



**GWICH'IN LAND AND WATER BOARD
WATER LICENCE APPLICATION**

BOX 2018 INUVIK NT X0E 0T0
PH 867 777 4954 FX 867 777 2616

SCHEDULE III

(Subsection 6(1) of the Northwest Territories Water Regulations)

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

APPLICATION/LICENCE NO: _____

(Amendment or Renewal only)

1. NAME AND MAILING ADDRESS OF APPLICANT

Aurora College
Box 1290, Conibeer Crescent
Fort Smith, NT
X0E 0P0

Telephone: (867) 872-7000

Fax (867) 873-4730

2. ADDRESS OF HEAD OFFICE IN CANADA IF INCORPORATED

See Above

3. LOCATION OF UNDERTAKING

(Describe and attach a map, indicating watercourses and location of any proposed waste deposits)

The proposed Rig Training Facility will be located in the gravel pit operated by the Town of Inuvik on Navy Road, adjacent to the access road to the Aklavik/Tuktoyaktuk winter road (See attached Survey Map)

Longitude: 68° 22' 28" N **Latitude:** 145° 43' 8" W

4. DESCRIPTION OF UNDERTAKING

(Describe and attach plans)

See Appendix I

5. TYPES OF UNDERTAKING

- 1. Industrial X
- 2. Mining and milling
- 3. Municipal
- 4. Power
- 5. Agriculture
- 6. Conservation
- 7. Recreation
- 8. Miscellaneous (describe)

6. WATER USE

- To obtain water
- Flood control
- To cross a water course
- 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)

Approximately 5000L of water will be utilized in the production of drilling fluid, during the drilling program for the proposed well (designated Aurora College Inuvik L58). This water will be obtained from the Town of Inuvik municipal supply (post-treatment), and trucked to the drill site on an as-required basis. Additionally, approximately 2500L *per* day will be utilized for human consumption, and in the operation of washroom facilities, on the drill site. All sewage and gray water will be removed from the site daily, for treatment at the Town of Inuvik Municipal Wastewater Treatment Facility.

8. WASTE DEPOSITED

(Quantity, quality, treatment and disposal)

Approximately 45 cubic meters of drilling fluid (see Appendix II, for anticipated compositional analysis) will be managed in an on-site disposal sump constructed utilizing the standard mix-bury-cover methodology, as *per* the protocols described in *Alberta Energy and Utilities Board Guideline 50* (November, 1996; see Appendix III, for a description of sump design, sump construction, and post-closure environmental monitoring program). As well, approximately 2500 L *per* day of sewage and gray water from washroom facilities located on the drill site will be removed from the site daily, for treatment at the Town of Inuvik Municipal Wastewater Treatment Facility.

9. OTHER PERSONS OR PROPERTIES AFFECTED BY THIS UNDERTAKING

(Give name, mailing address and location; attach list if necessary)

Town of Inuvik	Gwich'in Tribal Council
Box 1160	Box 2018
Inuvik, NT	Inuvik, NT
X0E 0T0	X0E 0T0
Ph: (867) 777-2607	Ph: (867) 777-4869
Fax: (867) 777-2701	Fax: (867) 777-4260

10. PREDICTED ENVIRONMENTAL IMPACTS OF UNDERTAKING AND PROPOSED MITIGATION

See Appendices IV and VI for a detailed description of potential environmental impacts, and proposed mitigations thereof.

11. CONTRACTOR AND SUB-CONTRACTORS

(Names, addresses and functions)

Akita Drilling
1110, 505-3rd Street S.W.
Calgary, AB
T2B 3E6

Canadian Petroleum Engineering
1710, 407- 2nd Street S.W.
Calgary, AB
T2P 2Y3

12. STUDIES UNDERTAKEN TO DATE


(Attach list if necessary)

13. PROPOSED TIME SCHEDULE

(Note: For initial Rig Training Program Only)

Start Date: 1 July 2000
Completion Date: 15 September 2001

Maurice Evans
Name (Print)


Signature

President, Aurora College
Title (Print)

May 12, 2001
Date

FOR OFFICE USE ONLY

Application Fee	Amount: \$ _____	Receipt No.: _____
Water Use Deposit	Amount: \$ _____	Receipt No.: _____



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#45 Bonnetplume Road, P.O. BOX 2300
INUVIK, NT Canada
X0E 0T0
PHONE: (867) 777 4286
FAX: (867) 777 4081
E-MAIL: nmdl@inuviktv.com

May 8, 2001

NEAL Project #:01-1790

Aurora College
P.O. Box 1008
Inuvik, NT
X0E 0T0
Ph. (867) 777-7839
Fax (867) 777-5117

Attn: Mr. Rick Clarke

Re: Calculations for Latitudes & Longitudes

▪ Well Hole Center	N-7 584 979.686	E-552 683.541
▪ Point #4	N-7 584 933.747	E-552 679.708
▪ Point #5	N-7 584 918.619	E-552 730.721
▪ Point #6	N-7 584 996.856	E-552 747.426
▪ Point #7	N-7 584 959.746	E-552 609.358
▪ Point #8	N-7 585 034.786	E-552 637.091

Here are the Lats & Longs Using NAD 27 for the Corners of the Lease and Well Hole Center.

▪ Well Hole Center	68d 22' 28.04178" N	145d 43' 8.47854" W
▪ Point #4	68d 22' 26.56149" N	145d 43' 8.89750" W
▪ Point #5	68d 22' 26.03893" N	145d 43' 4.46122" W
▪ Point #6	68d 22' 28.55312" N	145d 43' 4.46122" W
▪ Point #7	68d 22' 27.44788" N	145d 43' 15.00617 W
▪ Point #8	68d 22' 29.85151' N	145d 43' 12.44302" W

Enclosed is a map of the area and the points are also listed.

If you have any questions or concerns please feel free to contact me at the above number.

Sincerely,

Corey Wainman

TOWN LIMIT

11.5925
1977

260° 48' 05"

262.696
77° 56' 50"

200.563
352° 11' 15"

1
2
3
4
A

70.57

PLAN N°

LOT 100

15L59
R
1977

349° 02' 02"
24.382

5L
R
1977

343° 28' 58"
53.209

4L59-2
R
1977

Fd. no evidence
Pl. I., Mp.

69° 40' 30"

R = 400.629
Pl. I., Mp.

SEE DETAIL
ABOVE

Fd. I., R-5
69° 43' 00"

15.240
15.240

75.0m

ROAD

PLAN N°

GROUP 1355
51

PLAN 56702 C.L.S.R.
672 L.T.O.

GROUP 1355
53

PLAN 56703 C.L.S.R.
673 L.T.O.

ROAD

Appendix I:

Location and Summary of Operations

Site Location

The project area selected for the development of the proposed rig Training Facility is located in a gravel pit presently operated by the Town of Inuvik, within its Municipal boundaries on Commissioners Land. This pit is located on Navy Road, in the north-west end of the Town, adjacent to the access road to the Tuktoyaktuk/Aklavik winter road. Well hole centre, which is approximately 750 metres from the East Channel of the Mackenzie River, is located at the following geo-reference coordinates:

Latitude: 68° 22' 28.04178" N **Longitude:** 145° 43' 8.47845" W

These geo-reference coordinates fall with the Settlement Area described by the Gwich'in Final Agreement.

Site Selection Parameters

The Project Management Team, in determining possible sites for the proposed Rig Training Facility, set out a series of selection criteria:

- (1) Ease of access to the site from the Mackenzie River, both to facilitate drill rig mobilization from its present location in Hay River, and to facilitate its demobilization to the Akita Drilling's next operational site for Rig #15 (the JAPEX gas hydrate research project located in the Mallik field);
- (2) Proximity to the Town of Inuvik, to facilitate access to municipal services (water treatment, wastewater treatment, and landfill disposal facilities), hospital and educational facilities (Aurora Campus, Aurora College);
- (3) Presently existing road access to the site, to minimize both potential environmental impacts on aquatic, terrestrial and wildlife resources resulting from road construction activities and the costs of developing the site for the proposed rig Training Facility; and
- (4) Ease of public access to an area immediately adjacent to the site, to afford the opportunity for any visiting dignitaries, family members, and school tours to easily view operations on the site from a distance, although occupational health and safety regulations will preclude actual entry onto the site.

Project Elements

Site Survey

The leasehold for the proposed Rig Training Facility will be surveyed at 150 m x 80 m (1.2 ha) in size. A topographical survey designed to delineate the site contour characteristics will be completed, to provide information required to:

- (1) Complete determination of cut/fill volumes, to minimize time required to operate equipment to construct a level rig pad;
- (2) Affect the minimization of potential effects on permafrost, by minimizing the volumes of disturbance of permafrost-containing soil; and
- (3) Allow for the development of a series of on-site drainage ditches, settling ponds, and flow rate control structures to affect an effective mitigation of potential sediment impacts on watercourses located within 750 metres of the proposed facility (the Mackenzie River).

Leasehold Preparation

Following completion of the topographical survey component of the project, the leasehold will be prepared for drilling rig mobilization. A level pad will be prepared for rig set up, and all on-leasehold access roads required for rig access and OH&S regulations will be constructed. In addition, site sediment control structures (drainage ditches, flow control structures, and a settling pond of sufficient capacity to contain a 1 in 20 year storm event on the leasehold surface footprint, plus a 20% volume contingency) will be constructed.

Equipment utilized in this stage of the project will be as follows:

- (1) Caterpillar D7R, or equivalent track-type tractor;
- (2) Caterpillar 320B excavator, or equivalent;
- (3) Caterpillar 938G wheel loader, or equivalent;
- (4) 2-end dump type tandem trucks

Drilling Rig Mobilization

Following arrival in Inuvik, the drill rig will be removed from the transport barge, placed on a bed truck, and delivered to the drill pad. With respect to traffic interruption on a public access roadway, advertisements will be placed in local electronic and print media, to inform the public of the mobilization activities. As well, traffic control assistance will be requested from the Inuvik Detachment of the Royal Canadian Mounted Police

Test Well Hole Drilling/Training Program

Following rig mobilization, the intention is to drill, and set casing in, a 450 m test well hole. This well will be drilled according to the program designed by Canadian Petroleum Engineering (CPE) Inc. (Calgary, AB), who have been retained by Aurora College to provide drilling program design, and on-site support during the actual drilling operations. Additionally, CPE will carry out casing, formation, and S/P resistivity logging during test well drilling operations. Akita Drilling Ltd. (Calgary, AB) has been retained by Aurora College to provide drilling services. It is their intention to mobilize Akita Drilling Ltd. Rig # 15 (see Appendix VIII, for rig specifications) for these operations, as this rig has also been contracted to complete the JAPEX gas hydrate research project well in the Mallik field during the 2001-2002 winter drilling season.

Once completed, the well will be cased and cemented, according to the drilling program design, and in accordance with NEB conditions of approval. Once set in, this cased well will facilitate the oil and gas training opportunities described in detail in Aurora College's marketing survey studies (Appendix VII). In the first training cycle, 84 individuals will receive the training program described in detail therein, enabling them access employment in the 2001-2002 petroleum exploration programs in the Mackenzie Delta.

Drilling Rig Demobilization

Following completion of the initial rig training program at the proposed Rig Training facility in Inuvik, the drill rig will be removed from the drill pad, placed on a bed truck, and delivered to the transport barge. With respect to traffic interruption on a public access roadway, advertisements will be placed in local electronic and print media, to inform the public of the mobilization activities. As well, traffic control assistance will be requested from the Inuvik Detachment of the Royal Canadian Mounted Police. Following demobilization, Akita Rig #15 will be barged to a point off the Mallik drill site, in preparation for mobilization for the JAPEX drilling program.

Appendix II:

Compositional Analysis of Drilling Fluids

The drilling program for the well required as part of the development of the Proposed Rig Training Facility will be designed to accomplish the following objectives: to control hole erosion, prevent degradation of the permafrost, control possible gas hydrates or free gas beneath the permafrost and provide sufficient carrying capacity to carry out large cuttings or gravel that may be encountered in either hole section.

The drilling consultant engineers retained by Aurora College (Canadian Petroleum Engineering, Inc., Calgary, AB) have recommended using a basic water based drilling fluids program to accomplish the objectives outlined above. The relatively low pumping rates called for in this program will minimize hole erosion. Hole cleaning will then be accomplished by using a viscosified system made up using a long chain polymer. Small amounts of bentonite may be used to supplement the carrying capacity of the long chain polymer.

To prevent degradation of the permafrost, the drilling fluid system will be refrigerated to below 5⁰ C, which will require the addition of Potash (KCl) to lower the freeze point of the drilling fluids. Gas hydrates will also be removed from the well bore by drilling fluid refrigeration. As a result, any gas hydrates encountered will remain in in-situ condition, and hydrate disassociation will take place either on the shale shakers or in the cuttings pile rather than in the well bore. This affords an added safety margin during the drilling program, as hydrates are not a safety issue once removed from the well bore. If free gas is encountered beneath the permafrost, it can be controlled by weighting up the mud system through the addition of barite. This is, however, not anticipated in this well due to the relatively shallow terminal depth (TD) proposed (less than 425 m).

The constituents of the proposed drilling fluids, which the proponent is proposing to manage in the drilling waste management sump described in Appendix III, are as follows:

- (1) Potash (KCl) - approximate concentration 70 kg/m
- (2) Xanthum Polymer (Xanvis.) - approximate concentration 5 kg/m³
- (3) Caustic Soda (KOH) - approximate concentration 0.5 kg/m³
- (4) Sodium Sulfite -- approximate concentration 0.3 kg/m³
- (5) Bentonite - as required. Expect usage to be minimal.
- (6) Barite - as required. Expect usage to be minimal

Appendix III:

Description of Drilling Waste Management Sump Design Parameters, Construction Procedures and Post-Closure Environmental Monitoring Program

The management of drilling waste (see Appendix II, for anticipated compositional analysis) will be carried out in an on-site sump, constructed utilizing the standard mix-bury-cover methodology, as *per* the protocols described in *Alberta Energy and Utilities Board Guideline 50* (October, 1996). The objectives of the waste management program described below are as follows:

- (1) To protect the environment (including surface water, sub-surface water, and cryosols), and to return the drilling waste management site to an equivalent land capability;
- (2) To minimize both the overall extent of surface land disturbance, and any potential impacts on the traditional use of surrounding land; and
- (3) To maximize potential opportunities to build community capacity in sump construction techniques, environmental monitoring programs and sump research programs.

Drilling Waste Management Sump Design and Construction

Drilling waste management sumps will be restored in a manner suitable to the Gwich'in Land and Water Board and DIAND Land Use Inspector. The proponent is proposing to construct a drilling waste management sump of sufficient volume to contain the drilling waste anticipated to be produced during the completion of the drilling program, plus a 20% contingency volume, as follows:

- (1) Material in the active layer of permafrost (approximately 1m in thickness) will be excavated, segregated from any sub-surface materials, and retained for final capping. Additionally, sufficient volumes of clean sub-surface materials will also be segregated, to cover the sub-soil and drilling waste mixture, and to form part of the permafrost layer after freezeback.
- (2) The sump will be excavated, so as to produce a containment area in the permafrost layer which has a level bottom, walls with a minimum 3:1 slope, and which is free of large rocks. Sub-soil, which is free of large rocks, will then be placed back in the hole, in a series of lifts not exceeding a thickness of 5 cm, and re-compacted to a

hydraulic conductivity of 10^{-4} cm/sec, or greater. Total minimum thickness of the re-compacted layer will be 15 cm . A mil polyurethane liner will then be placed into the sump, and secured in place by means of a 1 m locking trench. Seams will be welded, as *per* manufacturers instructions.

- (3) Drilling waste will be mixed with the sub-soil, in a ratio of *at least* three parts subsoil to one part drilling waste, by volume. The actual volumes of sub-soil utilized will be such so as to affect the post-disposal analyte concentrations described in *Alberta Energy and Utilities Board Guideline 50* (November, 1996). Particular care in maintaining chloride concentrations less than 2000 mg/kg (dry solids basis) in the drilling waste/sub-soil mixture will be maintained, to minimize potential impacts on sump permafrost integrity. Following completion of the drilling waste/sub-soil mixing and sump placement, a cover layer of 1 m of clean sub-soil material will be placed over the drilling waste, in a minimum of 4 lifts, with the lift thickness not exceeding 25 cm, and re-compacted to minimize post-abandonment subsidence. This cover material, after freezeback, will form part of the permafrost layer. Finally, the sump will be capped with an additional 1 m of material, in a minimum of 4 lifts, with the lift thickness not exceeding 25 cm, and re-compacted to minimize post-abandonment subsidence. This cap material, after freezeback, will form part of the active layer, and will also function to divert surface water from the sump.

Post-Closure Environmental Monitoring Program

To monitor sump integrity, a series of active layer active layer monitoring point wells will be placed around the sump. An annual surface and sub-surface (active layer) sampling program will be established. Analytical parameters would be consistent with those outlined *Appendix III, Guide 50: Drilling Waste Management (October 1996)*, and would include: pH, specific conductance, total dissolved solids (TDS), sodium absorption ration (SAR), major ions, total metals, free cyanides (CN), oil and grease, total petroleum hydrocarbons (TPH), total organic carbon (TOC) and phenols.

Appendix IV:

Predicted Environmental Impacts of Undertaking and Proposed Mitigation

This Appendix supports Section 10 of the Water License Application form. Potential environmental impacts and/or issues, as well as corresponding mitigation measures are discussed below. Residual effects are also discussed below, for each appropriate environmental resource. As a result of proposed mitigative measures, no significant environmental impacts, or residual effects, as a result of the development of the proposed Rig Training Facility are predicted.

6.1 Permafrost

As this site is presently an operating gravel pit, with no vegetation or organic mat present in the area which the proponent proposes to develop the proposed Rig Training Facility, no additional impacts on permafrost other than those which have previously occurred are anticipated. Maintenance of proper on-site drainage, as well as minimizing exposure of permafrost during sump construction, will mitigate impacts on permafrost; residual impacts are anticipated to be minimal.

6.2 Soil and Terrain Conditions on the Proposed Site

As this site is presently an operating gravel pit, no additional impacts on permafrost other than those which have previously occurred are anticipated. No further disturbance to the topsoil portion of the soil horizon will occur in the development of the proposed Rig Training Facility. Some site specific compaction, and admixing, of the previously-disturbed soils on the site may occur as a result of the proposed activities. However, as this site is presently in operation as a gravel pit, and is as such a highly disturbed site, no significant additional impairments relative to the present soil condition of the site, as a result of compaction or admixing, are anticipated. Slopes on site will be kept to a 3:1 minimum, and appropriate erosion control put in place to affect slope stabilization, and to minimize potential sedimentation effects on local watercourses. Attempts to re-seed the slopes with native grasses, to improve the aesthetic appearance of the site and to increase slope stability, will be made. No residual effects, in addition to those which have occurred as a result of the site being operated as a gravel pit, are anticipated.

6.3 Vegetation

As this site is presently an operating gravel pit, no additional impacts on vegetation, other than those which have previously occurred are anticipated. No additional trees, or grasses, will be removed in the development of the proposed Rig Training Facility. No residual effects, in addition to those which have occurred as a result of the site being operated as a gravel pit, are anticipated.

6.4 Wildlife

As this site is presently an operating gravel pit, no additional impacts on wildlife habitat, other than those which have previously occurred are anticipated. No additional trees, or grasses, will be removed in the development of the proposed Rig Training Facility, therefore no additional wildlife habitat will be disturbed. While there is some minimal potential for the attraction of nuisance animals during the proposed activities, the site will be patrolled daily, and any garbage found onsite will be collected, and removed from the site for proper disposal at an approved municipal waste management facility. No residual effects on wildlife resources, and their traditional use, are predicted.

6.5 Aquatic Resources

All water utilized during the operation of the proposed Rig Training Facility will be obtained from the Town of Inuvik municipal water treatment system. All sewage and gray water will be treated at an approved wastewater treatment facility operated by the Town of Inuvik. A surface water management control program will be developed so as to minimize the potential of any release of surface water from the site. All surface water will be diverted through a series of ponds, and sediment control structures, which will be designed to contain a 1 in 20 year storm event on the footprint of the proposed leasehold, plus a 20% volume contingency. In the unlikely event of a fuel spill, or hydrocarbon release from the well, total containment of surface water on site will be affected by the blockage of drainage ditches with pre-placed material (impermeable, sub-surface soils), and the application of oil sorbent materials, such as peat moss or cellulose materials, which will be maintained on site (see Appendix V; Oil Spill Contingency Plan).

As a result of the mitigation procedures developed for this project, no effects on fish, or fish habitat are predicted. No residual effects on fish, or fish habitat, are predicted.

6.6 Air Quality and Noise

As a result of diesel engines running, during the construction of the leasehold, equipment mobilization, operation during the drilling training program, and demobilization, there are some emissions which will be generated. However, these effects will be limited in time, area affected, and total volumes generated. As the anticipated time line for completion of the drilling portion of the training program is less than 8 weeks, and all equipment will be equipped with appropriate mufflers and emissions equipment, no residual effects are anticipated. Recognizing that the potential for dust generation on the site does exist, an appropriate program to control dust generation will be instituted. This program will consist of the application of water to access roads, and the leasehold site itself, as affect dust control and to mitigate this potential effect on air quality in the area. No residual effects on air quality or on noise levels are predicted.

6.7 Cultural Resources

As this site is presently an operating gravel pit, no additional impacts on cultural resources, other than those which have previously occurred, are anticipated. As no additional surface will be disturbed during the completion of the proposed Rig Training Facility, no potential for additional effects on archaeological resources exists. No residual effects on cultural resources are predicted.

6.8 Socio-Economic Effects

Aurora College intends to develop a world class Training Facility, initially to train the local workforce for the anticipated activity in petroleum exploration and development in the Northwest Territories, which will offer training in a number of areas:

Floor Hand Training Program - Scope and Outcomes

The delivery of the floor hand training will see each trainee participate in a 12 day program. The first four days will focus on safety training (i.e. St. John's Ambulance Standard First Aid, CPR, Workplace Hazardous Material Information System (WHMIS) and H₂S Alive). It is expected that this training will be conducted at Aurora Campus in Inuvik. After successful completion of the safety training, participants will receive three days of classroom instruction with PITS certified instructors. This will be followed by six days of training on the drilling rig. Participants will work 12-hour shifts during rig training. It is anticipated that 84 students will be trained over a period of 6 weeks (mid July to the end of August).

Related Training Opportunities

The establishment and overall operation of the training site will create opportunities for related training to be conducted by Aurora College. Examples would be Camp Cook, Camp Catering, Kitchen Helper and Camp Attendant. Other training opportunities will include Class 1 and Class 3 driver training, and Heavy Equipment Operator (HEO) training. In addition, the development of a 425m cased training well will facilitate future training opportunities in a number of areas related to the operation of petroleum and natural gas production and transmission (see Appendix VI).

Related Research and Development Opportunities

The Aurora Research Institute - the research arm of Aurora College - is currently in consultation with the Inuvialuit, Gwich'in and CAPP to conduct research on abandoned drill sumps during the 2001 summer field season. This project, and related research on permafrost hydrology and drilling fluid management, has been identified as a regional priority. One of the anticipated outcomes of the research is to identify "best practices" in the area of drilling fluid management, and the eventual development of guidelines for the management of drilling waste.

The proposed project will result in a number of positive socio-economic benefits, through skills enhancement through training, increased economic activity for local businesses, and increased emphasis on, and investment in, research and development activities.

6.9 Potential Cumulative Effects

During the development of the proposed Rig Training Facility, no cumulative effects are anticipated.

No significant increases in traffic to the proposed Rig Training Facility are anticipated. As well, no new road construction, stream crossings, vegetation or topsoil removal, or impairment of cultural resources will occur as the result of this development. As a result of the setback distances from watercourses, sediment management programs and spill contingencies in place, no impairment of aquatic resources by the impingement of site construction, operation and transport activities on watercourses will occur. Additionally, all water utilized on the proposed Rig Training Facility site will be obtained from the Town of Inuvik municipal supply. Since the amounts required do not result in a significant increase in daily treatment volume of the Town of Inuvik system, and since all sewage and gray water will be treated in an approved municipal waste water treatment system, no impairment of aquatic resources, or decreases in fish habitat, will occur as the result of water usage, or waste treatment, during the proposed development.

Appendix V:

Fuel And Oil Spill Contingency Plan **Aurora College Rig Training Facility**

Purpose of the Plan

The purpose of this plan is to provide for a safe and efficient response strategy should a fuel or oil spill occur. This contingency plan provides for the protection of human life and property, the minimization of any potential residual effects that could occur as the result of fuel and/or oil spill, and describes proper procedures to follow should cleanup operations be required.

Drill Rig Training Program Fuel Transport and Handling Description

Location of Fuel:	Arctic Dove Fuel Distributors Inuvik, NT
Method of Delivery to Site:	10,000 L Delivery Vehicle
On-Site Fuel Storage:	15,000 L Maintained in Drilling Rig Storage Tank
On-Site Lube Oil Storage:	225 L 15W-40
On-Site Hydraulic Oil Storage:	225 L Hydraul 56
Fuel Delivery Time Line:	Daily, from 1 July 2001 – 7 September 2001

Administration:

Rick Clarke, Project Manager
Aurora College
Inuvik, NT
(867) 777-7839

Contact List

Government Regulatory and Emergency Response

(1) **GNWT 24 Hour Spill Line:** (867) 920-8130

(2) **DIAND (Inuvik Office)**

Rudy Cockney
District Manager
(867) 777-3361

(3) **GNWT-RWED Yellowknife**

Emery Paquin
Environment Protection Services
(867) 873-7654

(4) **DFO, Hay River**

Terry Cook
Base Manager
(867) 874-5559

(5) **NEB**

John Korec
Environmental Assessment Officer
(403) 292-6614 (office)
(403) 275-6256 (home)

(6) **Aurora College./AKITA**

Position; Person; Location; Phone Number
Project Manager; Rick Clarke, Inuvik, NT; (867) 777-7839
Director; Miki O'Kane; Inuvik, NT; (867) 777-7878
Rig Manager; Ray Coleman; Inuvik, NT; (867) 587-2640

Scope of Spills

Fuel Truck

Diesel fuel on un-frozen ground from a vehicle or valve or tank leak while transporting fuel, or spills during fuel transfer.

Rig Fuel Tank

Diesel fuel on un-frozen ground from a single 15000 L tank or leaky valve while storing fuel.

Rig Lubrication System

Leak of lube oil from burst hydraulic hose.

Operator Environmental Response Co-Ordination

Jim Wall
Response Plan Co-ordinator
(867) 777-4029

Equipment for Spill Response

Rick Clarke
Project Manager
(867) 777-7839

Ray Coleman
Rig Manager
(403) 997-2089

Initial Fuel Spill Response Actions

Upon discovery of a spill, the first person on the scene will:

- (1) Protect the safety and lives of individuals in the spill area.
 - (2) Isolate or remove any potential ignition sources if safe and possible.
 - (3) Locate the likely source or cause of the spill and stop the flow or release of product (avoiding unnecessary risks).
 - (4) Assess the likely size, extent and conditions of spill.
 - (5) Notify their immediate supervisor with information*
 - (6) Control access to the spill area until further assistance arrives on site.
 - (7) Attempt to contain spread of spill, using available equipment and materials. This will include the application of sorbent materials maintained on site, and the blockage of off-site drainage ditches with pre-placed, impermeable sub-soil materials.
 - (8) Record all relevant information for reporting purposes.
- Upon notification that a spill has occurred, the supervisor will notify GNWT @ 24 hours Spill Number (867) 920-8130, and NEB (403) 299-3868.

Summer Spills in Water

Containment

Booms.

Recovery-Skimmer

- (1) Use an oil spill skimmer to recover spilled fuel, if spill is too large to cover with sorbent materials.
- (2) Store recovered small volumes of fuel and water in steel drums.
- (3) Store larger volumes or recovered fuel and water in empty fuel tank for transfer to a remote recycling or acceptable disposal site. If necessary, a TDG waste manifest may be required.

Summer Spills on Land

Containment

Construct dikes or drainage trenches to prevent fuel spills from migrating (particularly into water). Block all off-site drainage ditches on the drilling site with pre-placed, impermeable sub-soil material

Recovery

Pump liquid product into empty drums or tanks for future acceptable disposal.

Transportation

TDG waste manifest if necessary.

Clean-up

Use sorbent materials to clean up remaining surface oil and fuel. Recover sorbent materials used and place into steel drums for future disposal.

Soil Removal

Contaminated soil will be removed to storage for acceptable disposal.

Disposal

Contaminated soil and contaminated debris from a spill on the drill site would be placed in steel drums, and removed from the site for disposal in a properly permitted waste management facility. Disposal would occur only after proper consultation with regulatory stakeholder agencies (see below). All methods will be in accordance to Land Use Permit and Water License conditions.

Gwich'in Land and Water Board

Robert Alexie, Executive Director , GLWB, Inuvik (867) 777-4954

DIAND

Rudy Cockney, DIAND District Manager, Inuvik (867) 777-3361

Municipal and Community Affairs

John Picek, Regional Superintendent (GNWT, Inuvik) (867) 777-7200.

Spill Reporting Procedure

1. Fill out “**SPILL REPORT**” form as completely as possible before making the report.
2. Report **IMMEDIATELY** to Yellowknife using the 24-hour Spill Report Line.
24-HOUR SPILL REPORTING LINE (867) 920-8130

Additional Information or Assistance

Government of Northwest Territories
Environmental Protection Services
Phone: (867) 873-7654
Fax: (867) 873-0221

Department of Indian and Northern Affairs
Northern Development Water Resources
Phone: (867) 920-8240
Fax: (867) 669-2716

National Energy Board
Exploration and Development Team
Phone: (403) 299-3926
Fax: (403) 292-5876

Appendix “B”

Training Site Location (Large Scale)

Appendix “C”

Drilling Lease Location (Lot Detail)

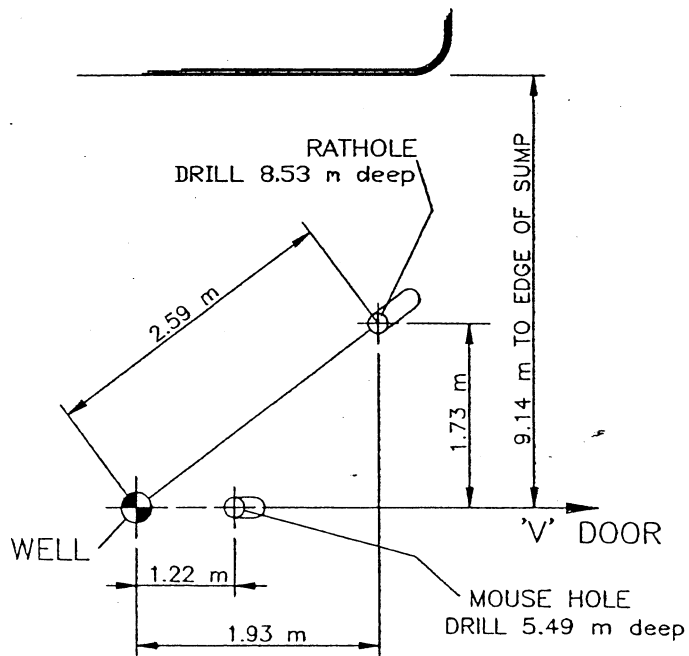
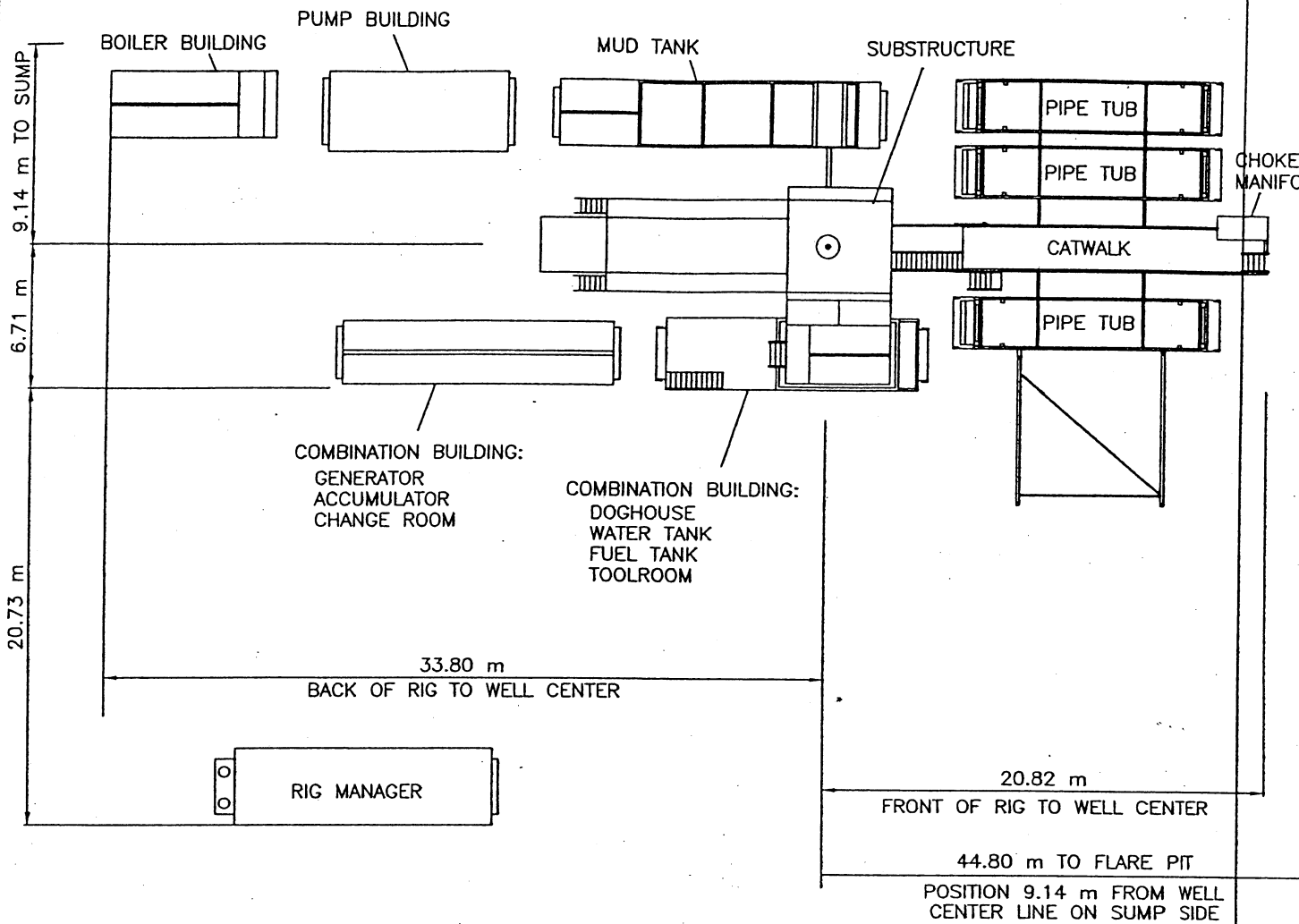


Appendix VIII

Akita Rig #15 Specifications

RIG 15

<u>CAPACITY</u> -	2000 m, 4.7 m KB, Floor Height 4.42 m.
<u>DRAWWORKS</u> -	P400 RigMaster single drum, grooved for 25.4 mm drill line. Equipped with Parkersburg 381 mm Double hydromatic brake. Rated 111,200 daN.
<u>RIG POWER</u> -	Cat 3406C rated 343 kW. Equipped with Allison HT750 automatic transmission with reverse.
<u>SUBSTRUCTURE</u> -	RigMaster step down. Casing capacity 100,000 daN irrespective of setback. Setback capacity 90,000 daN. Clear height 3.76 m.
<u>MAST</u> -	RigMaster 31.0 m clear height. Maximum static hook load with 8 lines 155,680 daN.
<u>BLOCK-HOOK</u> -	McKissick Fig #765 block with BJ 6150 hook rated for 133,400 daN.
<u>SWIVEL</u> -	Oilwell PC150, rated for 133,400 daN.
<u>ROTARY TABLE</u> -	National 175, 445 mm opening.
<u>MUD PUMP</u> -	2 Continental Emsco F-650 rated at 485 kW, powered by Caterpillar D379 rated at 375 kW. 152 mm liner – 14673 kPa, maximum 110 SPM.
<u>MUD SYSTEM</u> -	66 m ³ single tank system comprised of 5 compartments. Pill tank – hole fill and mix building equipped with 760 mm degasser, 2 only 127 mm x 152 centrifugal pumps – manifolded for back up of independent use and low pressure mud mix system.
<u>DESANDER/ DESILTER</u> -	Schiffner 10 cone desilter.
<u>SHAKER</u> -	2 Cagle Shale Shaker – Linear Motion.
<u>B.O.P. EQUIPMENT</u> -	Hydril GK 279 mm 21,000 kPa annular preventer. 2 Shaffer LWP 229 mm, 21,000 kPa single gate ram preventers. Valvcon 303 litre, 21,000 kPa 4 station accumulator, PLC remote. McEvoy 51 mm x 76 mm, 21,000 kPa choke manifold.
<u>LIGHT PLANTS</u> -	Caterpillar 3306 - 150 kW 480/208 volt AC generator and Isuzu 6BDIT 90 kW 480/208 volt AC generator.
<u>FUEL & WATER TANK</u> -	Fuel storage 15,000 litres. Water storage 50 m ³ .
<u>BOILER</u> -	Volcano 80 hp and William Davies 100 hp.
<u>DRILL STRING</u> -	As per Contract.
<u>RIG MANAGERS QUARTERS</u> -	ATCO electric skid unit.
<u>WINTER LOADS</u> -	16



RATHOLE, MOUSEHOLE CONFIGURATION



15

SCHEDULE 1
DESCRIPTION OF RIG EQUIPMENT PROVIDED BY CONTRACTOR
(ATTACHMENT TO BID AND/OR SPECIFICATION SHEET)

Contractor: AKITA Drilling Ltd. Rig Number: 15 Depth Capacity of: 2000 m, with 114 mm Drill Pipe

A. DRAWWORKS

Make: Rigmaster Model: P400 Input Power Rating: 298 kW
 Maximum Hoisting Capacity: 111200 daN (Manufacturers)
 Maximum Hoisting Capacity: 100000 daN (Contractors)
 No. of Hoisting Speeds: 5
 Auxiliary Brake: Type: Hydrodynamic Make: Parkersburg Model: 381 mm Dble
 Crown Block Protection: Yes Make: Barber Model: Crownsaver
 Drive Group: Make: Cat Model: 3406C Type: Diesel Input Power Rating: 343 kW
 Sand Reel: Line Size: N/A mm Length: _____ meters

B. PRIME MOVER

	Engine #1	Engine #2	Engine #3	Engine #4
Make:	<u>Caterpillar</u>	_____	_____	_____
Model:	<u>3406C</u>	_____	_____	_____
Continuous Power (kW)	<u>346</u>	_____	_____	_____
@ RPM	<u>1800</u>	_____	_____	_____

C. PRIME MOVER (Electric Rigs Only)

	Generator #1	Generator #2	Generator #3	Generator #4
Make:	_____	_____	_____	_____
Model:	_____	_____	_____	_____
Power Rating (kW)	_____	_____	_____	_____
kVA - AC	_____	_____	_____	_____
kVA - DC	_____	_____	_____	_____

D. ROTARY TABLE

Make: National Model: C175 Maximum Table Opening: 444.5
 Power Available _____ kW when Operating Main Pump
 Static Load Rating 222400 daN
 Rotary Speeds: Forward 5 Maximum RPM 180 Minimum RPM 20
 Reverse 1 Maximum RPM _____ Minimum RPM _____
 Drive Group: Make: IDECO Model: DWWK Chain Type: DWWK Chain Input Power Rating: 150 kW

E. DERRICK

Make: RigMaster Model: _____ Type: Telescoping
 Maximum Hook Load (Manufacturers) 155680 daN with 8 Lines
 Maximum Hook Load (Contractors) 140112 daN with 8 Lines
 Racking Capacity of 2000 meters of 114 mm Drill Pipe
 Height: 31.0 meters. Hook to Rotary Table Distance w/ Blocks at Crown Stop _____ meters
 Date of Last Inspection: New Build June 2001

F. SUBSTRUCTURE

Make: Rigmaster Model: ST-14-14.0225 Type: Step Down
 Max. Table Load (Casing Capacity) 100000 daN with 90000 daN Maximum Setback
 KB to Ground 4.7 meters
 Clear Height for BOP's 3.76 meters

G. TRAVELLING EQUIPMENT

	Crown Blks	Travel Blks	Hook	Bails	Elevators	Swivel
Make:	<u>Lee Eng.</u>	<u>BJ</u>	<u>BJ</u>	<u>B J</u>	<u>WTM</u>	<u>Oilwell</u>
Model:	_____	<u>6150</u>	<u>6150</u>	<u>96 X 2.25</u>	<u>MGG</u>	<u>PC150</u>
Load Rating (daN)	<u>112000</u>	<u>133400</u>	<u>111200</u>	<u>222400</u>	<u>133400</u>	<u>133400</u>
# of Sheaves	<u>6</u>	<u>6</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
API Bearing Rating (daN)	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>80900</u>
@ (RPM)	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>100</u>
Min. I.D. (mm)	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>57</u>
Date of Last Inspection	<u>Feb., 2000</u>	<u>Jan., 1999</u>	<u>Jan., 1999</u>	<u>Feb., 1998</u>	<u>Oct., 1999</u>	<u>Aug., 1977</u>

H. DRILLING LINE

Rope Diameter 25.4 mm Rope Type 6 X 26 EIPS Core Type IWRC
 Nominal Strength 46900 daN
 Slip Interval at 5500 Mega Joules
 Cut at 5500 Mega Joules

I. DEADLINE ANCHOR

Make: Rigmaster Model: _____ Dead Load Rating: 22250 daN

J. MUD PUMPS

Pump #1: Make: Emsco Model: F-650 Power Rating: 480 kW
 Make: Caterpillar Model: D379 Continuous Power: 375 kW RPM: 1200
 Stroke: 203 mm
 Pulsation Dampner: Make: Emsco Model: PD45 Precharge 4500 kPa
 Liner Sizes Available 165 mm, 152 mm, 142 mm, _____ mm, _____ mm, _____ mm
 Minimum Strokes/min. 80 spm 80 spm 80 spm _____ spm _____ spm
 Maximum Strokes/min. 160 spm 160 spm 160 spm _____ spm _____ spm
 Max. Manuf. Rated Press. 12521 kPa 15823 kPa 17409 kPa _____ kPa _____ kPa
 Max. Cont. Allowable Press. 10640 kPa 13449 kPa 14797 kPa _____ kPa _____ kPa

Pump #2: Make: Emsco Model: F-650 Power Rating: 480 kW
 Available Power to Pump: _____ kW
 Stroke: 203 mm
 Pulsation Dampner: Make: Emsco Model: PD45 Precharge 4500 kPa
 Liner Sizes Available 165 mm, 152 mm, 142 mm, _____ mm, _____ mm, _____ mm
 Minimum Strokes/min. 80 spm 80 spm 80 spm _____ spm _____ spm
 Maximum Strokes/min. 160 spm 160 spm 160 spm _____ spm _____ spm
 Max. Manuf. Rated Press. 12521 kPa 15823 kPa 17409 kPa _____ kPa _____ kPa
 Max. Cont. Allowable Press. 10640 kPa 13449 kPa 14797 kPa _____ kPa _____ kPa

K. MUD TANKS

Tank #1: # of Compartments 5, Height 1.65 m, Usable Capacity 65.4 m3
 Tank #2: # of Compartments _____, Height _____ m, Usable Capacity _____ m3
 Tank #3: # of Compartments _____, Height _____ m, Usable Capacity _____ m3
 Trip Tank: Width 1 m, Length 1.30 m, Height 1.06 m, Usable Capacity 2.8 m3
 Trip Tank Location Mud Tank
 Trip Tank Pump: Make: Fisher Model: Cent 51 mm Type: Electric
 Pill Tank Volume: 7.27 m3, Agitator Size 3.7 kW
 Premix Tank Volume: 7.27 m3, Agitator Size 3.7 kW
 Total No. of Agitators: 2 Power Rating 3.7 kW
 Mixing Hoppers: No. 1, Type: Venturi

L. SCHEMATIC DIAGRAM

Attached (Including All Pertinent Dimensions and Equipment Placement)

M. CENTRIFUGAL PUMPS

	Pump #1	Pump #2	Pump #3	Pump #4	Pump #5	Pump #6
Make:	<u>Mission</u>	<u>Mission</u>	_____	_____	_____	_____
Model:	<u>127 X 152</u>	<u>127 X 152</u>	_____	_____	_____	_____
Size:	<u>127 X 152</u>	<u>127 X 152</u>	_____	_____	_____	_____
Impeller Size (mm):	<u>279</u>	<u>279</u>	_____	_____	_____	_____
(RPM):	<u>1750</u>	<u>1750</u>	_____	_____	_____	_____
Input Power (kW):	<u>37</u>	<u>37</u>	_____	_____	_____	_____
Used For:	_____					
Pump #1:	<u>Desilter Desander Mud Mixer Mud Guns</u>					
Pump #2:	<u>Desilter Desander Mud Mixer Mud Guns</u>					
Pump #3:	_____					
Pump #4:	_____					
Pump #5:	_____					
Pump #6:	_____					

N. SOLIDS CONTROL

	Shale Shaker #1	Shale Shaker #2
Make:	<u>Cagle</u>	<u>Cagle</u>
Model:	<u>Linear Motion</u>	<u>Linear Motion</u>
Contractor Will Supply Mesh Screens.	<u>As Per Contract</u>	_____

Desander	Desilter
Make: _____	Schiffner
Model: _____	_____
Make of Cones: _____	Schiffner
No. of Cones: _____	10
Size of Cones (mm): _____	102
Capacity: _____	1895
Operating Pressure (meters of head): _____	32
Centrifuge: _____	Power Available for _____ kW, Volts _____
_____	Breaker Rating _____ Amps, Plug Type _____
Other: _____	Any power requirements beyond light plant capacity to be supplied by operator.

O. BLOWOUT PREVENTION EQUIPMENT

	Annular	Ram #1	Ram #2	Ram #3
Make:	Hydril	Shaffer	Shaffer	
Model:	GK	LWP	LWP	
Type:	N/A	Blind	Pipe	
Size (mm):	279	229	229	
Working Pressure (kPa):	21000	21000	21000	
Connection Type:	Flanged	Studded	Studded	
NACE:	No	No	No	
Manual/Hydraulic Lock:	N/A	Manual	Manual	
Ram Size (mm)	N/A	Blind	114,102	
Element Type:	Natural	Nitrile	Nitrile	
Date of Last Shop Inspection:	November, 1999	February, 2001	February, 1999	
Inspected By:	Shaffer	Shaffer	Shaffer	
Shock Hose: (Between BOP Stack and Choke Manifold)				
Make:	_____			Pressure Rating 21000 kPa
Date of Last Shop Inspection:	March, 1999			
Inspected By:	Reliance Industries			
Accumulator:	Make: Valvcon	Model: _____	Pressure Rating: 21000 kPa	
	No. of Bottles 8	_____ at 75.8	Liters Each	
	Precharge Pressure 7000	_____ kPa		
	Accumulator Pressure Operated by Contractor	14000	kPa	
	Manifold Pressure 10500	_____ kPa		
	No. of Stations 4			
	Master BOP Controls Accumulator	Location _____		
	Remote BOP Controls Doghouse	Location, Type Hydraulic		
	No. of Press. Regulators 1	Make: Hi Kalibre		
	Model: R3	Location: Accumulator		
Pump #1:	No. of N2 Bottles 3	Size: 37.9	Liters, Min. Press. 14000	kPa
	Make: Caterpillar	Model: 650	Type: Electric Triplex	
	Pressure Rating 21000	kPa,	Pump Rate 26.58	lpm
Pump #2:	Make: _____	Model: Air	Type: _____	
	Pressure Rating _____	kPa,	Pump Rate _____	lpm
HCR Valves:	Make: McEvoy	Model: Gate	NACE Trim No	
	No. 1	Size: 76	mm, Pressure Rating 21000	kPa
Choke Manifold Valves:	Make: McEvoy	Model: Gate	NACE Trim No	
	No. Valves 11	Size: 51	mm, Pressure Rating 21000	kPa
	Make: _____	Model: _____	NACE Trim _____	
	No. Valves _____	Size: _____	mm, Pressure Rating _____	kPa
Choke #1	Make: Willis	Model: M2	NACE Trim No	
		Size: 51	mm, Pressure Rating 21000	kPa
Choke #2	Make: Willis	Model: M2	NACE Trim No	
		Size: 51	mm, Pressure Rating 21000	kPa
Choke #3	Make: _____	Model: _____	NACE Trim _____	
		Size: _____	mm, Pressure Rating _____	kPa
Upper Kelly Cock:	Make: Griffith	Model: _____	NACE Trim No	
		Size: 168 Reg.	mm, Pressure Rating 21000	kPa
Lower Kelly Cock:	Make: _____	Model: _____	NACE Trim _____	
		Size: _____	mm, Pressure Rating _____	kPa
Stabbing Valve:	Make: Hydril	Model: Checkguard	NACE Trim No	
	No. 1	Size: 114XH	mm, Pressure Rating 21000	kPa
Inside BOP:	Make: Gray	Model: Flapper Float	NACE Trim No	
	No. _____	Size: 114XH	mm, Pressure Rating 21000	kPa
Bleed Off Line:	No. 1	Size: 76	mm, Pressure Rating 21000	kPa
			NACE Trim No	
Kill Lines:	No. 1	Size: 51	mm, Pressure Rating 21000	kPa
			NACE Trim No	
Check Valve:	Make: Stream Flo	Model: _____		
	No. 1	Size: 51	mm, Pressure Rating 21000	kPa
Mud Gas Separator #1:	Type: Poor Boy		Location: Mud Tank	
	Vessel OD: 762	mm		
	Inlet Size: 76	mm		
	Outlet Size: 152	mm,	Line Size to Flare Pit 152	mm
	Overall Height 3.06	meters		
	Distance Above Bottom of Tank 46	cm		
	Design Level _____			

Mud Gas Separator #2: Type: _____, Location: _____
 Vessel OD: _____ mm
 Inlet Size: _____ mm
 Outlet Size: _____ mm, Line Size to Flare Pit _____ mm
 Overall Height _____ meters
 Distance Above Bottom of Tank _____ cm
 Design Level _____
 Drilling Degasser: Make: _____ Type: _____ Capacity: _____ lpm

P. DRILL PIPE

See Section W

Q. HEVIWATE

See Section W

R. DRILL COLLARS AND SUBS

See Section W

S. LIGHT PLANTS

Plant #1 Output 150 _____ kW, Volts 440/208 Make: Caterpillar Model: 3306
 Plant #2 Output 90 _____ kW, Volts 440/208 Make: Isuzu Model: 6BDIT
 Power and Outlets to Run 2 _____ Additional Wellsite Units
 Power Available to Run Rental Equipment N/A kW (_____ Amps, _____ Volts, _____ Phase)

T. GENERAL

Drilling Instrumentation Pason Drilling Recorder _____
 7 Degree Deviation _____
 Tong Torque _____

 PVT and Flow show _____
 Automatic Driller Control Drilling _____
 High Pressure Wash Guns 1-Magikist _____
 Electric Sump Circulating Pump 76 mm Fisher Electric Centrifugal _____
 Kelly Spinner Yes _____
 Pipe Spinner Yes _____
 Kelly Hose: Make: _____ Size: 76 mm Working Pressure 21000 kPa
 Make Up Tongs: Make: Web Wilson Size: Type B Jaws Available 89 - 228
 Break Out Tongs: Make: Web Wilson Size: Type B Jaws Available 89 - 228
 Drill Pipe Elevators: Make: Web Wilson Size: _____
 Drill Collar Elevators: Make: BJ Size: _____
 Matting: No. 5 Size: 4.9 X 2.13
 No. 3 Size: 3.05 X 1.22
 No. _____ Size: _____
 No. _____ Size: _____
 Fuel Storage 15 m3
 Water Storage 50 m3
 Water Pumps: No. 2 Size 50 mm Output _____ m3/min.

U. BOILER

Power Rating 60 _____ kW Operating Pressure Rating 860 _____ kPa
 Boiler Certificate(Posted in Boiler House)Certificate Number: A0108844
 Date of Inspection: June 23, 1999

V. WINTER LOADS

Rig _____, Including _____ Oversize Loads Requiring Permit and Rig Managers Trailer
 Camp _____

W. OTHER MAJOR PIECES OF EQUIPMENT

Hydraulic Makeup And Breakout Cylinders _____
 Rig is normally equipped with 102 mm E2 premium drill pipe.
 Normal drill collars are 156 mm and 200 mm. Quantities determined by contract.
 (APRIL, 2001)



Photo 1: Looking southeast at the abandoned pit north of Inuvik, where Aurora College (Aurora Campus) proposes to erect a Rig Training Facility. The abandoned pit runs adjacent to Navy Road with three access roads. May 31, 2001.