



North Mackenzie District
P.O. Box 2100
Inuvik, NT X0E 0T0

Telephone: 867-777-8900
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November 9, 2011

Northwest Territories Water Board
P.O. Box 2531
Inuvik, NT X0E 0T0

Attn: Freda Wilson, Office and Finance Administrator

**RE: Industrial Water Use N7L1-1817
CLASS B - INDUSTRIAL
Swan Channel - Mackenzie River**

Dear Ms. Wilson,

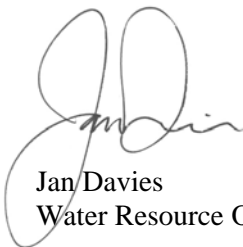
Please find the enclosed Inspection Report for your review and records.

An electronic copy (un-editable Adobe pdf.) has also been provided by e-mail.

Aboriginal Affairs and Northern Development Canada (AANDC) North Mackenzie District acknowledges there is infrastructure on site to monitor the existing drilling Waste Sumps 2L-38 and 3L/4L/5L-38 after closure for a period of at least seven (7) years as per Part H: Conditions Applying to Abandonment and Restoration, Item 2 of the Water Licence. To ensure consistency with other sump monitoring programs in the region AANDC North Mackenzie District therefore **“Recommends the Maintaining of Security” for Water Licence N7L1-1817.**

If you have any questions or concerns regarding the enclosed, and/or if additional information is required please contact me at (867) 777-8909.

Sincerely,



Jan Davies
Water Resource Officer

Cc: Conrad Baetz, District Manager, North Mackenzie District, Inuvik, NT

Enclosure: Industrial Water Use Inspection /Audit Report and Cover Letter (5 pages)



North Mackenzie District
P.O. Box 2100
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November 9, 2011

Aurora Research Institute
Box 1450
Inuvik, NT X0E 0T0

Attn: Pippa Seccombe-Hett

**RE: Industrial Water Use N7L1-1817
CLASS B - INDUSTRIAL
Swan Channel - Mackenzie River**

Dear Ms. Seccombe-Hett,

An inspection/audit of the Aurora Research Institute Water Licence N7L1-1817 was conducted on August 24, 2011. The operation under the above mentioned Industrial Water Use was inspected to assess compliance and ensure that the terms and conditions were met. Enclosed is a copy of the Inspection Report (3 pages) for your review and records.

Unfortunately, there was one violation during this inspection period. Please review and address this violation and the concerns as indicated in the enclosed Inspection Report. Please address the aforementioned items as non-compliance with the Water Licence is a serious matter.

Aboriginal Affairs and Northern Development Canada (AANDC) North Mackenzie District acknowledges there is infrastructure on site to monitor the existing drilling Waste Sumps 2L-38 and 3L/4L/5L-38 after closure for a period of at least seven (7) years as per Part H: Conditions Applying to Abandonment and Restoration, Item 2 of the Water Licence. Please note that final consideration for the maintenance of security for this Water Licence is mandated by the NWT Water Board. To ensure consistency with other sump monitoring programs in the region AANDC North Mackenzie District therefore **“Recommends the Maintaining of Security” for Water Licence N7L1-1817.**

Please note that it is the Licensee's responsibility to ensure compliance with all of the terms and conditions of its Water Licence. Aboriginal Affairs and Northern Development Canada looks forward to working with you as much as possible to achieve compliance.

A copy of this report will be sent to the Northwest Territories Water Board for their review and public records.

If you have any questions regarding the enclosed and/or if additional information is required, please do not hesitate to contact me at (867) 777-8909.



INDUSTRIAL WATER USE INSPECTION REPORT

Sincerely,

Jan Davies
Water Resource Officer

Cc: Conrad Baetz, District Manager, North Mackenzie District, Inuvik, NT

Enclosure: Industrial Water Use Inspection /Audit Report (3 pages)

Date:	August 24, 2011	Licence #:	N7L1-1817	Page No:	2
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INDUSTRIAL WATER USE INSPECTION REPORT

LICENCE #:	N7L1-1817	EXPIRY DATE:	November 30, 2016
LICENCEE:	Aurora Research Institute	PREVIOUS INSPECTION:	August 28, 2008
COMPANY REP:	Pippa Seccombe-Hett	INSPECTION DATE:	August 24, 2011

WATER SUPPLY

Source:	N/A	Quantity Used:	N/A
Owner/Operator:	N/A	Meter Reading:	N/A

Indicate: **A - Acceptable** **U - Unacceptable** **N/A - Not Applicable** **N/I - Not Inspected**

Intake Facilities	N/A	Storage Structures	N/A	Treatment Systems	N/A	Recycling	N/A
Flow Meas. Device	N/A	Conveyance Lines	N/A	Pumping Stations	N/A	Chem. Storage	N/A
						Modifications	N/A

Water Supply Comments:

- N/A

WASTE DISPOSAL

Well Waste:	Off-Site Removal	N/A	Drilling Sump	N/A	Downhole	N/A	Land spread	N/A
Solid Waste:	Open Dump	N/A	Landfill	A	Burn & Bury	N/A	Under ground	N/A
	Owner / Operator	N/A	Sludge Disposal	N/A	Other	N/A		
Tailings:	Tailings Pond	N/A	Natural Lake	N/A	Under ground	N/A		
Sewage:	Sewage Treat. System	N/A	Camp Sump	N/A	Natural Water Body	N/A	Wetland Treatment	N/A
	Continuous Discharge	N/A	Inter. Discharge	N/A	Seasonal Discharge	N/A	Trench	N/A

Indicate: **A - Acceptable** **U - Unacceptable** **N/A - Not Applicable** **N/I - Not Inspected**

Discharge Quality	N/A	Construction	N/A	Disch. Meas. Dev.	N/A	Freeboard	N/A
Decant Structures	N/A	O&M Plan	N/A	Dams, Dykes	N/A	Seepages	N/A
Dyke Inspections	N/A	A&R Plan	N/A	Erosion	N/A	Spills	A
Conveyance Lines	N/A	Pond Treatment	N/A	Runoff Diversion	N/A	Sump Treatment	N/A
Sump Liners	N/A		SNP Samples Collected		N/A		
Periods of Discharge	N/A		Effluent Discharge Rate		N/A		

Waste Disposal Comments:

- Cuttings location (N 69° 27' 32.9" W 134° 39' 44.7") from the March 2, 2007 spill with cuttings is barely detectable when compared to the previous inspections dated September 4, 2007 and August 28, 2008. Site visits during June 18, 2010 and August 23, 2010 during the summer months shows the area looking acceptable and it has had no lingering effects from the spill incident. The whole surrounding area has recovered without any problems. During further inspections of the Mallik area it is recommended to continue monitoring the spill area. (see the Inspection Images section)
- The effects from the Mallik Gas Hydrate Production Research Project have been minimal on the surrounding area and the sumps that are present. There seems to be no issues noted from its having taken place.
- Solid waste associated with the project has been removed and the site appears acceptable.



INDUSTRIAL WATER USE INSPECTION REPORT

GENERAL CONDITIONS

Indicate: **A - Acceptable** **U - Unacceptable** **N/A - Not Applicable** **N/I - Not Inspected**

Ore & Waste Rock Stockpiles	N/A	Records & Reporting	U ¹	Surv. Net. Prog.	N/A
Geotechnical Inspection	A	Posting, Signage	N/A	Contingency Plan	N/A
Restorations Activities	U ^{1,2}	New Construction	N/A	Fuel Storage	N/A
Mine Water Discharge	N/A	Chemical Storage	N/A	Annual Report	U ¹

General Condition Comments:

Concerns:

1. Upon review of the 2008 – 2010 Mallik Annual Sump Monitoring Reports submitted for this project including the Aurora Research Institute Mallik 2L-38 and 3L/4L/5L-38 Sump Monitoring and Retrofit Program as submitted to the Environmental Impact Screening Committee (EISC) – February 2008, it appears there was no thermistor or thermal monitoring results for the 1998 2L-38 drilling sump. This is a violation of Part H: Conditions Applying to Abandonment and Restoration, Item 2 of the Water Licence. The existing drilling Waste Sumps 2L-38 and 3L/4L/5L-38 shall be monitored in accordance with the Northwest Territories Water Board publication “Protocol for the Monitoring of Drilling-Waste Disposal Sumps, October 2005”, specifically thermal monitoring will be conducted of sumps.

This lack of information is of particular concern since it is going against commitments made by the Aurora Research Institute in their supporting documentation for this program. According to the Sump Monitoring and Retrofit Program at section 8 – Alternatives, page 22, it was stated that “during the first year of the 2006-2008 Mallik Gas Hydrate Production Research Project, a portion of the Mallik 2L-38 sump was overlain with a thick (30cm) ice pad....Monitoring of the thermal stability of the Mallik 2L-38 sump, therefore, is important for the Mallik Gas Hydrate Production Research Project and is also a requirement of project regulatory approvals (NEB Information Request No. 1, Appendix A).”

Upon consultation with the Sump Monitoring and Retrofit Program document at section 5.5 – Sump Monitoring Program, page 13, it stated that “The planned borehole in the centre of the Mallik 2L-38 sump was not completed as planned because the sump was covered by drilling equipment at the time....The planned Mallik 2L-38 borehole, along with one to five strategically place additional boreholes, may be drilled in winter 2007-08 as part of the Mallik 2006-08 Gas Hydrate Production Research Project. Soil sampling will take place at each borehole and a thermistor cable and datalogger will be added. If winter installation is not possible, installation by water jet drilling as part of the later summer field work is proposed.”

2. Further soil and water sampling of areas of concern as stated in the 2010 Mallik Annual Sump Monitoring Report needs to occur to further assess the presence of high response from electromagnetic surveys and revealed evidence of sump content migration.

Notes:

- No issues evident from the residual cuttings incident.
- Area looked good, same subsidence and issues noted from the sump sites as before.
- It is important to note that no sumps were used for this project but there were commitments to the monitoring of other drilling sumps in the area. The following information is from the 2010 Mallik Annual Sump Monitoring Report:

It was stated that the active layer measurements are consistent for the sumps and control location on site. There were slight variations for the ground temperatures recorded by the different thermistors which the report said could be explained by factors such as climate, vegetation covers, material type and size, compactions, etc. High salinity parameters were revealed from soil and water sampling which is for the most part consistent with samples taken from outside the influence of the sumps.

Ground temperature data for the 3L/4L/5L-38 sump (2002 sump) shows that the maximum thaw depth is 1.5m which should allow the sump material to stay frozen all year. From the electromagnetic survey an area of high response was located 60 m from the southern edge of the 3L/4L/5L-38 sump (2002 sump). There is a depression present (believed to be natural) which has about 30 cm of water and the high conductivity is thought to be from the annual input of sea water as compared to seepage from one of the sumps. The presence of free standing water could cause an increased thaw depth and this high response. Soil samples from this site were planned to be taken during the 2011 field visit.

Two small depressional areas were observed at each end of the 2L-38 sump (1998 sump). A water sample taken from the NW ponding water of the 1998 sump revealed evidence of sump contents migration. It was stated in the report that further sampling for both water and soil should be conducted in this location. No other major signs of settlement, erosion or instability in other sump areas were observed.

NON-COMPLIANCE/VIOLATIONS OF ACT OR LICENCE

Part H: Conditions Applying to Abandonment and Restoration, Item 2,

“The Licensee shall monitor the existing drilling Waste Sumps 2L-38 and 3L/4L/5L-38 after closure for a period of at least seven (7) years in accordance with the Northwest Territories Water Board publication “Protocol for the Monitoring of Drilling-Waste Disposal Sumps, October 2005”.”

Inspector’s Signature:





INDUSTRIAL WATER USE INSPECTION REPORT

Inspection Images:



Figure 1
Cuttings and affected area from the March 2, 2007 spill with cuttings. Photo taken September 4, 2007.

Figure 2
Cuttings significantly reduced from previous spill. Photo taken August 28, 2008.



Figure 3
Cuttings spill area - photo taken June 17, 2010.

Figure 4
Cuttings spill area - photo taken August 23, 2010.



Figure 5
Surrounding vegetation in vicinity of cuttings spill – photo taken August 23, 2010.

Figure 6
Cuttings spill area - photo taken August 24, 2011.