NgTt 12	? Burial	107C/3W	8WNM 1416 5697	Terrace	2.1
NgTu 1	H Burials/house	107C/3W	8WNM 130 5473	Bluff	0.8
NgTu 2	H Campsite	107C/3W	8WNM 1185 7194	Kame/West Shore	3
NgTu 3	P Stone Feature	107C/3W	8WNM 1178 7218	Kame/West Shore	3.1
NgTu 4	H Campsite	107C/3W	8WNM 1068 6575	Kame	1
NgTu 5	H Stone Feature	107C/3W	8WNM 1060 6606	Kame	0.8
NgTu 6	H Cabin	107C/3W	8WNM 1034 5874	Middle Channel	3.5
NgTu 7	P Stone Feature	107C/3W	8WNM 0833 6694	Kettle Lake	1.1
NgTu 8	H Stone Feature	107C/3W	8WNM 0982 6802	Lake	2
NgTu 9	H Stone Feature	107C/3W	8WNM 1153 6828		1.8
NhTt 1	? Artifact Scatter	107C/3W	8WNM 1566 7699	Ridge/North Shore	6
NhTt 2	P Artifact Scatter	107C/3W	8WNM 1593 7492	Ridge/East Shore	4
NhTt 3	P Artifact Scatter	107C/3W	8WNM 1594 7474	Ridge/East Shore	3.8

Notes: ? indicates timing or content of archaeological site is unknown
H = Historic
P = Precontact
* = mislabeled on original mapping data as site TeNs4



Chevron
CHEVRON CANADA RESOURCES

MACKENZIE DELTA
INUVIK BLKS. 1 & 2
WINTER SEISMIC PROGRAM

NORTHWEST TERRITORIES

EXISTING:
NEWCUT: 737.5 km

TOTAL: 737.5 km

UTM NAD 27, ZONE 8

ARCHAEOLOGICAL AND CULTURAL SITES

LICENSEE: CHEVRON NO.:
PERMITTEE: SCHLUMBERGER NO.:
EQUIPMENT: TRACKED / HELI-ASSIST
SOURCE: DYNAMITE
SCALE: 1:330,000
IMPACT FILE NO.: 00-313-5651
NTS MAPS: 107 B/C ('96)
DATE: Oct. 11, 2000

Line #	ORIENTATION	LENGTH (km)	PRIORITY
CCR-2001-001	SW-NE	57.0	1
CCR-2001-002	SE-NW	14.0	2
CCR-2001-003	SE-NW	46.4	1
CCR-2001-004	SE-NW	52.0	1
CCR-2001-005	SE-NW	40.0	1
CCR-2001-006	SE-NW	53.0	1
CCR-2001-007	SW-NE	25.0	2
CCR-2001-008	SW-NE	20.0	2
CCR-2001-009	SW-NE	33.0	2
CCR-2001-010	SW-NE	28.0	1
CCR-2001-011	SE-NW	42.0	1
CCR-2001-012	SW-NE	34.3	1
CCR-2001-013	S-N	17.0	1
CCR-2001-014	WSW-ENE	18.0	2
CCR-2001-015	SW-NE	35.0	2
CCR-2001-016	SE-NW	34.0	3
CCR-2001-017	SE-NW	28.0	3
CCR-2001-018	SE-NW	24.0	3
CCR-2001-019	SE-NW	38.2	2
CCR-2001-020	SW-NE	39.0	1
CCR-2001-021	SE-NW	35.6	2
CCR-2001-022	SE-NW	24.0	2

LEGEND:

Inuvialuit (Private) Lands: 7(1)(a) 7(1)(b)
Inuvik

Archaeological Sites:
Creek Crossings:
Access:
Production Licence (PL):
Significant Discovery Licence (SDL):

Figure 6

12.0 PROPOSED MITIGATION AND ANTICIPATED ENVIRONMENTAL IMPACTS

Chevron's winter seismic program has been designed to minimize impacts on the environment and land users. Potential environmental impacts were identified through ongoing public consultation, a review of existing literature and maps, as well as a field reconnaissance of the project area on September 5, 2000. On this date, Peter Jalkotzy (IEI), and Kevin Williams (Chevron) flew over the proposed seismic project area. The intent of the aerial reconnaissance was to identify environmentally significant sites. During this site visit, no major concerns were identified.

Without adequate mitigation, potential environmental impacts resulting from the winter seismic program may include temporary disturbance to terrain, soils and permafrost, vegetation, wildlife, aquatic resources, and other land uses. Potential environmental impacts and mitigative measures are described in Table 11.

It is predicted that the use of proposed mitigative measures by Chevron and their seismic contractor will ensure that no significant residual impacts will occur as a result of the project. Sensitive terrain features such as erosion prone slopes and eroded banks will be avoided during line routing and where appropriate, detours and/or snow ramps will be used. Any detours will be clearly marked and all traffic on the lines will be confined to right-of-way. Frozen ground conditions, the use of tracked equipment, and the cushioning effect of snow, will minimize impacts to the soil profile and organic mat along seismic lines and access routes.

Line sets on upland tundra are located in areas of sparse vegetation, limited mainly to willow and shrub communities (Plate 1). There may be some clearing of vegetation in areas of lowland delta where black spruce and tall shrubs are found along channels of the Mackenzie River (Plate 2). Where clearing is required, care will be taken to ensure that there is no organic mat disturbance. Cleared woody vegetation will be sheared off at ground level in frozen ground conditions, thereby leaving root systems intact. This ensures soil stability and promotes vegetation regeneration in the following growing season. Fluctuating water levels in the delta will also assist in natural vegetation regeneration. Vegetation that is cut or pushed down will be packed into the snow cover and will remain on line to enhance natural revegetation. No slash or debris will be left in waterbodies.

Along most of the lines, shrubs and willows will be rolled over, with the impacts related to crushing restricted to the aboveground woody material with the root systems remaining intact. Frozen ground conditions, snow cover and tracked or low-pressure wheeled vehicles will minimize impacts to vegetation communities. Additionally, the project will be completed during the dormant season for plants.

During final program design, areas of dense vegetation cover will be avoided to the extent feasible, while considering the other environmental constraints of the area (*e.g.*, setback distance from waterbodies for fisheries protection). In addition, mechanical overland travel of personnel or transport of equipment will be restricted to seismic access routes. Due to natural revegetation and the local extent of the disturbance, the potential environmental impacts to vegetation should be minimal. Survey control conducted by Schlumberger will identify sensitive areas, productive waterbodies and surface features that will require mitigation and line adjustment. General seismic activities will follow Indian and Northern Affairs Canada (INAC) *Environmental Guidelines: Northern Seismic Operations.*

Impacts to wildlife will be restricted to the immediate project area and will be short in duration. Once a program area is shot, the equipment will move out of the area. Dynamite charge sizes on land will be equal to or less than 20 kg. Waterbodies with bottom-fast ice or less than 0.5 m of water below ice are considered non-fish bearing, (Wright Pers. Comm.) and will be drilled as they would on land. Waterbodies with non-frozen water depths exceeding 0.5 m below ice will be considered potential overwintering habitat. Charge sizes beneath the lakes will meet DFO guidelines.

The combination of appropriate setback distances and charge size will protect aquatic furbearers. Setback distances described in Table 11 and the assistance of an Environmental Monitor will mitigate potential impacts to wildlife. All critical time periods for bird and mammal migrations will be avoided by program scheduling during the winter.

No effects on fish habitat are predicted to result from this project due to the mitigative measures developed for the project. Water withdrawals from the Mackenzie River and its channels will be small and intakes used for water withdrawal will be screened to avoid impingement or entrainment of fish. Activity within waterbodies will follow the guidelines set out by Fisheries and Oceans Canada.

Known cultural and archaeological sites will be identified during survey control, and avoided through the use of a vehicle tracking alarm system. Since the seismic program will be conducted under winter conditions and low-impact vehicles are being employed during the program, no impacts to these sites are predicted. A buffer of 100 m will be maintained between the reported locations of these sites and the activities associated with the seismic program. The specific details of potential impacts and mitigative measures are presented in Table 11. Mitigation techniques proposed for the program follow industry best practices.

Table 11 identifies how potential environmental and socio-economic impacts could arise during the program; recommended mitigative measures to avoid or mitigate the potential impacts; and the significance of the residual impacts. Residual impacts are those effects of the proposed

development, likely to remain after mitigation. The assessment criteria and definitions used in assessing the significance of each potential impact are provided below.

SIGNIFICANCE CRITERIA

AREAL EXTENT

Local:	Impacts are limited to the program rights-of-way and camp.
Subregional:	Impacts may extend beyond the limits of the right-of-way and camp, but are limited to within 1 km of the rights-of-way or camp.
Regional:	Impacts may extend beyond 1 km from the rights-of-way.

DURATION

Immediate:	Impact duration is limited to less than two days.
Short-term:	Impact duration is longer than two days but less than one year.
Medium-term:	Impact duration is one year or longer but less than ten years.
Long-term:	Impact duration extends ten years or longer.

SIGNIFICANCE

Significant Adverse Effect:	High probability of permanent or long-term residual effect of high magnitude on ecological, social, or economic sustainability that cannot be technically or economically mitigated or compensated.
Significant Positive Effect:	High probability of permanent or long-term positive residual effect of high magnitude on ecological, biological, social, or economic sustainability.
Unknown:	Potential significance cannot be defined with existing information or knowledge.
Not Significant Adverse Effect:	All other negative effects.
Not Significant Positive Effect:	All other positive effects.

TABLE 11
POTENTIAL ENVIRONMENTAL IMPACTS, MITIGATIVE MEASURES AND RESIDUAL IMPACTS

Environmental Concerns/ Potential Impacts	Mitigative Measures	Significance/ Duration/ Scope of Residual Impacts
1. Permafrost and Permafrost Features		
1.1 Disturbance of permafrost	.1 A minimum of 10 cm of snow will be left on all access trails and low ground pressure vehicles (tracks) will be used to mitigate permafrost disturbance. .2 The project will be completed under frozen ground conditions. .3 Vehicle movement will be restricted in the event of thaw or soft ground conditions. .4 An Environmental Monitor will be present to identify sensitive areas and assist in mitigation.	Not significant, short term and localized.
1.2 Pingos	.1 All pingos will be avoided by a minimum of 150 m.	
2. Terrain and Soils		
2.1 Disturbance to the soil profile (i.e. soil loss, compaction, admixing)	.1 Program will be completed under frozen ground conditions limiting soil disturbance caused by uprooting. .2 Any inadvertent surface disturbance will be repaired immediately and covered with slash as appropriate .3 Blasting will be restricted to isolated areas (shot hole) and will be conducted in accordance with all relevant regulations and safety guidelines. .4 Access routes and trails will be limited to seismic rights-of-way and ice access routes wherever possible. .5 Any soil or organic material displaced during operations will be replaced and compacted. .6 Tracked and low-pressure tire vehicles will be used to minimize surface disturbance. .7 Equipment turnarounds will be restricted to designated locations. Turnarounds on ice roads or waterbodies will be utilized as often as possible. .8 Equipment pulling sleigh mounted camp units will be adequately powered to prevent tracks from spinning and rutting soils.	Not significant, short term, minor and localized.
2.2 Disturbance to erosion prone banks and slopes.	.1 Snow/ice ramps will be constructed on riverbank slopes to prevent equipment disturbance and erosion. .2 Sensitive areas will be avoided by using detours. .3 Equipment operators will be instructed to not disturb the organic mat, and all access will be clearly marked to reduce the possibility of inadvertent surface disturbance. .4 If surfaces are disturbed in an area where drainage or erosion is a possibility, such as channels, lakes or oxbows, erosion control measures may include utilizing salvaged slash as rollback.	Not significant, short term and localized.
2.3 Disturbance to drainage	.1 Snow bridges or ice roads will be constructed across drainages or waterbodies. Only clean snow and/or ice will be used for drainage crossings. .2 Drainages will be left free of debris. .3 Any clearings will be re-contoured to restore natural cross drainages.	Not significant, short term and localized.

TABLE 11 Cont'd

Environmental Concerns/ Potential Impacts	Mitigative Measures	Significance/ Duration/ Scope of Residual Impacts
	.4 Surface drainage ditches will be reclaimed to original condition. V-notching of snow bridges will be performed upon completion.	
3. Vegetation		
3.1 Loss of vegetation communities	.1 Vegetation will be rolled over on seismic lines rather than cleared to accommodate natural regeneration. .2 Right-of-way widths will be restricted to 8 m. .3 Disturbed areas will be stabilized and slash rolled back to promote natural revegtation. .4 Tracked and low-pressure tire vehicles will be used to minimize disturbance to vegetation root zones. .5 Cleared trees will be windrowed within the right-of-way and not pushed into standing timber. .6 Densely treed areas will be avoided to the extent possible. .7 Cleared timber will be bucked into 2 m lengths and made available for firewood or other uses to local residents.	Not significant, short to long term and localized
3.2 Potential disturbance to rare, sensitive or unique plant species or vegetation communities	.1 Seismic operations will occur in winter, coinciding with the dormant period for herbaceous plants. .2 Natural re-vegetation of rights-of-way will be promoted by avoiding disturbance of root zone.	Not significant, short term and localized.
4. Wildlife		
4.1 Disturbance to wildlife	.1 Regular (daily) garbage patrols will be undertaken to remove materials (i.e. metals, plastics, chemicals) that may be potentially harmful to wildlife. .2 All activity will be restricted to access routes, sleigh camp and seismic rights-of-way. .3 Inuvialuit Environmental/Wildlife Monitors will be employed to assess potential wildlife conflicts in the area of operations. .4 Aircraft will maintain a ceiling of 500 m in areas of wildlife concentration (*ie.* caribou herd) and 3000 m in occupied goose staging areas where feasible. Goose staging occurs in September, prior to program start-up.	Not significant, immediate to short term, and subregional.
4.2 Disturbance of wildlife migration	.1 Seismic operations will be completed prior to the arrival of the majority of migratory bird species (mid-May) and after mating of caribou in October. Caribou calving occurs outside the project area. .2 Seismic operations will be completed expeditiously to minimize impacts to resident wildlife.	Not significant, immediate to short term, and subregional.
4.3 Attraction of nuisance animals	.1 Kitchen wastes will be incinerated. .2 Camp wastes will be incinerated daily. .3 Wildlife will not be harassed or fed.	Not significant, short term, and localized.
4.4 Encroachment on endangered species or important wildlife habitats	.1 Environmental/Wildlife Monitors will scout ahead of equipment in order to avoid potential conflicts with denning bears. Local RWED biologists and officers will be notified if a bear is encountered. Lines will avoid bear dens. .2 Vegetation supporting stick nests will not be cut down or rolled over if feasible.	

TABLE 11 Cont'd

Environmental Concerns/ Potential Impacts	Mitigative Measures	Significance/ Duration/ Scope of Residual Impacts
5. Aquatic Resources		
5.1 Erosion of stream banks and destabilization of slopes	.1 Snow ramps will be designed to minimize erosion and/or destabilization of slopes. .2 Shooflies will be utilized to avoid any steep slope where activity may increase the erosion potential. .3 Tracked units and dozers equipped with mushroom shoes will be used to reduce the possibility of surface disturbance. .4 Clean ice bridges will be constructed if ice thickness tests reveal ice that cannot support equipment loads. .5 If the surface is disturbed in an area such as channels or lakes where drainage or erosion is a possibility, control measures may include using earth breaks or cross ditches. Slash may also be used as rollback for erosion control. .6 Channel crossings will be made at a level location as often as possible. Crossings will be scouted in advance and will be constructed at 90 degree angles. .7 When access routes parallel lakes or streams, the access will be more than 30 m from a waterbody, where feasible.	Not significant. Properly designed access to project area will reduce any potential residual impacts.
5.2 Disturbance to Fish or Fish Habitat	.1 Waste materials and debris will not be disposed of in or on waterbodies. .2 No hazardous materials will be stored on any ice surface of a waterbody or within 30 m of such a waterbody. .3 Water intake from waterbodies will utilize screens on intake hoses to prevent disturbance to stream or lake bottoms and to prevent the entrainment of fish. .4 Water sources and fisheries will not be affected by drawdown as the Mackenzie River and its channels will act as the water source. .5 Dynamite shot holes on land will not be initiated within 50 m of any waterbody not frozen to bottom. .6 Charges will be set to a minimum depth below lakebed as recommended by DFO (Wright and Hopky 1998). .7 Drill cuttings will be disposed of in drill holes or a minimum of 30 m away from waterbodies. .8 Disturbance to creek banks will be minimized. Hand clearing will be conducted within 5 m of any stream or water crossing. The right-of-way width may be decreased at stream crossings to preserve riparian habitat.	Not significant, immediate and localized.
5.3 Introduction of oil, fuel or other pollutant to waterbody	.1 The mobile sleigh camp and associated facilities (i.e. kitchen, sanitary waste sumps, solid waste site) will be located a minimum of 100 m from any permanent waterbody or watercourse, where feasible. .2 Liquid fuels and oils will be stored in a closed system during transportation. .3 Fuels or hazardous materials will not be stored within 100 m of a waterbody where feasible. .4 Where fuel is stored within 100 m of a waterbody, secondary containment will be employed to prevent fuel escape.	Not significant, immediate to medium – term and localized. Spill contingency plans will minimize potential impacts.

TABLE 11 Cont'd

Environmental Concerns/ Potential Impacts	Mitigative Measures	Significance/ Duration/ Scope of Residual Impacts
	.5 Access routes will be on ice channels and down the lines. When access routes parallel lakes or streams, the access will be more than 30 m from the waterbody to prevent deleterious material from entering the waterbody and to prevent disturbance of banks that can result in sedimentation.	
	.6 Any deleterious material that accidentally falls into a waterbody will be removed.	
	.7 In the event of a spill, the Fuel Spill Contingency plan will be followed (Appendix B).	
	.8 Spills will immediately be reported to Chevron's Environmental, Health and Safety Coordinator, ILA and INAC. All accidental spills will be reported to the NWT Emergency Spill Response Line (867-920-8130), ILA, INAC and to Rick Turner, the Environmental and Safety Officer with the National Energy Board (403-292-6614).	
	.9 Personnel will be trained in spill response procedures and equipment use.	
5.4 Snow fills/ ramps/ bridges can act as dams during break-up resulting in impacts to channels and banks	.1 Snow fills/ ramps/ ice bridges will be removed by V-notching upon completion of seismic operations and prior to break-up.	Not significant, short term and localized.
6. Interference with Other Land Uses		
6.1 Possible conflict with wildlife harvesting in the area	.1 Public consultation with all local communities has been undertaken and is ongoing to notify communities of seismic operations and timing.	Not significant, short term and localized.
6.2 Trapline Operators	.1 Local trappers will be notified of seismic operations and timing.	Not significant, short term and localized.
	.2 Coloured lath will be present along seismic routes.	
6.3 Traffic accident on winter access	.1 Only identified access routes will be used and traffic safety will be implemented.	
6.4 Disturbance to snowmobile trails	.2 When an access route or seismic line crosses snowmobile trails utilized by community members, any debris from the seismic operation will be removed and the trail left clean and open.	
6.5 Loss or damage to existing cabins	.1 Chevron will discuss appropriate site-specific mitigation measures with cabin owners in the vicinity of the proposed project.	
7. Future Land Use		
	.1 The project is not anticipated to affect future land use by local and/or recreational users of the region.	
8. Archaeological, Historical or Palaeontological Sites		
	.1 Should any archaeological or palaeontological sites be discovered during construction or operations, work will be re-routed around that location. Notification of site discovery shall be provided in writing within 2 days to Inuvialuit organizations and the Prince of Wales Northern Heritage Centre.	Not significant. Effects would be short term, minor and restricted to the immediate area.

TABLE 11 Cont'd

Environmental Concerns/ Potential Impacts	Mitigative Measures	Significance/ Duration/ Scope of Residual Impacts
	.2 A 100 m buffer between camp facilities, access routes and seismic lines, and archaeologically or culturally important sites will be maintained.	
9. Health or Environmentally Threatening Emergency		
	.1 In the event of an emergency, Schlumberger's Emergency Response Plan will be implemented (Appendix B).	
10. Abandonment and Restoration		
	.1 All equipment and materials will be removed from area immediately following project completion.	Proper abandonment and restoration activities will result in no significant residual impacts.
	.2 Equipment will be removed before spring break up to prevent permafrost and organic mat disturbance.	
	.3 All garbage will be incinerated or transported to an approved waste management facility. No waste will be left at a campsite.	

13.0 EMERGENCY RESPONSE PLANS

In the event of an emergency, Schlumberger's Emergency Response Plan will be followed (Appendix B) and Indian and Northern Affairs Canada as well as the Inuvialuit Land Administration will be contacted immediately. In the event of a spill, the Fuel and Oil Spill Contingency Plan will be followed (Appendix B), and Indian and Northern Affairs Canada, the Inuvialuit Land Administration, National Energy Board and NWT Emergency Spill Response Line will be notified immediately as outlined in Table 11. Contingency plans for storm surges, permafrost degradation or fires will be in place prior to seismic operations.

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

Equipment, materials and any other debris will be removed from the project area prior to spring break-up and taken to Inuvik or Tuktoyaktuk. Any waste fluids generated and excess fuel or fuel containers (*e.g.* drums or propane bullets, fuel tanks or sloops) will be removed from the project area and disposed of appropriately.

15.0 OTHER ENVIRONMENTAL ASSESSMENT

A previous environmental assessment of a winter seismic program was conducted for Petro-Canada during the winter 1999/2000. In addition, an assessment was conducted for the Ikhil Gas Development, also located in the region. Both project descriptions are on file with the Environmental Impact Screening Committee and the National Energy Board. A number of assessments for proposed developments within the vicinity of the project area are currently underway or have been submitted for screening. Additional studies utilized in preparation for this Project Description are listed in the References section.

16.0 COMMUNITY CONSULTATION

Chevron initiated public consultation with the communities and regional organizations potentially affected by the proposed exploratory seismic program, early in the planning phase of the project. Government representatives were also informed of the proposed project, exploration schedule and where warranted, the technical details of the seismic program. This consultation has provided the opportunity for Chevron to present the program to the various groups, obtain information on the area from local residents and hear concerns raised regarding the project.

On August 30, 2000, IEI, on behalf of Chevron, sent an initial project notification along with a request for comments to all pertinent territorial, federal and Inuvialuit agencies with jurisdiction in the project area. The purpose of the notification was to provide agency representatives with an overview of the project prior to consultation meetings with Chevron representatives and to offer the opportunity for early comments or identification of concerns and to provide any information that might influence the project. Chevron representatives followed up the contacts during community meetings in Inuvik, Tuktoyaktuk and Aklavik where specific concerns and mitigative measures were discussed. A summary of the individuals who received project notification is provided in Table 12.

TABLE 12

GOVERNMENT AND NON-GOVERNMENT NOTIFICATION

Name	Agency	Date	Method
GOVERNMENT			
Rudy Cockney District Manager North Mackenzie District	Indian and Northern Affairs Canada, Inuvik, NWT	August 30, 2000	Email sent
Karen Ditz Area habitat Biologist NWT Area	Fisheries and Oceans Canada, Yellowknife, NWT	August 30, 2000	Email sent
John Nagy Wildlife Biologist	Resources, Wildlife and Economic Development	August 30, 2000	Email sent
Anne Wilson Water Pollution Specialist, Northern Division	Environment Canada, Yellowknife, NWT	August 30, 2000	Email sent
Sevn Bohnet Coordinator, Inuvialuit Region	Indian Affairs and Northern Development, Water Resources Division, Yellowknife, NWT	August 30, 2000	Email sent
Hans Arends Land Administrator	Inuvialuit Land Administration, Tuktoyaktuk, NWT	August 30, 2000	Email sent
NON-GOVERNMENT			
Duane Smith, Chair	Inuvialuit Game Council	August 30, 2000	Email sent
Frank Pokiak, Chair	Tuktoyaktuk Hunters and Trappers Committee	August 30, 2000	Email sent
Richard Binder, Chair	Inuvik Hunters and Trappers Committee	August 30, 2000	Email sent
Danny C. Gordon, Chair	Aklavik Hunters and Trappers Committee	August 30, 2000	Email sent
Patrick Gruben, Chair	Tuktoyaktuk Community Corporation	August 30, 2000	Facsimile sent
Donna Kisoun, Chair	Inuvik Community Corporation	August 30, 2000	Facsimile sent
Alex Illasiak, Chair	Aklavik Community Corporation	August 30, 2000	Facsimile sent
Linda Graf, Secretary	Environmental Impact Screening Committee	August 30, 2000	Email sent

Meetings were held on September 5th to 8th, 2000 in the communities of Inuvik, Tuktoyaktuk and Aklavik to discuss issues of concern and mitigative measures to be adhered to during the project. At the meetings, project information was presented to the various individuals and groups and input related to issues, concerns or questions were invited. A schedule of meetings is provided in Table 13. The issues raised during community consultation meetings are listed below in Table14.

TABLE 13

COMMUNITY CONSULTATION MEETINGS

Date	Consultation Group	Location
September 5, 2000	Inuvialuit Regional Corporation Gwich'in Tribal Council	Inuvik
September 6, 2000	Deputy Mayor Peter Clarkson and Town Council Inuvik Community Corporation Inuvik Hunters and Trappers Committee Community Meeting	Inuvik
September 7, 2000	Community Meeting including members of Aklavik Community Corporation and Aklavik Hunters and Trappers Committee	Aklavik
September 8, 2000	Mayor, Ernest T. Pokiak Tuktoyaktuk Hunters and Trappers Committee Tuktoyaktuk Community Corporation Inuvialuit Land Administration Tuktoyaktuk Community Corporation Community Meeting	Tuktoyaktuk

TABLE 14

COMMUNITY CONSULTATION ISSUES AND RESPONSES

Issue	Response
Is Chevron using dynamite or vibroseis?	Chevron will be using exclusively dynamite. Chevron believes that dynamite will produce the best quality data in this terrain and produce the least environmental impact..
Will Chevron be conducting seismic on water bodies? If so, how will we be protecting the fish and other wildlife?	Conducting seismic on water bodies is heavily regulated. At present, we do not plan to shoot seismic on bodies of water. It is possible, however, that the new technologies recently tested at Parson's Lake may be approved by the regulatory agencies (*ie.* DFO). If that is the case, we may consider incorporating such technologies into our seismic program.
Will Chevron be shooting seismic on the Mackenzie? If so, can the dynamite damage the ice road?	Under the existing regulations, we are not permitted to shoot seismic on fish bearing water bodies. As a result, we will not he shooting on the Mackenzie. There is, therefore, no risk to the ice road from dynamite.
Is Chevron coordinating their efforts with other companies to avoid duplication (*ie.* shooting the same line twice)?	Yes. We are working together with other companies where it makes sense for us to coordinate our efforts. One possible outcome is that either Chevron or another company will shoot a line and then we will share both the data and the costs.
Is Chevron duplicating information?	For the most part, we are not replicating any existing data. In a few cases, however, it is necessary for us to shoot over a line that has been shot previously because the data is not available for purchase or it is technically poor quality. We may need to do this if the line was shot several years ago and the technology has changed significantly since that time.
Are we going to have an environmental or wildlife monitor?	Yes. Chevron will be hiring monitor(s).
Is there research showing the effects of seismic exploration on muskrats?	There has been a significant amount of research on the effects on fish, but we are not aware of any studies focused on muskrats. We look into it for you.
Are we going to do any cutting or slashing in the summer?	We will not be working in the summer at this stage.

TABLE 14 Cont'd

Issue	Response
Are the seismic lines located close to cabins?	We have not compared the proposed location of the seismic lines to the locations of the cabins yet. IEI has the information on the locations of some of the cabins. The information does not appear on our map, as they have been asked to keep the information confidential. We will be reviewing this information, however, we encourage you to let us know if there are specific lines that you are concerned about. The earlier that these kinds of issues are brought to our attention, the easier it is for us to try and modify our plans.
Will air traffic interfere with the annual spring goose hunt?	We intend to finish our operations prior to spring break-up, before the spring goose hunt.
What are the effects of dynamite explosives on permafrost below ground?	We are not aware of any studies. We will investigate this.
What kind of 'imprint' did Petro-Canada's seismic operations leave on the land?	Petro-Canada conducted a review of their operations with Inuvialuit representatives at the end of the season. We are not certain if they generated a final report.
Cutting down willows • Willows that were cut down for Petro-Canada's program last year were not properly disposed of. They jammed up a creek and created flooding. It is important that these kinds of things do not happen again.	There are regulations governing how willows and other debris are to be disposed of. The regulations are quite clear that such debris needs to he placed above the high water mark. In practice, however, it can often be difficult to determine where the high water mark is, particularly in the winter. Inspections will be conducted following completion of the seismic work to try and minimize these types of problems.
Compensation for killing wildlife • Each local HTC is given a finite quota for animals that they can hunt for their own use and for sporting licences. • If it is necessary to kill wildlife (*ie.* a bear) the HTC's must be compensated for a sporting licence, as this will be taken out of their quota.	We understand your concern. We will be reviewing the wildlife compensation agreement that the Game Council is preparing. It is our understanding that it will provide a way to ensure that there is fair compensation.

17.0 PERSONAL COMMUNICATIONS

Inuvialuit Environmental Inc. wishes to acknowledge the following people for their assistance in supplying information and comments incorporated into this report.

Boag, Thomas. Fisheries Biologist. Applied Aquatic Research Ltd. Calgary, AB

Hatfield, Todd. Fisheries Biologist. Solander Ecological Research. Victoria, BC

Nagy, John. Wildlife Biologist, GNWT, Resources, Wildlife and Economic Development, Inuvik, NT

Wright, Dennis. Coordinator, Environmental Affairs, Fisheries and Oceans Canada, Winnipeg, MB.

18.0 REFERENCES

Bull, J. and J. Farrand, Jr. 1997. National Audubon Society Field Guide to North American Birds. Chanticleer Press, New York

Canadian Environmental Assessment Agency. 1999. Reference Guide: Addressing Cumulative Environmental Effects. Hull, PQ.

Canadian Wildlife Service (CWS). 2000a. Species at Risk Database. Ottawa/Hull. Website: http://www.speciesatrisk.gc.ca/Species/English/

Canadian Wildlife Service (CWS). 2000b. Hinterland Who's Who. Ottawa/Hull. Website: http://www.cws-scf.ec.gc.ca/hww-fap/eng_ind.html

Casselman, L.M., D.M. Dickinson, and A. M. Martell. 1984. Wildlife of the Mackenzie Delta Region. Boreal Institute for Northern Studies. Occaisional Publication No. 15. Edmonton, Alberta.

Carpenter, A., L. Treseder. 1989. Polar Bear Management in the South Beaufort Sea. Information North, Newletter of the Arctic Institute of North America. Vol.15(4).

Clarkson, P. and I. Liepins. 1989. Inuvialuit Wildlife Studies Western Arctic Wolf Research Project Progress Report, 1987-1988. Wildlife Management Advisory Council Technical Report No. 2.

Committee on the Status of Endangered Wildlife in Canada. 2000. Endangered Species in Canada, Ottawa.

Community of Aklavik, Wildlife Management Advisory Council (NWT) and the Joint Secretariat. 2000. Draft Aklavik Inuvialuit Community Conservation Plan (AICCP).

Community of Inuvik, Wildlife Management Advisory Council (NWT) and the Joint Secretariat. 2000. Draft Inuvik Inuvialuit Community Conservation Plan (IICCP).

Community of Tuktoyaktuk, Wildlife Management Advisory Council (NWT) and the Joint Secretariat. 2000. Draft Tuktoyaktuk Community Conservation Plan (TCCP).

Department of Fisheries and Oceans. 1986. The department of fisheries and oceans policy for the management of fish habitat. Fish Habitat Branch, Ottawa, Ontario.

Department of Fisheries and Oceans. 1991. 1:150,000 map. Mackenzie Bay. 7662.

Ecological Stratification Working Group. 1995. A National Ecological Framework for Canada. Agriculture and Agri-Food Canada, Research Branch, Centre for Land and Biological Resources Research and Environment Canada, State of the Environment Directorate, Ecozone Analysis Branch, Ottawa/Hull. Website: http://www1.ec.gc.ca/

Environmental Impact Screening Committee. 1999. Operating Guidelines and Procedures. EISC, Inuvik, NT.

Fedirchuk McCullough & Associates Ltd. (FMA). 2000. MacKenzie Delta Heritage Resources File Search, Aklavik 107B, MacKenzie Delta 107C. Calgary, AB.

Gill, D.A. 1971. Vegetation and environment in the Mackenzie River Delta, N.W.T. A study in subarctic ecology. Ph.D. thesis. U.B.C., Vancouver, B.C.

Golder Associates Ltd. 2000. Project description for the Petro-Canada Mackenzie Delta seismic program 2000.

Indian and Northern Affairs Canada. 1988. Environmental guidelines northern seismic operations. Prepared by Hardy BBT Ltd., Calgary, Alberta.

Inuvialuit Land Corporation and Inuvialuit Regional Corporation. 2000. Bid Package – Oil and Gas Concession for areas within the 7(1)(a) lands. Aklavik, Inuvik, Tuktoyaktuk areas.

Inuvialuit Regional Corporation. 2000. Guide to the Inuvialuit Settlement Region for Mineral Prospectors and Developers. Prepared by Alverez, Sloan and Associates Ltd.

Mackenzie River Basin Committee (MRBC). 1981. Mackenzie River Basin Study Report. Areport under the 1978-81 Federal-Provincial Study Agreement Respecting the Water and Related Resources of the Mackenzie River Basin.

McJannet, C.L., G.W. Argus and W.J. Cody. 1995. Rare vascular plants in the Northwest Territories. Syllogeus 73. Canadian Museum of Nature.

Natural Resources Canada. 1996. Aklavik 107B and Mackenzie Delta 107C. 1:250,000 map.

Pielou, E.C. 1994. A Naturalist's Guide to the Arctic. The University of Chicago Press.

Resources, Wildlife, and Economic Development (RWED). Minerals. Oil and Gas Division, GNWT. 1999. Beaufort-Mackenzie Mineral Development Area. Website: http://www.bmmda.nt.ca

Sekerak, A.D., N. Stallard amd W.B. Griffiths. 1992. Distribution of fish and fish harvests in the nearshore Beaufort Sea and Mackenzie Delta during ice-covered periods, October – June. Environmental Studies Research Funds Report No. 117. Calgary. 157 p. + appendices.

UMA Engineering, The SGE Group Inc. 1999. The Department of National Defence: Specifications for the Clean-up of Bar – 1 Komakuk Beach, YT, Dew Line Site.

Westworth, D.A. 1977. Impact of seismic activity on muskrat populations on the Mqackenzie Delta. Environmental Studies No. 1. Indian and Northern Affairs Canada, Ottawa.

Wildlife Management Advisory Board (WMAB) (North Slope, Northwest Territories). 1998. Co-management Plan for Grizzly Bears in the Inuvialuit Settlement Region, Yukon Territory and Northwest Territories.

Wright, D.G. and G.E. Hopky. 1998. Guidelines for the use of explosives in or near Canadian fisheries waters. Canadian Technical Report of Fisheries and Aquatic Sciences 2107. Fisheries and Oceans Canada.

APPENDIX A

DETAILS OF MOBILE SLEIGH CAMP

APPENDIX A

Mobile Sleigh Camp Layout