12.0 PROPOSED MITIGATION AND ANTICIPATED ENVIRONMENTAL IMPACTS

AEC's proposed winter seismic program has been designed, and the camp locations selected to minimize impacts on the environment and land users, however, the potential still exists for certain environmental impacts to occur over the duration of the program. 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 August 8, 2000. On this date, Cynthia Pyc, (IEI), John Bertsch (Veritas), Dave Baer and Ray Prudhomme (AEC), flew over the proposed lines and campsite locations. The intent of the aerial reconnaissance was to identify environmentally significant areas. During this site visit, steep slopes to be avoided were identified. The pre-survey scouting will provide additional information on sensitive areas.

Without adequate mitigation, potential environmental impacts resulting from the winter seismic program may include temporary disturbance to riparian areas along streams and lake edges; alteration of wildlife habitat; and elevated noise and air and water traffic levels resulting in temporary wildlife displacement and air quality impacts.

It is predicted that the use of proposed mitigative measures by AEC and their seismic contractor will ensure that no significant residual impacts will occur as a result of the project. AEC has taken measures to decrease environmental impact of the seismic program by aligning line sets to coincide with other operators conducting seismic in the vicinity of the proposed project. Line sets are located in areas of sparse vegetation, limited mainly to willow and shrub communities. Along line sets, 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. Where clearing is required, care will be taken to ensure that there is no organic mat disturbance. Frozen ground conditions, snow cover and tracked vehicles or low pressure wheeled vehicles will minimize impacts to vegetation communities. Lines may be bent to avoid watercourse channels or densely treed areas as appropriate. Lines may also be moved to avoid environmental and cultural sensitivities.

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 wherever feasible. Due to natural revegetation and the local extent of the disturbance, the potential environmental impacts to vegetation should be minimal.

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. The use of sleigh camps and tracked vehicles will decrease impact to terrestrial vegetation and wildlife. Inuvialuit environmental and wildlife monitors will be employed to limit the potential for environmental disturbance and human/wildlife conflicts.

The specific details of potential impacts and their mitigation techniques are presented in Table 9.

TABLE 9
POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATIVE MEASURES

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.	Insignificant, short term and localized.
	.2 Camp sleighs raise heated buildings above ground surface.	
	.3 Grey water discharges to temporary snow berm will be cooled prior to disposal to prevent thawing of the organic mat.	
	.4 Wheeled vehicles will only be used on compacted snow	
	.5 Vehicle movement will be restricted in the event of thaw or soft ground conditions.	
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.	Insignificant, short term, minor and localized.
	.2 Any inadvertent surface disturbance will be repaired immediately and covered with slash as appropriate	
	.3 Access routes and trails will be limited to seismic rights-of-way and ice access routes wherever possible.	
	.4 Any soil or organic material displaced during operations will be replaced and compacted.	
	.5 Tracked and low-pressure tire vehicles will be used to minimize surface disturbance.	
	.6 Equipment turnarounds will be restricted to designated locations. Turnarounds on ice roads or waterbodies will be utilized as often as possible.	
	.7 Equipment pulling sleigh camps will be adequately powered to prevent tracks from spinning and rutting soils. Multiple cats or winching procedures may be employed.	
	.8 Airstrips will be cleared on water bodies or existing seismic rights-of-way wherever possible. Airstrips will only be cleared in case of emergency.	

TABLE 9 Cont'd

Environmental Concerns/ Potential Impacts	Mitigative Measures	Significance/ Duration/ Scope of Residual Impacts
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 shooflies. .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.	Insignificant, short term and localized.
2.3 Disturbance to drainage	.1 Snow bridges or ice roads will be constructed across drainage 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. .4 Surface drainage ditches will be reclaimed to original condition. V-notching of snow bridges will be performed upon completion.	Insignificant, short term and localized.
3. Vegetation		
3.1 Loss of vegetation communities	.1 Vegetation will be rolled over on seismic lines rather than cleared to accommodate natural revegetation. .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.	Insignificant, short 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 the lease will be promoted by avoiding disturbance of root zone.	
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, camp locations and seismic rights-of-way. .3 Inuvialuit environmental and wildlife monitors will be employed to assess potential wildlife conflicts in the area of operations. .4 Aircraft will maintain a ceiling of 300 m over critical wildlife areas where feasible.	Insignificant, short term, minor and localized.
4.2 Disturbance of wildlife migration	.1 Seismic operations will be completed prior to the arrival of the majority of migratory bird species and prior to mating or calving of resident species.	Insignificant, short term, minor and localized.
4.3 Attraction of nuisance animals	.1 Kitchen wastes will be incinerated. .2 Camp wastes will be incinerated daily using a suitable container. .3 Wildlife will not be harassed or fed.	Insignificant, short term, and localized.

TABLE 9 Cont'd

Environmental Concerns/ Potential Impacts	Mitigative Measures	Significance/ Duration/ Scope of Residual Impacts
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 Trees supporting stick nests will not be cut down or rolled over if feasible.	
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.	Insignificant.
	.2 Shooflies will be utilized to avoid any steep slope where activity may increase the erosion potential.	Properly designed access to project area will reduce any potential residual impacts.
	.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 cannot support equipment load.	
	.5 If 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.	
5.2 Disturbance to Fish or Fish Habitat	.1 Waste materials and debris will not be disposed of in or on waterbodies.	
	.2 No 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 or pre-determined lakes will act as the water source.	
5.3 Introduction of oil, fuel or other pollutant to waterbody	.1 Sled camps and associated facilities (i.e. kitchen, sanitary waste sumps, solid waste site) will be located a minimum of 100 m from the ordinary high water mark of any permanent waterbody or watercourse.	Insignificant, short to medium – term and localized.
	.2 Liquid fuels and oils will be stored in a closed system during transportation.	
	.3 Storage of fuels or hazardous materials within 100 m of a waterbody will not be permitted.	Spill contingency plans will minimize potential impacts.
	.4 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.	
	.5 Any deleterious material that accidentally falls into a waterbody will be removed.	
	.6 Any mobile equipment will be refueled and serviced a minimum of 100 m away from waterbodies.	
	.7 Spill proof "Fuel-Com" interlocking fueling systems will be used.	

TABLE 9 Cont'd

Environmental Concerns/ Potential Impacts	Mitigative Measures	Significance/ Duration/ Scope of Residual Impacts
	.8 In the event of a spill, the Fuel Spill Contingency plan will be followed (Appendix B).	
	.9 Spills will immediately be reported to AEC'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 John Korec, the Environmental and Safety Officer with the National Energy Board (403-292-6614).	
	.10 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.	Insignificant, 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.	Insignificant, short term and localized.
	.2 Operations warning signs will be placed on access routes warning of equipment movement.	
6.2 Trapline Operators	.1 Local trappers will be notified of seismic operations and timing.	Insignificant, short term and localized.
	.2 Work areas will be flagged.	
	.3 Traplines will be avoided where feasible.	
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 AEC West 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 suspended at that location until permission is granted by the appropriate Inuvialuit organizations. Notification shall be provided in writing within 2 days.	Insignificant. Effects would be short term, minor and restricted to the immediate area.
	.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		

TABLE 9 Cont'd

Environmental Concerns/ Potential Impacts	Mitigative Measures	Significance/ Duration/ Scope of Residual Impacts
	.1 In the event of an emergency, AEC's Emergency Response Plan will be implemented (Appendix A)	
10. Abandonment and Restoration		
	.1 All equipment and materials will be removed from area immediately following project completion. .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.	Proper abandonment and restoration activities will result in no significant residual impacts.

13.0 EMERGENCY RESPONSE PLANS

In the event of an emergency, Veritas'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 9. 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 by for Petro-Canada by Golder Associates Ltd. 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. Additional studies utilized in preparation for this Project Description are listed in the References section.

16.0 COMMUNITY CONSULTATION

AEC 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 AEC to present the program to the various groups, obtain information on the area from local residents and hear concerns raised regarding the project.

On July 28 2000, IEI, on behalf of AEC, sent an initial project overview along with a request for comments to all pertinent territorial, federal and Inuvialuit agencies with jurisdiction in the project area. Agency representatives were requested to identify any concerns they might have and to provide any information that might influence the project. IEI followed up the contacts by telephone to discuss specific concerns and mitigative measures. A summary of government and non-government contacts is provided in Table 10.

TABLE 10

GOVERNMENT AND NON-GOVERNMENT CONTACTS

Name	Agency	Date	Method
GOVERNMENT			
Rudy Cockney District Manager North Mackenzie District	Indian and Northern Affairs Canada, Inuvik, NWT	July 21, 2000 July 26, 2000	Email sent Meeting in Inuvik
Karen Ditz Area habitat Biologist NWT Area	Fisheries and Oceans Canada, Yellowknife, NWT	July 21, 2000 July 21, 2000	Email sent Telephone conversation
John Nagy Wildlife Biologist	Resources, Wildlife and Economic Development	July 21, 2000 July 31, 2000	Email sent Telephone conversation
Anne Wilson Water Pollution Specialist, Northern Division	Environment Canada, Yellowknife, NWT	July 21, 2000 July 21, 2000 July 29, 2000	Email sent Email received Email sent
Sevn Bohnet Coordinator, Inuvialuit Region	GNWT Water Board	July 21, 2000 July 25, 2000	Email sent Telephone conversation
Hans Arends Land Administrator	Inuvialuit Land Administration, Tuktoyaktuk, NWT	July 21, 2000	Email sent
NON-GOVERNMENT			
Duane Smith Chair	Inuvialuit Game Council	July 21, 2000 July 28, 2000	Email sent Message left
Frank Pokiak Chair	Tuktoyaktuk Hunters and Trappers Committee	July 21, 2000 July 28, 2000	Email sent Message left
Richard Binder Chair	Inuvik Hunters and Trappers Corporation	July 21, 2000 July 28, 2000	Email sent Message left
Danny Gordon Chair	Aklavik Hunters and Trappers Corporation	July 21, 2000 July 28, 2000	Email sent Telephone conversation
Patrick Gruben Chair	Tuktoyaktuk Community Corporation	July 21, 2000 July 28, 2000	Facsimile sent Message left
Donna Kisoun Chair	Inuvik Community Corporation	July 21, 2000 July 28, 2000	Facsimile sent Message left
Alex Illasiak Chair	Aklavik Community Corporation	July 21, 2000 July 28, 2000	Facsimile sent Message left
Linda Graf Secretary	Environmental Impact Screening Committee	July 21, 2000 July 21, 2000	Email sent Email received

Meetings were held on August 9th through 11th, 2000 in the communities of Tuktoyaktuk, Inuvik 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 11. The issues raised during community consultation meetings are listed below in Table 12.

TABLE 11

COMMUNITY CONSULTATION MEETINGS

Date	Consultation Group	Location
August 9, 2000	Hamlet of Tuktoyaktuk	Tuktoyaktuk
August 9, 2000	Tuktoyaktuk Community Corporation	Tuktoyaktuk
August 9, 2000	Tuktoyaktuk Hunters and Trappers Committee	Tuktoyaktuk
August 9, 2000	Community Open House	Tuktoyaktuk
August 10, 2000	Inuvik Community Corporation	Inuvik
August 10, 2000	Inuvialuit Regional Corporation	Inuvik
August 10, 2000	Community Open House	Inuvik
August 11, 2000	Environmental Screening Committee/Wildlife Management Advisory Council	Inuvik
August 11, 2000	Aklavik Community Corporation and Hunters and Trappers Committee	Aklavik
August 11, 2000	Community Open House	Aklavik

TABLE 12

COMMUNITY CONSULTATION ISSUES AND RESPONSES

Issue	Response
Will all of the jobs go to people in Inuvik?	Jobs will be available to all Inuvialuit beneficiaries.
Oil and gas companies should look at building an all weather road from Inuvik to Tuktoyaktuk.	This issue is not within the scope of the currently proposed project.
Would the companies be prepared to run a gas pipeline to the community of Tuk?	This issue is not within the scope of the currently proposed project, and should be brought up at a later date as things progress in the delta region.
Could the companies provide periodic updates on their programs as things progress?	These updates can be provided.
There is a concern about the location of bear dens in the vicinity of the project.	AEC's environmental consultants will obtain information on previous locations of bear deans and AEC's seismic contractor will hire a wildlife monitor to identify bear dens during project operations.
What plan do you have regarding an oil spill?	AEC has a Fuel and Oil Spill Contingency Plan and an Emergency Response Plan in the event of an incident.
Communities would like more advance notice of contract opportunities.	AEC and their contractors will endeavour to provide the communities with better advance notice.
What type of equipment will Veritas use?	Veritas provided photos of equipment examples.
There may be an overlapping issue with the proposed reindeer development.	AEC will contact the individual involved in the proposed reindeer operation to see if a mutual agreement can be reached on the joint use of the proposed area (Note that this has been done).
What kind of funding do you have available for research in the area?	AEC supports educational research initiatives in the region.
AEC should address community (TUK) needs such as a bigger garbage dumps, a highway, crowded schools, nursing station closures.	This issue is not within the scope of the currently proposed project. Will raise issues with Mackenzie Delta Operators Group (MDOG).
Money made through IRC businesses does not filter to the communities.	This issue is related to leadership and is outside the scope of the currently proposed project.
What kind of visibility will AEC have in Tuk? Will they open an office there?	Visibility of AEC will be through Veritas, the seismic contactor and through AEC's community affairs coordinator.
How will contracting within Tuk be handled?	Veritas will deal with contracting issues.

TABLE 12 Cont'd

Issue	Response
Smaller businesses should have access to bidding processes.	AEC will follow the guidelines of the Northern Benefits Agreement when allocating contracts.
Training should include University degrees, not just skills for labourers.	AEC will work with Aurora College in Inuvik and PITS to bring training to the area. Individuals with basic training may pursue additional education on their own.
Who will be hiring wildlife monitors?	Wildlife monitors will be hired by AEC as directed by IRC and their Benefits Agreement.
Can you explain seismic offshore techniques *ie.* dynamite vs. vibroseis?	Explained.
How long will be here (operating in the region)?	Approximately 3 to 4 years is currently planned. Length of exploration dependant upon success of current activities.
Have you worked in the region before?	Individuals within AEC have previous Arctic experience. AEC is currently operating in the Sahtu region.
How much money will AEC spend?	This is uncertain at this time, but is likely in the neighbourhood of 60 million.
If someone fails the first drug/alcohol test, can they come back later and try again?	Yes.
Are your subcontractors subject to drug/alcohol testing?	Subcontractors cannot be tested by Veritas, but should an incident involving drugs or alcohol occur, a subcontractor can be dismissed.
How wide is a seismic line?	Approximately 12 feet wide or equal to 2 seismic vehicles operating beside each other.
If a caribou herd is encountered, can AEC shoot on a different line, or will they move the program temporarily?	This can be discussed further with the seismic contractor.
Can you explain the grey water disposal options being proposed?	Grey water consists of shower and kitchen water only. This water will be contained in snow berms temporarily until the camp moves on and it will then be spread out in the area. No sewage or black waste will be disposed of on the ground.
How will you deal with emergencies?	The appropriate community agencies will be contacted in case of an emergency.
There should be a compensation agreement with the HTC's in case someone loses a trapline due to industrial activity.	AEC will look into this.
Benefits should be spread out to all Inuvialuit beneficiaries.	AEC will abide by their Benefits Agreement to ensure that this occurs.
Can orientation be provided to show local people the seismic equipment and how it works?	Yes, Veritas will look into organizing this.
Can the companies help Aklavik find a gravel source?	Seismic information is gathered from areas lower than where gravel can be found. However, if information is found that can be of use to the community, it may be provided to them.
There is concern about the environment. We want to continue enjoying a traditional lifestyle, and have jobs.	AEC is committed to minimizing impacts to the environment while conducting exploration activities within the region.
What are the social impacts of the program? Will additional workers mean that there will be more stress on local social resources such as nurses etc?	Each sleigh camp will have their own paramedics to sustain life in the event of an accident, until a medivac can airlift the individual to Yellowknife.
There were areas where brush was left in creeks last year.	Veritas will endeavour to minimize this kind of impact. Post monitoring of the area will occur after spring.
When will you be starting training programs?	Exact dates are yet to be determined, but notice will be given well in advance of training.
Will Gwich'in people have opportunities to work?	There will be more work in the region than can be fulfilled by Inuvialuit personnel. There will likely be enough work to go around.
How long will people be out of town working?	We want people to commit to working a few weeks at a time. There will be a regular crew rotation period.

TABLE 12 Cont'd

Issue	Response
Are the jobs available to only Inuvik, Tuk and Aklavik?	Job opportunities will be available on a regional basis, but will go to Inuvialuit workers first as per the Benefits Agreement.
What happens when the 3 months are over? Will there be more training?	This is seasonal work and we cannot promise work beyond the proposed program. However, if individuals want to work outside the ISR, that opportunity will be made available to them.
Will you be hiring based on experience?	Experience will be an asset during the hiring process.
Will you be using the same equipment as last year?	Yes, similar equipment will be used.
Can we find out who your subcontractors are?	Yes. We can supply a list of successful bidders to the employment coordinators office.

17.0 PERSONAL COMMUNICATIONS

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

Bohnet, Sevn. Coordinator, Inuvialuit Region. Government of the Northwest Territories Water Board, Yellowknife, NT.

Cockney, Rudy. District Manager. Indian and Northern Affairs, North Mackenzie District, Inuvik, NT.

Ditz, Karen. Area Habitat Biologist, Fisheries and Oceans Canada, Yellowknife, NT.

Gallupe, Scott. Water Resources Officer. Indian and Northern Affairs, North Mackenzie District

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

Wilson, Anne. Water Pollution Specialist, Northern Division. Environment Canada, Yellowknife, NT

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APPENDIX A

DETAILS OF MOBILE SLEIGH CAMPS

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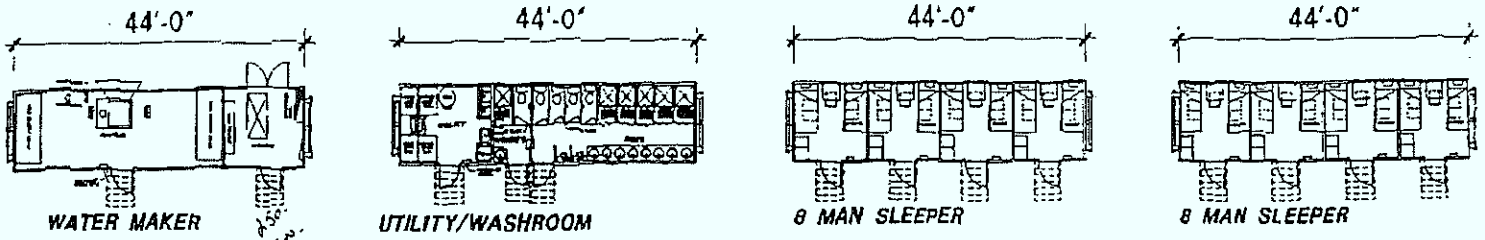

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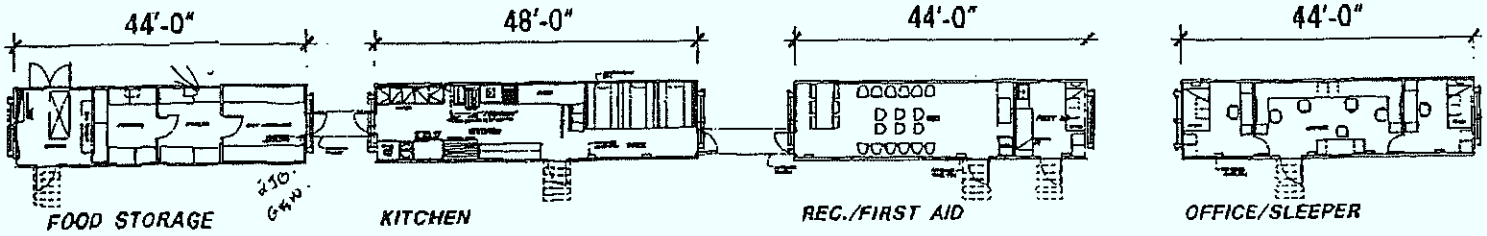

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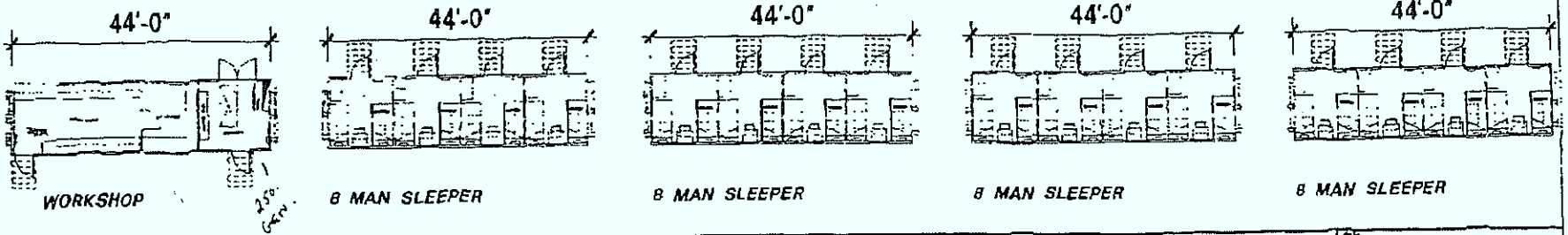


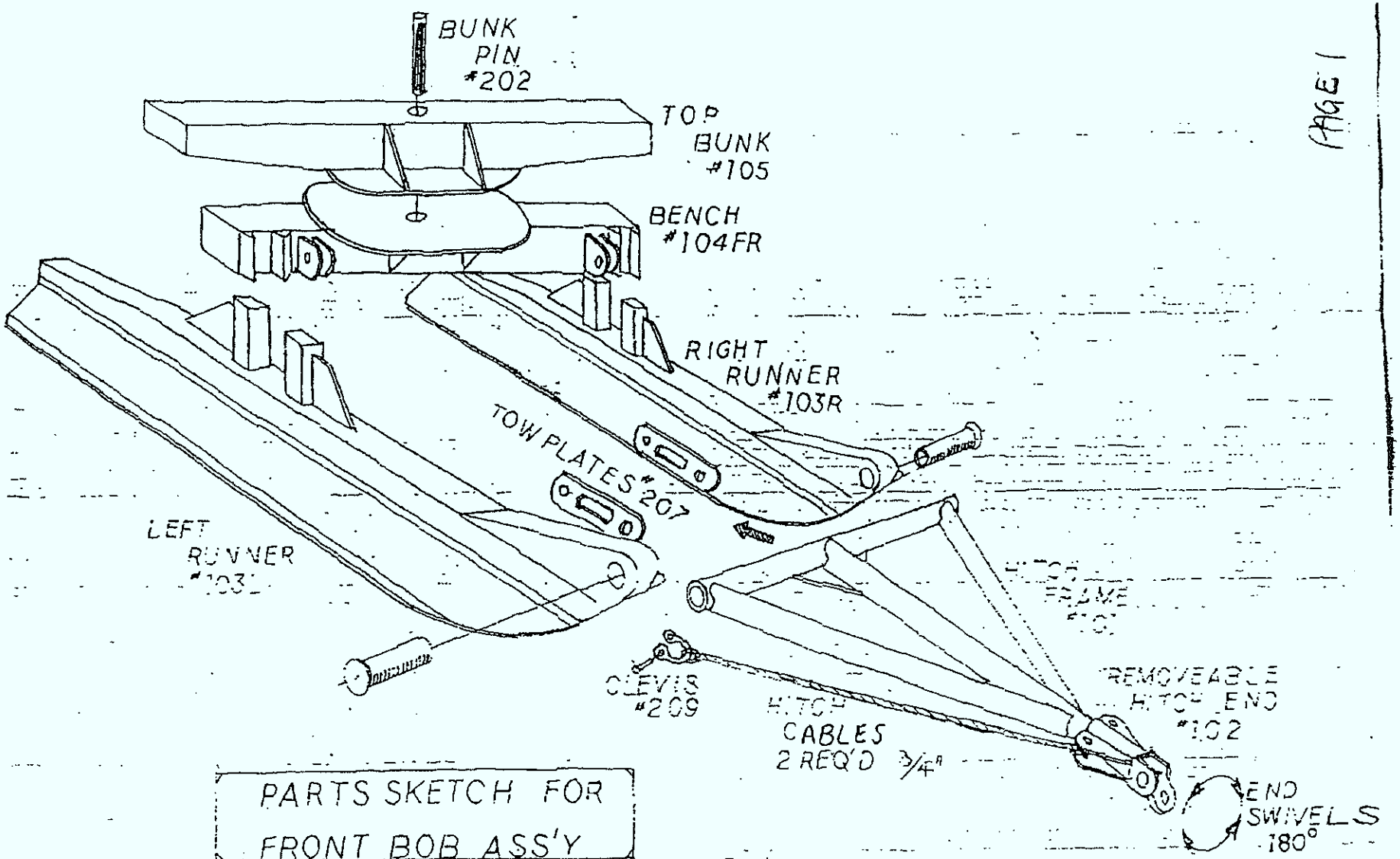
SITE PLAN

SCALE: 1"=20'-0"

	by VIC	date 03-07-00
	scale 1"=20'-0"	drawing number F-117A

project: SLEIGH CAMP COMPLEX

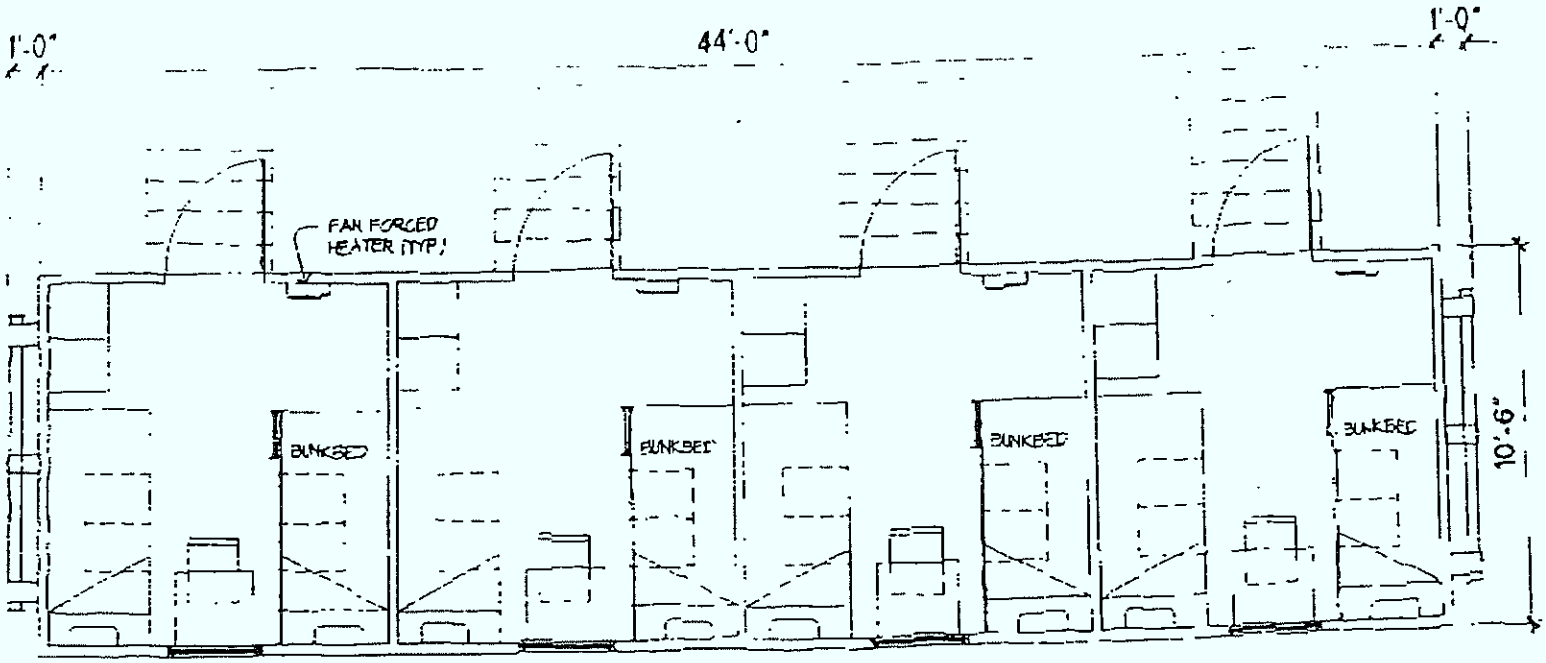
drawing: SITE PLAN



PARTS SKETCH FOR

FRONT BOB ASS'Y

HERB'S WELDING LTD. (403-624-3304)

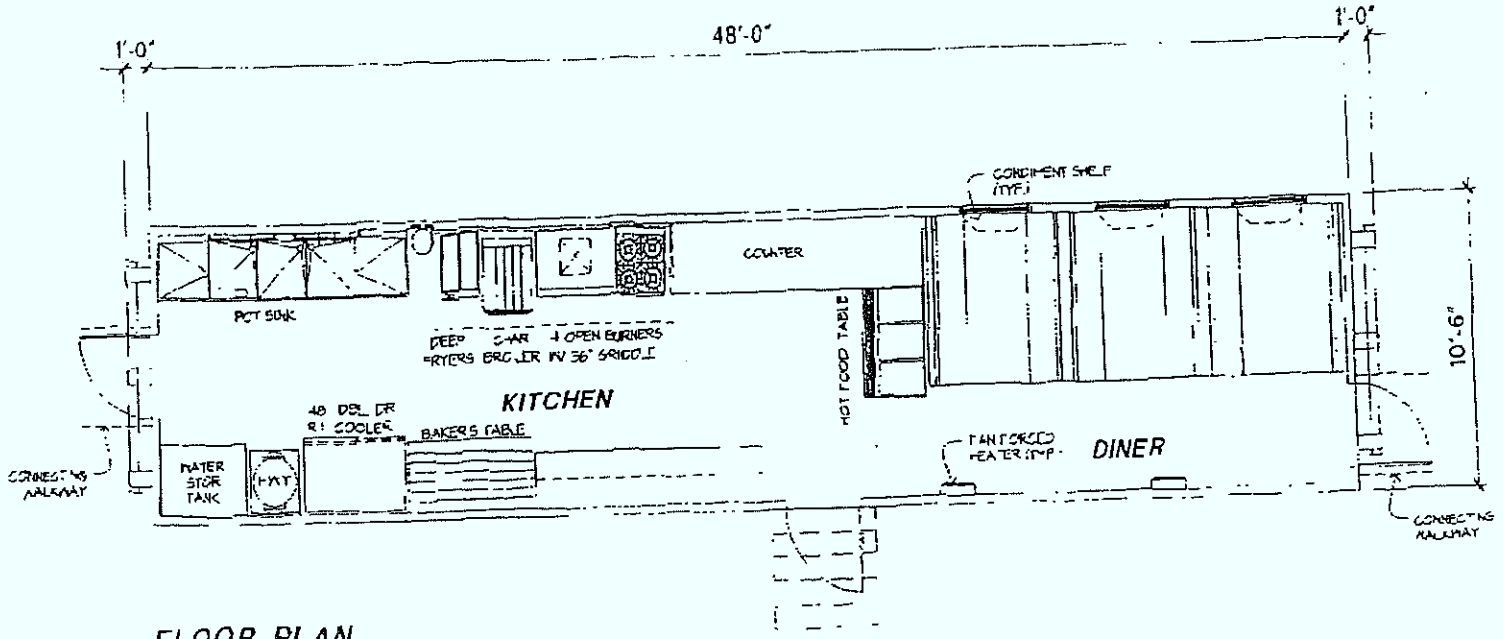


FLOOR PLAN

SCALE 3/16" = 1'-0"

	by VC	date 01-07-00
	scale 3/16"=1'-0"	drawing number F-1178
	printed	
	drawing	

SLEIGH CAMP COMPLEX
10'-6" x 44' SLEEPER UNIT
FLOOR PLAN

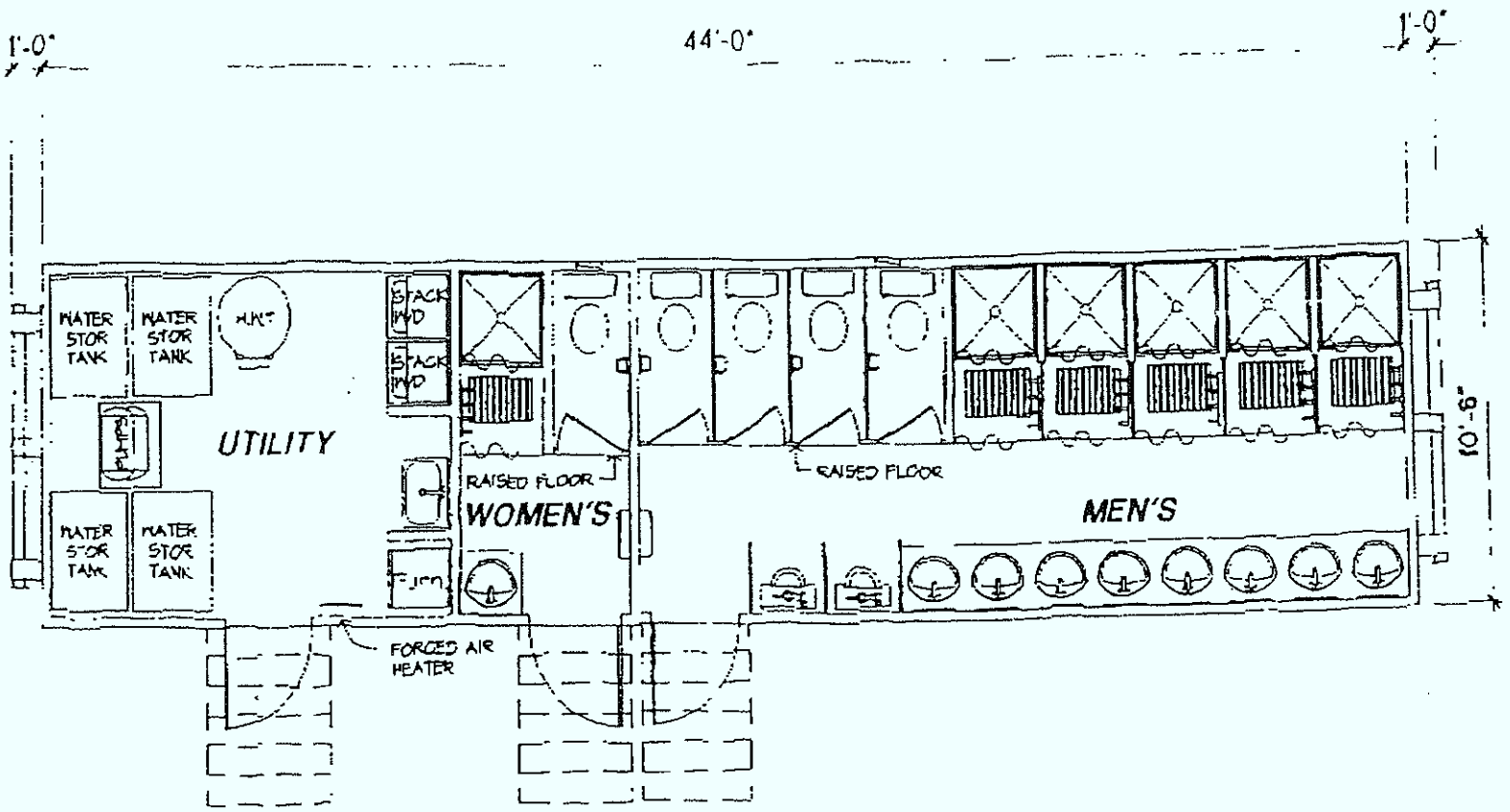


FLOOR PLAN

SCALE 3/16" = 1'-0"

	by VIC	date 03-07-00
	scale 3/16" = 1'-0"	sheet number F-117C

SLEIGH CAMP COMPLEX
10'-6" x 48' KIT./DINER/STOR.
FLOOR PLAN



FLOOR PLAN

SCALE: 3/16"=1'-0"

	by VIC	date 03-01-00
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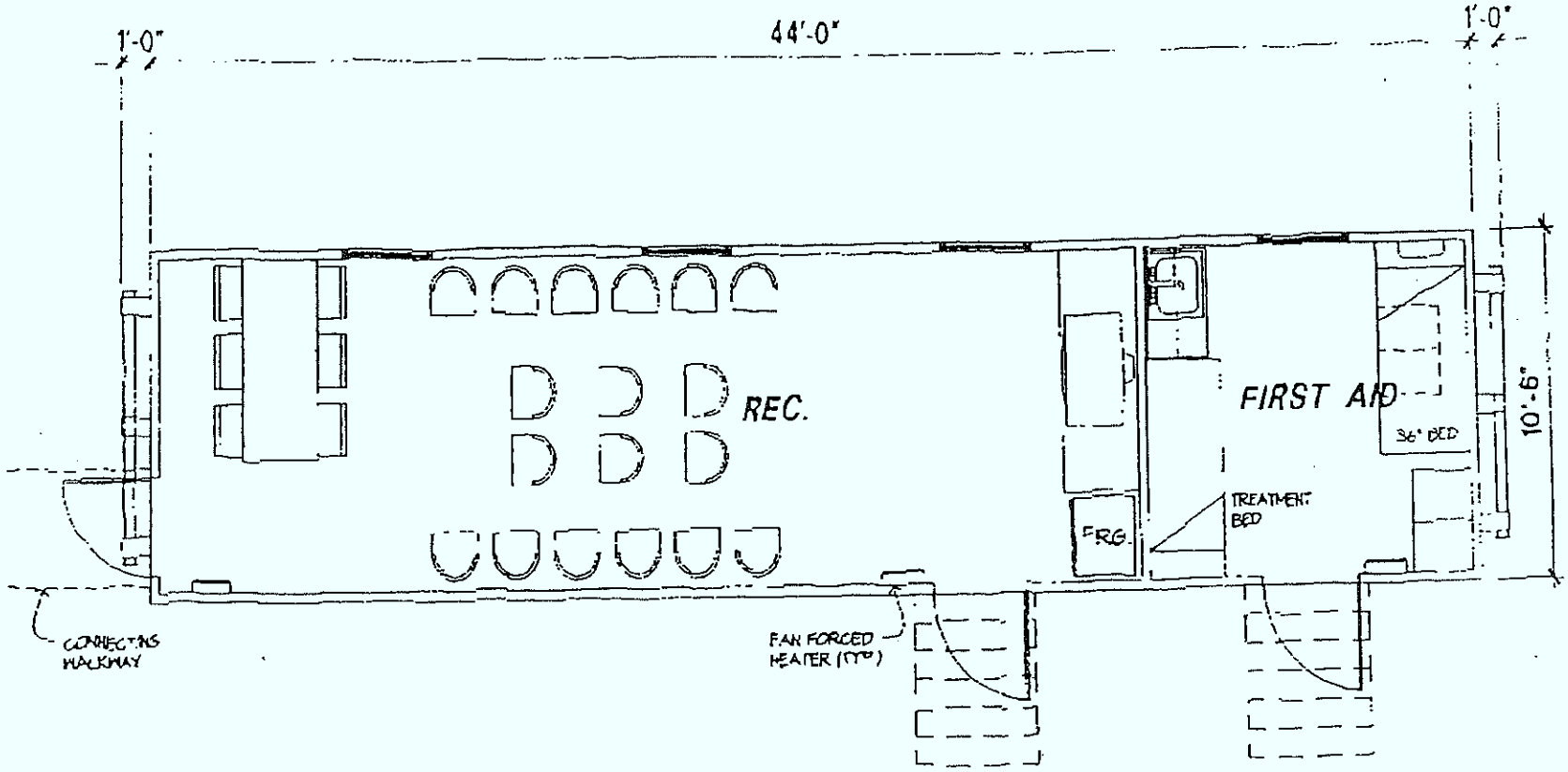
project: SLEIGH CAMP COMPLEX

drawing: 10'-6" x 44' UTILITY/WASHROOM FLOOR PLAN

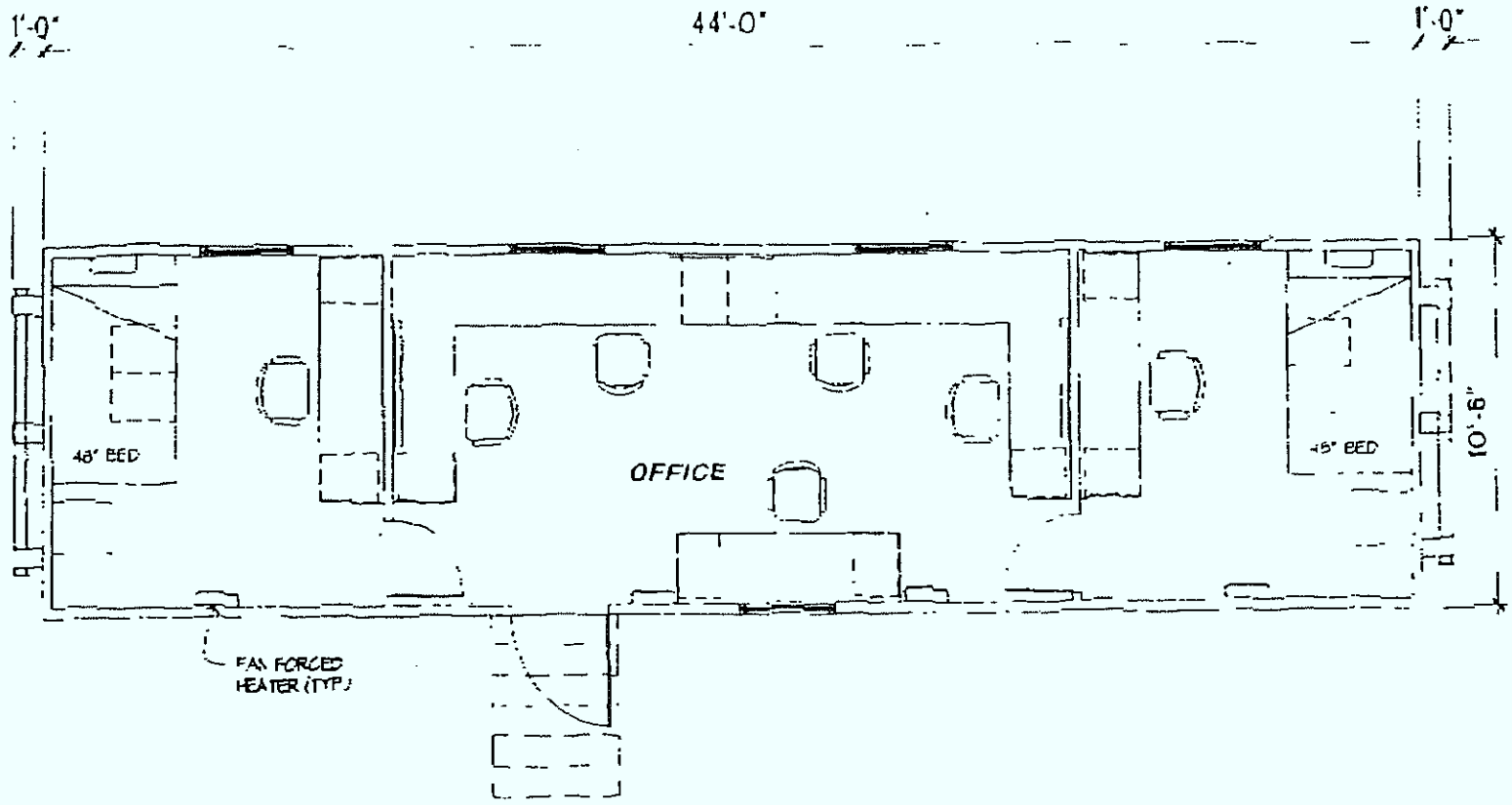


FLOOR PLAN

SCALE. 3/16"=1'-0"

	by VIC	date 01-07-00
	scale 3/16"=1'-0"	drawing number F-117E

project
SLEIGH CAMP COMPLEX
10'-6" x 44' REC./FIRST AID UNIT
drawing
FLOOR PLAN

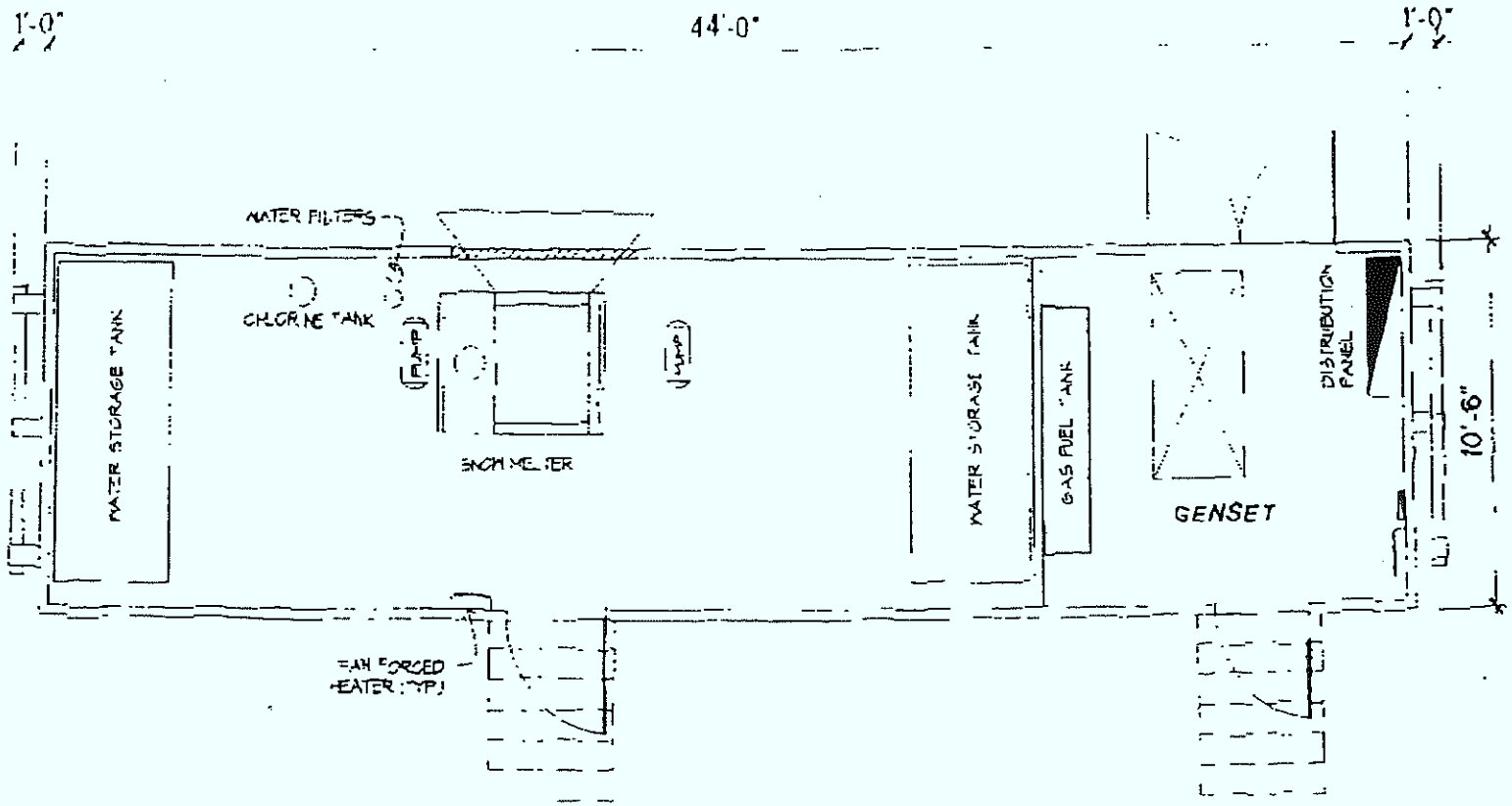


FLOOR PLAN

SCALE 3/16"=1'-0"

	by VIC	date 01-07-00
	scale 3/16"=1'-0"	sheet number F-117F

project
SLEIGH CAMP COMPLEX
drawing
10'-6" x 44' OFFICE/SLEEPER UNIT
FLOOR PLAN

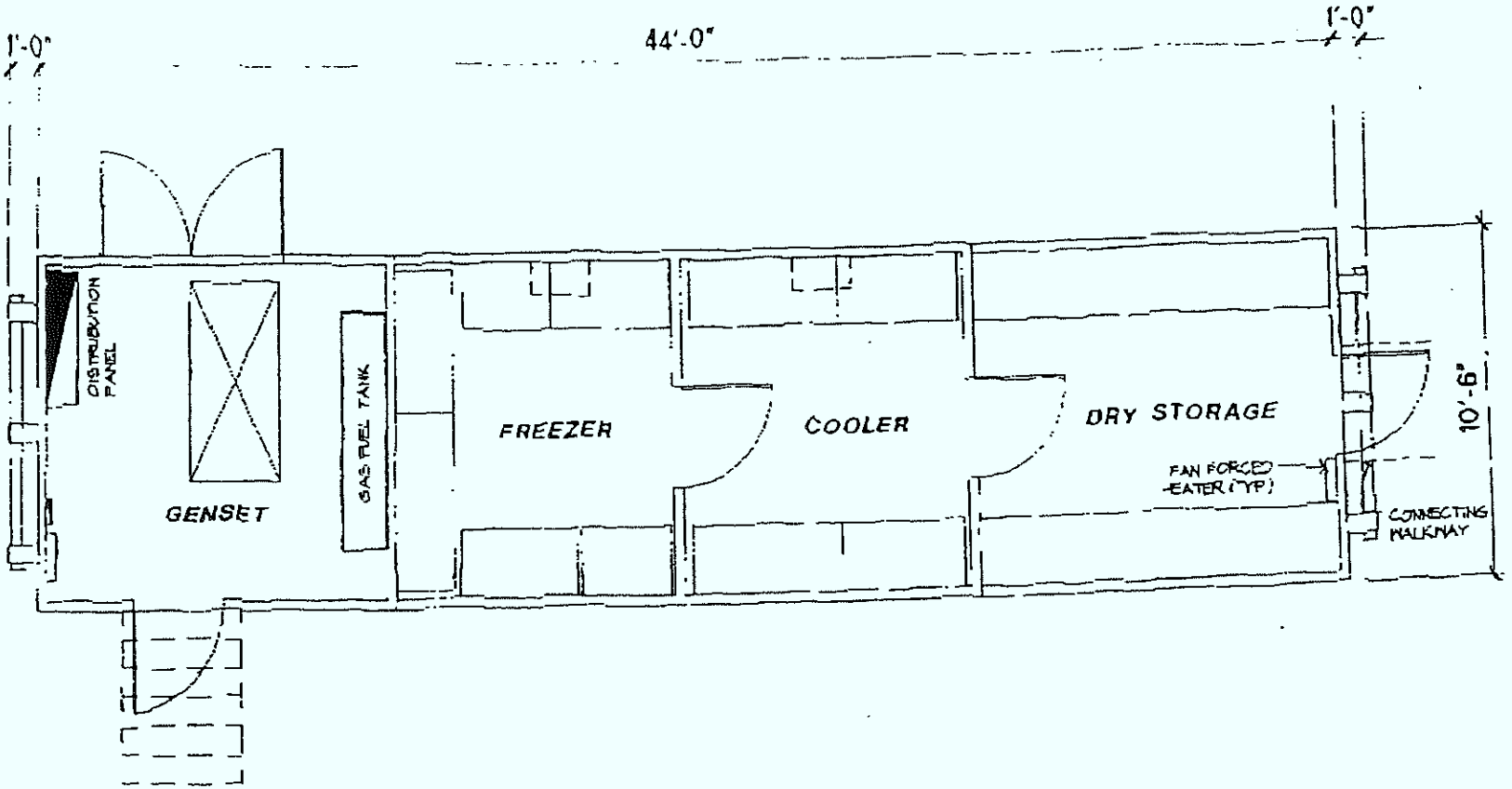


FLOOR PLAN

SCALE 3/16"=1'-0"

	by: MC	date: 01-07-00
	scale: 3/16"=1'-0"	drawing number: F-117G

SLEIGH CAMP COMPLEX
10'-6" x 44' WATER MAKER UNIT
FLOOR PLAN



FLOOR PLAN

SCALE. 3/16"=1'-0"

	by VIC	date 01-07-00
	scale 3/16"=1'-0"	sheet number F-117H

project: SLEIGH CAMP COMPLEX

drawing: 10'-6" x 44' FOOD STORAGE UNIT
FLOOR PLAN

APPENDIX B

EMERGENCY RESPONSE PLAN AND FUEL AND OIL SPILL CONTINGENCY PLAN

EMERGENCY CONTACTS

CONTACT	LOCATION	PHONE NUMBER
RCMP	Inuvik	(867) 777-2935
AMBULANCE	Inuvik	(867) 777-4444
HOSPITAL	Inuvik	(867) 777-2955
FOREST FIRE	Inuvik	(867) 777-3333 or (24 hr) 1-800-661-0800
NWT EMERGENCY SPILL RESPONSE LINE	Yellowknife	(867) 920-8130
NATIONAL ENERGY BOARD	Calgary	(403) 299-2792
CANADIAN HELICOPTERS LTD.	Inuvik	(867) 777-2424
CORPORATE SAFETY OFFICER	Gary Dick (Veritas) Calgary	(403) 296-7770 Cell: (403) 816-2679

Emergency Response Plans

The Emergency Response Plans developed for the Project are provided in the following pages along with Fuel and Oil Spill Contingency plans, Medical Emergencies, Fire Evacuation, Man or Equipment through the ice, and lost man or vehicle.

Additional sections from the Veritas DGC Land Safety and Operation Manual include:

- Section 9 – Fire Protection
  - 9.1.0 – General Provisions
  - 9.2.0 – Fire Prevention Guidelines
  - 9.3.0 – Fire Classification and Fire Extinguisher Guidelines
  - 9.4.0 – Fire Equipment Locations

- Section 11 – Environmental Issues
  - 11.1.0 – General Provisions
  - 11.2.0 – Penalties
  - 11.3.0 – Geophysical Operations Environmental Impact
  - 11.3.1 – Environmental Sensitive Concerns
  - 11.3.2 – Land Operations
  - 11.3.3 – Recording Crew Operations
  - 11.3.4 – Shot Holes
  - 11.3.5 – Hazardous Materials
  - 11.3.6 – Wildlife and Livestock
  - 11.4.0 – Environmental Responsibilities
  - 11.5.0 – Emergency Spill Response
  - 11.5.1 – Spill Response Primary Objectives
  - 11.5.2 – Hazardous and Recyclable Products
  - 11.5.3 – Spill Reporting Quantities
  - 11.5.4 – Release Reporting
  - 11.6.0 – Spill Reporting Quantities
  - 11.7.0 – Spill Control Command Functions

- Section 23 - Emergency Response Procedures (E.R.P.)
  - 23.1.0 – General Provisions
  - 23.2.0 – Field E.R.P
  - 23.3.0 – Hotel, Motel and Camp E.R.P.
  - 23.4.0 – Helicopter E.R.P.
  - 23.4.0 – Dangerous Goods Emergency Response Procedures
  - 23.6.0 – Explosives Emergency Response Procedures
  - 23.7.0 – Forest and Prairie Fire Emergency Response Procedures

THE FOLLOWING EMERGENCY RESPONSE PLANS WILL BE PUT INTO PLACE PRIOR TO COMMENCEMENT OF WORK IN THE MACKENZIE DELTA REGION. The Veritas DGC Land Health Safety and Environment Manual will be available and referred to in the event of an emergency situation.

In the event of an emergency situation the local emergency agencies will be utilized as much as possible. This will include but not be limited to air-medivac and utilization of government resources, i.e. Coast Guard search and rescue.

Medical Emergencies: (Sec 23.2)
Paramedics will be present in all camps at all times whenever possible. The paramedics will be fully trained and equipped to meet Alberta Pre-hospital Professionals Association standards. In the event of a Medical emergency the Veritas emergency response plan will be put into use (Sec 23.2). If the emergency requires Medical Evacuation of the victim, the local aircharter service will be utilized. In the event an aircraft is available on site, weather fixed or rotary wing aircraft will be utilized for transport of the patient. The use of fixed wing will be dependent on the availability of a landing strip at time of the incident. Depending on the severity of the injury further Medical Evacuation may be required to a larger facility such as Yellowknife. This will be accomplished with the use of the local air Medi-vac system already in place or the use of regular airline service.

Fire evacuation: (Sec 23.3)
In the event of a fire in camp, The Veritas fire evacuation plan will be immediately put into place. All crew members will report to the designated fire muster area (will be identified immediately after each camp move). A head count will be taken to ensure the safety of all personnel.

In the event the camp is destroyed or inhabitable, all personnel will be moved to the closest facility able to accommodate the crew. This will be an onsite decision by the Project Manager and HSE Advisor. In the event of an injury the medical emergency response procedure will be utilized.

Man or equipment through the ice
Due to the fact the crew will be working on areas including lakes and watercourses, there is the possibility of ice fracturing allowing men or equipment to fall through. At no time will ice crossings be performed prior to the ice being checked for thickness and stability. In the event an incident should occur every effort would be given to protect life and limb. The emergency response plan will be implemented immediately; keeping in mind the possible need for more advanced equipment or trained people in dive rescue techniques. Flotation devices with a recovery line will be carried on designated vehicles.

Lost man or vehicle

During inclement weather there is the possibility of men or equipment becoming lost in white out conditions. If this should occur all personnel will be accounted for and will remain in camp until further direction is given. At no time will personnel be sent out in white out conditions to perform a search party. This will take away the possibility of further personnel becoming lost. If possible the vehicle guidance/tracking system will be utilized to establish last known co-ordinates and when weather permits a grid type search will commence. Should weather permit both fixed wing and helicopter support would be further utilized in a search.

SECTION NINE
FIRE PROTECTION

9.1.0 GENERAL PROVISIONS

The prevention of fires is of utmost importance. Good housekeeping and equipment maintenance must be followed to keep fire hazards at a minimum.

One of the biggest fire hazards in the seismic industry is when a worker makes a fire on line and then walks away without extinguishing the fire properly. In heavily wooded or bushy areas this can lead to a serious fire. If it is absolutely necessary to make a fire for survival, you must extinguish the fire completely before leaving the area.

Caution must always be exercised as to hazards that may be present intermittently within a given seismic operation. A hazard absent at a given place one day may be present the following day. Therefore, always caution others with respect to the changing circumstances that create these hazards. In locations where a fire or an explosion may occur, the below listed rules must be followed.

All fires must be reported immediately. An Incident report must also be completed and must include all known or reasonable surmised details as an additional report may be required by governmental agencies.

9.2.0 FIRE PREVENTION GUIDELINES

Gasoline, paint thinners, diesel oil, kerosene, and other fuels must never be used for anything other than what they are intended. Fuels and other petroleum products can be absorbed through the skin and become health hazards as well as fire hazards. Vapours from petroleum products can be harmful when inhaled, and can be fire hazards when absorbed into clothing. Gasoline, especially, is to be used only as a fuel for internal combustion engines.

Use the following precautions to help prevent fires:

1) Smoking in bed is prohibited at any time.
2) Smoking, fire or the use of an ignition source is prohibited in/on:
   a) Areas where ANO SMOKING≅ signs are posted.
   b) Any area or part of a building or in which flammable liquid vapors may be present.
   c) The vicinity of fuel tanks, or other vessels containing or having contained oil or other flammable liquids.
   d) The vicinity of an oil or gas well.
   e) The vicinity of a pipeline pump or other machinery or equipment transporting or containing crude oil, gas or other flammable liquids.
   f) The vicinity where there has been or is a leak of flammable liquids.
   g) The vicinity of gas operated chemical pumps.

NOTE: The term Ain the vicinity of,≅ is defined as a minimum distance of 30 metres from a flammable gas source.

3) Safety matches must be used. Matches and cigarette lighters must not be taken into areas containing flammable materials. ANO SMOKING≅ signs will be conspicuously posted. Strike anywhere matches and disposable butane lighters are not permitted in hazardous or high temperature areas.
4) Extra gasoline or other flammable material must not be carried in the trunks of Company owned or leased vehicles.
5) Designated areas must be established for the storage of flammable liquids. All chemicals, including fuel, must be properly labelled as per WHMIS Guidelines.
6) Areas used for storage of fuels, kerosene, solvents, and other flammable liquids should be clearly marked as **NO SMOKING AREAS.**
7) Cans of oil and kerosene, oily rags, waste, etc., are prohibited near stoves, furnaces, or gas fires.
8) Oily rags, waste, and other combustible materials must be stored in covered, metal containers to prevent fire from spontaneous combustion.
9) Solvents and engine oils must be disposed of in an environmentally sound manner and according to local requirements.
10) Flammable liquids (i.e. gasoline, paint thinners, diesel oil, kerosene, etc.) must not be used as a cleaning agent. Use specially manufactured cleaning solvents to clean parts and hands.
11) Flammable aerosols (i.e. paints, insect spray, and most paint remover, etc.) must not be used near open flames or other sources of ignition.
12) Storage of flammable liquids must be well ventilated.
13) Use non-volatile cleaning solvents to clean grease from spills. Use water-soluble degreasers when cleaning and washing inside or in areas in which ventilation is inadequate.
14) Engine-magnetos, spark plugs, or other ignition devices must not be tested in places where flammable gas or vapours are present.
15) Pressurized flammable gas must not be used as a propellant in spray equipment or air operated tools, filling tires, etc.
16) Designated areas must be established for smoking. Place discarded matches, cigarette butts, and other smoking materials in ashtrays or suitable containers.
17) When entering areas with tall or dried grass, or wooded areas, check your vehicle often for any trash, twigs, leaves, limbs, or grass. Turn the engine off, set the emergency brake, and remove any of these items that are near the exhaust systems, especially around the manifold or catalytic converter systems. Wear gloves to prevent injury to the hands when

removing these items. Park the vehicle in the clearest, most convenient area, and try not to park in high grass. Keep close watch on the vehicle and be prepared to extinguish a fire as quickly as possible.

18) Gasoline or other flammable products must be transported or stored in approved safety containers. Plastic containers manufactured for food products and other non-petroleum products are not suitable for petroleum products. Petroleum products may cause rapid deterioration of this type of plastic container.

19) Smoke detectors must conform to building code regulations for fire protection. In addition smoke detectors must be placed in battery shack, recorder, and mechanic=s workshop.

20) Employees must not remove the battery from a smoke detector without replacing it immediately with another one.

REMEMBER! LABEL ALL CONTAINERS AS TO THEIR CONTENTS!

DON'T TAKE CHANCES: REMEMBER FIVE GALLONS OF GASOLINE EXPLODES WITH AS MUCH FORCE AS 415 LBS. OF DYNAMITE.

9.3.0 FIRE CLASSIFICATION AND FIRE EXTINGUISHER GUIDELINES

Portable Fire Extinguishers - General Requirements

Veritas DGC Land will provide portable fire extinguishers and shall mount, locate and identify them so that they are readily accessible to employees without subjecting the employees to possible injury.

Only approved fire extinguishers shall be used.

Fire extinguishers shall be maintained in a fully charged and operable condition and kept in their designated places at all times except during use.

CLASSIFICATIONS OF FIRES ARE:

CLASS A: Fire involves **ordinary combustible materials such as paper, wood, cloth and some rubber and plastic materials.** Fires of this type can be *fought by smothering the fire with water, foam, loaded steam or multi-purpose dry chemical.* The use of sand, water, confinement, etc., puts out these fires by cutting off the oxygen supply. Water also reduces the temperature.

CLASS B: Fire involves **flammable or combustible liquids, flammable gases, greases and similar materials, and some rubber and plastic materials.** A smothering or combustion-inhibiting effect is necessary to extinguish Class B fires. Fires of this type are best ***fought with foam or loaded steam equipment, dry chemical, or carbon dioxide-type extinguisher.*** Typical Class B liquid spill fires occur when flammable or combustible liquids accumulate under motor vehicles, fuel skids, and when spillage occurs around diesel equipment, bulk fuel storage areas and maintenance shops. **(NOTE: Water is heavier and when sprayed on the fires splashes and spreads the fire by sinking below the surface of the material.)**

CLASS C: Fire involves **energized electrical equipment**. Fires of this type present the problem of potential electrical shock. This type of fire can be ***fought with carbon dioxide or dry chemical-type mixtures.*** Typical electrical fires include ballasts on fluorescent light fixtures, electric motors, battery charging stations, junction boxes, transformers, circuit breakers, and control panels. **(NOTE: When electrical equipment is involved, always fight the fire as if the electrical current were on, unless you have definitely established that the electric current is completely cut off from the equipment involved in the fire. Water is a good conductor of electricity; DO NOT USE WATER ON ELECTRICAL FIRES.)**

Common **blasting agents used in seismic operations are often oxidizers** (Nitrocarbonite, Ammonium Nitrates). They create their own oxygen as they burn. Smothering cannot fight these fires. Confinement of these materials during burning only increases the temperature and creates an explosion. ***These fires must be flooded with water from the bottom up.*** DO NOT CONFINE THE FIRE!

REFER TO THE ATTACHMENT FOR A CHART OF CLASSIFICATION OF FIRES AND THE PROPER EXTINGUISHING AGENTS.

HOW TO USE:

1. HOLD FIRE EXTINGUISHER UPRIGHT, PULL RING PIN! (Rupture cartridge if applicable)
2. DIRECT DISCHARGE AT BASE OF FLAMES IN SWEEPING MOTION
3. GRADUALLY DIRECT IT FORWARD OR AT REMAINING MATERIAL THAT IS BURNING

RANGE DISTANCES:

9 m to 12 m for Water/Stored Pressure Extinguishers - Class A fires
1 m to 1.5 m for CO2 Extinguishers - Class B & C fires
5 m to 7.5 m for Dry Chemical (Multi-Purpose) Extinguishers - Class A, B & C fires

NOTICE: WORKPLACE USERS OF FIRE EXTINGUISHERS SHOULD RECOGNIZE W.H.M.I.S. HAZARD SYMBOLS AND UNDERSTAND ALL RELATED MATERIAL SAFETY DATA SHEETS

NOTE: ALL EXTINGUISHERS REQUIRE ANNUAL SERVICING OR SERVICING AFTER USE.

9.4.0 FIRE EQUIPMENT LOCATIONS

Fully charged and inspected Fire Extinguishers shall be located in positions and locations such that they are readily available. At least one extinguisher, of a suitable type, shall be positioned near the access door to the area it is designed to protect. The locations of the fire extinguishers and their type are as follows:

VEHICLES (COMPANY OWNED OR LEASED) - Each vehicle in service must be equipped with a 5 lb. ABC Dry Chemical fire extinguisher. Mount the extinguishers inside the cab on the driver's side of the vehicle.

STAGING AREA (RECORDING) - Mount a 20 lb. ABC Dry Chemical fire extinguisher near the access door of the staging trailers.

RECORDER - Mount a 10 lb BC CO2 fire extinguisher in the recorder and a 5 lb. ABC Dry Chemical extinguisher inside the cab on the driver's side of the vehicle.

VIBRATORS - Mount a 5 lb. ABC Dry Chemical extinguisher in the cab, on the drivers side and a 20 lb. ABC Dry Chemical fire extinguisher on the vibrator. (NOTE: the fire extinguisher must be easily accessible to the driver and be no more than 1.5 m above the ground.)

HELICOPTER STAGING AREA - Each staging area shall have either an ABC Dry Chemical or BC CO2 extinguisher with a total capacity of 100 lbs (45 kg.) Also one or more gas fire extinguisher with a total capacity of 40 lbs. (18 kg) shall be available near the helicopter landing area. (Purple K BC fire extinguisher is specially designed for combustible fuels.)

FUEL BOWSER - Each fuel bowser must have 2- 20 lb. fire extinguisher. Also one or more gas fire extinguisher with a total capacity of 40 lbs. (18 kg) shall be available near the fuel bowser. (Purple K BC fire extinguisher is specially designed for combustible fuels.) **NOTE: Carbon Dioxide extinguishers are not recommended for use out doors because of dilution by the wind.**

FIELD OFFICE - Place a 5 lb. fire extinguisher near the access door of the office.

DRILL PUSH - The vehicle must be equipped with 2- 10 lb. BC CO2 fire extinguisher. Mount one in the front of the cab on the driver's side and one in the rear. NOTE: The rear fire extinguisher must be approved for explosives.

VIB TECH TRUCK w/ FUEL SLOOP - The vehicle must be equipped with 2-10 lb. ABC fire extinguishers on the rear of the vehicle and a 5 lb. ABC extinguisher in the cab, on the driver's side

.

NOTE: Dry chemical extinguishers are ineffective when the powdered chemical becomes compacted. It is recommended that these extinguishers be mounted horizontally on vehicles so that the vibration does not cause the powder to pack down.

SECTION ELEVEN
ENVIRONMENTAL ISSUES

11.1.0 GENERAL PROVISIONS

The environment today has rapidly become a far more important matter than most people realize. The depletion of some parts of our protective ozone layer, the contamination of great areas of the worlds fresh water supply, the ever increasing amount of man-made particles in the air we breathe, and the vast piles of garbage, thrown away with out much concern, are all environmental issues that must be of greater concern to all of us.

Fortunately, Veritas DGC Land operation produces little environmentally unfriendly products. While this fact is comforting, we still engage in practises, which require the use of some hazardous materials and must also handle some of these materials as waste. Some of our shop procedures produce harmful vapours from which we must protect our workers and ensure that these vapours are collected and disposed of in an appropriate manner.

In addition to this, we use some materials not necessarily hazardous or toxic that can be recycled.

Transportation of these hazardous materials is covered under the ATransportation of Dangerous Goods Act and Regulations≅ of which we are well aware of and competent in the compliance there of. These same materials must be stored and handled for their intended purpose.

This section will identify the products and procedures, the handling, disposal and recording of results when dealing with hazardous materials. By charting these materials throughout their use, following the remainder and observing their end result, we can best determine who is responsible for handling the process and means of disposal.

Provincial spill clean-up and reporting requirements are more comprehensive and more frequently enforced than Federal or Municipal requirements. These are generally under the Transportation of Dangerous Goods Regulations and Occupational Health and Safety Regulations, both having some specific reporting requirements.

As each province has different reporting categories, we must make ourselves knowledgeable of the requirements in each province and territory.

11.2.0 PENALTIES

The Conservation and Reclamation Regulation of the Environmental protection Act (EPEA), in brief states that its objective is to see that land disturbed by our operations must be returned to its "equivalent land capability".

Should an inspector find an operation in default of any of the regulations they may issue an Environmental Protection Order (EPO), which could result in:

- A security deposit being required in an amount sufficient to ensure proper reclamation costs.
- Operations may be ceased.
- Reclamation must be conducted.
- If the reclamation is not satisfactory, forfeit of the security deposit.

(If necessary an appeal may be instituted and would be governed by the Environmental Appeal Board Regulation of the EPA Act).

When operations are carried out which contravene any sections of the various environmental regulations, as previously noted, restraining orders may be issued for the company to cease further activity. Depending on the seriousness of the breach of such regulations, individuals may be liable to penalties ranging from as low as $2,000.00 to as high as $1,000,000.00 for more serious breaches. Such minor offences as making untrue statements in a manifest or unauthorized transportation of waste materials could result in a penalty not exceeding $200,000.00.

A person who" intentionally causes damage to or loss of the use of the environment, or shows wanton or reckless disregard for the lives or safety of other persons causing a risk of death or harm to other persons" may be "liable to a fine of not more than $3,000,000.00 or to imprisonment for not more than three years or to both" (excerpted from British Columbia Waste Management Act, SBC Chap. 41, Index Chap. 428.5, 34.2 para. a & para. b).

These are examples of possible fines for individuals. Fines for corporations can be equal or larger. These examples are included to indicate the gravity with which we must concern ourselves when dealing with the environment today. We are long past the days of "toss it away" or "sweep it under the carpet". The importance of an effective and active Environmental Committee must surely be understood. This committee must be formed and be comprised of members from all branches of the company. They must be allotted time to become familiar with all the acts and regulations which pertain to Veritas DGC Land operations not only in Canada but in all locations.

If **Due Diligence**, a recent buzz-word broadly meaning "paying proper regard to", has been practised in our care of hazardous materials, waste or surplus goods and in the clean up of our everyday operations, following acts and regulations, we cannot be found negligent nor subsequently fined or imprisoned. On the other hand, if due diligence is not part of the standards which we set for ourselves, it is possible for responsible parties to be fined heavily and/or sentenced to jail. These responsibilities follow all the way up to management and directors of a public company.

11.3.0 GEOPHYSICAL OPERATIONS ENVIRONMENTAL IMPACT

Geophysical operations affect the environment in a number of ways; and having knowledge of these issues helps reduce the impact. The following information is a general overview and is discussed in greater detail in the following subsections.

11.3.1 Environmental Sensitive Concerns

Following are some Environmental Sensitive Concerns that can be addressed at HSE - Operations Meetings and at regular meetings of an Environmental Committee. These concerns must be discussed with crew personnel to keep abreast of current issues.

Water:

Surface and Ground water must be safeguarded by careful practices in the field operations. Drinking water reserves, wildlife habitats and recreational usage are based on water quality.

Vegetation:

Disturbance of vegetation may result in subsequent erosion and can raise aesthetic issues. Removing or driving over plant vegetation can also have a bearing on the nesting or feeding patterns of wildlife.

Wildlife:

All personnel must be alert to the presence of animal wildlife when operating on the prospect. Operating procedures may cause a temporary relocation of animals. Special care must be taken to reduce the effect on nesting, feeding and migration patterns. For more detailed information refer to Wildlife Awareness within this section.

Erosion:

Erosion is a gradual, natural process caused by wind and water. The rate of the erosion process can be altered by simply driving over and killing vegetation in a desert region. Utilizing proper erosion control measures can reduce the effects to steep slopes, high winds, rapid water flow or freezing conditions.

Air:

Two factors that can disturb wildlife and animals are emissions and noise. Properly designed and maintenance procedures can reduce the effects of exhaust and odours release into the air.

Waste:

While some wastes can be disposed of on site or in local land fill sites, others may require transportation to an authorized recycling or disposal facility. Wastes can include camp refuse or used oil products. An important concept when dealing with waste disposal is to remember the Acradle-to-grave≅ concept. If you produce the waste, you are responsible for it forever. It is important to choose a hauler and a facility that are responsible and reliable. The liability of the company is not minimized or eliminated simply because the waste is no longer in our possession.

Archaeological:

Archaeological sites are generally of historical or cultural significance. If a suspected site is discovered, crew must not disturb the site and the proper authorities contacted.

11.3.2 Land Operations

Start Up:

Environmental issues must be discussed at the job start up safety meetings. Issues will include, environmental planning, reporting procedures, emergency response plan, site specific sensitive areas within the prospect along with operating procedures.

Clearing:

When clearing areas for geophysical operations, whether preparing helipads, lines, access routes, the objective is to have a safe working environment for personnel as well as minimizing our impact on the environment.

Hand Cut Lines:

Minimize the width of a cut line and the amount of vegetation disturbed. Cut trees as local regulations permit. To encourage regeneration leave topsoil, root stocks and reseed if needed. Leaners must be cut to prepare a safe working environment. Snags that are discovered to have a wildlife value (nests, animal habitation) must be left and a Ano work area around the tree created. Fire prevention measures must be adhered to.

Access Roads:

Utilize existing routes as much as possible. Isolated trees or stands of vegetation should be left undisturbed if possible. (To minimize timber loss, skid access routes around these areas.)

Keep the width of the access route to minimum, especially at river crossing. Take particular care not to block or cause further erosion at river crossings.

Helipads:

(See helicopter Section for detailed size requirements when constructing helipads.)
Use existing or natural clearings rather than clearing new ones. Plan helipads in areas with the least amount of vegetation, use hilltops, or next to water bodies.

11.3.3 Recording Crew Operations

Line truck drivers must only drive on designated routes and roads. Attention to fire prevention in the form of only smoking in designated areas for non-heliportable operations and no smoking requirements for heliportable operations. Progressively clean up lines, shot holes and staging areas, remove all debris, garbage, pin flags, survey stakes, flagging etc.

Air Travel:

Flight paths and approaches must be planned to minimize stressing wildlife and people. Aircraft must be kept an appropriate distance form sensitive wildlife areas, cliff faces where nesting birds or animals may be.

11.3.4 Shot Holes

Ensure shot holes are deep enough and small enough to prevent the hole from cratering. Do not drill holes deeper than the permit regulations. Ensure that offsets are in accordance with regulations when used at structures and water bodies. Clean all debris from the shotpoint location, measures must be taken to smooth out cuttings.

Wet Holes:

Backfill wet holes to just above the standing water to protect aquifers. (Use loading poles to ensure proper backfill.) Other authorized may be used to fill the remainder of the hole such as Bentonite. Bentonite in contact with water will expand, sealing off the hole.

Flowing Holes:

Attempt to plug it immediately, notify the project manager, who will then notify the proper authorities. Never load explosives in a flowing hole. If the flow is to great for backfilling procedures, an inflatable plug can be placed at the top of the aquifer to stop the flow.

11.3.5 Hazardous Materials

Fuels and Oils:

Storage
Install fuel storage areas to contain spills, which will protect soil and ground water. Fuel storage facilities must be kept a minimum of 100 metres and downhill from any body of water. Storage areas must be located on stable terrain or in natural depressions separated from water. Secondary

containment systems such as a berm which can contain 110% of one container and any rainfall should be considered.

Fuel containers must be inspected routinely for leaks; and deficiencies must be reported to the person in charge for speedy corrective measures. Fuel Trucks must have a valve located between the output of the tank and the fuelling hose.

Lubricating Oil
Lubricating oil must be recycled, never pour oil onto the ground in lakes or sumps.

Refuelling
Refuelling operations must be done so that there is no spillage. Avoid refuelling near streams or lakebeds. Place drip pans or absorbent materials under leaking or unsealed connections. Do not fill vehicles or tanks to a maximum capacity; leave room for expansion or vehicle movement.

The fuel handler must never leave the refuelling operation while it is progress.

All mechanics must take measures to utilize a secondary catchment system, sheets of plastic placed under the vehicle or sufficient drip trays must be used.

Leaks and Spills:

Tools and materials must be available to employees to clean up any spills or drips. After cleaning up a site mark it on the map for follow up inspection. Waste fuels, oils, lubricants, hydraulic fluids, solvents and certain paints must be stored in their properly labelled containers. Mechanics should be encourage to substitute and use less hazardous chemicals

Proper catch precautions must be utilized, drip pails, absorbent materials, leak free hoses and connections.

CFC (chlorofluorocarbon) products and aerosol propellants should not be used, except with refrigeration equipment where a closed recovery recharge system is employed.

Consider the use of recyclable or reusable materials whenever practical.

THE HSE DEPARTMENT MUST BE THE FIRST CONTACT WHEN RESPONDING TO A SPILL OR LEAK. Remediation work for all Provinces and Territories must include an immediate response to take corrective actions to stem, restrict, or contain the flow or spill. Steps must be taken to return the spill site to A previous condition or within the Provincial TEIR 1 Guidelines.

11.3.6 Wildlife and Livestock

The interaction between geophysical operations and animals can very greatly depending on the area of operation and the kind of animal. There are times of the year when wildlife is more sensitive to our operations. Such times include mating, birthing, denning and spawning.

Stay clear of wildlife areas marked on the hazard identification map to avoid denning nesting, spawning, migration and feeding areas.

Hunting and trapping of animals by non-native workers is strictly forbidden. Wildlife must only be killed if it threatens the workers safety and then only when all other deterrents have been exhausted. Crew members should not purchase wildlife killed for consumption or souvenir made from animals which would encourage locals to exploit wildlife.

Precautions must be taken to avoid putting wildlife or livestock to flight. **Intentional harassment of animals is not permitted.**

Pets are not allowed on the crews.

11.4.0 ENVIRONMENTAL RESPONSIBILITIES

The following Environmental Responsibility Chart covers all commodities that Veritas DGC Land handles. Of those commodities the only ones of great volume are petroleum fuels. While this is covered under the Transportation of Dangerous Goods Act, which we feel that we are reasonably well trained in, there are other goods to be considered should an incident occur as follows:

Scenario

A 20,000 litre fuel sloop has been brought in for the helicopter contractor. All of the regulations seem to be adhered to but the camp site slopes towards an unnamed creek. The creek is well off in the dense bush and does not appear to present a problem as the access road and program do not cross this creek.

Setting up the large tanker poses no problem. Regulations require a berm to be placed around the fuel sloop so the cat hired for the job proceeds to build a berm by pushing frozen earth up around the tank, but in the process the edge of the blade gets too close to the piping and cracks the threads opening the 4" pipe which allows jet fuel to spill. In a panic to get back from the fuel that is spraying up the cat makes a manoeuvre that sprays fuel up onto the hot manifold that starts a fire.

The cat operator, already very close to the burning fuel jumps off the cat and runs for help.

- the fire extinguisher on the cat cannot be reached
- the fire extinguishers for the fuel sloop are not set up yet
- the berm is not completed and burning fuel pours downhill towards heavy brush and a creek
- the helicopter is not at the site yet
- the only fire extinguishers available are 100 meters away at camp.

At this point fire extinguishers are not of any use as the fire is too big. The source cannot be turned off as the pipe is broken on the supply side. A heavy stand of spruce trees is ready to catch fire and if the surplus fuel doesn't burn it will drain into the creek.

I know that the likelihood of this happening is not great, but what if it did? What is Veritas DGC Lands liability? Equipment damage, lost lives, burnt timber and pollution of water is all-possible.

We could learn many things from this scenario, so why not profit from them now?

1. Locate fuel sloops/tanks in a level area where there is no possibility of a spill flowing into a watercourse.
2. Have fire-fighting equipment nearby and available as soon as the fuel is on-site.
3. Use bladder type dykes that will work in freezing conditions.

Insurance is bought to cover our company from losses greater than is encountered in everyday business. We are the insurance to cover the company from extreme loss. We have been trained to fight forest fires prior to conducting heliportable operations in the spring. We must include training and planning for the unexpected, and we must prepare for prevention of extreme loss.

There is one other way we can prepare for loss of petroleum products from our equipment. Line trucks, vibrators and other vehicles as well as sub-contractors all have oil leaks to some degree, particularly on hydraulic systems. Effort must be made to clean the equipment more frequently and replace worn parts.

There is a recent development that could help us to reduce the effects of a formerly hazardous spill, of small but consistent quantities. This is newly developed hydraulic oil made from canola that is biodegradable. We are presently researching the feasibility of this product. Naturally it is more expensive than the petroleum based oil, however, we must consider the higher cost as a premium for the insurance. This will allow us to continue working on the land with a reduced risk of environmental damage that will lessen our chances of being denied access in the future.

RESPONSIBILITIES:

It shall be the responsibility of the **Supervisor** in each of the office and shop departments to determine the dollar value of waste materials, make arrangements for either pick up or delivery of these products and obtaining the best price for that product, if a value can be negotiated.

Those office and shop supervisors shall determine, by talking with the field R.C.M. and/or co-ordinator and mechanics if there is sufficient value in the field generated recyclable materials to warrant shipping them into Calgary or whether it would be more cost efficient to dispose of the waste in rural deposits, such as UFA Co-ops.

Note: It is not sufficient for Veritas DGC Land or our appointee to deliver our waste to a collection point and assume that they will handle our waste correctly. It is our obligation to determine whether those who accept our waste are handling this material in an environmentally correct manner.

If this field/office co-ordination cannot be accomplished, someone must be appointed to research the cost efficiency to make a determination.

Mr. Rothwell's memo regarding Environmental Commitment of December 20, 1994, mentioned charting our disposal. To make this possible, a simple **Environmental Disposal Form** is enclosed which is to be submitted by each crew, office and shop along with other monthly reporting to the HSE Manager. This report can easily be "eye-balled" by the co-ordinator of each crew and a supervisor in the office and shops, which indicates the quantities recycled. If, for example, a product such as waste oil is only picked up once in six months, report it only as picked up, not as dumped into a collection container. The report should reflect only the final disposition of a product as far as Veritas DGC Land is concerned.

Some shop processes produce hazardous vapours that must be monitored both for hazard to workers and hazard to the atmosphere.

Arc welding, oxyacetylene cutting and welding, soldering and spray painting are all conducted in our shops and are in the process of being monitored. Personal Protective Equipment (P.P.E.) is being used in compliance with O.H. & S. regulations.

An excerpt from "Ozone Depleting Substances" states in part that "No person shall service equipment that contains or may contain an ozone depleting substance unless that person is authorized to do such servicing under the Apprenticeship and Industry Training Act and regulations under that act". This includes C.F.C.s in refrigeration or air conditioning units.

At no time is any waste product to touch the surface of the ground. Mechanics, for instance, must use spill pans and absorbent pads when changing oil on trucks. Fuelling points must have preventative measures in place to stop leaks and spills from contaminating the overburden, or waterways. All recyclable products must be returned for proper disposal. Our goal is to leave Mother Earth healthy.

11.5.0 EMERGENCY SPILL RESPONSE

At Veritas DGC Land, one of our goals is the protection of our employees, the general public, the waterways, water tables and general land areas from harm. The environment and the ecoystems are very fragile, and in the event of an uncontrolled release we need to ensure that we limit the environmental damage to the smallest amount possible. Furthermore, the key to limiting damage is **prevention**. This is conducted by jobsite inspections, frequent audits of crews and equipment, training, and general observations of areas that will be most impacted if an uncontrolled release occurs.

Spill response is not limited to special training for certain individuals. It is the responsibility of all employees to understand the basic methods of preventing, controlling, cleaning up, and reporting of spills. Anytime that there is a spill, there are hazards to both the environment and to our workers. These hazards can be devastating if the chemical involved is not stopped at the source, controlled at the flow, absorbed where able, and impact assessed prior to and after the fact.

Under the Canadian environmental protection act, we must show that Adue diligence≅ was utilized if a spill occurs. This means that by law we must do everything that a reasonable person would do under similar circumstances. For example, if a leak occurred in a fuel bowser at staging, you would need to plug the leak with any means available, build a berm around the bowser, put absorbent pads on the chemical, and notify Alberta Environmental Protection and other regulatory boards as necessary.

In addition, it is against the law to withhold information, or give wrong or misleading information to an environmental protection officer. These individuals are special constables, and they have enforcement powers that are designed to deter individuals who are unwilling to cooperate in an investigation. Therefore, the following will be a regulated practice at Veritas DGC Land:

ASSISTANCE AND FULL COOPERATION WILL BE GIVEN TO ENVIRONMENTAL

PROTECTION OFFICERS AT ALL TIMES DURING AN INVESTIGATION

Preparation and planning in the advance stages of our operations play a crucial role in determining the amount of damage that occurs to the environment if an uncontrolled release occurs. Take for instance, the fuel sloop at one of our camps. If the sloop is placed away from a creek or stream, the amount of damage that would occur from a spill would be significantly different than if the same sloop was placed on a high slope that runs into the water course.

11.5.1 Spill Response Primary Objectives

There are **four primary objectives** when dealing with an uncontrolled release of hazardous substances. They are, in order of importance and sequence of handling:

SAFETY OF PERSONNEL

RESCUE

SPILL CONTROL

ENVIRONMENTAL CONSERVATION

Safety of Personnel

Nothing that we do in emergency spill control is as important as the safety of the individuals involved in the incident. At Veritas DGC Land, if any portion of the response procedures is dangerous to the safety or well being of the worker it will not be conducted. That is to say, if a plan needs reworking, this will be conducted prior to proceeding.

Rescue

Any personnel who may have been injured due to a spill need to be removed from the area immediately, keeping in mind the anatomy and severity of the injury. You should remember that the hazardous material involved may be dangerous to the injured worker, or dangerous to the type of rescue and material used.

Spill Control

Spill control methods utilized are to be concerned with protecting people, the waterways, the water tables, and all other aspects of environmental conservation. This means that we need to do everything possible to stop, control, and clean up any releases to minimize the danger and subsequent problems after the fact. Proper techniques in spill control are to be taught to personnel on crews, and this information is to be disseminated to new workers as soon as possible after arriving on the crew.

Environmental Conservation

Efforts at spill control clean up are concentrated upon protection of the workers, the environment, and limiting the amount of damage to the area. Workers should have the phone contact numbers of appropriate agencies on site at all Veritas DGC Land jobs to facilitate their ability to receive proper, knowledgeable assistance from various professionals.

11.5.2 Hazardous and Recyclable Products

Anytime that we have hazardous or recyclable wastes they have to be sent to the proper facility for either disposal or recycling as the situation dictates. In either case, the shipper must receive the **two** documents that are generated during this process. The first one is from the company that is transporting the product from our site. This document will show the name of the shipper, the type and quantity of the chemical, and the date of pick-up. The second and most important paperwork is from the receiver, which is the end recipient of the product. This document will show that the chemical that was sent from you via the carrier, and that they have received it as stated. If at this point you have received both these documents, we have met the requirement for Adue diligence≅ and are able to show that our waste product has been handled properly to the best of our knowledge.

Occasionally the carrier and the receiver of the product is one and the same. This does not release our responsibility to having to receive both documents. Again, we must show that the product has either been recycled or disposed of in a proper manner. These waste chemicals belong to us from cradle to grave, and therefore we must ensure that they are handled properly. Irrespective of what the shipper may tell you, we must receive both documents, and these are kept on file for two years. While this is not a regulation specific to the Canadian Environmental Protection Act, it is required under the Transportation of Dangerous Goods Act.

11.5.3 Spill Reporting Quantities

There are spill-reporting quantities that are included in this section, but there are also requirements for who is to report this. They are:

a) the person who releases or causes or permits the release of the substance
b) the person having control of a substance that is released (unless they have reasonable grounds to believe that the spill has already been reported)
c) a police officer or employee of a local authority or other public authority who is informed of or who investigates a release of a substance (unless they have reasonable grounds to believe that the spill has already been reported), and
d) an employee of a local authority or other public authority.

In addition to the reporting quantities, we need to report any quantity of spills that may have an adverse effect or has the potential to cause an adverse effect. This also includes any quantity if it enters the water tables or waterways.

11.5.4 Release Reporting

When to Report the Release

The release should be reported as soon as a person knows or ought to have known of the release. This means that at the first available opportunity, not when it is convenient and the emergency has been handled.

Provincial Reporting Centres

ALBERTA
Director of Pollution Control Division
1-800-222-6514 (24 hours)

BRITISH COLUMBIA
Spill Reporting Hotline
1-800-663-3456 (24 hours)

SASKATCHEWAN
Environmental Protection Branch
1-800-667-7525 (24 hours)

NORTH WEST TERRITORY

Enviromental 24 hour Spill Reporting (867) 920-8130
National Energy Board, John Korec, Chief Conservation Officer (403)299-2792 (w)
(403) 239-5032 (h)

YUKON / INUVIK

Enviromental 24 hour Spill Reporting (867) 667-7244

11.6.0 SPILL REPORTING QUANTITIES

ACCIDENT / SPILL REPORTING QUANTITIES

CLASS AND DIVISION	QUANTITY OR LEVEL
1	ALL
2.1	AT LEAST 100 L *
2.2	AT LEAST 100 L *
2.3	ALL

2.4	ALL
3	AT LEAST 200 L
4	AT LEAST 25 Kg
5.1	AT LEAST 50 Kg OR 50 L
5.2	AT LEAST 1 Kg OR 1 L
6.1	AT LEAST 5 Kg OR 5 L
6.2	ALL
7	ANY DISCHARGE EXCEEDING 10 mSv/h AT PACKAGE SURFACE AND 200 mSv/h AT 1 METRE FROM THE PACKAGE SURFACE
8	AT LEAST 5 KG OR 5 L
9.1	AT LEAST 50 Kg
9.2	AT LEAST 1 Kg
9.3	AT LEAST 5 Kg OR 5 L

NOTE * DENOTES CONTAINER CAPACITY
NWT, Yukon, Inuvik all have a zero tolerance policy on any spill amounts. They must be reported to the Chief Conservation Officer of the National Energy Board, and the Environmental 24 hour spill reporting number, both found on the release reporting form (11.5.4)

11.7.0 SPILL CONTROL COMMAND FUNCTIONS

There are 10 basic command functions that the spill response team will utilize to help them to control and clean up a hazardous substance release:

1) Establish a command position
2) Quickly ascertain the details of the incident
3) Establish communications with radios and telephones
4) Determine and establish a safety zone
5) Organize groups, and develop an attack plan
6) Utilize command from the SOP framework
7) Study, assess, and rework the plan as necessary
8) Orchestrate the plan with the senior Veritas DGC Land employee on site
9) Solicit and commission additional units as required
10) Return to first position and terminate attack / defence posture

After the spilled chemical has been identified, the following information is to be determined and documented from the MSDS:

1) Physical and chemical characteristics
2) Physical hazards of the chemical
3) Health hazards and signs & symptoms of exposure

4) Routes of entry into the body and maximum exposure levels
5) Reactivity hazards
6) Environmental concerns

SECTION TWENTY-THREE
EMERGENCY RESPONSE PROCEDURES (E.R.P.)

23.1.0 GENERAL PROVISIONS

To prepare for an emergency or survival situation, employees and contractors must become familiar with the emergency response procedures manual that pertains to their specific work location. They must also be trained in the first aid procedures required for such a situation. (See "FIRST AID" Section). A current list of emergency phone numbers must be kept near a centrally located telephone.

23.2.0 FIELD ERP

As every work group with Veritas DGC Land has at least one hand-held radio and every vehicle has a crew radio, make sure every employee/subcontractor is instructed in radio use and protocol. A radio call will put you in immediate contact with a superior who can direct you in a solution to your emergency. (See RADIO COMMUNICATION Section in this manual)

Every vehicle is provided with a current ***Emergency Response Plan*** updated for each location. If you are the operator of that vehicle, ensure that the latest ERP is posted on the sun visor of the driver's side. You can obtain a copy of the ERP from the field office, co-ordinator, or recorder.

If an incident occurs involving serious personal injury or vehicle collision or upset, the severity may govern the actual procedure to follow. This is a general guide:

1) If an emergency, break in by stating, "This is an emergency." (If an extreme emergency the cal is, "MEDIC, MEDIC, MEDIC ". This is _____ and state the problem.) **ALL RADIO COMMUNICATION WILL CEASE IN THE FIELD AT THIS TIME AND ALL PERSONNEL WILL STOP WORKING UNTIL THEY ARE GIVEN FURTHER DIRECTION.**

2) Attend to the injured, remove from danger if possible, render first aid, keep warm.
3) If a fire is involved, only attempt to put it out if you are trained in fire protection and you are not at risk.
4) Contact your Observer, Co-ordinator, Recording Crew Manager or Project Manager.
5) Secure the area.

Once the field crew supervisory people have been notified they will follow the next reporting sequence:

1) Notify the H.S.E. Manager.
2) Notify the appropriate Operations Supervisor.

The Project Manager, Recording Crew Manager or Clerk will determine from information supplied whether to contact the following:

1) The nearest ambulance and medical facility.
2) Alternate helicopter and/or air Medivac service.
3) Other local industrial first aid, ambulance or helicopter.
4) Local Police or RCMP.
5) Fire department, Forestry, Environmental Agencies or any other state departments as may be applicable for the incident and area worked.
6) The nearest WCB, OH&S or other agency if the injury is of a serious nature or in the case of a fatality. **NOTE: This will be done by the H.S.E. Manager.**

When we have a First Aid Attendant on the project they will be called at the outset and the Attendant will be able to assess the situation and will determine the next required action to take after conferring with field managers.

If you arrive at the scene of a vehicle collision where injuries have occurred, Veritas DGC Land encourages you to stop and offer assistance.

Should this situation happen to you.

1) Pull your vehicle off to the side out of harms way and turn on your beacon and four-way flashers about 300 ft (100 m) from the incident site. Do this on both sides if two vehicles are available.
2) Leave a flag person with safety vest to control traffic.
3) First aid trained persons are to proceed to the injured and offer help.
4) Radio for local police and/or ambulance service as is necessary.
5) Continue to offer assistance as long as needed or until relieved by authorities.
6) Notify your superior of the situation as soon as convenient.

23.3.0 HOTEL, MOTEL & CAMP E.R.P.

The Field Clerk will always keep a record of rooms that personnel and visitors are assigned. Do not change rooms without making corresponding changes to records.

Like all buildings, hotels, motels and camps can have fires. Plan what to do when you check in. You won't have time to plan during a fire.

When you arrive at a camp, motel, hotel or any type of accommodation, always make yourself familiar with the location of all fire fighting equipment, fire alarm pull stations and emergency exits.

HOTEL AND MOTEL:

1) Find two exits nearest your room. Be sure they are unlocked and unblocked. Count doors between your room and exits so you'll have a reference point if it's smoky.
2) When you hear an alarm, act, don't investigate.
3) If fire is in your room, get out and close the door. Once out, report the fire. Pull fire alarm and/or shout "FIRE-FIRE-FIRE".
4) If the fire is not in your room, leave if you can. First, feel your door. If it is cool, open it slowly and go to the nearest exit. Crawl in smoke. Fresh air will be at the floor. Take your key so you can go back if you can't use your exits.
5) Never use elevators during a fire. They could stop at the fire floor.
6) If your room door is hot, don't open it. Your room may be the safest place to be. Seal all cracks with wet towels, shut off fans and air conditioners. Signal at your window. Call the fire department and wait to be rescued.
7) **Take adequate clothing for protection from the elements and gather at the DESIGNATE AREA to allow for head count.**

CAMP RESPONSE PROCEDURE:

1) Pull fire alarms and/or shout "FIRE-FIRE-FIRE". Continue this throughout entire camp yourself or assign to another person.
2) Assess fire and attempt to extinguish with available fire extinguishers.
3) **If unable to extinguish or contain the fire, an evacuation and head count procedure must be instituted.**

BUILDING EVACUATION:

1) Remove people from each room in an orderly manner, closing windows and doors when leaving.
2) If room is smoke filled, don't panic, lower yourself to below smoke level (breathable air at floor level) and creep or crawl to nearest exit.

3) If exit door is hot, do not open. Exit through other door or window.
4) **Take adequate clothing for protection from the elements and gather at the DESIGNATED AREA to allow for a head count.**

EMERGENCY RESPONSE TEAM:

The Emergency Co-ordinator will assign person to:

a) check all buildings and rooms to assure all have been vacated;
b) take a head count and institute a search if everyone is not accounted for;
c) assign people to remove vehicles if they are at risk;
d) cut power and propane supply to buildings on fire or at risk; and
e) extinguish or contain fire only if minimal personal risk is involved.

MEDIC:

1) Report to office and await instructions from Emergency Co-ordinator.
2) Treat any burns or related injuries.
3) Plan evacuation of any injured to the hospital if necessary.

CLERK:

1) Assure that head count is accurate and account for all personnel.
2) Radio/phone for fire fighting assistance from outside sources, BLM, fire department or other nearby camps or industrial operations.
3) Advise company/client through regular channels as soon as appropriate when local situation is under control.

NOTE: Smoking in bed may be your last resting place.

23.4.0 HELICOPTER E.R.P.

When a helicopter must set down because of an emergency the following procedures must be observed.

1) Follow orders from the pilot.
2) Tighten your belt. Remove and secure your glasses, dentures, pens and other personal items. Note the location of life rafts and survival kits. Be prepared to deploy them should the pilot not be in a position to do so.
3) Select an orientation point. This should be a fixed part of the helicopter such as the bracing underneath the seat. Grasp this tightly during an emergency so that you will maintain a reference point. This cannot be a moveable part such as a door handle.
4) Brace for impact. Stay strapped to the helicopter seat. Keep one hand firmly on your seat belt, near the buckle, not on it. Keep the other hand on your orientaiton point.

5) Wait for the pilot's command to open windows or doors. Do not attempt to exit until the blades have completely stopped.
6) Should the pilot be unconscious or unavailable to take command, the most senior person will take charge. Survival becomes an individual responsibility. DO NOT pan or hamper the survival of others.
7) Be prepared to assist others who may be disoriented or incapacitated. Remove everyone from danger and commence first aid as necessary.

23.5.0 DANGEROUS GOODS EMERGENCY RESPONSE PROCEDURES

An incident involving dangerous goods is any leak or loss of containment that may present a hazard to the safety and health of our workers, the public or the environment.

1) If the escaped dangerous goods might burn, explode or cause breathing problems, remove all persons to a safe distance.
2) Attempt to eliminate the escape of dangerous goods from the source. For example, close valves, plug leak, collect spilled product, if it can be done without risk.
3) Contact your Project Manager or Recording crew Manager if you are in doubt about a containment or clean-up procedure or if the situation may become out of control.

The following chart will give you a guideline as to what quantities are considered necessary for immediate reporting to Dangerous Goods authorities:

Class & Division	Quantities for Immediate Reporting	Examples of Product Names	Placard, No. & Colour
1	Any quantity	All explosives & detonators	1.1 D orange
2.1	100 litre bottle (22 gal.)	Propane, Acetylene	2.1 red
2.2	100 litre bottle (22 gal.)	Nitrogen, Oxygen	2.2 green
3.1	Over 200 litres (44 gal.)	Gas, Diesel, Jet B fuel	1202, 1863, 1203 red
8	Over 5 litres or 5 kg	Battery acid	8 black/white

Bottled Compressed Gas Release - Cautions

1) Propane and Acetylene escaping may burn or explode.
2) Nitrogen does not burn but supports combustion.
3) Oxygen does not burn but supports combustion.
4) All escaping liquids can cause severe frostbite.
5) If possible without risk, turn off leaking valve, turn bottle to allow gas rather than liquid to escape.
6) Excessive quantities of all gases could asphyxiate.
7) Remove all bottles from a fire if possible and not hazardous.
8) Cool any release gases with water spray, not stream.
9) Withdraw from area if leaking gases cause a rising sound.
10) Vessels may explode and ruptured vessels may rocket. Stay away from vessel ends.

11) In battery acid spills, the fumes are toxic. Ventilate the area. Flood spills on skin with generous quantities of water. Go to eye-wash station for splash on eyes and use as directed. Dilute all contaminated areas with lots of water. Handle batteries and containers with neoprene gloves. Dispose of used batteries and acid in an approved manner.

Dangerous Goods Emergency Contact

Alberta Public Safety Services	1-800-272-9600
Saskatchewan Spill Response Centre	1-800-667-7525
B.C. Provincial Emergency Program	1-800-663-3456 or (604) 387-5956
N.W.T. Emergency Measures Organization	(403) 873-7554

IF YOU SUSPECT A POISONOUS SUBSTANCE HAS BEEN INGESTED AN NO IMMEDIATE FIRST AID HELP IS AVALABLE CALL EDMONTON POISON CENTRE:

1-800-332-1414

Hazardous Waste

In addition to "Dangerous Goods" or "Hazardous Materials" we also deal with a considerable amount of what we term collectively as "Hazardous Waste."

This will include used motor and transmission oils, gear oils, hydraulic and brake fluids, anti-freeze and cleaning solvents, etc. These waste materials cannot be spilled on the ground or into domestic or storm drains. They must be contained, marked clearly and disposed of legally at sites authorized to accept these materials.

It will be the responsibility of the Project Manager of his appointee (i.e. the mechanic) to determine where and how hazardous wastes may be legally disposed of in each area worked.

Incidents concerning an emergency involving Dangerous Goods release or injury must be reported to the Director General Dangerous Goods in Ottawa on a Schedule IX Form 2 report within 30 days of the occurrence.

The Environmental Disposal Form must be completed at the end of each month. Therefore, it is necessary to keep notes of the disposal of all such waste material for accurate reporting.

23.6.0 EXPLOSIVES EMERGENCY RESPONSE PROCEDURES

If an incident involving explosives occurs which has the potential to inflict serious injury or considerable damage, the following procedure must be implemented:

1) Attend to the injured, remove from danger if possible, render first aid, treat for shock, keep warm.

2) Put out the fire if possible and you are not endangered.
3) Remove all persons to a safe distance and secure the area.
4) If the vehicle containing explosives is burning, consider that it will burn to detonation and maintain a minimum distance of 300 meters as well as protecting people from possible flying projectiles.
5) Notify the Project Manager of all details.
6) Ensure that the local RCMP, fire department and medical facility are notified.
7) Ensure that OH & S/WCB and the Federal Chief Inspector of Explosives are notified.
8) Ensure that management and the client are notified.
9) Notify CANUTEC at (613) 996-6666 if necessary. DO NOT ATTEMPT TO RETURN TO VEHICLES UNTIL THE FIRE IS OUT AND IT HAS COOLED DOWN. THIS MAY TAKE SEVERAL HOURS AND GUARDS MUST BE MAINTAINED AT THE SITE UNTIL THE EXPLOSIVES (OR REMNANTS) HAVE BEEN REMOVED BY QUALIFIED PERSONNEL.

A Dangerous Occurrence report (Schedule IX Form 2) must be filed for such an incident within 30 days of occurrence.

If necessary, the following list of explosives distributors will put you in touch with someone who is well qualified to advise you about the characteristics of the specific explosives you are dealing with:

Ace Explosives	(403) 291-4300
Austin Powder Co.	(403) 243-5566
Explosives Limited	(403) 255-7776
Western Explosives	(403) 236-9160

Contact the Veritas DGC Land Manager of Safety in the event of any incident concerning explosives or any irregularities concerning quality, packaging or product count.

23.7.0 FOREST AND PRAIRIE FIRE EMERGENCY RESPONSE PROCEDURE

All personnel working on heliportable operations in B.C. will have been trained in basic forest fire fighting. Similarly most persons working in other forest areas will have had fire fighting training also.

Fire fighting equipment and helicopter water buckets will be kept at staging areas. Familiarize yourself with the location of this equipment and the location of the key for the lock on the fire equipment box. Where portable water extinguishers are kept or carried, they must be filled with water at all times. In fall weather water extinguishers may freeze overnight therefore THESE MUST BE EMPTIED NIGHTLY and re-filled the following morning.

When a fire is spotted or suspected:

1) Radio your Project Manager or Recording Crew Manager and give the details and location.
2) Notify the helicopter to divert his activities, hook-up with a water bucket, load and proceed to fire.
3) Notify Forestry or other applicable government agency.
4) Establish a "Fire Captain" and organize an assault on the fire, establish fire guards and/or secure the area as applicable.
5) Do not allow single persons to fight fires or send a crew without maintaining radio contact.
6) During all fire fighting operations, keep a constant inventory of all personnel. Do not allow individuals or groups to get caught in back fires or dead ends. At day's end or shift changes, double check all head counts.
7) Co-operate with Forestry or Land Use officials as directed.

The following numbers apply for fire reporting:

Alberta	(403) 427-3473
B.C.	Dial "0" ask for Zenith 5555
Saskatchewan	1-800-667-9660
N.W.T.	1-800-661-0800

APPENDIX C

APPROPRIATE LICENCES

GEOPHYSICAL OPERATION AUTHORIZATION

Applicant: AEC West Ltd.

Operating Licence Number: _____ Land Use Permit Number: _____

Geographical Area: 68° 45′ to 69° 35′ N and 133° 25′ to 134° 35′ W

Grids or NTS Map Sheets: 107B and 107C

Interests: EL 384 and EL 385

Description of Operation: Vibroseis – Seismic Exploration

SPECIFICS OF OPERATION

Exclusive ☒ For AEC West Ltd. Non-Exclusive ☐ Participation ☐ Purchase / Reprocessing ☐

Proposed Commencement Date: January, 2001 Proposed Completion Date: April - May, 2001

Number of Personnel: Approx. 75 Number of Crews: 1

Data Acquisition Equipment Sercel 408UL and 800 OYO 30 CT Estimated Kilometres: ~665

Vessel / Aircraft Names / Registration Numbers: T.B.A.

Energy Source: Vibroseis

Depth: N/A Charge Size: N/A

Source Parameters: Every 50 m Detector Parameters: Group interval of 25 m

OPERATIONAL CONTACT

Name: Veritas DGC Land John Bertsch – Calgary Project Manager / Wayne Ross, Inuvik Project Manager

Address: 2700 – 61st Avenue S.E. Calgary, Alberta T2C 4V2

Telephone: (403) 257-6705 or (867) 777-3493 Cellular: (403) 860-2329 Facsimile: (403) 257-6789

ESTIMATED EXPENDITURES

	On-Interest	Off-Interest
Field Work:	~$ 12 M	0
Data Processing:	~$ 1 M	0
Interpretation / Laboratory:	~$ .1 M	0

CONTRACTORS

Data Acquisition: Veritas DGC Land

Data Processing: Veritas DGC Land

Data Interpretation / Laboratory Studies: AEC West Ltd.

I certify that I have complied with the notification, permitting and / or licencing requirements of all federal / territorial legislation that are applicable to this operation.

Signed: John Duckett
Responsible Officer

Title: Senior Engineer, Western Region

Name: John Duckett Date: August 21, 2000

Company: AEC West Ltd.

Address: 3700, 707 – 8th Ave. S.W. Telephone: (403) 261-2569

AUTHORIZATION

This operation is authorized under Section 5 of the Canada Oil and Gas Operations Act and is subject to the terms and conditions attached to this Authorization

Signed: _____ Date: _____

Chief Conservation Officer

ILA Application # _____

INUVIALUIT LAND ADMINISTRATION
APPLICATION FORM

All rights applied for are subject to the IFA, ILA Rules and Procedures and the laws of General Application.

LOCATION NAME/LOCAL NAME

Coordinates	68°45' to 69°35'	N	133°25' to 134°35'	W
UTM	762 6300 m to 772 21200 m	N	51 3731 m to 56 4552 m	E

If a heading does not apply to your application, please indicate N/A. If insufficient space, please attach a separate sheet(s).

1. **Name and mailing address of Head Office of Applicant:**
AEC West Ltd.
3700, 707 – 8th Ave. S.W.
Calgary, Alberta
T2P 1H5

Responsible officer or manager of Applicant:

John A. Duckett, Senior Engineer, Western Region New Ventures Business Unit

Telephone and Fax:

Phone (403) 261-2569, Fax (403) 716-2569

2. **Type of Right(s) applied for: (Note: If a Right-of-Way forms part of the general activity applied for, make a separate application for the Right-of-Way.)**

Land Use Permit (C), Reconnaissance Permit

3. **Type of Operation(s) to be carried out:**

Helicopter reconnaissance for the purpose of GPS location and installation of survey monuments for Pingos, archaeological sites, and other environmentally sensitive sites.

4. **Planned duration of activities:**

Late August and early September 2000

Please attach a detailed Schedule of Operation.
To be determined

5. **Total Number of Personnel / Manpower requirements:**

4

6. **Total Number of Inuvialuit employed:**

1

7. **Names, addresses and functions of Inuvialuit contractors and sub-contractors:**

Inuvialuit Environmental Inc. – identification and verification of sites to be marked, and provide logistical support

8. **Names, addresses and functions of non-Inuvialuit contractors and sub-contractors:**
Veritas DGC Land (Seismic Contractor) – supply and carry out location and installation of survey monuments
Canadian Helicopters – supply and operate helicopter transport, and provide logistical support.

9. **Attach a concluded or proposed Participation Agreement or Access Agreement.**
The work is being conducted as part of AEC West Ltd. Winter Seismic Program, and therefore falls under the applicable Concession Agreement.

10. **Planned surface requirements for land use / occupancy in hectares (ha):**

None

Attach a 1:50,000 NTS map showing the location and a preliminary plan showing area, measurements and location of all buildings, work areas, etc.
See attached.

11. **Planned length of Right-of Way in kilometers (km):**
None

12. **Waste and/or drilling fluid disposal arrangement (fuel fired forced air incinerator or specify other method):**

None

Garbage:
None

Sewage (Sanitary & Grey Water:
None

13. **Equipment, vehicles, and facilities to be used (type, number, size, purpose, weight, etc.):**
Helicopter, GPS equipment, survey monuments and installation equipment

14. **Fuels to be used (type, number of containers, capacity, etc.):**

Aviation Fuel: less than 20 barrels of Jet "B"

15. **Method of emptying and filling fuel containers:**

Standard operations and refueling procedures for helicopters at airport

16. **Please attach FUEL/OIL SPILL CONTINGENCY PLAN.**

As per requirements according to local airport operational guidelines and procedures

17. **Radio Equipment to be utilized with identification #:**

Standard radio and other communication equipment onboard the helicopter including Emergency Locator Transmitter (ELT).

18. **Emergency First Aid Facilities:**

Standard safety equipment onboard the helicopter.

19. **Potable Water Requirements:**

None

20. **Attach a detailed project description expanding on the information given above and including any additional relevant information.**

Survey and Monument installation is being conducted in support of the Proposed Winter 2000-2001 Seismic Program. The purpose of the survey and monument installation is to provide the necessary GPS database to accurately locate sensitive sites, Pingos, and archaeological sites as well as lake depths. This GPS database will be installed in all vehicles used for the seismic program to ensure that these sensitive sites are avoided and minimum setback distances are observed during the operations.

21 **Where the applicant applies for a Right pursuant to Subsection 7(18) of the Agreement, attach copy of the right or interest granted by Canada on the basis of which this application is being made.**

Not applicable

22. **Fee calculations (based on ha and/or km as per current ILA Fee Schedules(s):**

As discussed with ILA, application fees will include Land Use Permit type C, and reconnaissance permit fees, plus GST.

Name of Representative and Title	AEC West Ltd. Company Name
Signature of Representative	2100. Aug. 21 Date
Signature of Land Administrator	Date
Location	

Issuing ILA Office: Inuvialuit Land Administration
P.O. Box 290
Tuktoyaktuk, NT
X0E 1C0
Telephone: (867) 977-2202 or (867) 977-2466
Fax: (867) 977-2467

ILA Application # _____

INUVIALUIT LAND ADMINISTRATION
APPLICATION FORM

All rights applied for are subject to the IFA, ILA Rules and Procedures and the laws of General Application.

LOCATION NAME/LOCAL NAME

Coordinates	68^0 45' to 69^0 35'	N	133^0 25' to 134^0 35'	W
UTM	762 6300 m to 772 21200 m	N	51 3731 m to 56 4552 m	E

If a heading does not apply to your application, please indicate N/A. If insufficient space, please attach a separate sheet(s).

1. Name and mailing address of Head Office of Applicant:

AEC West Ltd.
3700, 707 – 8th Ave. S.W.
Calgary, Alberta
T2P 1H5

Responsible officer or manager of Applicant:

John A. Duckett, Senior Engineer, Western Region New Ventures Business Unit

Telephone and Fax:

Phone (403) 261-2569, Fax (403) 716-2569

2. Type of Right(s) applied for: (Note: If a Right-of-Way forms part of the general activity applied for, make a separate application for the Right-of-Way.)

Land Use Permit (A), Reconnaissance Permit.

3. Type of Operation(s) to be carried out:

2D Seismic Program

4. Planned duration of activities:
From: November 2000
To: May 2001

Please attach a detailed Schedule of Operation.

Please see Project Description. This operation period is dependant upon acquiring approvals.

5. **Total Number of Personnel / Manpower requirements:**

~75 x approximately 120 days of operation = 9000 person days

6. **Total Number of Inuvialuit employed:**

Still to be determined. See attached Project Description.

7. **Names, addresses and functions of Inuvialuit contractors and sub-contractors:**

Inuvialuit Regional Corporation (IRC) to recommend names of sub-contractors.

8. **Names, addresses and functions of non-Inuvialuit contractors and sub-contractors:**
Veritas DGC Land.

9. **Attach a concluded or proposed Participation Agreement or Access Agreement.**
Project applications being submitted in support of a proposed Participation/Access Agreement.

10. **Planned surface requirements for land use / occupancy in hectares (ha):**

The program is regional in scope and includes up to 20 lines of seismic with a total line length of approximately 665 kilometres. Maximum right-of-way width is 8 m. Total hectare occupancy is approximately 531.6.

Attach a 1:50,000 NTS map showing the location and a preliminary plan showing area, measurements and location of all buildings, work areas, etc.

Please see Project Description.

11. **Planned length of Right-of Way in kilometers (km):**
Up to 665 km

12. **Waste and/or drilling fluid disposal arrangement (fuel fired forced air incinerator or specify other method):**

Vibroseis will be used as the main energy source. No cuttings will result from this operation.

Garbage: Combustible and non-combustible garbage will be separated. Combustible garbage will be burned in an incinerator on a daily basis. Non-combustible garbage will be compacted and taken for disposal at an approved landfill.

Sewage (Sanitary & Grey Water):
This water will be contained in snow berms temporarily until the camp moves on, and it will then be spread out in the area. Sanitary sewage will be incinerated by electric toilets. No sewage or black waste will be disposed of on the ground.

13. **Equipment, vehicles, and facilities to be used (type, number, size, purpose, weight, etc.):**

1	Chieftain and Trailer – Recorder	59,000 lbs.
4	Mertz H-44 Track-mounted Vibrators	55,000 lbs. each
5	110C Foremost Line Trucks	42,000 lbs. each
1	110C Foremost Vib Tech Unit	42,000 lbs.
1	110C Foremost Fuel Hauler	42,000 lbs.
1	110C Foremost Recording Crew Manager Unit	42,000 lbs.
2	110 FN Crew Cab Units	50,000 lbs. each
2	110 C Additional Support Units	42,000 lbs. each

Skidoo's

Additional equipment that will be acquired or subcontracted through Inuvialuit companies will include at a minimum:

3	D6 Cats for towing the camp, building air strips and pulling fuel trains
1	Michelin rubber tired front-end loader for use around camp, putting snow in melter and pulling cargo on moves
	Delta 3 units for utilization as water trucks and for fuel hauling

14. **Fuels to be used (type, number of containers, capacity, etc.):**

Diesel: Two 2000 gallon tanks and two sleighs holding 500 gallon fuel tanks

Gasoline: N/A

Aviation Fuel: N/A

Propane: N/A

15. **Method of emptying and filling fuel containers:**

Conventional tubing fitted with Fuel-Com fueling mechanism consisting of specialty interlocking nozzles and receptacles.

16. **Please attach FUEL/OIL SPILL CONTINGENCY PLAN.**

Please see attached Project Description.

17. **Radio Equipment to be utilized with identification #:**

A radio telephone and/or satellite phone will be used. Numbers to be determined.

18. **Emergency First Aid Facilities:**

The sleigh camp will be equipped with first aid equipment and an on-site medic.

19. **Potable Water Requirements:**

Water for camp use will come from channels of the Mackenzie River or pre-determined lakes as per DFO recommendations. Volume needs will be less than $20m^3$ per day and will be supplemented with water obtained using a snow-melter.

20. **Attach a detailed project description expanding on the information given above and including any additional relevant information.**

See attached Project Description.

21 **Where the applicant applies for a Right pursuant to Subsection 7(18) of the Agreement, attach copy of the right or interest granted by Canada on the basis of which this application is being made.**

See attached Project Description.

22. **Fee calculations (based on ha and/or km as per current ILA Fee Schedules(s):**
As discussed with ILA, application fees will include Land Use Permit type A, and Reconnaissance Permit fees, plus GST.

Name of Representative and Title John Duckett Senior Engineer, Western Region New Ventures Business Unit	Company Name AEC West Ltd. 3700, 707 – 8th Ave. S.W. Calgary, Alberta T2P 1H5
Signature of Representative	Date 2000 Aug. 21
Signature of Land Administrator	Date
Location	

Issuing ILA Office: Inuvialuit Land Administration
P.O. Box 290
Tuktoyaktuk, NT
X0E 1C0
Telephone: (867) 977-2202 or (867) 977-2466
Fax: (867) 977-2467

Indian and Northern Affairs

Application for Land Use Permit

Office use only					
Application fee	Land use fee	General receipt no.	Date	Class	Permit no.

To be completed by all applicants ☒ New Application ☐ Amendment

1. Applicant's name and mailing address (full name, no initials)

AEC West Ltd.
3700, 707 – 8th Ave. S.W.
Calgary, Alberta
T2P 1H5

Telephone no. (403) 261-2569
Fax no. (403) 716-2569

2. Head office address

Same as above.

Telephone no. Same as above
Fax no. Same as above

3. Field Supervisor

Wayne Ross
Veritas DGC Land
(867) 777-3493

Radio telephone

4. Other personnel (Subcontractor, contractors, company staff, etc.)

Veritas DGC Land – Geophysical Operations

All others yet to be determined.

5. Qualifications

Refer to Section 21 – Territorial Land Use Regulations.

A (i) ☐ a(ii) ☒ a(iii) ☐ b ☐ c ☐

6. (a) Summary of operation (Describe purpose, nature and location of all activities – refer to Section 22 (2) (b) – Territorial Land Use Regulations. (Use last page of form if additional room is required).

Please see attached Project Description.

(b) Please indicate if a camp is to be set up (Use last page to provide details)

The AEC West Ltd. (AEC) program will be completed with the crew traveling and being accommodated in mobile sleigh camps.
The sleigh camp will consist of 3 strings of trailer type ski equipped structures. For further details and camp layout drawings please see attached Project Description.

7. Summary of potential environmental and resource impacts (Describe the effects of the proposed program on land, water, flora & fauna and related socio-economic areas. (Use separate pages if necessary).

Please see attached Project Description.

8. Proposed restoration plans (please use last page if required).

Please see attached Project Description.

9 Other rights, licences or permits related to this permit application (mineral claims, timber permits, water licences, etc.)

A water licence has been applied for from the GNWT water board, a Class A Land Use and Reconnaissance Permit has been applied for from the Inuvialuit Land Administration.

Roads: ☐ Is this to be a pioneered road? ☐ Has the route been laid out or ground truthed? ☐ Has funding been applied for (i.e. RTAP)?

Program will use winter access routes only.

10. Proposed disposal methods

Garbage:
Combustible and non-combustible garbage will be separated. Combustible garbage will be burned in an incinerator on a daily basis. Non-combustible garbage will be compacted and taken for disposal at an approved landfill.

Sewage (Sanitary & Grey Water):
Sanitary sewage will be incinerated using electric toilets. No sewage or black waste will be disposed of on the ground. Grey water will be contained in snow berms temporarily until the camp moves on, and it will then be spread out in the area. See attached Project Description for more details.

11. Equipment (includes drills, pumps, etc.) (Please use last page if required)

Type & Number	Size	Proposed Use
Chieftain and Trailer – Recorder	59,000 lbs	Support of proposed program.
Mertz H-44 Track-mounted Vibrators	55,000 lbs	
110C Foremost Line Trucks	42,000 lbs	
110C Foremost Vib Tech Unit	42,000 lbs	
110C Foremost Fuel Hauler	42,000 lbs	
110C Foremost Recording Crew Manager Unit	42,000 lbs	
110 FN Crew Cab Units	50,000 lbs	
110 C Additional Support Units	42,000 lbs	

12. Fuels - Combustibles	(✓)	Number of Containers	Capacity of Containers
• Diesel (Tracked Chieftan Fuel Tanker)	✓	12/2	2000 gallon/500 gallon
• Gasoline			
• Aviation Fuel			
• Propane			
• Other			

13. Containment fuel spill contingency plans (Please attach separate contingency plan if necessary)

Please see attached Project Description.

14. Methods of fuel transfer (To other tanks, vehicles, etc.)

Fuel-Com System. Please see attached Project Description.

15. Period of operation (includes time to cover all phases of project work applied for, including restoration)

November 15, 2000 to May 15, 2001

16. Period of permit (up to two years, with maximum of one year extension)	Start date	Completion date
2 years	November 15/2000	November 15/2002

17. Location of activities by map co-ordinates (attached maps and sketches)

MN Lat Deg	68° 45' 00" N	Max Lat Deg	69° 35' 00" N
MN Long Deg	133° 25' 00" W	Max Long Deg	134° 35' 00" W

18. Applicant
Print name in full John Duckett for AEC West Ltd. — Signature — 2000 Aug. 21 — Date

19. Fees

☒ Class A $150.00 ☐ Class B $150.00

Land use fees:

331.05 Hectare @ $50.00 $16,552.50

Total Application and Land Use Fees $16,702.50

Schedule III
(Subsection 6(1))

APPLICATION FOR LICENCE, AMENDMENT OF LICENCE, OR RENEWAL OF LICENCE

APPLICATION/LICENCE NO:
(amendment or renewal only)

1. Name and Mailing Address of Applicant

AEC West Ltd.
3700, 707 – 8th Ave. SW
Calgary, AB
T2P 1H5

Telephone: 403-261-2569 Fax: 403-716-2569

2. Address of Head office in Canada if incorporated

Same as previous

Telephone: Fax:

3. Location of Undertaking (describe and attach a map, indicating watercourses and location of any proposed waste deposits)

See attached.

Latitude 68°45'00" N - 69°35'00" N Longitude 133°25'00" W - 134°35'00" W

4. Description of Undertaking (describe and attach plans)

Seismic Program and Camp Facilities: Refer to attached Project Description for additional details.

5. Type of Undertaking

1. Industrial	X	4. Power		6. Conservation	
2. Mining and milling		5. Agriculture		7. Recreation	
3. Municipal					

8. Miscellaneous (describe)

6. Water Use

To obtain water	X	Flood Control	
To cross a watercourse		To divert water	
To modify the bed or bank of a watercourse		To alter the flow of, or store, water	

Other (describe)

7. Quantity of Water Involved (litres per second, litres per day or cubic metres per year, including both quantity to be used and quality to be returned to source)

Total of less than 100 m^3/day for the camp facilities: 16 m^3/day to be obtained from nearby lakes, or 16m^3/day to be obtained from the Mackenzie River. Main source of water will be provided by water trucks or obtained by using a snow melter. No amount of water to be returned to source.

SCHEDULE III – *Concluded*

APPLICATION FOR LICENCE, AMENDMENT OF LICENCE, OR RENEWAL OF LICENCE - *Concluded*

8. Waste Deposited (quantity, quality, treatment and disposal)

Approximately up to 20 m^3/day of wastewater to be deposited. Camp sewage will be treated in electric toilets with only ash residues as waste to be spread out on ground. Camp grey water (including shower and kitchen water) will be frozen within temporary snow berms, broken up and then spread across ground surface as per GNWT Water Board recommendations. All wastewater criteria will be at or below *Guidelines for the Discharge of Treated Municipal Wastewater in the Northwest Territories.*

9. Other Persons or Properties Affected By This Undertaking (give name, mailing address and location; attach list if necessary)

Cabin owners in the vicinity of the camp will be contacted prior to operation commencement. Cabin owners will be determined through regional Hunters and Trappers Committee.

10. Predicted Environmental Impacts of Undertaking and Proposed Mitigation

See attached Project Description.

11. Contractor and Sub-Contractors (names, addresses and functions)

Veritas DGC Land – seismic contractor

John Bertsch – Manager Sales and Marketing
2700 –61st Ave. SE
Calgary, AB
T2C 4V2
Phone: 403-257-6705
Fax: 403-257-6789

Inuvik Contact: Wayne Ross
Phone: 867-777-3493

12. Studies Undertaken to Date (attach list if necessary)

EIA in progress by Inuvialuit Environmental Inc. to be submitted August 2000.

13. Proposed Time Schedule

See attached Project Description.

Start date January 2001 Completion date April 2001

FOR OFFICE USE ONLY

APPLICATION FEE	Amount: $ _____	Receipt No.: _____
WATER USE DEPOSIT	Amount: $ _____	Receipt No.: _____

NORTHWEST TERRITORIES WATER BOARD

ONSHORE OIL AND GAS EXPLORATION DRILLING QUESTIONNAIRE

FOR

WATER LICENCE APPLICATIONS

Prepared by:
Department of Indian Affairs and Northern Development
Water Resources Division
August 1999
Version 5.07

Introduction

The purpose of this questionnaire is to solicit supplemental information from an applicant to support their application for a water licence (or renewal). It is anticipated that the completion of this questionnaire will reduce delays arising from the Northwest Territories Water Board having to solicit additional information after an application has already been submitted. This information will also be useful during the environmental assessment and screening of your application, which must be undertaken prior to development and approval of a water licence.

The applicant should complete the questionnaire to the best of his/her ability, recognizing that some questions may not be relevant to the project under consideration. For questions that do not relate to his/her operation, the applicant is requested to indicate "N/A" (Not Applicable).

If any questions arise while completing the questionnaire, the applicant may wish to contact the Northwest Territories Water Board at (867) 669-2772. If your question is that of a technical nature please contact the Regulatory Approvals Section of the Water Resources Division, Department of Indian Affairs and Northern Development (INAC), at (867) 669-2651.

Chairman,
Northwest Territories Water Board

TABLE OF CONTENTS

If space is insufficient for any of the responses on this questionnaire, use the back of the sheet or attachments.

List attachments in Appendix 1.

Print or type your responses.

SECTION 1:

PRELIMINARY SITE ASSESSMENT

DATE: August 22, 2000

1.1 APPLICANT

COMPANY NAME: AEC West Ltd.

ADDRESS: 3700, 707 –8th Ave. SW

Calgary, AB

T2P 1H5

PROPERTY NAME/EXPLORTION LIC. #: EL384, EL385

CLOSEST COMMUNITY: Tuktoyaktuk (22 km) and Inuvik (42 km)

LATITUDE/LONGITUDE OF WELL CENTRE (Degrees, minutes, seconds): N/A

1.2 PRIMARY COMPANY CONTACT:

NAME: John Duckett

TITLE: Senior Engineer, Western Region. New Ventures Business Unit

CONTACT NUMBER: 403-261-2569

ALTERNATE CONTACT NUMBERS:

1.3 FIELD CONTACT:

NAME (If known): Wayne Ross

TITLE (If known): Seismic Operations Manager

CONTACT NUMBER: Calgary: 403-256-6700 Inuvik: 867-777-3493

1.4 INDICATE THE STATUS OF THIS APPLICATION:

NEW APPLICATION [X] RENEWAL [ ]

IF RENEWAL, INCLUDE LICENCE NUMBER: N/A

1.5 SITE HISTORY

INDICATE IF THIS SITE CONTAINS ANY KNOWN:

FORMER WELL SITES	Yes
WASTE DUMPS	N/A
FUEL AND CHEMICAL STORAGE AREAS	N/A
SUMP AREAS	N/A
WASTE WATER DISCHARGE LOCTIONS	N/A

DESCRIBE SITES AND REFERENCE THEM ON THE MAP IN QUESTION 1.6

Abandoned oil and gas wells not connected to this project.

1.6 ATTACH MAPS DRAWN TO SCALE SHOWING LOCATIONS OF EXISITNG AND PROPOSED:

CAMP FACILITIES,	On map
WELL SITE(S),	N/A
SUMPS,	N/A
WATER SOURCES,	TBD
FUEL AND CHEMICAL STORAGE FACILITIES,	Portable on sleigh camps
DRILLING MUD STORAGE FACILITIES,	N/A
DRAINAGE CONTROLS,	N/A
TRANSPORATION ROUTES (SEASONAL AND ALL WEATHER)*,	On map, ice roads and seismic lines
ELEVATION CONTOURS,	On map
LOCATIONS OF WATERBODIES	On map
DRAINAGE PATTERNS FOR WELL AND CAMP SITES.	On map

*** Clearly identify crossings over water courses greater than 5 m at ordinary high water mark.**

See attached Project Description for watercourse crossing details.

1.7 DESCRIBE THE PROPOSED OR CURRENT METHOD OF FRESHWATER WITHDRAWL, THE TYPE AND OPERATING CAPACITY OF THE PUMPS USED AND THE INTAKE SCREEN SIZE.

Water will be obtained from the Mackenzie River, local lakes and supply vessels using a pump and 6" line. Intakes used for withdrawing water will be screened with 1.3 cm (0.5") wire mesh to avoid impingement or entrainment of fish.

1.8 ESTIMATE MAXIMUM DRAW DOWN AND RECHARGE CAPABILITY OF THE RIVER OR LAKE FROM WHICH FRESH WATER WILL BE DRAWN. QUOTE DRAW DOWN IN CENTIMETRES, OR, STATE PERCENTAGE OF FLOW WITHDRAWN.

Should it be necessary to pump water, it would be pumped from the channels of the or a lake as per DFO recommendations. The draw down could be considered as insignificant or less than 1%.

1.9 INDICATE IF PERMAFROST IS EXPECTED TO BE ENCOUNTERED UNDER:

CAMP FACILITIES	X
WELL SITE	N/A
ACCESS ROUTES	X
SUMPS	N/A
OTHER	N/A

1.10 INDICATE ANY POTENTIAL FOR ENCOUNTERING ARTESIAN AQUIFERS OR LOST CIRCULATION WITHIN THE SURFACE HOLE (TO CASING DEPTH)

N/A

1.11 ATTACH A DESCRIPTION OF THE SURFICIAL GEOLOGIC AND HYDRO-GEOLOGIC CONDITIONS IN THE IMMEDIATE VICINITY OF THE WELLSITE

N/A

SECTION 2:

WATER USE AND WASTE DISPOSAL

2.1 OUTLINE ALL WATER USAGE IN THE DRILL PROGRAM, CAMP FACILITIES, AND ROAD CONSTRUCTION. INDICATE THE SOURCE AND VOLUME OF WATER FOR EACH USE.

	Source	Use	Average Volume (m^3/day)
1.	Nearby lakes	Camp facilities/roads	Up to 16m^3/day
2.	Mackenzie River	Camp facilities/roads	Up to 16m^3/day
3.			

TOTAL: 16 m^3/day

Note: Applicant is currently proposing to use a snow melter to obtain water. Additional water required for ice thickening procedures may utilize water withdrawal amount as indicated above.

2.2 WILL DRILLING WASTES CONTAIN DETRIMENTAL SUBSTANCES INCLUDING, BUT NOT LIMITED TO, OIL BASED OR INVERT MUDS AND HIGH SALINITY FLUIDS?

YES ____ **NO** ____

IF YES, INDICATE SUBSTANCES:

N/A

2.3 INDICATE THE TOTAL ESTIMATED VOLUME OF DRILLING WASTES

N/A **CUBIC METRES**

2.4 INDICATE METHODS FOR DISPOSAL OF DRILLING WASTES.

N/A SUMP

N/A DOWN HOLE (REQUIRES NEB APPROVAL)

N/A ON-SITE TREATMENT (PROVIDE PLAN)

N/A OFF-SITE (GIVE LOCATION AND METHOD OF DISPOSAL)

2.5 IF A SUMP IS BEING USED, ATTACH THE FOLLOWING INFORMATION

SCALE DRAWINGS AND DESIGN OF SUMPS, N/A
CAPACTIY IN CUBIC METRES,
BERM EROSION PROTECTION,
SOIL PERMEABILITY AND TYPE
RECYCLING/RECLAIMING WATERS,
SURFACE DRAINAGE CONTROLS,
ABANDONMENT PROCEDURES.

2.6 WILL A CAMP BE PROVIDED?

YES [X] NO [ ]

2.7 IF YES, THEN INDICATE THE CAPACITY AND THE EXPECTED MAXIMUM NUMBER OF PERSONS THAT WILL BE ACCOMMODATED.

CAPACITY 75 PERSONS

MAXIMUM ACCOMMODATED 75 PERSONS

SECTION 3:

CONTINGENCY, ABANDONMENT AND RESTORATION PLANNING

3.1 **ATTACH THE PROPOSED OR EXISTING CONTINGENCY PLAN WHICH DESCRIBES COURSE OF ACTION, MITIGATIVE MEASURES AND EQUIPMENT AVAILABLE FOR USE IN THE EVENT OF SYSTEM FAILURES AND SPILLS OF HAZARDOUS MATERIALS (IN COMPLIANCE WITH NWT WATER BOARD GUIDELINES FOR CONTINGENCY PLANNING, 1987).**

See attached Project Description.

3.2 **ATTACH AN INVENTORY OF HAZARDOUS MATERIALS ON THE PROPERTY (AS DEFINED UNDER TRANSPORTATION OF DANGEROUS GOOD REGULATIONS).**

N/A

3.3 **ATTACH AN OUTLINE OF PLANNED ABANDONMENT AND RESTORATION PROCEDURES.**

See attached Project Description.

SECTION 4:

ENVIRONMENTAL ASSESSMENT AND SCREENING

Your application and other project details, such as this questionnaire, will be sent out for review by local aboriginal and public groups as well as territorial and federal government agencies. Their comments regarding the significance of project impacts are considered before a decision is made to allow the project to proceed. Because formal assessment and screening of water licences was only initiated in about 1989, applicants will find that this process may be required even if the project has been built and in operation for several years. However, if your project has been previously screened a further assessment may not be required, or a more limited process may be used. This will depend on individual circumstances, including the stage of the project. Some projects may need a higher level of review or submission of more information before being screened.

4.1 HAS THIS PROJECT EVER UNDERGONE AN INITIAL ENVIRONMENTAL ASSESSMENT, INCLUDING PREVIOUS OWNERS?

YES [X] **NO** [ ]

IF YES, BY WHOM / WHEN: Submitted by Inuvialuit Environmental Inc. – August 2000

4.2 HAS BASELINE DATA BEEN COLLECTED FOR THE MAIN WATER BODIES IN THE AREA?

YES [X] **NO** [ ]

IF YES, ATTACH DATA.
EA completed by Inuvialuit Environmental Inc. - see attached Project Description.

4.3 HAS BASELINE DATA BEEN COLLECTED AND EVALUATED WITH RESPECT TO THE BIOPHYSICAL COMPONENTS OF THE ENVIRONMENT POTENTIALLY AFFECTED BY THE PROJECT (WILDLIFE, SOILS, AIR QUALITY).

YES [X] **NO** [ ]

IF YES, ATTACH DATA.
See attached Project Description.

4.4 ATTACH A DESCRIPTION OF ALL PROPOSED AND EXISTING ENVIRONMENTAL MONITORING PROGRAMS.
N/A

4.5 HAS A COMMUNITY CONSULTATION PROGRAM BEEN INITIATED?

YES [X] **NO** [ ]

IF YES, PROVIDE DETAILS OF THE PROGRAM. See attached Project Description

SECTION 5:

LIST OF ATTACHMENTS

Reference to Question #	Title	Number of pages
1.6	Maps of Existing and Proposed Facilities	Figure 2 – Project Description and attached.
3.1	Emergency Response Plans	Appendix B – Project Description.
3.3	Abandonment and Restoration Procedures	Section 14 – Project Description.
4.1	Project Description	Attached.
4.2	Baseline Water Data	Section 11 – Project Description.
4.3	Biophysical Components	Section 11 – Project Description.
4.5	Community Consultation	Section 16 – Project Description.