

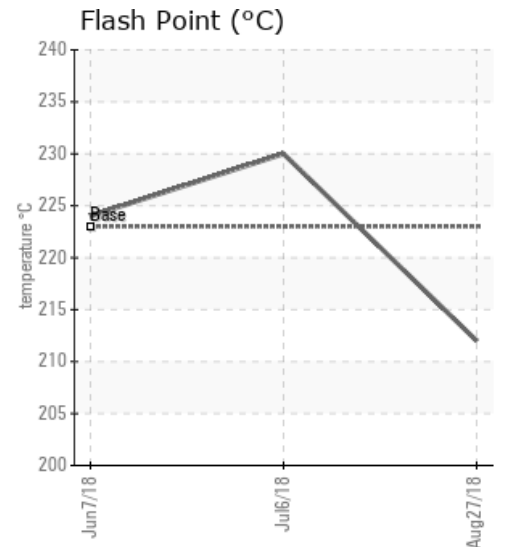
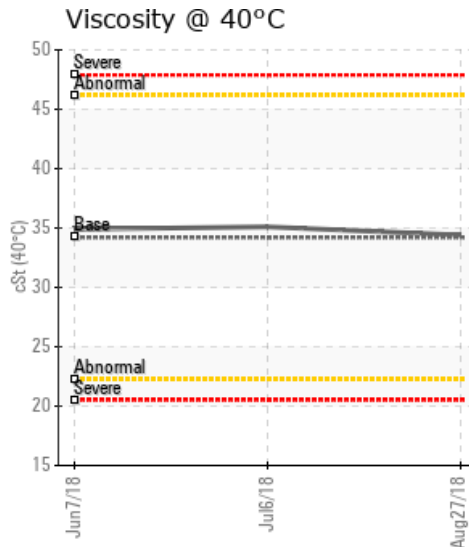
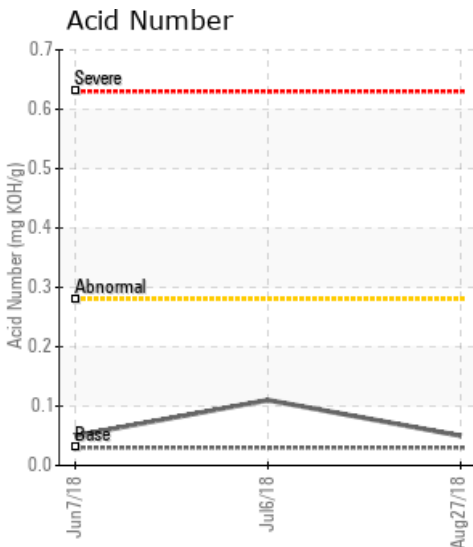
[CNRL / 13-26-67-5W6] STABILIZER #2

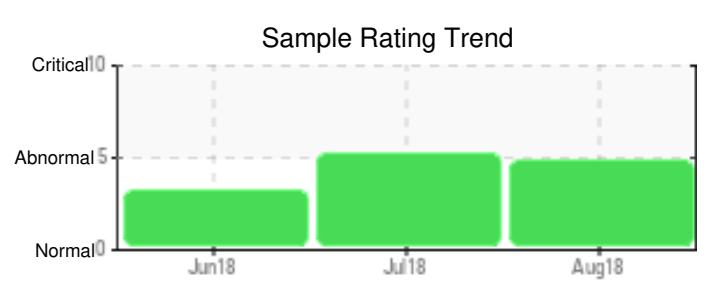
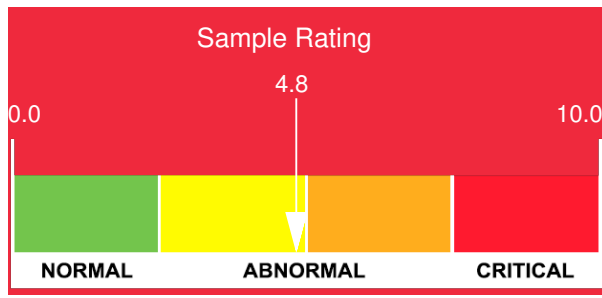
| Customer: PTRHTF20197 | System Information | Sample Information |
|--|--|---|
| CNRL GOLD CREEK 13-26-67-05W6 GRANDE PRAIRIE, AB Canada Attn: Joe Beamish Tel: (780)512-7015 E-Mail: joe.beamish@cnrl.com | System Volume: 15000 ltr Bulk Operating Temp: 428F / 220C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: PETRO-TECH | Lab No: 02236851 Analyst: Clinton Buhler Sample Date: 08/27/18 Received Date: 08/30/18 Completed: 09/10/18 To discuss this report contact Clinton Buhler at 780-516-9920 |

Recommendation: Sample results indicate that there is excessive water in the system. It is understood that appropriate steps were taken to draw a representative sample (at pump discharge). 2,156ppm Water poses a safety risk of fluid boil over when the boiling point of the water is reached and also can contribute to oxidation of the fluid and corrosion if left in service. Water needs to be removed from system before heater is brought back to normal operating temperatures. Upon initial start-up, system needs to be safely vented to remove water via steam. Do not allow system to exceed 105°C during the venting of the steam. Vent system until steam has subsided while taking all necessary safety precautions. During venting, blanket gas cannot be active as this will impeded the steam from exiting the system. If blanket gas is required for proper pump head pressure, investigate other means of water removal. Pentane insoluble (solids) level is also abnormally high. It is understood that this fluid was replaced. Please investigate possible sources of continued water contamination. Please call Petro-Canada Technical Services for further support as required. Please re-sample once water has been removed. Please ensure a thorough purge of sample point before filling sample container.

Comments: Water contamination levels are severely high. Water contamination levels are severely high.. ppm Water contamination levels are severely high. Pentane Insolubles levels are abnormally high. (GCD) 90% Distillation Point is marginally high.

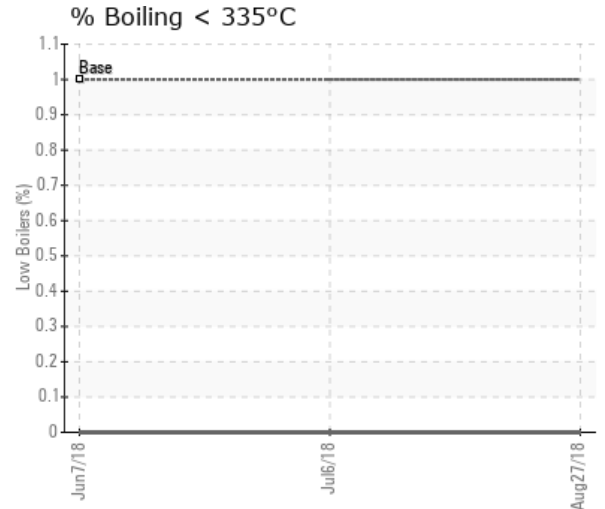
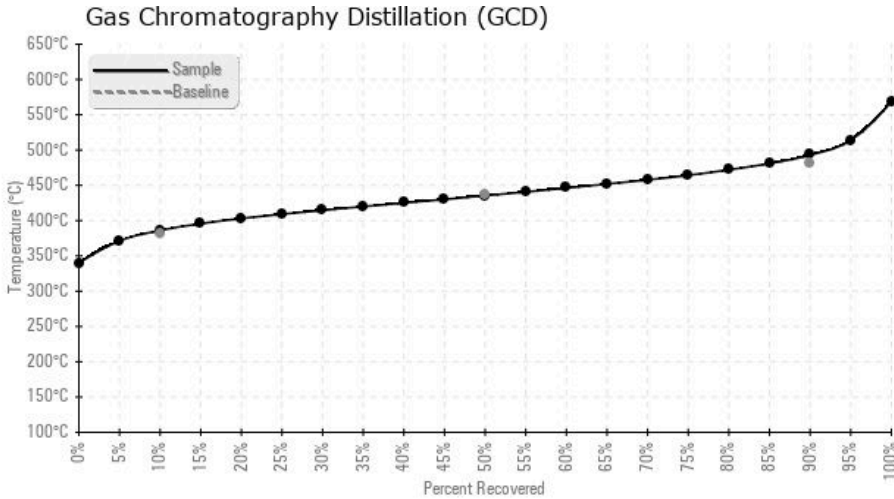
| Sample Date | Received Date | Fluid Age | Sample Location | Flash Point (COC) | Water (KF) | Viscosity (40°C) | Acid Number | Solids | GCD 10% | GCD 50% | GCD 90% | GCD % < 335°C |
|---------------|---------------|-----------|----------------------|-------------------|------------|------------------|-------------|--------|-----------|-----------|-----------|---------------|
| | mm/dd/yy | | | °F/°C | ppm | cSt | mg/KOH/g | %wt | °F/°C | °F/°C | °F/°C | % |
| 08/27/18 | 08/30/18 | 1w | DISCHARGE OF PUMP | 414 / 212 | 2156.2 | 34.4 | 0.05 | 0.492 | 727 / 386 | 816 / 435 | 919 / 493 | 0.00 |
| 07/06/18 | 07/10/18 | 3w | DISCHARGE CIRC PUMPS | 446 / 230 | 2726.5 | 35.1 | 0.11 | 0.116 | 704 / 373 | 779 / 415 | 860 / 460 | 0.00 |
| 06/07/18 | 06/11/18 | 2w | POINT INLET | 435 / 224 | 1753.6 | 34.9 | 0.050 | 0.093 | 698 / 370 | 781 / 416 | 899 / 482 | 0.00 |
| Baseline Data | | | | 433 / 223 | | 34.2 | 0.03 | | 720 / 382 | 817 / 436 | 900 / 482 | 1.00 |





| Sample Date | Iron | Chromium | Nickel | Aluminum | Copper | Lead | Tin | Cadmium | Silver | Vanadium | Silicon | Sodium | Potassium | Titanium | Molybdenum | Antimony | Manganese | Lithium | Boron | Magnesium | Calcium | Barium | Phosphorus | Zinc |
|---------------|------|----------|--------|----------|--------|------|-----|---------|--------|----------|---------|--------|-----------|----------|------------|----------|-----------|---------|-------|-----------|---------|--------|------------|------|
| 08/27/18 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 5 | 0 | 2 | 1 |
| 07/06/18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 06/07/18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Baseline Data | | | 0 | 0 | | | | | | 0 | | | 0 | 0 | | | | | 0 | | | | 0 | |

Elemental analysis results (above) in parts per million (ppm). [10,000 ppm = 1.0%]



| Historical Comments | |
|---------------------|--|
| 07/06/18 | Sample results indicate that there is excessive water in the system. Fluid lab re-tested water content and confirmed that there is 2,726 ppm water. This is nearly 1,000 ppm more water than initial sample drawn June 7, 2018. It is understood that appropriate steps were taken to draw a representative sample on July 6, 2018 (at pump discharge). 2,726 ppm Water poses a safety risk of fluid boil over when the boiling point of the water is reached and also can contribute to oxidation of the fluid and corrosion if left in service. Water needs to be removed from system before heater is brought back to normal operating temperatures. While system is down, this would be a good opportunity to drain any free water from low lying spots in the heat transfer system. Upon initial start-up, system needs to be safely vented to remove water via steam. Do not allow system to exceed 105°C during the venting of the steam. Vent system until steam has subsided while taking all necessary safety precautions. During venting, blanket gas cannot be active as this will impeded the steam from exiting the system. If blanket gas is required for proper pump head pressure, investigate other means of water removal. Please re-sample once system is safely back on-line under normal conditions (after water has been removed). Please call Petro-Canada Technical Services for further support as required. Water contamination levels are severely high. ppm Water contamination levels are severely high. |
| 06/07/18 | Heat transfer fluid is contaminated with water: 1753 ppm. This is considered excessive and poses a safety risk of fluid boil over when the boiling point of the water is reached. Consider vacuum dehydration of the fluid to remove the water. Water needs to be released from the fluid before system is brought to normal operating temperatures. Careful start-up is critical. All other parameters indicate the fluid is suitable for service. Re-sample in 6 months. Water contamination levels are severely high. ppm Water contamination levels are severely high. |
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