



**Steve Pangracs, P. Eng**  
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December 19, 2018

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

**Re: Monthly Water Use Report for November 2018  
Water Licence S13L1-007, Annex A, Part D, Condition 1  
Imperial Oil Resources N.W.T. Limited (Imperial)**

Dear Ms. Bergsma,

Imperial is submitting this report as per Water Licence S13L1-007, Annex A, Part D, Condition 1. All water licence requirements were met for the month of November.

If you require further information, please contact Sloan Leavitt at 587-476-4449 or [sloan.n.leavitt@esso.ca](mailto:sloan.n.leavitt@esso.ca).

Sincerely,

A handwritten signature in black ink that reads "Sloan Leavitt". The signature is written in a cursive style and is placed on a light grey rectangular background.

Sloan Leavitt  
Environment and Regulatory Advisor

cc: T. Morton, INAC, Yellowknife

IMPERIAL - NORMAN WELLS OPERATIONS  
WATER LICENCE S13L1-007  
CPF DAILY VOLUMES  
November 2018

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	6,111	6,111	0	6,567	6,567	8.2	17.7	0*
2	5,747	5,747	0	6,208	6,208	3.0	17.4	0*
3	4,952	4,952	0	6,268	6,268	2.8	16.3	0*
4	4,801	4,801	0	6,112	6,112	2.4	15.5	0*
5	4,801	4,801	0	6,028	6,028	2.3	14.6	0*
6	4,801	4,801	0	6,175	6,175	2.4	14.4	0*
7	4,801	4,801	0	6,301	6,301	2.6	14.9	0*
8	4,801	4,801	0	6,333	6,333	2.9	15.9	0*
9	4,801	4,801	0	6,396	6,396	2.5	18.4	0*
10	4,831	4,831	0	6,273	6,273	2.3	18.5	0*
11	5,001	5,001	0	6,220	6,220	2.5	19.1	0*
12	5,142	5,142	0	6,127	6,127	2.8	18.4	0*
13	5,101	5,101	0	5,980	5,980	2.6	17.3	0*
14	5,213	5,213	0	5,655	5,655	2.7	15.4	0*
15	5,461	5,461	0	6,221	6,221	2.8	15.6	0*
16	5,390	5,390	0	6,017	6,017	2.6	15.5	0*
17	5,388	5,388	0	5,731	5,731	2.0	16.4	0*
18	5,387	5,387	0	5,778	5,778	2.7	16.9	0*
19	5,385	5,385	0	5,780	5,780	2.7	15.8	0*
20	5,382	5,382	0	5,725	5,725	2.7	15.4	0*
21	5,381	5,381	0	5,705	5,705	2.6	16.9	0*
22	5,381	5,381	0	5,835	5,835	2.7	17.5	0*
23	5,379	5,379	0	5,678	5,678	2.9	17.2	0*
24	5,377	5,377	0	5,793	5,793	2.3	16.5	0*
25	5,378	5,378	0	5,532	5,532	2.8	17.2	0*
26	5,359	5,359	0	5,616	5,616	2.8	16.7	0*
27	5,351	5,351	0	5,970	5,970	2.2	17.6	0*
28	5,351	5,351	0	5,810	5,810	2.1	17.3	0*
29	5,340	5,340	0	5,630	5,630	2.7	18.8	0*
30	5,301	5,301	0	5,699	5,699	2.2	19.0	0*
<b>TOTAL</b>	156,888	156,888	0	179,165	179,165			
<b>AVG</b>	5,230	5,230	0	5,972	5,972	2.8	16.8	-
<b>HIGH</b>	6,111	6,111	0	6,567	6,567			

\* Chlorine injection offline

IMPERIAL - NORMAN WELLS OPERATIONS  
WATER LICENCE S13L1-007  
CPF MONTHLY VOLUMES SUMMARY  
November 2018

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

Total fresh water injected	0	
Total produced water injected	179,165	
<b>Total Monthly</b>	<b>179,165</b>	Total Injected

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

Total CPF intake water S13L1-007-01	156,888	
Total CPF effluent water S13L1-007-02	156,888	
Highest daily water intake S13L1-007-01	6,111	Max. Allow. 16,000 m <sup>3</sup> /day.
<b>YTD water intake S13L1-007</b>	<b>405,417</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>0</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>19,385</b>

IMPERIAL - NORMAN WELLS OPERATIONS  
WATER LICENCE S13L1-007  
CPF MONTHLY WATER DATA  
November 2018

SNP S13L1-007-1 (Intake Water)			
Dates	Total Suspended Solids (mg/L)	pH	Specific Conductivity (uS/cm)
<b>Max. Grab Limit</b>			
1-Nov	6.7	8.1	300.0
5-Nov	3.3	8.0	280.0
8-Nov	4.7	8.1	310.0
12-Nov	1.3	8.1	330.0
15-Nov	8.0	8.0	320.0
19-Nov	2.0	8.0	320.0
22-Nov	<1.0	8.0	300.0
26-Nov	2.0	8.1	300.0
29-Nov	2.0	8.1	290.0

SNP S13L1-007-2 (Effluent Water)			
Dates	Total Suspended Solids (mg/L)	pH	Specific Conductivity (uS/cm)
<b>Max. Grab Limit</b>		<b>6.0 - 9.0</b>	
1-Nov	3.3	8.1	280.0
5-Nov	4.0	8.1	280.0
8-Nov	1.3	8.1	310.0
12-Nov	3.3	8.1	330.0
15-Nov	2.7	8.0	310.0
19-Nov	2.0	8.1	320.0
22-Nov	<1.0	8.1	300.0
26-Nov	2.7	8.1	310.0
29-Nov	2.7	8.0	290.0

SNP S13L1-007-1 (Intake Water)		
Dates	Total Petroleum Hydrocarbons (mg/L)	Phenols (mg/L)
<b>Max. Grab Limit</b>		
5-Nov	<2.0	<0.0020
12-Nov	<2.0	<0.0020
19-Nov	<2.0	<0.0020
26-Nov	<2.0	<0.0020

SNP S13L1-007-2 (Effluent Water)				
Dates	Total Petroleum Hydrocarbons (mg/L)	Phenols (mg/L)	Daily Chlorine (mg/L)	Temp (C)
<b>Max. Grab Limit</b>	<b>5</b>	<b>0.14</b>		
5-Nov	<2.0	<0.0020	*	14.6
12-Nov	<2.0	0.0021	*	18.4
19-Nov	<2.0	<0.0020	*	15.8
26-Nov	<2.0	0.0022	*	16.7

\* Chlorine injection still offline

IMPERIAL - NORMAN WELLS OPERATIONS  
WATER LICENCE S13L1-007  
CPF MONTHLY WATER DATA  
November 2018

SNP S13L1-007-2 (Effluent Water) - FOUR WEEK AVERAGE CONCENTRATION							
Parameter	Total Petroleum Hydrocarbons (mg/L)	Phenol (mg/L)	Total Suspended Solids (mg/L)	pH	Specific Conductivity (uS/cm)	Daily Chlorine (mg/L)	Temp (C)
<b>Max. Average Limit *</b>	<b>5.00</b>	<b>0.14</b>		<b>6.0 - 9.0</b>			
Nov 1 - 29	1.0	0.0016	2.5	8.1	303.3	**	16.8

\* Half the detection limit was used where results were below the detection limit

\*\* Chlorine injection system not operational

**IMPERIAL - NORMAN WELLS OPERATIONS**  
**WATER LICENCE S13L1-007-1**  
**QUARTERLY CPF WATER INLET DATA**  
**November 2018**

<b>SNP S13L1-007-1 (Intake Water)</b>					
<b>Parameter</b>	<b>January 2018* (mg/L)</b>	<b>April 2018* (mg/L)</b>	<b>July 2018* (mg/L)</b>	<b>October 2018 (mg/L)</b>	<b>YTD Avg. (mg/L)</b>
pH				7.87	7.87
Phenols				0.0025	0.0025
Dissolved Sodium				9.80	9.8
Total Sodium				8.7	8.7
Dissolved Potassium				1.0	1.0
Total Potassium				0.92	0.92
Dissolved Sulphate				37	37
Dissolved Chloride				11.0	11
Dissolved Calcium				33.0	33
Total Calcium	N/A	N/A	N/A	31	31
Dissolved Magnesium				9.6	9.6
Total Magnesium				10.0	10
Total Alkalinity				88	88
Specific Conductivity				270	270
Total Suspended Solids				55.0	55
Total Dissolved Solids				150	150
Total Petroleum				<2.0	<2.0
Total Phosphorus				<0.10	<0.10
Total Hardness				130	130

**IMPERIAL - NORMAN WELLS OPERATIONS**  
**WATER LICENCE S13L1-007-2**  
**QUARTERLY CPF WATER EFFLUENT DATA**  
**November 2018**

<b>SNP S13L1-007-2 (Effluent Water)</b>					
<b>Parameter</b>	<b>January 2018* (mg/L)</b>	<b>April 2018* (mg/L)</b>	<b>July 2018* (mg/L)</b>	<b>October 2018 (mg/L)</b>	<b>YTD Avg. (mg/L)</b>
pH				7.92	7.92
Phenols				0.0022	0.0022
Dissolved Sodium				9.40	9.4
Total Sodium				8.7	8.7
Dissolved Potassium				1.0	0.96
Total Potassium				0.94	0.94
Dissolved Sulphate				37.0	37
Dissolved Chloride				11	11
Dissolved Calcium				33	33
Total Calcium	N/A	N/A	N/A	31.0	31
Dissolved Magnesium				10	10
Total Magnesium				9.50	9.5
Total Alkalinity				87.00	87
Specific Conductivity				280	280
Total Suspended Solids				3	3.3
Total Dissolved Solids				150	150
Total Petroleum				<2.0	<2.0
Total Phosphorus				<0.10	<0.10
Total Hardness				120	120

**IMPERIAL - NORMAN WELLS OPERATIONS**  
**WATER LICENCE S13L1-007-2**  
**QUARTERLY ACUTE LETHALITY**  
**November 2018**

<b>SNP S13L1-007-2 (Effluent Water)</b>		
<b>Date</b>	<b>Rainbow Trout (% Survival)</b>	<b>Daphnia Magna (% Survival)</b>
<b>Licence Criteria</b>	<b>&gt; 50% Survival</b>	<b>&gt; 50% Survival</b>
Q1 - January	100%	100%
Q2 - April*	N/A	N/A
Q3 - July*	100%	100%
Q4	100%	100%

