



November 26, 2007

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Northwest Territories Water Board  
 P.O. Box 1326  
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Attention: Gordon Wray, Chairman  
 Northwest Territories Water Board

Dear Sir:

**RE: Shell Canada Limited  
 Niglintgak Natural Gas Field Development  
 Niglintgak 2006/2007 Winter Geotechnical Program:  
 Annual Report, Class B Water License N7L1-1816**



**Introduction**

This report outlines the activities completed within the Kendall Island Bird Sanctuary under Northwest Territories Water Board License No. N7L1-1816 for the Shell Canada Limited (Shell) Niglintgak 2006/2007 Winter Geotechnical Investigation (the Program). The purpose of the report is to satisfy requirements set out as a condition of Part B: General Conditions, Section 1; items a – i, as well as provide information regarding the activities that occurred during the execution of the Program.

**Scope**

The objective of the Program was as follows:

- Obtain information with respect to subsurface conditions at the proposed Niglintgak Gas Conditioning Facility barge landing site and adjacent infrastructure locations, and at the entry and exit points of the horizontal directional drill (HDD) pipeline crossing of Kumak Channel.
- Use this information to verify design and to plan construction of the foundations for facilities to be located at the Niglintgak Field Development site.

The Program was to be accomplished by drilling up to twenty -nine (29) boreholes for barge set-down site, selected land-based facilities and HDD entry and exit points in order to characterize subsurface soil and ice conditions; delineate the thickness of the active layer and any interfaces between frozen and unfrozen ground; collect undisturbed samples of both frozen and unfrozen soil; and obtain ground temperature data and install ground temperature monitoring equipment. In addition, a small test pit was to be excavated close to the GCF set-down site to investigate the performance of an insulating foundation designed to protect the permafrost. This would be a scaled down version of the foundation to be installed beneath the GCF. The General Services contractor was E.Grubens Transport based out of Tuktoyaktuk and Inuvik and drilling was contracted to Allen Services Contracting based out of Inuvik, NT, who partnered with Bertram Drilling.

## **Activities Completed**

Access to the Niglintgak site was from Camp Farewell via 14 km of ice road constructed along Middle Channel and 3 km of ice road constructed along Kumak Channel. The Program started on February 14, 2007 and was completed on March 26, 2007.

Site preparation for geotechnical drilling operations commenced on February 14, 2007 and geotechnical operations at Niglintgak were completed March 15, 2007. Activities included constructing an ice road from Camp Farewell to the Niglintgak site using snow and river channel water; surveying and staking of proposed access lines (4m width) to borehole locations; packing snow on access lines with snowmobiles and tracked equipment while ensuring adequate snow cover was present; and mobilization and siting of a survival shack on the channel ice to support the drilling operations. This was followed by the successful drilling of 29 geotechnical boreholes.

A 16 m x 10 m test pit was excavated into the permafrost close to the barge set-down site and lined with an insulating foundation and instrumentation to monitor the temperature of the permafrost during the summer and water levels following encroachment of the river into the test pit during and after the spring freshet. The material excavated from the test pit was spread out on the ice of Kumak Channel and allowed to disperse into the river during the freshet. The fate of the material was monitored by land-based cameras mounted at three sites agreed upon with Environment Canada and the Dept. of Fisheries & Oceans (DFO).

## **Facilities, Fuel Storage & Waste**

Existing permitted camp facilities at Camp Farewell provided accommodations and fuel storage for subcontractors and Shell personnel during the program. Upon receiving the required authorization a survival shack was sited on the Kumak Channel adjacent to the work site. All waste generated from the field program was trucked back to Inuvik for disposal at the landfill (solid waste) or the sewage treatment plant (sewage and greywater). No drill mud was used and all drill cuttings that remained at the drill sites were allowed to settle back into the boreholes after completion of geotechnical drilling.

## **Water Use**

In accordance with the Northwest Territories Water Act, a Type 'B' Water License was issued to Shell Canada Limited by the Northwest Territories Water Board. Water License #N7L1-1816 has an effective date of February 1, 2007 and an expiry date of December 31, 2007. The License allowed for the withdrawal of up to 300 cubic meters per day. The primary use of the water was for the construction of the ice road and for access ramps and overland access trails to the borehole sites. Intake hoses on pumps were fitted with appropriate mesh screens meeting DFO requirements ( $\leq 2.54\text{mm}$ ). The total quantity of water obtained was 1760 m<sup>3</sup> (888 m<sup>3</sup> in February 2007 and 872 m<sup>3</sup> in March 2007). The majority of this water was used for construction of land-based access ways to geotechnical drill sites (water taken from Kumak Channel), while a small amount was used for ice road construction (Kumak and Middle Channels). See Attachment 1 water withdrawal summary for details.

## **Land Use**

The total length of land surface covered by borehole sites and access ways to the boreholes was 1740m, with an area of 6,960 m<sup>2</sup> (access ways were 4m wide). A map of the access routes onto land and borehole access ways on land are shown in Figure 1.

## **Wildlife & Habitat**

There were no notable interactions with wildlife. Due to the timing of the Program, migratory birds were not observed. The Program was conducted under snow covered frozen conditions and no negative interactions with wildlife or wildlife habitat resulted from the Program.

## **Spills**

Five (5) spills occurred during execution of the Program. All incidents were small and minor in nature and each instance ranged from approximately 1 liters to 10 liters in volume and were composed of hydraulic fluid or motor oil. Product recovery was 100% in all cases and the on-site Environmental Monitor inspected each spill site before and after clean-up. The impacted snow and ice was collected and stored in a lined container onsite and transported to a remote site upon completion of the Program for disposal. Adverse environmental impacts did not result from any of these spills and further follow up is not required. See Attachment 2 spill summary report for details.

## **Field Inspections**

During completion of Program activities, an Environmental Monitor was assigned by the Inuvialuit Land Administration (ILA) to assist the Shell HSE Supervisor with routine Program inspections. A Wildlife Monitor assigned by either the Aklavik or Inuvik Hunters and Trappers Committee (HTC) was also onsite to monitor for wildlife sightings. Specific site visits were conducted by CWS and INAC representatives, with both regulatory agencies being satisfied that the Program was carried out and completed under accepted practices and in compliance with permitted conditions. Shell also conducted its own post-field program and post-snow melt site inspection at Niglintgak and Camp Farewell on 10<sup>th</sup> and 11<sup>th</sup> June 2007. The results of that inspection were submitted to the Canadian Wildlife Service (CWS) in compliance with the Program's CWS permit # NWT-MBS-07-02.

## **Conclusions**

As a result of careful planning and execution, the Program was completed without significant incident and is considered to have been a success. The small number of minor spills that occurred during implementation of the Program was reported, recorded and cleaned-up in an appropriate and time effective manner with no adverse effects to the environment. All activities were conducted under frozen snow-covered conditions and further monitoring or restoration activities at the site related to the Program are not required.

Sincerely,  
SHELL CANADA ENERGY



Ben Seligman  
Project Integration Coordinator

Attachment 1. Water Withdrawal Summary Table.  
Attachment 2. Spill Report Summary Table.  
Figure 1. Niglintgak Winter Program Access Routes.



Attachment 2

<b>Shell Canada Winter 2006-07 Geotechnical Field Program Spill Summary</b>
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INAC License #N2006B0033, Water License #N7L1-1816, CWS License #NWT-MBS-07-02, Aurora License #14092R

Date of Spill	Product Spilled	Amount (litres)	Extent of Contaminated Area (m <sup>2</sup> )	Location (latitude and longitude)	Action Taken	Agency Report To	Response and Follow-up Required
FEB.26, 2007	Hydraulic Fluid	10	2 - 3	69 18 0059" 135 06 15"	Cleaned with Absorbent pads. Snow and ice collected and placed in bag for proper disposal. Site inspected by environmental monitor before and after clean-up.	INAC CWS	NONE
Feb.28, 2007	Hydraulic Fluid	10	1	69 12 316" 135 06 042"	As above	INAC CWS	NONE
Mar.06, 2007	Hydraulic Fluid	2	1	69 12 475" 135 06 196"	As above	INAC CWS	NONE
Mar.12, 2007	Hydraulic Fluid	2	2	69 12 475" 135 06 196"	As above	INAC CWS	NONE
Mar.16, 2007	Motor Oil	1	1	69 12 528" 135 06 292"	As above	INAC CWS	NONE

Figure 1

**Shell Canada Winter 2006-07 Geotechnical Field Program  
Niglintgak Access Routes**

