

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 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</p>	<p>Fax no. (403) 237-2102</p> <p>Telephone no. (403) 237-3984 Other Contacts: Jim Hawkins, IORVL Regulatory Tel. (403) 237-2806 Fax. (403) 237-8052</p> <p>Al Kennedy, IORVL Environmental & Socio-Economic Tel. (403) 237-3485 Fax. (403) 237-2102</p> <p>Larry Graburn, ColtKBR Technical Tel. (403) 258-8053 Fax. (403) 258-5825</p>
<p>2. Head office address Same as above</p> <p>Field Supervisor Dave Andersen, ColtKBR</p>	<p>Fax no. (403) 237-2102</p> <p>Telephone no. (403) 237-2876</p> <p>Radiotelephone no. N/A</p>
<p>3. Other personnel (subcontractor, contractors, company staff etc.)</p> <ul style="list-style-type: none"> • <u>Geotechnical Consultant</u> - Responsible for directing the geotechnical aspects of the investigation program. • <u>Geotechnical Drilling Subcontractor</u> – Responsible for drilling test holes as directed by the geotechnical consultant. • <u>General Contractor</u> – Responsible for site clearing, access road construction and similar work. • <u>Camp and Catering</u> – Responsible for providing mobile camps, meals and 	

accommodation. This subcontract will only be necessary on a site-specific basis.

- Land Surveyor – Responsible to survey test hole locations, survey access roads to be cleared and conduct topographic surveys.
- Geophysical Surveyor – Responsible for shallow geophysical surveys.
- Safety and Environmental Supervisors – Responsible for providing safety briefings, enforcing of procedures and compliance with the Environmental Protection Plan.
- 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 Representative – Responsible for providing information on community issues and concerns.
- Telecommunications – Responsible for providing local and long-distance communications between mobile equipment and offices.
- Emergency Medical Technician – Responsible for medical emergency support services.

Total number of persons on site:

The number of people at each site at any one time will range between 4 and 8 as described under Tab B, Private Lands, Sub tabs 1 to 14 and under Tab C, Crown Lands, Sub tabs 15 to 23.

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 2003 Winter Field Geotechnical Investigation Program (the Program) in this application is to obtain information with respect to subsurface conditions in the Gwich'in Settlement Area along a preliminary pipeline route, at proposed or potential river crossings and within potential borrow sources. This information is required in order to assess the feasibility of a Mackenzie Valley pipeline and for the preparation of subsequent regulatory applications should the Mackenzie Valley pipeline project proceed.

The work will be conducted by subcontractors, under the direction of ColtKBR, who will be responsible for directing all operations and liaising with the local community representatives and regulatory authorities.

SITE ACCESS OPERATIONS

Contracts will be awarded upon receipt of all necessary permits and approvals and an access crew will be mobilized by the week of January 20, 2003. The access crews will mobilize and operate from local communities and/or from a mobile camp. They will prepare access to the

various sites shown on the maps included under Tabs B and C. Disturbance to new areas will be minimized by the use of existing winter roads, existing rights-of-way and existing cut lines, where practical. New winter roads may be constructed, as required, to access sites. Care will be taken to avoid steep slopes, side hills and environmentally 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 intersects watercourse crossings.

Upon completion of access crew activities, the geotechnical crews will begin site investigation operations at the sites identified on the maps located under Tabs B and C. Individual site reports are also included with the maps under Tabs B and C.

SITE INVESTIGATION EQUIPMENT

Site investigations will be conducted using some or all of the following types of geotechnical equipment:

- Auger drill rigs
- Air rotary drill rigs
- Mud rotary drill rigs
- Coring drill rigs
- Backhoes

The selection of equipment to be used at each site depends on the expected ground conditions and the data collection requirements at the particular test site. These geotechnical rigs will either be mounted on a rubber-tracked carrier or low-ground-pressure wheeled vehicles.

Auger Drill Rigs

In locations where the ground does not contain bedrock or boulders, the test holes will be drilled with solid or hollow stem augers. If solid stem augers are used, soil samples will be taken off the augers as the hole is advanced. In the event that there is sloughing of the walls of the test hole, 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 might be taken with specialty core samplers. This method does not require drilling fluids. The practical limit of drilling in frozen ground with auger rigs is a depth of about 10 metres. Following field assessment, the test holes will be backfilled to the ground surface with cuttings.

Air Rotary Drill Rigs

In locations where bedrock or boulders are encountered or the ground is frozen, the test holes may be drilled with an air rotary rig. Compressed air will be forced down the center of the drill string and will blow the cuttings to the surface in the space between the walls of the test hole 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. Following completion of the field assessment, the test holes will be backfilled to ground surface with drill cuttings.

Mud Rotary Drill Rigs

In a few locations, it may be necessary to use a mud rotary drilling rig to stabilize the walls of the test hole. In these instances the drilling mud will consist of non-toxic bentonite slurry. The bentonite slurry is pumped down the centre of the drill string to the bit and it is forced to the surface in the space between the wall of the hole and the outside of the drill string. The slurry is contained in an above ground steel tank. The volume of drilling mud used for each test hole will be minimal (approximately 1 to 3 cubic metres) and will not contain any hazardous materials or hydrocarbons. Following completion of the field assessment, the drilling fluid and cuttings will be backfilled into the test hole. Excess drilling mud will be disposed of at an approved facility.

Coring Drill Rigs

Coring rigs may be used in locations where it is necessary to recover frozen core samples. Chilled brine will be used as the drilling fluid, to prevent thawing of the permafrost. The brine will be pumped down the centre of the drill string to the bit face. The brine and cuttings will be flushed up the outside of the drill string and into an above ground steel tank and then the brine will be re-circulate into the test hole to minimize waste fluids. Waste brine will be stored in tanks and hauled to an approved disposal facility. The recovered core will be logged in the field and selected samples are retained for laboratory testing. Following completion of the field assessment the hole will be backfilled to the ground surface with cuttings and fresh water, which will freeze.

Backhoes

Backhoes will be used to excavate test pits at the potential sources of granular borrow material. The test pits are required to recover samples of the granular materials for testing. If topsoil is present at the test pit location, the topsoil will be stripped and kept separate from the inorganic soils. The test pits will be excavated to a maximum of 5 metres long, 5 metres wide and 5 metres deep, depending on the stability of the walls of the test pit. The test pit will be backfilled with original materials upon completion of the sampling. The ground surface will be returned to the original grade and stripped topsoil replaced.

SITE INVESTIGATION PROCEDURES

Rivers and Streams

The program includes some sites where it is planned to drill test holes in rivers or streams. It may be necessary to construct an ice bridges in these cases, depending on the weight of the drill rig that is used. The drill hole will be cased through the ice and water and through any pervious deposits below the river bed. Drilling will then be conducted from inside the casing, so that drilling fluids and cuttings from the drill hole will not be released into the water. Boreholes might be drilled to total depths up to 30 metres. Upon completion of sampling, any portion of the borehole located in rock will be backfilled with cement grout.

Topographic Survey

Survey cross-sections across river valleys will be carried out to determine the crossing design. The topography of all or portions of the various borrow sources will be used as the basis for

estimating volumes of granular material. It will be necessary to clear some vegetation along each of the survey sections so that this work can proceed. Clearing of the sections will be carried out by hand, to minimize disturbance to the vegetation.

Ground Thermistors

Ground temperature information is required as input to the design of the pipeline systems. 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. Thermistor strings may be installed in up to 50 percent of the frost heave and overland test holes. The number of beads to be installed in each selected test hole may vary from 1 to 10. The thermistor will remain in the borehole permanently.

Geophysical Surveys

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

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, to the greatest extent practical, from existing facilities in local communities. Camps will be required when travel time exceeds 1 to 1½ hours. The expected types of camps are: (1) 35-man mobile sleigh camps, which will move frequently from site to site (approximately every 2-4 days); (2) a portable trailer camp, which will maintain a location for a period of approximately 4 to 8 weeks.

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 Attachment 1 is a report "Environmental and Socio-Economic Overview for the Proposed Winter 2003 Field Geotechnical Investigation Program in the Gwich'in Settlement Area" and Appendix A to Attachment 1, "Environmental Protection Plan for the 2003 Winter Field Geotechnical Investigation Program".

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

Included as Attachment 1 is a report "Environmental and Socio-Economic Overview for the Proposed Winter 2003 Field Geotechnical Investigation Program in the Gwich'in Settlement Area" and Appendix A to Attachment 1, "Environmental Protection Plan for the 2003 Winter Field Geotechnical Investigation Program".

Also, refer to section 5 above.

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

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

N Has the route been laid out or ground truthed?

Access to the sites will be by existing cut lines and winter roads where practical. The roads will be constructed as per the Government of the Northwest Territories Department of Transportation specifications or of regional specifications.

The criteria for selection of potential granular borrow investigation sites and proposed access route are:

- (1) Assessment of previous studies that incorporate government and industry data on potential granular materials;
- (2) Location of potential granular sites within a reasonable distance from the preliminary pipeline right of way;
- (3) Reconnaissance visits to each site, by helicopter, conducted during summer 2002 to assess the potential of each site and access options;
- (4) Number and quality of granular sites required to supply estimated granular material requirements of the pipeline project;
- (5) Potential granular borrow sites were ranked and those with highest potential were selected for inclusion in the borehole investigation program;
- (6) Selection of an access route to conduct the investigation that minimizes the disturbance to vegetation and timber.

The same rationale was used, to the extent applicable, to select access routes to investigate overland sites and river crossings.

9. Proposed disposal methods

a) Garbage:

Any garbage generated on site will be collected and hauled in an enclosed container to the camp for incineration. The remnants of incineration will be hauled to the nearest approved

solid waste disposal facility. If applicable, camp kitchen waste that is not incinerated will be stored in animal-proof containers for shipment to an approved disposal site.

b) Sewage (Sanitary & Grey Water):

Sumps will be dug for disposal of all sewage generated from the camps. The sumps will be treated, consistent with the *General Sanitation Regulations*. The camps will accommodate fewer than 50 persons.

In the event that sumps are not viable, grey water from sinks, showers and similar sources will be released near the closest poorly drained area, such as bogs. Sewage will be contained in holding tanks and disposed of at an approved facility. The local inspector will be provided with the locations of sumps and discharge sites of grey water resulting from the activities during this geotechnical program.

c) Brush & trees:

Clearing of vegetation will be minimized by using existing winter roads, rights-of-way and cut lines. Clearing of vegetation and regrowth may be required along some of the older cut lines and previously undisturbed areas. Should clearing be required, brush cutters, bulldozers or other methods may be used to remove vegetation.

d) Overburden (Organic soils, waste material, etc.):

Disturbance to organic topsoil will be minimized. 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 proposed activities. The equipment indicated is subject to change depending on the availability of the equipment and selection of equipment to be used by the subcontractors.

Type & number	Size - Dimensions	Proposed use
Bulldozers	D5, D6, D7, D8 or equivalent	Remove snow, clear brush and trees, provide access to sites and tow mobile camps
Graders	12H, 14H, 140 or equivalent	Level working surfaces, provide access to sites and maintain access roads
Backhoes	235 or equivalent	Move material, dig test pits and assist other activities
Drill rigs on rubber-tracked carrier or low-ground-pressure wheeled vehicles	Auger drills, air drills or equivalent	Obtain borehole data
Tracked personnel carriers	Passenger type Nodwell or equivalent	Transport crews and materials to and from worksites, camps and settlements
Snowmobiles	One and two person models	Transport crews and materials
4 X 4 Pick-up Trucks	Half and three-quarter ton	Transport crews and materials
Tracked Fuel Carriers	Nodwell 240, Nodwell 320 or equivalent	Provide fuel to equipment and peripherals
Brush Cutter	BC 604, BC 705 or equivalent	Clear overgrown cut lines or small brush for access

Generators (camps)	To be determined when subcontracts are awarded	Provide electrical power for camps
Water pump (camps)	To be determined when subcontracts are awarded	Supply water from holding tanks
Drill pumps	To be determined when subcontracts are awarded	Circulate the necessary fluids during drilling, as required
Helicopter	To be determined when subcontracts are awarded	Deliver supplies and support emergency evacuations, if required
Tractor trailers	Lowboy and highboy models	Transport equipment and materials via main roads and winter roads
Tandem axle trucks	Various models	Transport fuel or water
Water trucks	Various sizes, depending on subcontractor	Support construction of roads, access and haul potable water to camps

11. Fuels	(√)	Number of containers	Capacity of containers	Location
Diesel		Slip tanks, fuel trucks, tracked fuel carriers. Number to be determined	Slip tanks (150-300 gallons). Fuel Trucks/tracked fuel carriers 3500 gallon	On pick-ups, bulk fuel sleds for camps, on fixed fuel carriers.
Gasoline		Slip tanks, fuel trucks, tracked fuel carriers. Number to be determined	Slip tanks (150-300 gallons)	On pick-ups, bulk fuel sleds for camps, on fixed fuel carriers.
Aviation Fuel		Determined by aviation contractor	45 gallon drums may be required	Existing fuel caches owned and operated by the aviation contractor
Propane		3-4 tanks to accompany each sleigh camp	400lb tanks or equivalent depending on requirements	Secured to a portable skid near the camp

The fuel requirements will depend on the type of equipment and the size of the camps to be used.

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

The possible fuel quantities stated above are preliminary and subject to change. Envirotanks will be used.

All subcontractors will be required to comply with the Environmental Protection Plan (See Appendix A to Attachment 1) and to provide a fuel spill contingency plan prior to commencing work.

<p>13. Methods of fuel transfer (to other tanks, vehicles, etc.)</p> <p>The method of fuel transfer will be dependant upon the type, location, source and quantity of fuel. Fuel tanks will be filled using electrical or mechanical pumps.</p>		
<p>14. Period of operation (includes time to cover all phases of project work applied for, including restoration)</p> <p>The period of operation will be from immediately following approval (January 2003 through April 2003 (spring break-up).</p>		
<p>15. Period of permit (up to five years, with maximum of two years of extension)</p>	<p>Start Date January 2003</p>	<p>Completion Date January 2004</p>
<p>16. Location of activities by map co-ordinates (attach maps and sketches)</p> <p>The locations of the geotechnical sites are provided in the Index Summary under Tabs B and C and are given a site specific sub-tab number. Site reports and 1:50,000 maps are located under each sub-tab.</p> <p>The mobile sleigh camps supporting the program will be moved as necessary.</p>		
<p>Minimum latitude (degree, minute)</p> <p>See the Index Summary Sheet and Site Reports</p>	<p>Maximum latitude (degree, minute)</p> <p>See the Index Summary Sheet and Site Reports</p>	
<p>Minimum longitude (degree, minute)</p> <p>See the Index Summary Sheet and Site Reports</p>	<p>Maximum longitude (degree, minute)</p> <p>See the Index Summary Sheet and Site Reports</p>	
<p>Map Sheet no.</p> <p>See the Index Summary Sheet and Site Reports</p>		
<p>17. Applicant (Print name in full)</p> <p>Imperial Oil Resources Ventures Limited</p>		
<p>Signature <u></u></p> <p>Peter D. Grout</p>		<p>Date November 21, 2002</p>

18. Fees

Type A - \$150.00

Type B - \$150.00

Land Use Fees: 26 hectares @ \$50.00/hectare

\$ 1,300.00

Assignment fee \$50.00

N/A

Total application and land use fees

\$ 1,450.00

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