



**Geoff Pearse**  
Cold Lake & Conventional SSH&E Manager  
780-639-5269 Tel  
geoff.a.pearse@exxonmobil.com

December 29<sup>th</sup>, 2015

SLWB File: S13L1-007

Bonnie Bergsma  
Sahtu Land and Water Board  
Regulatory Specialist  
P.O. Box 1  
Fort Good Hope, NT  
X0E 0H0

**Re: Water Licence S13L1-007 Monthly Water Use Report for November 2015**

Dear Ms. Bergsma,

Imperial Oil Resources (Imperial) N.W.T. Limited is submitting the November 2015 monthly results for the Surveillance Network Program under Water Licence S13L1-007.

On September 20, 2015 the chlorine injection was shut off until a new colorimeter device was received. This was communicated to the SLWB on September 24, 2015 and in the September Monthly Water Use Report. A new device arrived on November 4, 2015. For this reason chlorine is blank in the data sheet for up to November 5<sup>th</sup>.

Any questions or concerns please contact me at (867) 587-3215.

Sincerely,

A handwritten signature in black ink, appearing to read "Lindsay Hollands".

Lindsay Hollands, B.ASc  
Regulatory and Environmental Advisor

cc: T. Morton, AANDC, Yellowknife

circulate: A. Phelps Environment and Regulatory Supervisor, Cold Lake

**IMPERIAL OIL RESOURCES - NORMAN WELLS OPERATIONS**  
**WATER LICENCE S13L1-007**  
**CPF DAILY VOLUMES**  
**November 2015**

Date	VOLUMES (m <sup>3</sup> )					TEMP (C)		CHLORINE (mg/l)
	S13L1-007-1 CPF Intake Water	S13L1-007-2 CPF Effluent Water	Fresh Water Injection	Produced Water Injection	Total Water Injection	S13L1-007-1 CPF Intake Water	S13L1-007- 2 CPF Effluent Water	S13L1-007-2 CPF Effluent Water
1	5550	3449	2101	7215	9,316	7	14	**
2	5551	3457	2093	7213	9,306	2	14	**
3	5550	3493	2058	7071	9,129	2	13	**
4	5551	3496	2055	7167	9,221	2	13	**
5	5551	3485	2066	7319	9,385	2	12	0.00
6	5550	3486	2064	7348	9,412	2	12	0.05
7	5551	3338	2213	7547	9,760	2	12	0.00
8	5551	2900	2650	7401	10,051	2	12	0.00
9	5550	2887	2664	7355	10,019	2	12	0.00
10	5551	2985	2565	7597	10,162	2	13	0.00
11	5551	2943	2607	7556	10,163	2	12	0.00
12	5551	2952	2599	7574	10,173	2	12	0.00
13	5550	2943	2608	7574	10,182	2	10	0.00
14	5551	2912	2639	7526	10,165	2	11	0.00
15	5551	2921	2630	7519	10,149	2	11	0.00
16	5551	2990	2561	7572	10,133	2	11	0.05
17	5550	2933	2617	7512	10,129	2	10	0.01
18	5551	2834	2716	7425	10,141	3	9	0.01
19	5551	2874	2677	7402	10,078	2	9	0.01
20	5551	2877	2674	7397	10,071	2	11	0.01
21 *	5551	2781	2711	7299	10,010	3	10	0.01
22 *	5467	0	2456	7442	9,898	3	10	0.01
23 *	5300	0	2603	7569	10,171	3	10	0.09
24 *	5332	1516	2732	7430	10,162	2	11	0.09
25	5549	3288	2261	7596	9,857	2	11	0.04
26	5551	3143	2408	7569	9,977	2	13	0.01
27	5551	3545	2005	7727	9,733	2	14	0.00
28	5550	3507	2044	7539	9,583	2	13	0.00
29	5551	3456	2094	7344	9,438	2	13	0.00
30	5550	3469	2082	7481	9,562	2	11	0.01
<b>TOTAL</b>	165,961	86,859	72,252	223,286	295,538	0	0	
<b>AVG</b>	5,532	2,895	2,408	7,443	9,851	3	12	0.02
<b>HIGH</b>	5,551	3,545	2,732	7,727	10,182			

\* E-112 exchanger event occurred on Nov 22 (NT-NU 15-475). Settling pond was recycling for the whole day or a portion of the day. Outlet volumes are adjusted accordingly.

\*\* Colorimeter inoperable, new one on order. No chlorine was injected during this time.

**IMPERIAL OIL RESOURCES - NORMAN WELLS OPERATIONS**  
**WATER LICENCE S13L1-007**  
**CPF MONTHLY VOLUMES SUMMARY**  
**November 2015**

**Water Injection Volumes (m<sup>3</sup>)**

Total fresh water injected	72,252	
Total produced water injected	223,286	
<b>Total Monthly</b>	<b>295,538</b>	Total Injected

**CPF Water Volumes (m<sup>3</sup>)**

Total CPF intake water S13L1-007	165,961	
Total CPF effluent water S13L1-007	86,859	
Highest daily water intake S13L1-007	5,551	Max. Allow. 16,000 m <sup>3</sup> /day.
<b>YTD water intake S13L1-007</b>	<b>2,125,157</b>	Max. Allow. 3,500,000 m <sup>3</sup> /yr.

**Alternate Water Usage Volumes (m<sup>3</sup>)**

Alternate surface water usage	0
<b>YTD Alternate surface water usage</b>	<b>20</b>

**Surface Runoff Water Release Volumes (m<sup>3</sup>)**

Refinery Impound Basin	0
LT 11 Impound Basin	0
Refinery Water flood Basin	0
CPF Impound Basin	0
Misc. Mainland Impound Areas	0
Misc. Bear Island Impound Areas	0
Misc. Goose Island Impound Areas	0
<b>Total - YTD Surface Runoff</b>	<b>65,216</b>

**IMPERIAL OIL RESOURCES - NORMAN WELLS OPERATIONS**  
**WATER LICENCE S13L1-007**  
**CPF MONTHLY WATER DATA**  
**November 2015**

SNP S13L1-007-1 (Intake Water)			
	Suspended Solids (mg/l)	pH	Specific Conductivity uS/cm
<b>Max. Grab Limit</b>			
November 2 - 5	120.0	8.10	310
November 5 - 9	<1.0	7.84	300
November 9 - 12	43.0	7.91	320
November 12 - 16	25.0	8.08	320
November 16 - 19	46.0	8.09	330
November 19 - 21	25.0	7.93	310
November 22 *	580.0	8.05	330
November 23 - 26	11.0	8.05	330
November 26 - 30	2.7	8.03	310

\* Grab sample due to Nov 22, 2015 (NT-NU 15-475) exchanger incident

SNP S13L1-007-2 (Effluent Water)			
	Suspended Solids (mg/l)	pH	Specific Conductivity uS/cm
<b>Max. Grab Limit</b>		<b>6.0 - 9.0</b>	
November 2 - 5	17.0	8.16	320
November 5 - 9	15.0	8.01	300
November 9 - 12	11.0	8.00	320
November 12 - 16	10.0	8.11	320
November 16 - 19	4.0	8.11	330
November 19 - 21	6.0	8.05	310
November 22 *	3.3	8.07	340
November 23 - 26	12.0	8.06	330
November 26 - 30	4.0	8.08	320

\* Grab sample due to Nov 22, 2015 (NT-NU 15-475) exchanger incident

SNP S13L1-007-1 (Intake Water)		
	Total Petroleum Hydrocarbons (mg/l)	Phenol (mg/l)
<b>Max. Grab Limit</b>		
November 2 - 9	<2.0	<0.0020
November 9 - 16	<2.0	<0.0020
November 16 - 21*	<2.0	<0.0020
November 22 *	<2.0	<0.0020
November 23 - 30	<2.0	<0.0020

\* Grab sample due to Nov 22, 2015 (NT-NU 15-475) exchanger incident

SNP S13L1-007-2 (Effluent Water)				
	Total Petroleum Hydrocarbons (mg/l)	Phenol (mg/l)	Daily Chlorine (mg/l)	Temp (C)
<b>Max. Grab Limit</b>	<b>5</b>	<b>0.14</b>		
November 2 - 9	<2.0	<0.0020	0.01	13
November 9 - 16	<2.0	<0.0020	0.00	11
November 16 - 21*	<2.0	<0.0020	0.02	10
November 22 *	<2.0	0.0037	0.01	10
November 23 - 30	<2.0	0.0029	0.03	12

\* Grab sample due to Nov 22, 2015 (NT-NU 15-475) exchanger incident

**IMPERIAL OIL RESOURCES - NORMAN WELLS OPERATIONS**  
**WATER LICENCE S13L1-007**  
**CPF MONTHLY WATER DATA**  
**November 2015**

SNP S13L1-007-2 (Effluent Water) - FOUR WEEK AVERAGE CONCENTRATION							
Parameter	Total Petroleum Hydrocarbons (mg/l)	Phenol (mg/l)	Suspend Solids (mg/l)	pH	Specific Conduct. (uS/cm)	Daily Chlorine (mg/l)	Temp (C)
<b>Max. Average Limit</b>	<b>3.00</b>	<b>0.0700</b>		<b>6.0 - 9.0</b>			
October 12 - November 9	<2.0	0.0020	21	8.07	299	0.01 *	14
October 19 - November 16	<2.0	0.0021	16	8.06	305	0.01 *	13
October 26 - November 23	<2.0	0.0024	11	8.07	316	0.01 *	12
November 2 - November 30	<2.0	0.0020	9	8.07	321	0.01	11

\*Chlorine is a 1 week average due to colorimeter being inoperable

\*Chlorine is a 2 week average due to colorimeter being inoperable

\*Chlorine is a 3 week average due to colorimeter being inoperable

**IMPERIAL OIL RESOURCES - NORMAN WELLS OPERATIONS**  
**WATER LICENCE S13L1-007**  
**QUARTERLY CPF WATER INLET DATA**  
**November 2015**

SNP S13L1-007-1 (Intake Water)					
Date	Q2	Q3	Q4	Q1	YTD Avg. (mg/L)
	April 2015 (mg/L)	Aug 2015 (mg/L)	October 2015 (mg/L)	(mg/L)	
pH	8.2	7.85	7.78		7.93
Phenols	0.003	<0.002	<0.0020		0.00
Dissolved Sodium	8.7	7.7	9.3		8.57
Total Sodium	9.2	8.0	9.9		9.03
Dissolved Potassium	1.0	0.65	0.77		0.81
Total Potassium	1.1	1.4	0.96		1.15
Dissolved Sulphate	67.0	39.0	42.0		49.33
Dissolved Chloride	11.0	10.0	9.8		10.27
Dissolved Calcium	42.0	31.0	33.0		35.33
Total Calcium	43.0	40.0	35.0		39.33
Dissolved Magnesium	16.0	9.9	11.0		12.30
Total Magnesium	17.0	13.0	12.0		14.00
Total Alkalinity	110.0	90.0	89.0		96.33
Specific Conductivity	320	270	270		286.67
Total Suspended Solids	<1.0	190	31		<1.0
Total Dissolved Solids	250.0	160.0	230.0		213.33
Total Petroleum	<2.0	<2.0	<2.0		<2.0
Total Phosphorus	<0.10	0.22	<0.10		<0.10
Total Hardness	170	120	130		140.00

SNP S13L1-007-2 (Effluent Water)					
Date	Q2	Q3	Q4	Q1	YTD Avg. (mg/L)
	April 2015 (mg/L)	Aug 2015 (mg/L)	October 2015 (mg/L)	(mg/L)	
pH	8.24	7.88	7.76		8.0
Phenols	0.003	<0.002	<0.0020		0.0
Dissolved Sodium	9.0	8.3	9.6		9.0
Total Sodium	8.9	8.1	10.0		9.0
Dissolved Potassium	1.0	0.76	0.76		0.8
Total Potassium	1.1	1.0	0.88		1.0
Dissolved Sulphate	65.0	40.0	41.0		48.7
Dissolved Chloride	11.0	10.0	10.0		10.3
Dissolved Calcium	43.0	33.0	33.0		36.3
Total Calcium	43.0	34.0	35.0		37.3
Dissolved Magnesium	17.0	10.0	11.0		12.7
Total Magnesium	17.0	11.0	11.0		13.0
Total Alkalinity	110.0	89.0	89.0		96.0
Specific Conductivity	330	280	260		290.0
Total Suspended Solids	<1.0	29	17		<1.0
Total Dissolved Solids	240	150	430		273.3
Total Petroleum	<2.0	<2.0	<2.0		<2.0
Total Phosphorus	<0.10	0.11	<0.10		<0.10
Total Hardness	180	120	130		143.3

QUARTERLY CPF EFFLUENT DATA  
 QUARTERLY ACUTE LETHALITY  
 November 2015

SNP S13L1-007-2 (Effluent Water)		
Date	Rainbow Trout (% Survival)	Daphnia Magna (% Survival)
Q2 - April 2015	100%	100%
Q3 - August 2015	100%	100%
Q4 - October 2015	100%	100%
Q1 - 2016		
Licence Criteria	> 50% Survival	> 50% Survival

IMPERIAL OIL RESOURCES - NORMAN WELLS OPERATIONS  
 WATER LICENCE S13L1-007  
 SURFACE WATER RUNOFF RELEASE REPORT  
 November 2015

Discharge Where Contamination Suspected

	Date	Start/ Middle/ End	Total Discharge Volume (m <sup>3</sup> )	Total Petroleum Hydrocarbons (mg/l)	Phenols (mg/l)	Chlorides (mg/L)	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conduct. (uS/cm)
Max Grab Sample Limit				5	0.14	<500	6.0-9.0			
Mainland Areas			0							
Misc. Mainland Impound Areas			0							
Misc. Bear Impound Areas			0							
Misc. Goose Impound Areas			0							

IMPERIAL OIL RESOURCES - NORMAN WELLS OPERATIONS  
 WATER LICENCE S13L1-007  
 SURFACE WATER RUNOFF RELEASE REPORT

Discharge Where No Contamination Suspected

	Date	Total Discharge Volume (m <sup>3</sup> )	Chlorides (mg/L)	pH	Sheen Y/N
Sample Limits			< 500	6.0-9.0	N
Mainland		0			
Bear		0			
Goose Island		0			