

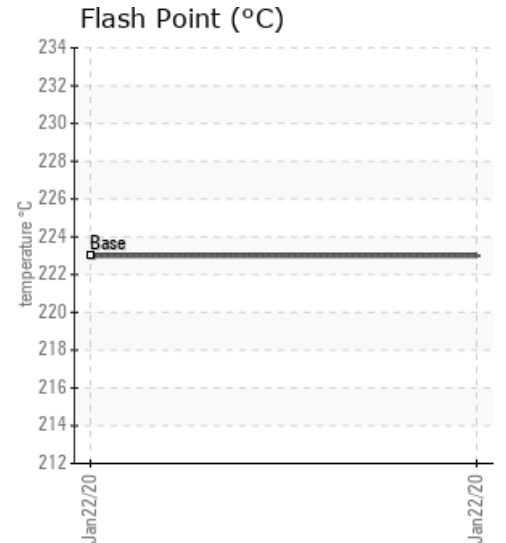
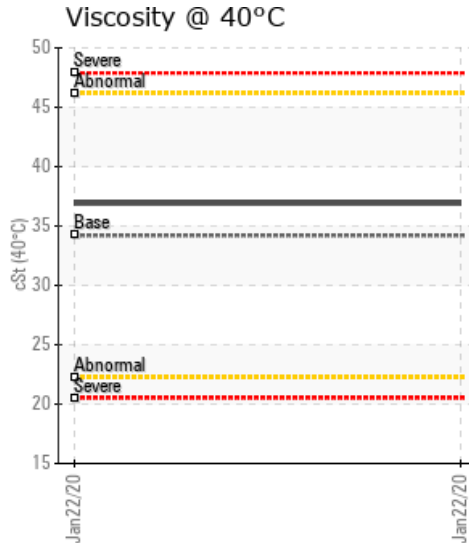
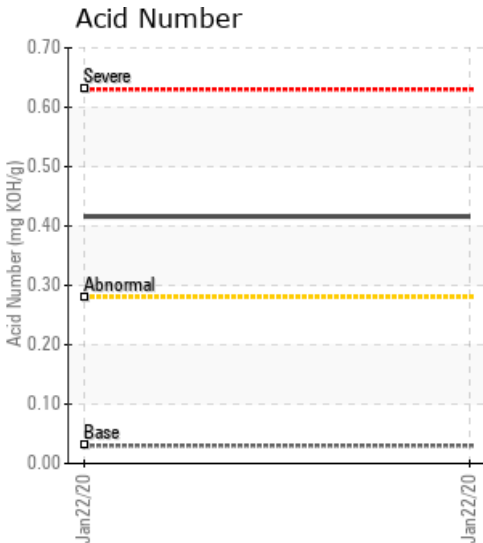
## [LSD / 4-34-47-9W5] HEATTRANSFER

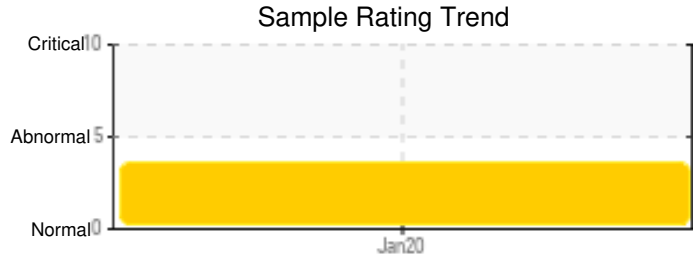
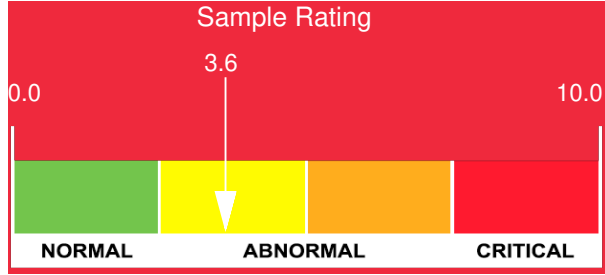
| Customer: PTRHTF20235   | System Information   | Sample Information   |
|---|--|--|
| <b>OBSIDIAN ENERGY</b><br>200, 207 - 9TH AVENUE SW<br>CALGARY, AB T2P 1K3 Canada<br>Attn: Morley James<br>Tel: (780)690-2015<br>E-Mail: morley.james@obsidianenergy.com | System Volume: 6500 ltr<br>Bulk Operating Temp: 356F / 180C<br>Heating Source:<br>Blanket:<br>Fluid: PETRO CANADA PETRO-THERM<br>Make: | Lab No: 02334961<br>Analyst: Terry Veenstra<br>Sample Date: 01/22/20<br>Received Date: 01/30/20<br>Completed: 02/25/20<br>Terry Veenstra<br>terry.veenstra@hollyfrontier.com |

### Recommendation:

Comments: Water content is higher than normal, although it has greatly improved since last sample. Otherwise sample looks good. Resample in 6 months. Water contamination levels are marginally high. Water contamination levels are marginally high.. ppm Water contamination levels are marginally high. Acid Number (AN) is abnormally high. (GCD) 10% Distillation Point is marginally high.

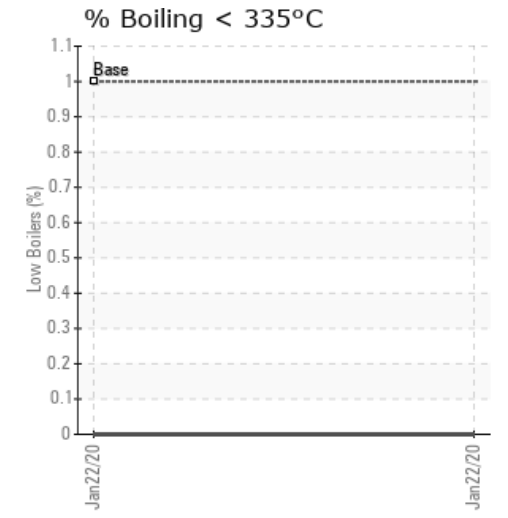
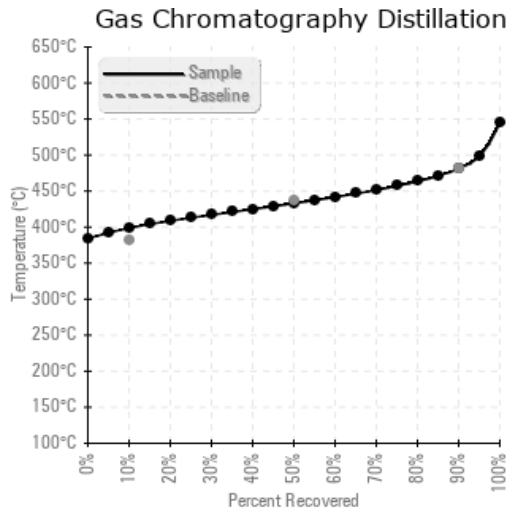
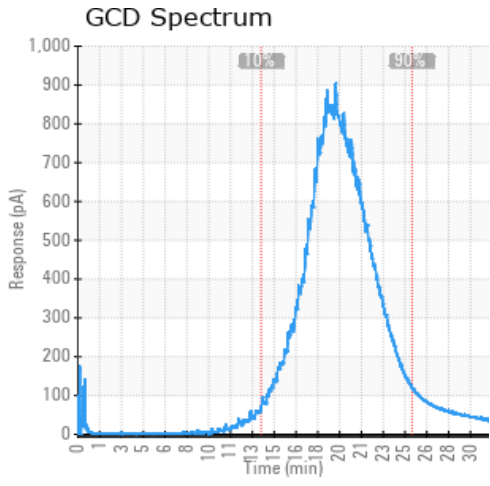
| Sample Date   | Received Date | Fluid Age | Sample Location | Flash Point (COC) | Water (KF) | Viscosity (40°C) | Acid Number | Solids | GCD 10%   | GCD 50%   | GCD 90%   | GCD % < 335°C |
|---------------|---------------|-----------|-----------------|-------------------|------------|------------------|-------------|--------|-----------|-----------|-----------|---------------|
|               | mm/dd/yy      |           |                 | °F/°C             | ppm        | cSt              | mg/KOH/g    | %wt    | °F/°C     | °F/°C     | °F/°C     | %             |
| 01/22/20      | 01/30/20      | 4.0y      | BOTTOM DRAIN    | 433 / 223         | 554.5      | 36.9             | 0.416       | 0.360  | 750 / 399 | 811 / 433 | 898 / 481 | 0.00          |
| 01/22/20      | 01/30/20      | 5.0y      |                 | 176 / 80          | 1591.7     | 47.5             | 1.56        | 1.26   | 731 / 388 | 821 / 439 | 929 / 498 | 1.40          |
| 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 |
|---------------|------|----------|--------|----------|--------|------|-----|---------|--------|----------|---------|--------|-----------|----------|------------|----------|-----------|---------|-------|-----------|---------|--------|------------|------|
| 01/22/20      | 32   | 0        | 0      | 0        | 0      | 0    | 0   | 0       | 0      | 0        | 1       | 0      | 0         | 0        | 0          | 0        | 0         | 0       | 0     | 0         | 1       | 0      | 3          | 3    |
| 01/22/20      | 77   | 0        | 0      | 0        | 0      | 0    | 0   | 0       | 0      | 0        | 0       | 2      | 2         | 0        | 0          | 0        | 0         | 0       | 102   | 0         | 0       | 0      | 2          | 1    |
| 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 |  |
|---------------------|--|
| 01/22/20            | Water is severely high and Flash Point is severely low. Boron in sample indicates that system may have glycol contamination. System should be vented to eliminate lighter ends from fluid to try and restore the flash point. This venting should also help to eliminate the water from the system. Water contamination levels are severely high. Water contamination levels are severely high.. ppm Water contamination levels are severely high. Pentane Insolubles levels are severely high. Acid Number (AN) is severely high. COC Flash Point is severely low. Boron ppm levels are severely high. (GCD) 90% Distillation Point is abnormally high. Visc @ 40°C is abnormally high. |

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