

# Gwich'in Land and Water Board

## SCHEDULE 2

(Subsection 19 (2) of Mackenzie Valley Land Use Regulations)

Information In Support of an Application for a Land Use Permit

New Application

Amendment

<p>1. Applicant's name and mailing address:</p> <p>Imperial Oil Resources Ventures Limited 237 Fourth Avenue S.W. P.O. Box 2480, Station M Calgary, Alberta Canada T2P 0H6</p> <p>Peter D. Grout Manager, Regulatory Affairs Mackenzie Gas Project Tel: (403) 237-3984 Fax: (403) 237-2102</p>	<p>Other Contacts:</p> <p>Jim Hawkins, Imperial Regulatory Tel: (403) 237-2806 Fax: (403) 237-2102</p> <p>Al Kennedy, Imperial Environmental &amp; Socio-Economic Tel: (403) 237-3485 Fax: (403) 237-2102</p> <p>Greg Giesbrecht, ColtKBR Technical Tel: (403) 301-7081 Fax: (403) 258-1948</p>
<p>2. Head office address: Same as above</p> <p>Field Operations Manager: Dave Andersen, ColtKBR Radiotelephone: N/A</p>	<p>Tel: (403) 259-1802</p> <p>Fax: (403) 258-5838</p> <p>Toll Free Telephone Number: 1-877-265-8527</p>
<p>3. Other personnel (subcontractor, contractors, company staff etc.)</p> <p>Imperial Oil Resources Ventures Limited (Imperial) applies for authorization to conduct the 2005 Winter Field Geotechnical Investigation Program in the Gwich'in Settlement Area (the Program). Contracts have not been awarded.</p>	

It is expected that these subcontracts will be awarded covering the following services under supervision and direction of the lead Contractor, ColtKBR:

- Geotechnical Consultant - Responsible for directing the geotechnical aspects of the Program.
- Geotechnical Drilling Subcontractor – Responsible for drilling test holes as directed by the Geotechnical Consultant.
- General Contractor – Responsible for site preparation, access construction, excavation of test pits and support of other subcontractors.
- Camp and Catering Subcontractor – Responsible for providing the camp, meals and accommodation. This subcontract will only be necessary on a site-specific basis.
- Topographic Surveyor – Responsible for the survey of test hole locations, access to be cleared and conducting topographic surveys.
- Geophysical Surveyor – Responsible for shallow geophysical surveys.
- Helicopter Subcontractor – Responsible for providing emergency and routine services, as required.
- Fixed Wing Aircraft Subcontractor – Responsible for providing emergency and routine fixed wing support, as required.
- Local Environmental Monitor – Responsible for providing input on environmental issues to the Environmental Inspector.
- Local Wildlife Monitor – Responsible for providing wildlife encounter management.
- Telecommunications – Responsible for providing local and long-distance communications between mobile equipment and offices.
- Emergency Medical Technician – Responsible for medical emergency support services.

The subcontractors will be directed and supported by the following ColtKBR personnel:

- Construction Manager - Responsible for planning and implementation of the Program.
- Field Operations Manager - Responsible for field implementation.
- Field Superintendent - Responsible for supervising field activities.
- Project Engineer - Responsible for all drilling and survey operations.
- Safety Advisor - Responsible for providing safety briefings, enforcing of procedures and compliance with the Emergency Response Plan (see Attachment 3 under Tab A-3).
- Environmental Inspector - Responsible for providing environmental briefings, enforcement of procedures and compliance with the Environmental Protection Plan (see Attachment 2 under Tab A-2).

Total number of persons on site:

The number of personnel required at the investigation sites is estimated to range between 10 and 15 at any one time, depending on site requirements.

4. Eligibility (Refer to section 18 of the Mackenzie Valley Land Use Regulations.)

(a)(i)       (a)(ii)       (a)(iii)       (b)(i)       (b)(ii)

5. a) Summary of operation (describe purpose, nature and location of all activities)  
(Refer to paragraph 19(3)(b) of the Mackenzie Valley Land Use Regulations.)

The objective of the Program is to conduct geotechnical investigations to gather information on the soil and ground conditions adjacent to a proposed pipeline right-of-way in the Mackenzie Valley and for preparing subsequent regulatory applications. Included in these investigations are five (5) potential borrow sources, one (1) facility site and one (1) anchor trial location. This information will be used to determine the availability of suitable granular materials for pipeline construction, the design of pilings and foundations of the structures and to evaluate pipeline anchor systems.

Slurry and screw anchor trials will be conducted following drilling of the boreholes and installation of thermistors at the anchor trial location. The purpose of these trials is to obtain test data on the technical aspects of the installation and load capability of pipe hold-down anchors. This information is required in order to assess various alternate methods of maintaining the minimum burial depth of a proposed pipeline in the Mackenzie Valley.

This application covers seven (7) sites within the Gwich'in Settlement Area. Three (3) sites are on Crown Land, two (2) sites are on Private Land, one (1) site straddles both Crown and Private Land and one (1) site is on land at an airport administered by the Government of the Northwest Territories – Department of Transportation. Concurrent applications are being filed with the Gwich'in Land and Water Board for a Type B Water Licence, with the Gwich'in Tribal Council for a Temporary Right-of-Way and Type II Research Authorization, with the Aurora Research Institute for a Scientific Research Licence and with the Government of the Northwest Territories – Department of Transportation for approval to access land at an airport. An application for a Highway Access Permit will be made to the Government of the Northwest Territories – Department of Transportation prior to the commencement of Program activities.

The Program is expected to commence in early January and be completed by mid-April 2005. The exact timing and sequence of the field operations will be adjusted from day to day, depending on weather and other factors that cannot be predicted.

Subcontractors, under the supervision and direction of ColtKBR, will conduct the work. ColtKBR will be responsible for directing all operations and acting as liaison with the local community representatives and local regulatory authorities.

#### Site Investigation Operations

Following receipt of all necessary permits and approvals, access crews will mobilize from Inuvik in early January 2005 and commence activities. The primary access for the Program is the Dempster Highway and the C.N.T. Trail. The proposed access is shown on the accompanying 1:100,000 scale maps (See Drawing Nos. 107-0000-011-388-003, 107-0000-011-388-004 and 107-0000-011-388-005 under Tab C). Using bulldozers, a plow truck and a grader, the access crew will ensure construction of an ice road consistent with the Government of Northwest Territories – Department of Transportation specifications.

Secondary access to the investigation sites and potential water sources will follow existing winter roads, rights-of-way and cutlines where possible. The routes were identified using maps and aerial photographs and were either confirmed or modified based on observations made during 2003 and 2004 summer reconnaissance programs. Additional details of the proposed access are shown on the attached 1:100,000 scale maps under Tab C and a series of 1:50,000 scale topographical and satellite maps under Tab B.

New winter roads and trails might be constructed, as required, to access investigation sites and potential water sources. Care will be taken to avoid steep slopes, side hills and environmentally or culturally sensitive areas while maintaining a direct route to the site. Efforts will be made to retain riparian vegetation and minimize disturbance to stream banks along the constructed access where it intersects with watercourses. Snow will be packed to provide ground cover protection. Where insufficient snow pack is encountered, snow will be obtained from the surface of lakes or water will be withdrawn from approved sources to build a layer of ice over the snow pack to ensure ground cover protection.

The access and drilling crews will conduct site operations using existing accommodation in Inuvik.

Site investigations will be carried out by using two (2) drill rigs mounted on tracks. Equipment used in support of the geotechnical drilling operation might include the following:

- Bulldozer/Challenger
- Backhoe (on tracks)
- Grader/Delta 3
- Hydro-Axe/Brush Cutter
- Snow Cat
- Personnel Carriers
- ¾ Ton Trucks
- 4x4 Trucks
- Highboy with Envirotank
- Mechanics Truck
- Snowmobiles
- Hydro Vac Truck
- Water Truck
- Fuel Sloop

#### Auger Drill Rigs

In locations where the ground is frozen, but does not contain bedrock or boulders, auger drill rigs are ideal for drilling the boreholes. Hollow stem augers will be used and samples will be taken at selected intervals from inside the hollow stem augers. In frozen silts and clays, undisturbed samples may be taken with specialty core samplers. This method of drilling does not require drilling fluids. The practical limit of drilling in frozen ground with auger drill rigs is to a depth of about 20 metres. An area of up to 10 metres x 10 metres (0.01 hectares) is required to be cleared of vegetation prior to drilling each borehole. On completion, the boreholes will be backfilled to the ground surface with drill cuttings.

#### Air Rotary Drill Rigs

In locations where bedrock or boulders are encountered or the ground is frozen, boreholes may be drilled with an air rotary drill rig. Compressed air will be forced down the centre of the drill string and will blow the cuttings to the surface in the space between the walls of the borehole and the outside of the drill string. This method of drilling does not require drilling fluids. The practical limit of drilling in frozen ground with air rotary drills ranges from a depth of 15 to 30 metres, depending on the size of the air compressor supplied with the drill. On completion, the boreholes will be backfilled to the ground surface with drill cuttings.

## Backhoes

Backhoes will be used to excavate test pits to obtain stratigraphic information and bulk samples of granular materials. If organic surficial material is present at the test pit location, it will be stripped and kept separate from the inorganic soils. A pit of 5 metres x 5 metres and 5 metres deep is required for each test pit within a maximum disturbed area of 25 metres x 25 metres (0.06 hectares).

Upon completion of the sampling, test pits will be backfilled with inorganic material to the ground surface. Stripped organic surficial material will be placed on top of the inorganic soils forming a crown to allow for subsidence.

## SITE INVESTIGATION PROCEDURES

### Topographic Survey

It is planned to take survey cross-sections across the sites. These topographic surveys will be carried out to accurately locate access and to record the location of boreholes and test pits. The topography of all or portions of the various borrow sources will be used as the basis for estimating volumes of granular material.

### Geophysical Surveys

Shallow geophysical surveys will be used at borrow sites and at other selected investigation sites in order to provide information on subsurface conditions. Geophysical survey equipment being considered includes ground-penetrating radar, electro-magnetic and electrical resistivity methods. The equipment is either carried by hand or towed in a small sled behind a snowmobile. All of the methods are non-intrusive. The use of explosives is not required, either at ground surface or below the surface in drill holes.

### Thermistors

Ground temperature information is required as input to the design of the pipeline systems where permafrost is traversed. Ground temperatures are measured using a thermistor, which is a small bead about 3 mm in diameter. The bead will be connected to a two-strand insulated wire lead, which will be brought to the ground surface. The number of beads to be installed in each selected borehole may vary from 1 to 10. The thermistor will remain in the borehole until the site is reclaimed.

### Anchor Trial Procedures

Boreholes will be drilled at numerous locations within the anchor trial location in order to optimize the locations of the proposed trials. The trials will be conducted in at least three (3) sites within the anchor trial location. Thermistors will be installed in approximately half of the boreholes and most will be removed following the trials. In the case of a screw anchor trial, a steel rod or pile with an auger bit is screwed into the selected borehole. In the case of a slurry anchor trial, a steel rod or pile is placed into the selected borehole. The hole or annular space around the pile will be backfilled with water or a sand and water slurry and allowed to freeze into place. Hydraulic jacks set up against reaction anchors will be used to test the ultimate pull load required to cause anchor failure. Hydraulic jacks set up against reaction anchors will be used to test the ultimate pull load required to fail an anchor. Individual anchor trials may occur over several hours or several days.

Some anchors will be left in the ground and covered by a plastic cap. These anchors will be the subject of trials in successive years. After the trial has been completed and the anchor removed, the area around the thermistor string will be backfilled with sand or drill cuttings. In boreholes without thermistors, the holes will be backfilled to the ground surface with drill cuttings.

b) Indicate if a camp is to be set up. (Provide details on a separate page, if necessary.)

Field investigation activities will be directed and carried out from existing accommodation in Inuvik.

6. Summary of potential environmental and resource impacts (describe the effects of the proposed land-use operation on land, water, flora & fauna and related socio-economic impacts). (Use separate page if necessary.)

Included as attachments to this application are the following reports:

Attachment 1: "Environmental, Socio-Economic and Heritage Resource Overview and Impacts for the 2005 Winter Field Geotechnical Investigation Program" under Tab A-1

Attachment 2: "Environmental Protection Plan for the 2005 Winter Field Geotechnical Investigation Program" under Tab A-2

Attachment 3: "Emergency Response Plan for the 2005 Winter Field Geotechnical Investigation Program" under Tab A-3

Attachment 4: "Heritage Resources Protection Plan for the 2005 Winter Field Geotechnical Investigation Program" under Tab A-4

7. Proposed restoration plans (use a separate page if necessary)

Included as attachments to this application are the following reports:

Attachment 1: "Environmental, Socio-Economic and Heritage Resource Overview and Impacts for the 2005 Winter Field Geotechnical Investigation Program" under Tab A-1

Attachment 2: "Environmental Protection Plan for the 2005 Winter Field Geotechnical Investigation Program" under Tab A-2

Attachment 3: "Emergency Response Plan for the 2005 Winter Field Geotechnical Investigation Program" under Tab A-3

Attachment 4: "Heritage Resources Protection Plan for the 2005 Winter Field Geotechnical Investigation Program" under A-4

Also, refer to section 5 above.

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

Concurrent with the filing of this application, Imperial is submitting the following:

- An application to the Gwich'in Land and Water Board for a Type B Water Licence, authorizing withdrawal of water as a contingency for ice road construction. The Water Licence application identifies water requirements, water sources and access to those water sources. Attached under Tab B is Table 2, which identifies the amount of access required to obtain water. This land use requirement is included in the permit fee calculation below.
- An application to the Gwich'in Tribal Council for a Temporary Right-of-Way and Type II Research Authorization.
- An application to the Government of the Northwest Territories – Department of Transportation for permission to access airport land.

Concurrent with the filing of this application, ColtKBR is applying to the Aurora Research Institute for a Scientific Research Licence in support of the Program.

An application to the Government of the Northwest Territories - Department of Transportation for a Highway Access Permit will be filed prior to the commencement of Program activities.

Roads:            Is this to be a pioneered road?             Y  
                         (Provide details on a separate page.)

                         Has the route been laid out or ground truthed?             Y

Primary access to the sites will utilize the Dempster Highway or the C.N.T. Trail.

Secondary access to the investigation sites and potential water sources will utilize existing cutlines, rights-of-way, trails and winter roads where practical. Compacted snow will be used to protect the ground surface. Where snow depths do not provide sufficient protection from the effects of vehicular and heavy equipment activity, additional snow will be obtained from lake surfaces. Alternatively, water will be obtained from approved sources for ice road construction. The access will be constructed consistent with the Government of the Northwest Territories - Department of Transportation specifications.

Aerial reconnaissance of the proposed access into the investigation sites and potential water sources was conducted during the summers of 2003 and 2004. In addition, feedback was obtained from community organizations and incorporated into the access route selection process (refer to Attachment 5 - Public Involvement Report under Tab A-5).

9. Proposed disposal methods

- a) Garbage:  
Garbage generated at the drilling sites will be collected and hauled in an enclosed container to the sanitary landfill site in Inuvik.

b) Sewage (Sanitary & Grey Water):  
Sewage will be collected on site and hauled to the sewage treatment lagoon in Inuvik.

c) Brush & trees:  
Clearing of vegetation will be minimized by using existing winter roads, trails, rights-of-way and cutlines. Clearing of vegetation and regrowth may be required along some of the older cutlines and previously undisturbed areas. Brush and small trees will be walked down rather than removed. Should clearing be required, brush cutters, bulldozers or other methods may be used. Select timber will be salvaged and decked along the access.

d) Overburden (Organic soils, waste material, etc.):  
Conducting the Program during the winter season will minimize disturbance to organic surficial material. Overburden will only be stripped on test pit locations.

10. Equipment (includes drills, pumps, etc.) (Use separate page if necessary.)

The table below identifies the possible equipment types that might be used to conduct the geotechnical investigation. The equipment that will be used is subject to change depending on need and availability of the equipment.

Type	Size - Dimensions	Proposed use
Bulldozers	D6 or equivalent	Used to remove snow, clear and walk down brush and trees and provide access to sites
Graders	14G or equivalent	Used to level working surfaces and provide access to sites
Front End Loader	955 or equivalent	Used to remove snow and provide access to sites
Backhoes	235 or equivalent	Used to move material, dig test pits and assist other activities
Drill rigs on tracks	Auger drills, air rotary drills or equivalent	Used to obtain borehole data
Profiler		Used to measure ice thickness
Tracked Personnel Carriers	Passenger type Nodwell or equivalent	Used to transport crews and materials to and from worksites
Snowmobiles	One and two person models	Used to transport crews and materials
4 X 4 Pick-up Trucks	¾ ton trucks	Used to transport crews and materials
Tandem Axle Fuel Truck		Used to haul fuel from Inuvik
Brush Cutter	BC 604, BC 705 or equivalent	Used to clear overgrown cut lines or small brush for access
Snow Cat		Used to remove snow and provide access to sites
Fuel Sloop	6 x 500 gallon tanks	Used to temporarily store fuel on site and to supply fuel to site vehicles

Type	Size - Dimensions	Proposed use		
Plow Truck	5 Ton	Used to remove snow and provide access to sites		
Helicopter	To be determined following award of subcontract	Used to deliver supplies and support emergency evacuations, if required		
Tractor Trailer/Float	Lowboy and Highboy models	Used to transport equipment and materials via main roads and winter roads		
Tandem Axle Trucks	Various models	Used to transport fuel or water		
Water Truck	Various sizes depending on contractor	Used to support construction of roads and access		
Hydro Vac Truck	Various sizes depending on contractor	Used to transport sewage to sewage lagoon in Inuvik		
Flood Truck	Various sizes depending on contractor	Used to support construction of ice roads and access if necessary		
Delta 3 (with water tank sprayer)		Used to support construction of ice roads and access if necessary		
4x4 Truck (with Envirotank)		Used to transport fuel		
Mechanic/Utility Welding Rig	1 Ton	Used to service equipment		
11. Fuels	√	Number of containers	Capacity of containers	Location
Diesel	√	Fuel trucks, Fuel Sloop	Fuel Sloop 5 x 500 Gallons Fuel Truck 1000 Gallons	On pick-ups, bulk fuel sleds on fixed fuel carriers
Gasoline	√	Fuel trucks, Fuel Sloop	Fuel Sloop 1 x 500 Gallons Fuel Truck 1000 Gallons	On pick-ups, bulk fuel sleds on fixed fuel carriers
Aviation Fuel	√	To be determined by aviation contractor	45 gallon drums may be required	Existing fuel caches owned and operated by the aviation contractor
<p>The exact numbers of containers, fuel types and locations have not been finalized. The requirements will depend on the type of equipment that is used by the selected contractors. The numbers contained above are preliminary and are subject to change.</p>				

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

All contractors will be required to comply with the Environmental Protection Plan (see Tab A-2); and the Spill Contingency Plan provided as Section 3 of the Emergency Response Plan (see Tab A-3). Fuel sloops equipped with a double floor and sidewalls that provide containment in the event of leakage from the tanks will be used to fuel vehicles in the field.

13. Methods of fuel transfer (to other tanks, vehicles, etc.)

The method of fuel transfer will be dependent upon type, location, source and quantity of fuel. Fuel tanks will be filled by electrical or mechanical pumps (see Environmental Protection Plan under Tab A-2, Section 2).

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

Subject to regulatory approval, the proposed period of operation will be from early January 2005 through mid-April 2005 (or spring break-up). The term of this permit request is two years, to April 15, 2006. This would allow for portions of the program to be conducted in the winter 2006 in the event that weather conditions do not allow completion of this work in 2005 and in the event that anchor trials are conducted in 2006.

15. Period of permit (up to five years, with maximum of two years of extension)

Start Date

January 1, 2005

Completion Date

April 15, 2006

16. Location of activities by map co-ordinates (attach maps and sketches)

The locations of the investigation sites are provided in the Index Summary Sheet under Tab B and are given a site specific sub-tab number. Site reports and 1:50,000 topographical and satellite maps are located under each Sub-tab 1 – 7.

Minimum latitude (degree, minute) See the Index Summary Sheet and Site Reports	Maximum latitude (degree, minute) See the Index Summary Sheet and Site Reports
Minimum longitude (degree, minute) See the Index Summary Sheet and Site Reports	Maximum longitude (degree, minute) See the Index Summary Sheet and Site Reports
Map Sheet no.  See the Index Summary Sheet and Site Reports under Tab B and 1:100,000 scale maps and 1:500,000 scale map under Tab C.	

17. Applicant (Print name in full)  
Imperial Oil Resources Ventures Limited

Signature *Peter D. Grout* Date October 29, 2004  
for Peter D. Grout

18. Fees  Type A - \$150.00  Type B - \$150.00

Land Use Fees: 41.4 hectares @ \$50.00/hectare \$ 2070.00
















Assignment fee \$50.00 N/A





Total application and land use fees \$ 2220.00

Please make cheques payable to "Receiver General of Canada"




# Permit Map Series Legend

## Point Layers






-  Activity Location
-  CHIN Heritage and Archeological Sites
-  DFO Fisheries Studies
-  DIAND Boreholes Exploration
-  DIAND Licenses
-  DOT Granular Resources Inventory
-  Env Canada Stream Gauging Stations
-  GSC Mineral Showings
-  GSC Wells
-  Gwich'in Cabins
-  NTDB Contour Lines
-  NWT Mineral Showings
-  NWT Wells
-  NWT/Yukon Placename
-  Public Registry









-  Rwed Cabins
-  RWED Land Permits
-  Surface disposition
-  Yukon Mineral Showings

## Line Layers

-  Dempster Highway
-  Dene Traditional Trails
-  NTDB Cutlines

## Region Layers

-  GLUPB Proposed Protected Areas
-  GLUPB Special Management Areas
-  Grand River Resource Blocks
-  Gwich'in Harvest Boundaries
-  Gwich'in Parcels

-  Gwich'in Territorial Park
-  Mineral lease
-  NTDB Sand/Gravel
-  NTDB Water Bodies
-  NTDB Wetlands
-  Prospect Lease 98
-  RWED Forest Inventory
-  Town Boundaries