



Kal S. Virk, P.Eng.
Environment & Regulatory Manager
587.476.3879 Tel
kal.s.virk@esso.ca

August 31, 2016

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 July 2016

Dear Ms. Bergsma,

Imperial Oil Resources N.W.T. Limited (Imperial) is submitting the July 2016 monthly results for the Surveillance Network Program under Water Licence S13L1-007.

On July 4, 2016 the freshwater injection system was taken out of service to facilitate a tank cleaning. As a result additional freshwater was diverted to the Settling Pond. On July 5, 2016 following notification to Tim Morton (INAC) along with submission of valid laboratory sample results Imperial began diverting freshwater from the Settling Pond to Retention Area. This diversion continued intermittently until July 19, 2016. During the diversion, representative grab samples were taken twice weekly from the outlet location with the exception of a composite sample unintentionally taken July 14, 2016. All sample results during that time met licence criteria and approximately 36,392 m³ of freshwater was diverted.

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, INAC, Yellowknife

IMPERIAL - NORMAN WELLS OPERATIONS
WATER LICENCE S13L1-007
CPF DAILY VOLUMES
July 2016

Date	VOLUMES (m ³)					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	8,410	6,253	2,157	6,447	8,604	19	26	**
2	8,076	6,041	2,036	6,149	8,185	19	27	**
3	8,359	6,222	2,137	6,798	8,935	20	29	**
4	8,366	7,123	1,243	6,902	8,144	21	29	**
5	8,208	8,208	*	7,101	7,101	20	29	**
6	8,022	8,022	*	6,966	6,966	21	29	**
7	8,143	8,143	*	7,012	7,012	20	29	**
8	8,069	8,069	*	6,785	6,785	21	28	**
9	8,153	8,153	*	6,635	6,635	21	28	**
10	8,296	8,296	*	6,930	6,930	21	29	**
11	8,238	8,238	*	6,687	6,687	21	29	**
12	8,154	8,154	*	6,651	6,651	21	29	**
13	8,254	8,254	*	6,745	6,745	20	29	**
14	8,185	8,185	*	6,710	6,710	20	29	**
15	8,301	8,301	*	6,581	6,581	20	29	**
16	8,301	8,301	*	6,587	6,587	20	27	**
17	8,300	8,300	*	6,626	6,626	20	27	**
18	7,851	7,851	*	6,442	6,442	20	27	**
19	7,718	6,836	883	6,199	7,082	19	26	**
20	7,553	5,535	2,018	6,283	8,302	17	24	**
21	7,304	5,288	2,016	6,400	8,417	17	24	**
22	7,384	5,482	1,903	6,681	8,584	17	25	**
23	7,456	5,483	1,973	6,860	8,833	18	27	**
24	7,833	5,800	2,032	6,715	8,747	17	26	**
25	7,469	5,456	2,013	6,740	8,753	17	26	**
26	7,543	5,654	1,889	6,847	8,736	17	26	**
27	7,886	6,170	1,716	6,435	8,151	18	27	**
28	7,996	6,499	1,497	6,517	8,014	18	27	**
29	7,779	6,215	1,564	6,534	8,098	18	27	**
30	7,728	6,167	1,561	6,877	8,439	19	27	**
31	8,316	6,633	1,683	6,780	8,463	19	27	**
TOTAL	247,649	217,330	30,320	206,623	236,942			
AVG	7,989	7,011	1,784	6,665	7,643	19	27	-
HIGH	8,410	8,301	2,157	7,101	8,935			

*Freshwater injection system offline due to T203 cleaning July 4 - 19

**Chlorine injection system inoperable since June 19. No chlorine sampling occurred during this time.

IMPERIAL - NORMAN WELLS OPERATIONS
WATER LICENCE S13L1-007
CPF MONTHLY VOLUMES SUMMARY
July 2016

Water Injection Volumes (m³)

Total fresh water injected	30,320	
Total produced water injected	206,623	
Total Monthly	236,942	Total Injected

CPF Water Volumes (m³)

Total CPF intake water S13L1-007-01	247,649	
Total CPF effluent water S13L1-007-02	217,330	
Highest daily water intake S13L1-007-01	8,410	Max. Allow. 16,000 m3/day.
YTD water intake S13L1-007	1,390,374	Max. Allow. 3,500,000 m3/yr.

Alternate Water Usage Volumes (m³)

Alternate surface water usage	0
YTD Alternate surface water usage	0

Surface Runoff Water Release Volumes (m³)

Refinery Impound Basin	1,162
LT 11 Impound Basin	0
Refinery Water flood Basin	0
CPF Impound Basin	7,260
Misc. Mainland Impound Areas	0
Misc. Bear Island Impound Areas	0
Misc. Goose Island Impound Areas	0
Total - YTD Surface Runoff	40,183

IMPERIAL - NORMAN WELLS OPERATIONS
WATER LICENCE S13L1-007
CPF MONTHLY WATER DATA
July 2016

SNP S13L1-007-1 (Intake Water)			
	Suspended Solids (mg/L)	pH	Specific Conductivity (uS/cm)
Max. Grab Limit			
June 30 - July 4	130.0	8.13	260
July 4 - 7	13.0	8.00	270
July 7 - 11	13.0	8.11	290
July 11 - 14	23.0	8.20	290
July 14 - 18	22.0	8.09	310
July 18 - 21	38.0	8.11	290
July 21 - 25	12.0	8.00	290
July 25 - 28	49.0	8.10	290

SNP S13L1-007-2 (Effluent Water)			
	Suspended Solids (mg/L)	pH	Specific Conductivity (uS/cm)
Max. Grab Limit		6.0 - 9.0	
June 30 - July 4	26.0	8.12	260
July 4 - 7	39.0	8.00	300
July 7 - 11	41.0	8.16	280
July 11 - 14	6.0	8.18	280
July 14 - 18	170.0	8.09	270
July 18 - 21	150.0	8.13	280
July 21 - 25	65.0	8.01	290
July 25 - 28	40.0	8.17	290

SNP S13L1-007-1 (Intake Water)		
	Total Petroleum Hydrocarbons (mg/L)	Phenols (mg/L)
Max. Grab Limit		
June 27 - July 4	<2.0	<0.0020
July 4 - 11	<2.0	<0.0020
July 11 - 18	<2.0	0.0030
July 18 - 25	<2.0	<0.0020

SNP S13L1-007-2 (Effluent Water)				
	Total Petroleum Hydrocarbons (mg/L)	Phenols (mg/L)	Daily Chlorine (mg/L)	Temp (C)
Max. Grab Limit	5	0.14		
June 27 - July 4	<2.0	<0.0020	*	27
July 4 - 11	<2.0	<0.0020	*	29
July 11 - 18	<2.0	<0.0020	*	28
July 18 - 25	<2.0	<0.0020	*	26

*Chlorine injection system inoperable since June 19

IMPERIAL - NORMAN WELLS OPERATIONS
WATER LICENCE S13L1-007
CPF MONTHLY WATER DATA
July 2016

SNP S13L1-007-2 (Effluent Water) - FOUR WEEK AVERAGE CONCENTRATION							
Parameter	Total Petroleum Hydrocarbons (mg/L)	Phenols (mg/L)	Suspend Solids (mg/L)	pH	Specific Conduct. (uS/cm)	Daily Chlorine (mg/L)	Temp (C)
Max. Average Limit	5.00	0.14		6.0 - 9.0			
June 6 - July 4	<2.0	0.0024	49.4	8.07	262.5	0.02*	25
June 13 - July 11	<2.0	0.0021	44.9	8.07	271.3	0.01*	26
June 20 - July 18	<2.0	<0.0020	56.1	8.07	271.3	*	27
June 27 - July 25	<2.0	<0.0020	74.0	8.08	277.5	*	27

*Chlorine system inoperable since June 19; Chlorine is averaged accordingly

IMPERIAL - NORMAN WELLS OPERATIONS
WATER LICENCE S13L1-007
CPF MONTHLY WATER DATA
July 2016

SNP S13L1-007-2 (Effluent Water) Grab Sample for T-203 Cleaning					
Parameter	Total Petroleum Hydrocarbons (mg/L)	Phenols (mg/L)	Suspend Solids (mg/L)	pH	Specific Conduct. (uS/cm)
4-Jul	<2.0	<0.0020	4.1	8.11	270
7-Jul	<2.0	<0.0020	27.0	8.01	280
11-Jul	<2.0	0.0025	8.0	8.18	280
14-Jul *	<2.0	0.0026	28.0	8.17	280
18-Jul	<2.0	<0.0020	150.0	8.17	270

*Composite sample taken

IMPERIAL - NORMAN WELLS OPERATIONS
WATER LICENCE S13L1-007-1
QUARTERLY CPF WATER INLET DATA
July 2016

SNP S13L1-007-1 (Intake Water)					
Date	January 2016 (mg/L)	April 2016 (mg/L)	July 2016 (mg/L)	October 2016 (mg/L)	YTD Avg. (mg/L)
pH	7.92	8.05	8.00		7.99
Phenols	<0.0020	<0.0020	<0.0020		<0.0020
Dissolved Sodium	9.0	9.0	8.3		8.8
Total Sodium	9.8	9.4	7.4		8.9
Dissolved Potassium	0.84	0.86	0.95		0.88
Total Potassium	0.94	0.92	1.90		1.25
Dissolved Sulphate	36.0	37.0	55.0		42.7
Dissolved Chloride	11.0	11.0	8.2		10.1
Dissolved Calcium	26.0	28.0	36.0		30.0
Total Calcium	28.0	29.0	38.0		31.7
Dissolved Magnesium	10.0	10.0	11.0		10.3
Total Magnesium	11.0	11.0	12.0		11.3
Total Alkalinity	80.0	83.0	90.0		84.3
Specific Conductivity	270.0	260.0	290.0		273.3
Total Suspended Solids	<1.0	<1.0	140.0		47.33
Total Dissolved Solids	120.0	140.0	170.0		143.3
Total Petroleum Hydrocarbons	<2.0	<2.0	<2.0		<2.0
Total Phosphorus	0.13	<0.10	0.13		0.12
Total Hardness	110.0	110.0	140.0		120.0

IMPERIAL - NORMAN WELLS OPERATIONS
WATER LICENCE S13L1-007-2
QUARTERLY CPF WATER EFFLUENT DATA
July 2016

SNP S13L1-007-2 (Effluent Water)					
Date	January 2016 (mg/L)	April 2016 (mg/L)	July 2016 (mg/L)	October 2016 (mg/L)	YTD Avg. (mg/L)
pH	7.99	8.03	7.97		8.00
Phenols	<0.0020	<0.0020	<0.0020		<0.0020
Dissolved Sodium	9.4	9.0	8.5		9.0
Total Sodium	9.6	9.4	7.7		8.9
Dissolved Potassium	0.91	0.87	0.91		0.90
Total Potassium	0.93	0.92	1.40		1.08
Dissolved Sulphate	36.0	38.0	54.0		42.7
Dissolved Chloride	11.0	12.0	9.3		10.8
Dissolved Calcium	28.0	28.0	36.0		30.7
Total Calcium	28.0	30.0	35.0		31.0
Dissolved Magnesium	11.0	11.0	11.0		11.0
Total Magnesium	11.0	11.0	10.0		10.7
Total Alkalinity	83.0	83.0	90.0		85.3
Specific Conductivity	270.0	260.0	290.0		273.3
Total Suspended Solids	<1.0	<1.0	36		12.7
Total Dissolved Solids	150.0	140.0	170.0		153.3
Total Petroleum Hydrocarbons	<2.0	<2.0	<2.0		<2.0
Total Phosphorus	0.11	<0.10	<0.10		<0.10
Total Hardness	110.0	110.0	140.0		120.0

QUARTERLY CPF EFFLUENT DATA
QUARTERLY ACUTE LETHALITY
July 2016

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

IMPERIAL - NORMAN WELLS OPERATIONS
WATER LICENCE S13L1-007
SURFACE WATER RUNOFF RELEASE REPORT
July 2016

Discharge Where Contamination Suspected										
	Date	Start/ Middle/ End	Total Discharge Volume (m ³)	Total Petroleum Hydrocarbons (mg/L)	Phenols (mg/L)	Chlorides (mg/L)	pH	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										
CPF Impound	4-Jul	Start	7,260	<2.0	0.0052	15	7.04	200	1,400	1,700
	11-Jul	Mid 1		<2.0	<0.0020	12	7.84	220	470	740
	18-Jul	Mid 2		<2.0	0.0057	11	7.65	5.3	500	700
	25-Jul	End		<2.0	<0.0020	14	7.79	4.7	500	770
Refinery Impound	4-Jul	Start	1,162	<2.0	0.0048	26	8.19	1.3	560	840
	11-Jul	Mid 1		<2.0	<0.0020	28	8.44	4.0	520	810
	18-Jul	End		<2.0	0.0061	28	8.23	2.7	520	810
Misc. Mainland Impound Areas										
Retention Area	5-Jul	Mid 1	*	<2.0	0.0310	22	7.59	5,100	970	1,400
	12-Jul	Mid 2		<2.0	<0.0020	9.5	7.85	1.3	360	560
	19-Jul	End		<2.0	0.0046	8.6	7.72	4.0	300	500

* A portion of Freshwater from Retention Area naturally flows into CPF Impound Basin

IMPERIAL - NORMAN WELLS OPERATIONS
WATER LICENCE S13L1-007
SURFACE WATER RUNOFF RELEASE REPORT
July 2016

Discharge Where No Contamination Suspected					
	Date	Total Discharge Volume (m ³)	Chlorides (mg/L)	pH	Sheen Y/N
Sample Limits			< 500	6.0-9.0	N
Mainland					
		0			
Bear Island					
		0			
Goose Island					
		0			