

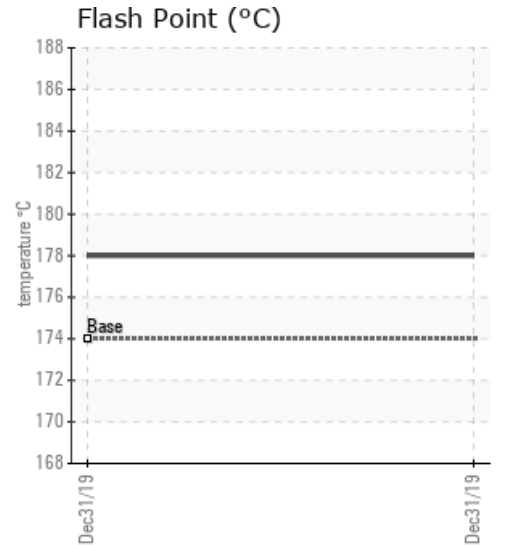
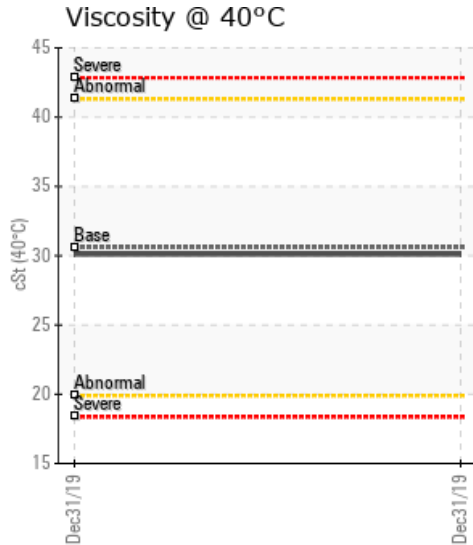
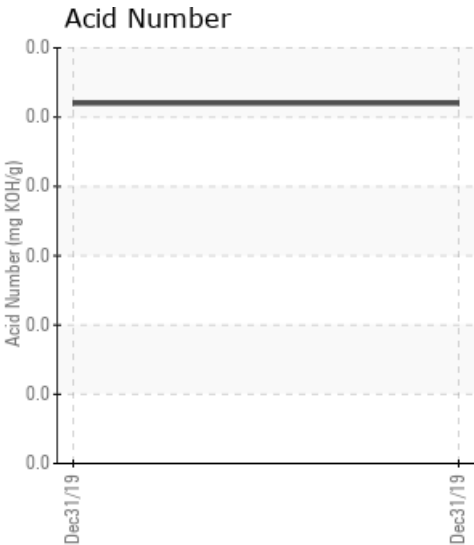
[LSD 11-21-66-3W6M] SEMCAMS PATTERSON CREEK GAS PLANT

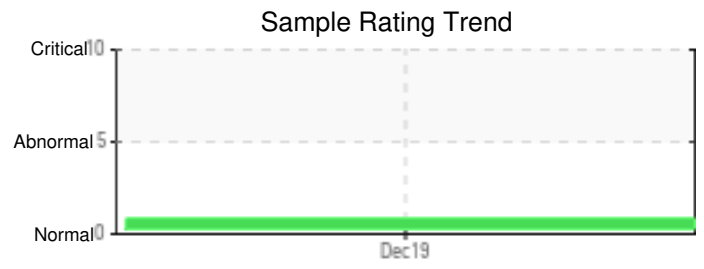
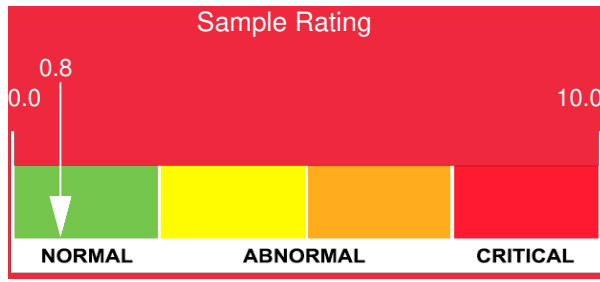
| Customer: PTRHTF20046 | System Information | Sample Information |
|---|--|---|
| QUADRA CHEMICALS 12925 146TH STREET EDMONTON, AB T5L 2H6 CANADA Attn: Quadra Samples Tel: E-Mail: quadra_samples@quadra.ca | System Volume: 25000 ltr Bulk Operating Temp: 356F / 180C Heating Source: Blanket: Fluid: BRENNTAG CHEMTHERM 550 Make: PETRI-TECH | Lab No: 02335521 Analyst: Clinton Buhler Sample Date: 12/31/19 Received Date: 02/03/20 Completed: 02/20/20 Clinton Buhler Clinton.Buhler@PetroCanadaLSP.com |

Recommendation: Sample results indicate that the fluid is suitable for continued service. GCD 90% Distillation Point is marginally low. Please re-sample in 12 months

Comments:

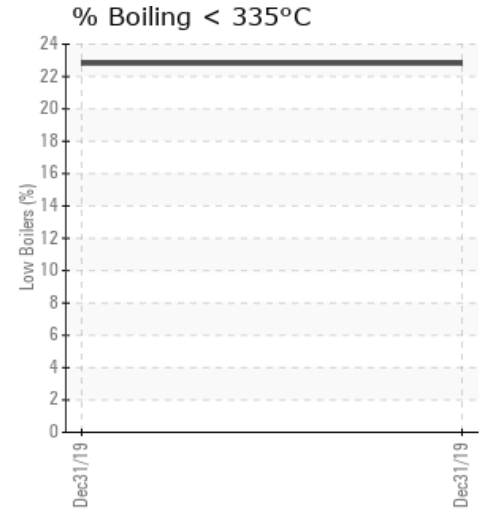
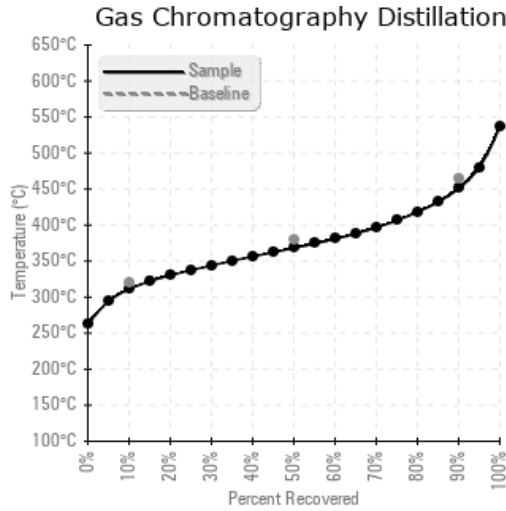
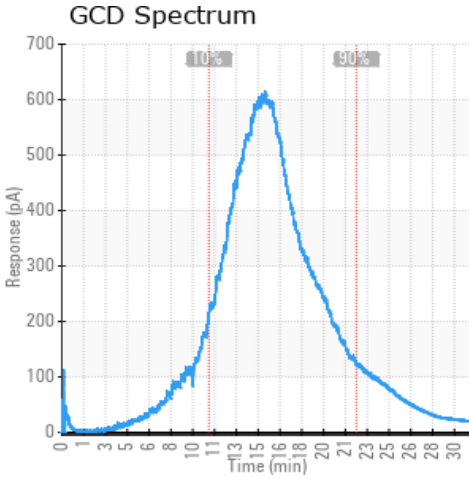
| Sample Date | Received Date | Fluid Age | Sample Location | Flash Point (COC) | Water (KF) | Viscosity (40°C) | Acid Number | Solids | GCD 10% | GCD 50% | GCD 90% | GCD % < 335°C |
|---------------|---------------|-----------|------------------|-------------------|------------|------------------|-------------|--------|-----------|-----------|-----------|---------------|
| | mm/dd/yy | | | °F/°C | ppm | cSt | mg/KOH/g | %wt | °F/°C | °F/°C | °F/°C | % |
| 12/31/19 | 02/03/20 | 2y | UPSTREAM OF PUMP | 352 / 178 | 0.00 | 30.1 | 0.026 | 0.045 | 592 / 311 | 695 / 368 | 843 / 450 | 22.81 |
| Baseline Data | | | | 345 / 174 | | 30.6 | | | 609 / 321 | 714 / 379 | 867 / 464 | |





| 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 |
|---------------|------|----------|--------|----------|--------|------|-----|---------|--------|----------|---------|--------|-----------|----------|------------|----------|-----------|---------|-------|-----------|---------|--------|------------|------|
| 12/31/19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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

| |
|--|
| |
| |
| |
| |
| |

Petro-Canada makes no representation or warranty of any kind, either express or implied, as to the accuracy or completeness of the analysis and assumes no responsibility and shall have no liability whatsoever with respect to such analysis, or a party's use of it. Petro-Canada is a division of HollyFrontier Corporation.