

## Permits

---

**From:** Miki Ehrlich  
**Sent:** Thursday, November 26, 2015 2:55 PM  
**To:** Permits  
**Subject:** FW: Emailing: 5110894\_1 RPT\_CARO-M0 Nov 20 15 1508.pdf  
**Attachments:** 5110894\_1 RPT\_CARO-M0 Nov 20 15 1508.pdf

Please post email and attachment to MV2009L3-0025 - Reports and studies - Operations and Notifications  
Title: Ft Liard - Inspector response to decant request - Nov24-15

-----Original Message-----

From: Wendy Bidwell [mailto:Wendy\_Bidwell@gov.nt.ca]  
Sent: Tuesday, November 24, 2015 4:08 PM  
To: Manager Works and Services  
Cc: Peters, Ann; Miki Ehrlich; Heather Scott; Brad McInnes  
Subject: RE: Emailing: 5110894\_1 RPT\_CARO-M0 Nov 20 15 1508.pdf

Good afternoon Alan,

Further to our phone conversation yesterday, I have reviewed the sample results from Cells #2 & #3 (attached) and noted multiple exceedences of the Effluent Quality Criteria (EQC) in the licence (i.e. TSS EQC=30 mg/l, BOD EQC=40 mg/l, Fecal Coliforms EQC=1000 CFU/100ml). I realise the results are due to the cell transfers that occurred in order to "recalibrate" or reset the lagoon facility in hopes that TSS levels may decrease to a point where they meet set licence EQC. Given the limited amount of freeboard in Cell #3 and that there is wetland treatment following the lagoon system, I authorize emergency decant of Cell #3.

In order to avoid emergency decants in future and ensure better monitoring of effluent discharged to the receiving environment, I recommend that the Hamlet budget to have overdue maintenance work completed at the Sewage lagoon cells next year (i.e. de-sludge cells) and that the inactive SNP Station 1478-6 be sampled again on a regular basis for the duration of the 2016 open water season. Completing this work will show Due Diligence on the Hamlet's part and be considered if there are future exceedences to licence EQC. Please note that Section 2(a) of the Surveillance Network Program in the Hamlet's licence states that:

"Water at station number 1478-9 shall be sampled one week prior to discharge and weekly during discharge. If the decant period is less than seven days, station number 1478-9 shall be sampled on the first and last day of decant."

Thus, I look forward to receiving the results of the post-decant effluent samples as appropriate based on the above licence requirements and your decant schedule. Please keep Brad and I posted on progress with decant operations. Don't hesitate to contact me if you have any questions regarding the above.

Regards,

Wendy

Wendy Bidwell  
Water Resource Officer  
South Slave Region  
Department of Environment & Natural Resources Government of the Northwest Territories P.O. Box 900 I Fort Smith,  
NT I X0E 0P0

Tel: 1-867-872-6421 Cell: 1-867-446-3775 Fax: 1-867-872-4250

Email: wendy\_bidwell@gov.nt.ca

Web: <http://www.enr.gov.nt.ca>

---

From: Manager Works and Services [mws@fortliard.com]

Sent: November 23, 2015 11:37 AM

To: Miki; Wendy Bidwell

Cc: Peters, Ann

Subject: Emailing: 5110894\_1 RPT\_CARO-M0 Nov 20 15 1508.pdf

Please find attached the lab results obtained from Ft Liard sewage lagoon's #2 & #3. The results are in-line with what was expected. I will wait for you to have a chance to review these results, your feedback on them and to see if we can proceed with our planned decant operations.

Thank you,

Alan Harris

Manager Municipal Operations

Hamlet of Fort Liard

867 770 4104 ext. 103

mws@fortliard.com

Your message is ready to be sent with the following file or link attachments:

5110894\_1 RPT\_CARO-M0 Nov 20 15 1508.pdf

Note: To protect against computer viruses, e-mail programs may prevent sending or receiving certain types of file attachments. Check your e-mail security settings to determine how attachments are handled.

**REPORTED TO** Fort Liard, Hamlet of  
174 Valley Main Street  
Fort Liard, NT X0G 0A0

**TEL** (867) 770-4104  
**FAX** (867) 770-4004

**ATTENTION** Alan Harris

**WORK ORDER** 5110894

**PO NUMBER** 3437  
**PROJECT** Sewage Lagoon  
**PROJECT INFO**

**RECEIVED / TEMP** Nov-13-15 10:35 / 14°C  
**REPORTED** Nov-20-15  
**COC NUMBER** A04614

**General Comments:**

CARO Analytical Services employs methods which are conducted according to procedures accepted by appropriate regulatory agencies, and/or are conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts, except where otherwise agreed to by the client.

The results in this report apply to the samples analyzed in accordance with the Chain of Custody or Sample Requisition document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Samples will be disposed of 30 days after the test report has been issued unless otherwise agreed to in writing.



Authorized By:

**Michelle LaBonte, B.Sc., P.Chem.**  
Lab Manager, Edmonton

***If you have any questions or concerns, please contact your Account Manager:  
Sarah Cunningham-Fleming (scunningham-fleming@caro.ca)***

**Locations:**

#110 4011 Viking Way  
Richmond, BC V6V 2K9  
Tel: 604-279-1499 Fax: 604-279-1599

#102 3677 Highway 97N  
Kelowna, BC V1X 5C3  
Tel: 250-765-9646 Fax: 250-765-3893

17225 109 Avenue  
Edmonton, AB T5S 1H7  
Tel: 780-489-9100 Fax: 780-489-9700

[www.caro.ca](http://www.caro.ca)

**REPORTED TO PROJECT** Fort Liard, Hamlet of Sewage Lagoon

**WORK ORDER REPORTED** 5110894 Nov-20-15

Analysis Description	Method Reference	Technique	Location
Ammonia-N in Water (total)	APHA 4500-NH3 D	Ion Selective Electrode	Edmonton
BOD (5-day)	APHA 5210 B	Dissolved Oxygen Meter	Edmonton
BOD, Carbonaceous (5-day)	APHA 5210 B	Dissolved Oxygen Meter	Edmonton
Conductivity in Water	APHA 2510 B	Conductivity Meter	Edmonton
Fecal Coliforms (Quanti-Tray)	APHA 9223 B*	Most Probable Number / Enzyme Substrate Endo Agar	Edmonton
pH in Water	APHA 4500-H+ B	Electrometry	Edmonton
Total Dissolved Solids (Gravimetric)	APHA 2540 C*	Gravimetry (Dried at 103-105C)	Edmonton
Total Suspended Solids	APHA 2540 D*	Gravimetry (Dried at 103-105C)	Edmonton

**Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method**

**Method Reference Descriptions:**

APHA Standard Methods for the Examination of Water and Wastewater, 22nd Edition, American Public Health Association/American Water Works Association/Water Environment Federation

**Glossary of Terms:**

MRL Method Reporting Limit  
 < Less than the Reported Detection Limit (RDL) - the RDL may be higher than the MRL due to various factors such as dilutions, limited sample volume, high moisture, or interferences  
 mg/L Milligrams per litre  
 MPN/100 mL Most Probable Number per 100 millilitres  
 pH units pH < 7 = acidic, pH > 7 = basic  
 µS/cm Microsiemens per centimetre

**REPORTED TO PROJECT** Fort Liard, Hamlet of Sewage Lagoon

**WORK ORDER REPORTED** 5110894 Nov-20-15

Analyte	Result / Recovery	MRL / Limits	Units	Prepared	Analyzed	Notes
---------	-------------------	--------------	-------	----------	----------	-------

**Sample ID: Lagoon #3 (5110894-01) [Water] Sampled: Nov-12-15 10:00**

<i>General Parameters</i>						
BOD, 5-day	81	2	mg/L	Nov-13-15	Nov-18-15	
BOD, 5-day Carbonaceous	65	2	mg/L	Nov-13-15	Nov-18-15	
Conductivity (EC)	1400	2	µS/cm	N/A	Nov-17-15	
Ammonia as N, Total	33.5	0.05	mg/L	Nov-13-15	Nov-13-15	
pH	7.46	0.01	pH units	N/A	Nov-17-15	HT2
Solids, Total Dissolved	684	10	mg/L	N/A	Nov-17-15	
Solids, Total Suspended	54	2	mg/L	N/A	Nov-16-15	
<i>Microbiological Parameters</i>						
Coliforms, Fecal (Q-Tray)	> 10025	1.0	MPN/100 mL	Nov-13-15	Nov-14-15	

**Sample ID: Lagoon #2 (5110894-02) [Water] Sampled: Nov-12-15 10:10**

<i>General Parameters</i>						
BOD, 5-day	175	2	mg/L	Nov-13-15	Nov-18-15	
BOD, 5-day Carbonaceous	142	2	mg/L	Nov-13-15	Nov-18-15	
Conductivity (EC)	1780	2	µS/cm	N/A	Nov-17-15	
Ammonia as N, Total	69.6	0.05	mg/L	Nov-13-15	Nov-13-15	
pH	7.30	0.01	pH units	N/A	Nov-17-15	HT2
Solids, Total Dissolved	764	10	mg/L	N/A	Nov-17-15	
Solids, Total Suspended	15	2	mg/L	N/A	Nov-16-15	
<i>Microbiological Parameters</i>						
Coliforms, Fecal (Q-Tray)	100000	1.0	MPN/100 mL	Nov-13-15	Nov-14-15	

**Sample / Analysis Qualifiers:**

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

## APPENDIX 1: QUALITY CONTROL DATA

**REPORTED TO PROJECT** Fort Liard, Hamlet of Sewage Lagoon

**WORK ORDER REPORTED** 5110894 Nov-20-15

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk):** Laboratory reagent water is carried through sample preparation and analysis steps. Method Blanks indicate that results are free from contamination, i.e. not biased high from sources such as the sample container or the laboratory environment
- **Duplicate (Dup):** Preparation and analysis of a replicate aliquot of a sample. Duplicates provide a measure of the analytical method's precision, i.e. how reproducible a result is. Duplicates are only reported if they are associated with your sample data.
- **Blank Spike (BS):** A known amount of standard is carried through sample preparation and analysis steps. Blank Spikes, also known as laboratory control samples (LCS), are prepared from a different source of standard than used for the calibration. They ensure that the calibration is acceptable (i.e. not biased high or low) and also provide a measure of the analytical method's accuracy (i.e. closeness of the result to a target value).
- **Standard Reference Material (SRM):** A material of similar matrix to the samples, externally certified for the parameter(s) listed. Standard Reference Materials ensure that the preparation steps in the method are adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
<b>General Parameters, Batch B5K0748</b>									
<b>Blank (B5K0748-BLK1)</b> Prepared: Nov-13-15, Analyzed: Nov-18-15									
BOD, 5-day	< 2	2 mg/L							
<b>Blank (B5K0748-BLK2)</b> Prepared: Nov-13-15, Analyzed: Nov-18-15									
BOD, 5-day	< 2	2 mg/L							
<b>LCS (B5K0748-BS1)</b> Prepared: Nov-13-15, Analyzed: Nov-18-15									
BOD, 5-day	186	2 mg/L	198		94	85-115			
<b>General Parameters, Batch B5K0749</b>									
<b>Blank (B5K0749-BLK1)</b> Prepared: Nov-13-15, Analyzed: Nov-18-15									
BOD, 5-day Carbonaceous	< 1	2 mg/L							
<b>Blank (B5K0749-BLK2)</b> Prepared: Nov-13-15, Analyzed: Nov-18-15									
BOD, 5-day Carbonaceous	< 1	2 mg/L							
<b>LCS (B5K0749-BS1)</b> Prepared: Nov-13-15, Analyzed: Nov-18-15									
BOD, 5-day Carbonaceous	192	2 mg/L	198		97	85-115			
<b>Duplicate (B5K0749-DUP1)</b> Source: 5110894-02 Prepared: Nov-13-15, Analyzed: Nov-18-15									
BOD, 5-day Carbonaceous	157	2 mg/L		142				20	
<b>General Parameters, Batch B5K0776</b>									
<b>Blank (B5K0776-BLK1)</b> Prepared: Nov-13-15, Analyzed: Nov-13-15									
Ammonia as N, Total	< 0.05	0.05 mg/L							
<b>LCS (B5K0776-BS1)</b> Prepared: Nov-13-15, Analyzed: Nov-13-15									
Ammonia as N, Total	0.22	0.05 mg/L	0.200		108	92-111			

**General Parameters, Batch B5K0883**

**APPENDIX 1: QUALITY CONTROL DATA**

**REPORTED TO PROJECT** Fort Liard, Hamlet of Sewage Lagoon

**WORK ORDER REPORTED** 5110894 Nov-20-15

Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
<b>General Parameters, Batch B5K0883, Continued</b>									
<b>Blank (B5K0883-BLK1)</b>			Prepared: Nov-16-15, Analyzed: Nov-16-15						
Solids, Total Suspended	< 2	2 mg/L							
<b>LCS (B5K0883-BS1)</b>			Prepared: Nov-16-15, Analyzed: Nov-16-15						
Solids, Total Suspended	51	2 mg/L	50.0		103		93-105		
<b>General Parameters, Batch B5K0929</b>									
<b>Blank (B5K0929-BLK1)</b>			Prepared: Nov-17-15, Analyzed: Nov-17-15						
Solids, Total Dissolved	< 20	10 mg/L							
<b>Duplicate (B5K0929-DUP1)</b>			<b>Source: 5110894-01</b>		Prepared: Nov-17-15, Analyzed: Nov-17-15				
Solids, Total Dissolved	676	10 mg/L		684			1	5	
<b>Reference (B5K0929-SRM1)</b>			Prepared: Nov-17-15, Analyzed: Nov-17-15						
Solids, Total Dissolved	218	10 mg/L	240		91		85-115		
<b>General Parameters, Batch B5K0931</b>									
<b>Duplicate (B5K0931-DUP1)</b>			<b>Source: 5110894-01</b>		Prepared: Nov-17-15, Analyzed: Nov-17-15				
pH	7.46	0.01 pH units		7.46			< 1	1.5	
<b>Reference (B5K0931-SRM1)</b>			Prepared: Nov-17-15, Analyzed: Nov-17-15						
pH	7.00	0.01 pH units	7.00		100		98-102		
<b>General Parameters, Batch B5K0932</b>									
<b>Blank (B5K0932-BLK1)</b>			Prepared: Nov-17-15, Analyzed: Nov-17-15						
Conductivity (EC)	< 2	2 µS/cm							
<b>LCS (B5K0932-BS1)</b>			Prepared: Nov-17-15, Analyzed: Nov-17-15						
Conductivity (EC)	1430	2 µS/cm	1410		101		99-103		
<b>Duplicate (B5K0932-DUP1)</b>			<b>Source: 5110894-01</b>		Prepared: Nov-17-15, Analyzed: Nov-17-15				
Conductivity (EC)	1410	2 µS/cm		1400			< 1	3	
<b>Microbiological Parameters, Batch B5K0782</b>									
<b>Blank (B5K0782-BLK1)</b>			Prepared: Nov-13-15, Analyzed: Nov-14-15						
Coliforms, Fecal (Q-Tray)	< 1.0	1.0 MPN/100 mL							
<b>Duplicate (B5K0782-DUP1)</b>			<b>Source: 5110894-01</b>		Prepared: Nov-13-15, Analyzed: Nov-14-15				
Coliforms, Fecal (Q-Tray)	> 10025	1.0 MPN/100 mL		> 10025				36	