



Kal Virk
(Interim) Upstream SSHE Manager
587-476-3879 Tel
kal.s.virk@esso.ca

March 30, 2016

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 February 2016

Dear Ms. Bergsma,

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

On December 4, 2015 the chlorine injection system was shut off and is inoperable due to a piping issue. The chlorine system will remain out of service until a repair can be completed. Chlorine sampling will not be conducted until after the repair.

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

Circulate: A. Phelps Environment and Regulatory Lead, Cold Lake

IMPERIAL OIL RESOURCES - NORMAN WELLS OPERATIONS
WATER LICENCE S13L1-007
CPF DAILY VOLUMES
February 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-Jan | 5,551 | 3,049 | 2,502 | 6,642 | 9,144 | 2 | 11 | * |
| 2-Jan | 5,551 | 3,312 | 2,239 | 6,741 | 8,979 | 2 | 11 | * |
| 3-Jan | 5,551 | 3,397 | 2,154 | 6,887 | 9,040 | 3 | 11 | * |
| 4-Jan | 5,551 | 3,393 | 2,158 | 6,813 | 8,970 | 3 | 11 | * |
| 5-Jan | 5,551 | 3,390 | 2,160 | 6,720 | 8,880 | 2 | 11 | * |
| 6-Jan | 5,551 | 3,384 | 2,167 | 6,771 | 8,938 | 3 | 11 | * |
| 7-Jan | 5,550 | 3,366 | 2,185 | 6,749 | 8,934 | 2 | 12 | * |
| 8-Jan | 5,551 | 3,383 | 2,168 | 6,553 | 8,720 | 3 | 12 | * |
| 9-Jan | 5,551 | 3,381 | 2,169 | 6,659 | 8,828 | 2 | 12 | * |
| 10-Jan | 5,551 | 3,417 | 2,133 | 6,727 | 8,860 | 2 | 10 | * |
| 11-Jan | 5,551 | 3,397 | 2,153 | 6,771 | 8,924 | 2 | 9 | * |
| 12-Jan | 5,551 | 3,396 | 2,155 | 6,768 | 8,923 | 2 | 11 | * |
| 13-Jan | 5,551 | 3,442 | 2,108 | 6,766 | 8,875 | 2 | 12 | * |
| 14-Jan | 5,551 | 3,466 | 2,085 | 6,723 | 8,808 | 2 | 12 | * |
| 15-Jan | 5,551 | 3,484 | 2,067 | 6,658 | 8,725 | 2 | 12 | * |
| 16-Jan | 5,551 | 3,489 | 2,061 | 7,005 | 9,066 | 2 | 9 | * |
| 17-Jan | 5,550 | 3,175 | 2,376 | 6,889 | 9,265 | 3 | 10 | * |
| 18-Jan | 5,551 | 3,391 | 2,160 | 7,250 | 9,410 | 2 | 10 | * |
| 19-Jan | 5,551 | 3,373 | 2,178 | 7,360 | 9,538 | 2 | 10 | * |
| 20-Jan | 5,551 | 3,430 | 2,120 | 7,449 | 9,569 | 3 | 11 | * |
| 21-Jan | 5,551 | 3,432 | 2,118 | 7,376 | 9,494 | 2 | 12 | * |
| 22-Jan | 5,551 | 3,444 | 2,107 | 7,343 | 9,449 | 2 | 13 | * |
| 23-Jan | 5,551 | 3,456 | 2,094 | 7,414 | 9,508 | 2 | 13 | * |
| 24-Jan | 5,551 | 3,477 | 2,073 | 7,481 | 9,554 | 2 | 13 | * |
| 25-Jan | 5,551 | 3,486 | 2,064 | 7,481 | 9,546 | 2 | 13 | * |
| 26-Jan | 5,551 | 3,448 | 2,103 | 7,490 | 9,593 | 2 | 11 | * |
| 27-Jan | 5,551 | 3,436 | 2,115 | 7,485 | 9,600 | 3 | 11 | * |
| 28-Jan | 5,551 | 3,446 | 2,105 | 7,481 | 9,586 | 2 | 9 | * |
| 29-Jan | 5,551 | 3,448 | 2,103 | 7,483 | 9,586 | 2 | 11 | * |
| TOTAL | 160,967 | 98,587 | 62,380 | 203,934 | 266,314 | | | |
| AVG | 5,551 | 3,400 | 2,151 | 7,032 | 9,183 | 2 | 11 | - |
| HIGH | 5,551 | 3,489 | 2,502 | 7,490 | 9,600 | | | |

*Chlorine system inoperable therefore no samples were taken during this time

IMPERIAL OIL RESOURCES - NORMAN WELLS OPERATIONS
WATER LICENCE S13L1-007
CPF MONTHLY VOLUMES SUMMARY
February 2016

Water Injection Volumes (m³)

| | | |
|-------------------------------|----------------|----------------|
| Total fresh water injected | 62,380 | |
| Total produced water injected | 203,934 | |
| Total Monthly | 266,314 | Total Injected |

CPF Water Volumes (m³)

| | | |
|---|----------------|------------------------------|
| Total CPF intake water S13L1-007-01 | 160,967 | |
| Total CPF effluent water S13L1-007-02 | 98,587 | |
| Highest daily water intake S13L1-007-01 | 5,551 | Max. Allow. 16,000 m3/day. |
| YTD water intake S13L1-007 | 332,992 | 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 | 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 |
| Total - YTD Surface Runoff | 0 |

IMPERIAL OIL RESOURCES - NORMAN WELLS OPERATIONS
 WATER LICENCE S13L1-007
 CPF MONTHLY WATER DATA
 February 2016

| SNP S13L1-007-1 (Intake Water) | | | |
|--------------------------------|-------------------------|-------|-----------------------------|
| | Suspended Solids (mg/L) | pH | Specific Conductivity uS/cm |
| Max. Grab Limit | | | |
| Jan 28 - Feb 1 | 6.0 | 8.07 | 26-Sep |
| Feb 1 - 4 | 8.0 | 8.07 | 6-Oct |
| Feb 4 - 8 | <1.0 | 8-Jan | 26-Sep |
| Feb 8 - 11 | 7.3 | 8-Jan | 26-Sep |
| Feb 12 - 15 | 2.7 | 7-Jan | 26-Sep |
| Feb 15 - 18 | 7.3 | 8-Jan | 6-Oct |
| Feb 18 - 22 | 11.0 | 8-Jan | 26-Sep |
| Feb 22 - 25 | 19.0 | 8-Jan | 26-Sep |
| Feb 25 - 29 | 21.0 | 8.03 | 16-Sep |

| SNP S13L1-007-2 (Effluent Water) | | | |
|----------------------------------|-------------------------|------------------|-----------------------------|
| | Suspended Solids (mg/L) | pH | Specific Conductivity uS/cm |
| Max. Grab Limit | | 6.0 - 9.0 | |
| Jan 28 - Feb 1 | <1.0 | 8-Jan | 26-Sep |
| Feb 1 - 4 | <1.0 | 8.07 | 26-Sep |
| Feb 4 - 8 | <1.0 | 8-Jan | 26-Sep |
| Feb 8 - 11 | 2.7 | 8-Jan | 26-Sep |
| Feb 12 - 15 | 1.3 | 8.01 | 26-Sep |
| Feb 15 - 18 | 12.0 | 8.08 | 26-Sep |
| Feb 18 - 22 | 2.7 | 8-Jan | 26-Sep |
| Feb 22 - 25 | 1.3 | 7-Jan | 26-Sep |
| Feb 25 - 29 | <1.0 | 8-Jan | 26-Sep |

| SNP S13L1-007-1 (Intake Water) | | |
|--------------------------------|-------------------------------------|---------------|
| | Total Petroleum Hydrocarbons (mg/L) | Phenol (mg/L) |
| Max. Grab Limit | | |
| Jan 25 - Feb 1 | <2.0 | <0.0020 |
| Feb 1 - Feb 8 | <2.0 | <0.0020 |
| Feb 8 - 15 | <2.0 | <0.0020 |
| Feb 15 - 22 | <2.0 | <0.0020 |
| Feb 22 - 29 | <2.0 | <0.0020 |

| SNP S13L1-007-2 (Effluent Water) | | | | |
|----------------------------------|-------------------------------------|---------------|-----------------------|----------|
| | Total Petroleum Hydrocarbons (mg/L) | Phenol (mg/L) | Daily Chlorine (mg/L) | Temp (C) |
| Max. Grab Limit | 5-Jan | 0-Jan | | |
| Jan 25 - Feb 1 | <2.0 | <0.0020 | * | 12 |
| Feb 1 - Feb 8 | <2.0 | <0.0020 | * | 11 |
| Feb 8 - 15 | <2.0 | <0.0020 | * | 11 |
| Feb 15 - 22 | <2.0 | <0.0020 | * | 11 |
| Feb 22 - 29 | <2.0 | <0.0020 | * | 12 |

*Chlorine system inoperable therefore no samples were taken during this time

IMPERIAL OIL RESOURCES - NORMAN WELLS OPERATIONS
 WATER LICENCE S13L1-007
 CPF MONTHLY WATER DATA
 February 2016

| 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) |
| Max. Average Limit | 3.00 | 0.070 | | 6.0 - 9.0 | | | |
| Jan 4 - Feb 1 | <2.0 | <0.0020 | 1.5 | 8.03 | 267.50 | * | 11 |
| Jan 11 - Feb 8 | <2.0 | <0.0020 | 1.5 | 8.03 | 268.75 | * | 11 |
| Jan 18 - Feb 15 | <2.0 | <0.0020 | 1.3 | 8.04 | 270.00 | * | 11 |
| Jan 25 - Feb 22 | <2.0 | <0.0020 | 2.9 | 8.05 | 270.00 | * | 11 |
| Feb 1 - 29 | <2.0 | <0.0020 | 2.9 | 8.05 | 270.00 | * | 11 |

*Chlorine system inoperable therefore no samples were taken during this time

IMPERIAL OIL RESOURCES - NORMAN WELLS OPERATIONS
WATER LICENCE S13L1-007
SEMI-ANNUAL CPF WATER INLET DATA
February 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-Jan | | | | 7.92 |
| Phenols | <0.0020 | | | | <0.0020 |
| Dissolved Sodium | 9.0 | | | | 9.0 |
| Total Sodium | 9.8 | | | | 9.8 |
| Dissolved Potassium | 0.84 | | | | 0.84 |
| Total Potassium | 0.94 | | | | 0.94 |
| Dissolved Sulphate | 36.0 | | | | 36.0 |
| Dissolved Chloride | 11.0 | | | | 11.0 |
| Dissolved Calcium | 26.0 | | | | 26.0 |
| Total Calcium | 28.0 | | | | 28.0 |
| Dissolved Magnesium | 10.0 | | | | 10.0 |
| Total Magnesium | 11.0 | | | | 11.0 |
| Total Alkalinity | 80.0 | | | | 80.0 |
| Specific Conductivity | 270.0 | | | | 270.0 |
| Total Suspended Solids | <1.0 | | | | <1.0 |
| Total Dissolved Solids | 120.0 | | | | 120.0 |
| Total Petroleum | <2.0 | | | | <2.0 |
| Total Phosphorus | 0.13 | | | | 0.13 |
| Total Hardness | 110.0 | | | | 110.0 |

| 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 | | | | 7.99 |
| Phenols | <0.0020 | | | | <0.0020 |
| Dissolved Sodium | 9.4 | | | | 9.4 |
| Total Sodium | 9.6 | | | | 9.6 |
| Dissolved Potassium | 0.91 | | | | 0.91 |
| Total Potassium | 0.93 | | | | 0.93 |
| Dissolved Sulphate | 36.0 | | | | 36.0 |
| Dissolved Chloride | 11.0 | | | | 11.0 |
| Dissolved Calcium | 28.0 | | | | 28.0 |
| Total Calcium | 28.0 | | | | 28.0 |
| Dissolved Magnesium | 11.0 | | | | 11.0 |
| Total Magnesium | 11.0 | | | | 11.0 |
| Total Alkalinity | 83.0 | | | | 83.0 |
| Specific Conductivity | 270.0 | | | | 270.0 |
| Total Suspended Solids | <1.0 | | | | <1.0 |
| Total Dissolved Solids | 150.0 | | | | 150.0 |
| Total Petroleum | <2.0 | | | | <2.0 |
| Total Phosphorus | 0.11 | | | | 0.11 |
| Total Hardness | 110.0 | | | | 110.0 |

QUARTERLY CPF EFFLUENT DATA
QUARTERLY ACUTE LETHALITY
February 2016

| SNP S13L1-007-2 (Effluent Water) | | |
|----------------------------------|-------------------------------|-------------------------------|
| Date | Rainbow Trout (% Survival) | Daphnia Magna (% Survival) |
| Licence Criteria | > 50% Survival | > 50% Survival |
| 16-Jan | 100% | 100% |
| 16-Apr | | |
| 1-Jul | | |
| 1-Oct | | |

IMPERIAL OIL RESOURCES - NORMAN WELLS OPERATIONS
WATER LICENCE S13L1-007
SURFACE WATER RUNOFF RELEASE REPORT
February 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 | Suspend Solids (mg/L) | Total Dissolved Solids (mg/L) | Specific Conduct. (uS/cm) |
| Max Grab Sample Limit | | | | 5-Jan | 0-Jan | <500 | 6.0-9.0 | | | |
| Mainland Areas | | | 0-Jan | | | | | | | |
| Misc. Mainland Impound Areas | | | 0-Jan | | | | | | | |

IMPERIAL OIL RESOURCES - NORMAN WELLS OPERATIONS
WATER LICENCE S13L1-007
SURFACE WATER RUNOFF RELEASE REPORT
February 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-Jan | | | |
| Bear Island | | 0-Jan | | | |
| Goose Island | | 0-Jan | | | |