

**facsimile**  
TRANSMITTAL

	FILE
	W. RES.
	E.A.
	G.W.
	BOARD



to: Vicki/ELi  
 fax #: 669-2719  
 re: IPC - Ikh. Licence - N321-1710.  
 date: April 30  
 pages: 8, including this cover sheet.

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BOARD.	6
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**COMMENTS:**

Attached for your files is the  
 Supplementary information I requested for  
 This A+R plan. Please include this with  
 The A+R plan Submitted by North of 60  
 engineering on March 2, 98.

Thanks  
 Bern.

Any question please call.

From the desk of...

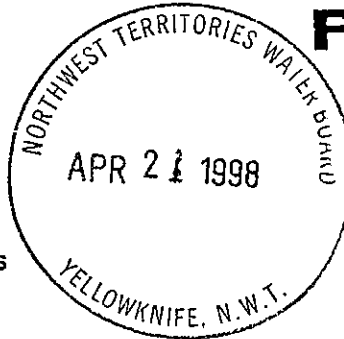
Sevn Bohmet  
 Regulatory Technician  
 DIAND Water Resources Division  
 Box 1500  
 Yellowknife NT X1A 2R3

(867) 669-2696  
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## FACSIMILE

1710  
Inuvik Dist  
WB

**To:** Sevn Bohnet  
**Company:** Water Resources  
**Phone:** (867) 669-2696  
**Fax:** (867) 669-2716

**From:** James C. McDougall, P.Eng.  
**Date:** April 19, 1998  
**Pages:** 7 Including this cover page

**Subject:** Ikhil Development – Class B Water Permit

- Urgent    Information    For Review    For Comment    Please Reply

### Comments:

Dear Sir:

Attached is our response to questions from the NWT Water Board's Technical Advisory Committee regarding the Abandonment and Restoration Plan for the Ikhil Water Licence N3L1-1710. I would appreciate if you would treat this Fax as an addendum to the Abandonment and Restoration Plan.

### Background

As per the original plan there were three sumps associated with the Ikhil Development Drilling Program that was carried out this winter. Two of the three sumps were used to contain drill cuttings from the two wells that were drilled this winter. The third sump, which was located adjacent to a temporary camp, was used to contain wastewater from the camp. The locations and details of all three sumps are summarized in the following table.

Dimension	Camp Sump	N35 Drilling Sump	N26 Drilling Sump
Location	68°44'43.677"N, 134°09'16.067"W	68°44'35.582"N, 134°08'34.928"W	68°45'55.221"N, 134°06'37.214"W
Length (m)	24	24	24
Width (m)	11	16	16
Depth (m)	3.5	4	4

Table 1

The two drilling sumps contain drill cuttings and drilling mud that was used to lift the cuttings to surface. These drilling muds were formulated from non-toxic non-hydrocarbon compounds. A list of the mud additives used in the drilling of each well is documented in Table 2. Data sheets for each of these chemicals is attached for reference.

Aquagel	Potassium Chloride
Barite	Kelzan XCD
Bicarbonate of Soda	Kwik Seal M
Potassium Chloride	Q Stop XP
Kelzan XCD	Sawdust
Kwik Seal M	Soda Ash
Sawdust	Staflor Regular
Soda Ash	
Staflor Regular	
Ultra Seal XP	
XL Defoamer	

Table 2 - Mud Additives

Samples were taken from both sumps prior to back filling and tested for chloride levels as required by the Canada Oil and Gas drilling regulations. The chloride level was 11,500 ppm and 10,500 ppm in the J-35 and N-26 sumps respectively. The maximum permissible level is 15,000 ppm.

### Sump Abandonment and Monitoring

All three sumps were abandoned according to the Abandonment and Restoration plan that was submitted to the NWT Water Board in late February. Abandonment of the sumps was carried out between April 1<sup>st</sup> and April 15<sup>th</sup>. The sumps were covered over with native silt that was removed and stockpiled from the sumps when they were excavated. The sumps will be re-vegetated this summer with after consultation with our environmental consultant and the Inuvialuit Land Administration as to an appropriate species.

The Abandonment and Restoration Plan mentioned a monitoring program, which was questioned by the Technical Advisory Committee. The proposed monitoring program will consist of at least one annual visit to each of the three sumps to visually inspect for seepage. The inspections will be carried out by representatives of the operator, IPC, the Inuvialuit Land Administration and other organizations such as DFO. This monitoring

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program will continue as long as necessary to insure that there is no long-term negative impacts from the sump restoration. I envision that the sumps will be monitored for a two-year period.


If problems such as slumping or seepage are identified during the inspections then IPC will implement remedial measures as required and as agreed upon by the ILA and other appropriate agencies.

### **Project Abandonment**

The Northwest Territories Department of Resources, Wildlife and Economic Development raised a question regarding the final abandonment of the field. As indicated on third page of the Abandonment and Restoration plan, the field abandonment plans are contained in the Development Plan Application that has been reviewed and endorsed by the National Energy Board of Canada. The Department of Wildlife and Economic Development should have a copy of the Development plan in their files. Notwithstanding, I have attached the pertinent sections from the plan for their information.

If you have any additional questions regarding this addendum or the original Abandonment Restoration Plan submitted in February please call me at (403) 263-2121.

Sincerely,

  
for:-  
James C. McDougall P.Eng.  
President

cc. Hans Arends – ILA

Attachments: Management and Restoration Plan, February 1998  
NEB Abandonment Plan

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# COPY

February 27, 1998

Northwest Territories Water Board  
P.O. Box 1500, Yellowknife  
NWT, X1A 2R3

Attention Mr. Gordon Wray, Chairman

Dear Sir:

**Subject: Abandonment & Restoration Plan for Water Use Permit N3L-1710**

### **Introduction**

The Inuvialuit Petroleum Corporation is in the process of developing the Ikhil Gas reservoir to supply natural gas to the Town of Inuvik. This development plan includes the drilling of two wells, the installation of production facilities and a small diameter pipeline to deliver the gas from Ikhil to Inuvik. The first part of the development plan, which includes the drilling of the two wells and the repair of the existing K35 well, is being carried out this winter. A class B water permit, No. N3L1-1710 has been issued by the Northwest Territories Water Board to support this activity. In accordance with the permit North of 60 Engineering Ltd. is filing this Abandonment and Restoration Plan for the drilling sumps and the camp sewage sump.

### **Goal of Abandonment and Restoration Plan**

The goal of the Abandonment and Restoration Plan is to prevent progressive degradation, and to enhance the natural recovery of the drilling and sewage sump areas.

### **Objectives of Abandonment and Restoration Plan**

Specific objectives of the Abandonment and Restoration program are:

- 1) To ensure that the sumps are abandoned in such a manner that the requirement for long term maintenance and monitoring is minimized.
- 2) To prevent seepage from the sumps to the environment.
- 3) To return the affected areas to a state compatible with the original undisturbed conditions giving due consideration to practical factors including economics, aesthetics and future users.

**Overview of Current Operation**

Water to support the current operations has been drawn from three locations, the East Channel of the Mackenzie River, a small lake adjacent to the Ikhil K35 Well location and Peter Lake (see attached map). Water taken from the first two locations was used to ice down the overland access route from the East Channel and to the camp and well sites. Now that construction of the access route is complete, all water is being taken from Peter Lake. A pump with a water intake screen is used to pump water from the lake into a tank truck which is used to haul the water to the camp for camp use and to the drilling rig to be used as boiler makeup water and for drilling fluids to support the drilling of the well.

The potable water for the camp is tested every month. Samples are taken at the lake and from taps within the camp and are then submitted to the Inuvik Regional Health Board for analysis.

Effluent from the camp is discharged to a sump adjacent to the camp. All solid waste associated with the camp and drilling program is either incinerated or hauled to Inuvik for disposal in the town solid waste dump.

Drilling fluids that are associated with the drilling of the two wells will be contained in sump adjacent to each well. A plan view and cross section of the drilling sump is shown in Figure 2. Dimensions of the three sumps are shown in Table 1

Dimension	Camp Sump	K35 Drilling Sump	N26 Drilling Sump
Length (m)	24	24	24
Width (m)	11	16	16
Depth (m)	3.5	4	4

Table 1

Fuel storage is within double wall tanks located adjacent to the camp and each well site. Snow and ice berms surround each of the well sites as an added containment measure. Any fuel spills will be handled as per the Emergency Response Plan that was submitted along with the Water User Permit application.

All drilling mud and cements are contained in pallets. Specialized drilling mud additives are stored in sea can metal shipping containers.

**Sump Abandonment & Restoration Plan**

Sumps (both drilling and camp) will be covered with native material and then topped with gravel or re-vegetated in a manner acceptable to the Water Board and the Inuvialuit Land Administration. The sumps will be contoured so as to ensure future stability. A plan and cross-section of the restored sump are shown in Figure 3.

Mud from the drilling activities and gray water from the camp will be frozen within the sump, thus minimizing potential for seepage. Samples of fluids within the sump will be

February 27, 1998

taken prior to backfilling the sumps. The potential for acid generation is low. Based on criteria outlined in Table 1 of the Guidelines for Abandonment and Restoration Planning for Mines in the Northwest Territories, the potential for environmental impact is classified as "Low".

A monitoring program will be implemented to assess the effectiveness of the sump restoration. This program will be carried with Water Board and ILA inspectors.

**Final Abandonment & Restoration Plans for the Gas Development Project**

The final abandonment and restoration plans for the gas development (i.e. when the field is depleted after 15 to 20 years) are contained in the Development Plan Application, which has undergone environmental and technical screening by the National Energy Board. Board approval for these plans has been received.

**Closing**

Additional information or clarification in regard to the proposed plan may be obtained from the undersigned at (403) 263-2121.

Sincerely,

James C. McDougall P.Eng.  
President

Attachments - Figures.



## **Pipeline**

Pipeline volumes and pressure will be monitored and recorded on a daily basis both at the inlet and the Town Gate. Operators in Inuvik will monitor the performance of the line and will have the capability of shutting in the line at either end in the event of an emergency. The cathodic protection system will be checked on an annual basis, and pigging of the line will be carried out as required.

## **DECOMMISSIONING AND ABANDONMENT PROGRAM**

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### **Wells**

At the end of the life of the field the wells would be abandoned as per NEB requirements. The small gravel pads that surround each well head would remain.

### **Gathering System & Production Facilities**

The above ground gathering system would be decommissioned and removed. All piles supporting the gathering system would be cut at ground level and removed from the area.

Production facilities would be decommissioned and removed from the site. The only remaining items would be the gravel pads.

### **Pipeline**

The pipeline from Ikhil to Inuvik, if no longer needed, would be decommissioned, purged with nitrogen and capped. Any above ground portions would be removed.

## **DEVELOPMENT AND OPERATING COSTS**

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### **Development Costs**

A cost estimate for the development drilling is shown in Table 11. Assumptions that underlie the estimate are:

- The rig and camp will be moved in from the Ft. Nelson B.C. area.
- Both wells will use a common camp site and sumpless mud disposal system for cuttings.
- Road access will be from the ice-road near Reindeer Station.
- No permanent airstrip will be built at the site. A temporary airstrip on a nearby lake will be constructed for emergency purposes.