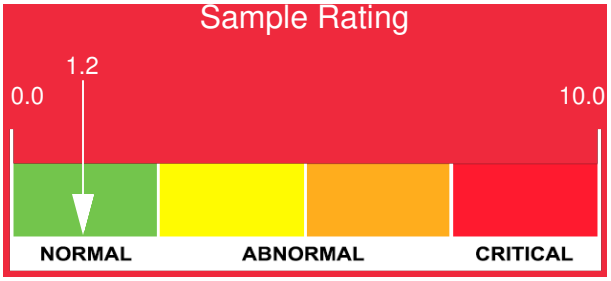
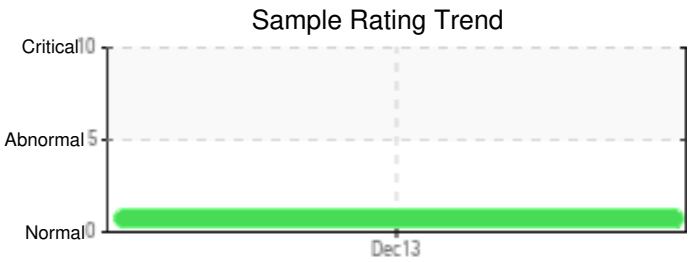


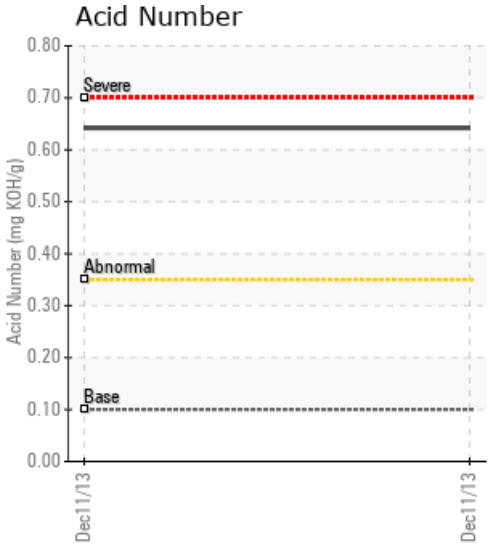

# [ATHABASCA OIL CORP / 08-28-078-10W4M] L4 (PAD D) LIESMER

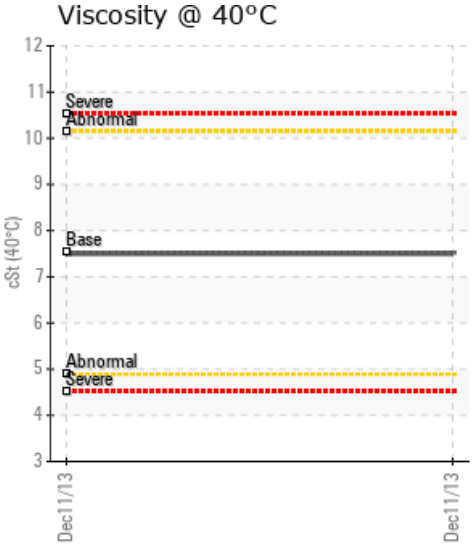
| Customer: PTRHTF20133 | System Information | Sample Information |
|---|---|---|
| ATHABASCA OIL CORP.<br>LEISMER DEMONSTRATION PLANT<br>LSD2-79-10-W4M<br>NEAR CONKLIN, AB Canada<br>Attn: George Ball<br>Tel: (587)233-1312<br>E-Mail: gball@atha.com | System Volume: 8000 ltr<br>Bulk Operating Temp: 212F / 100C<br>Heating Source:<br>Blanket:<br>Fluid: PETRO CANADA CALFLO LT<br>Make: TORNADO TECHNOLOGIES | Lab No: 01889720<br>Analyst: Peter Harteveld<br>Sample Date: 12/11/13<br>Received Date: 01/15/14<br>Completed: 01/22/14<br>Peter Harteveld<br>peter.harteveld@HFSinclair.com |

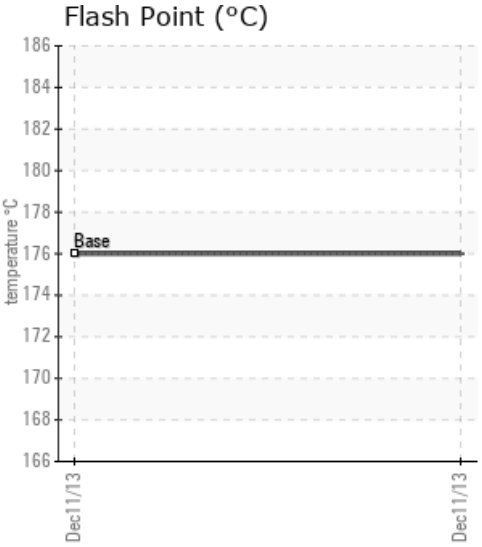
Recommendation: TAN is high. This is most likely the result of oxidation taking place in the expansion tank of the system.The reported fluid temperature in the expansion tank is 120 degrees C. Sweetening of the fill is recommended. When loss of efficiency is suspected an inspection of system internals is recommended.For now it is recommended to lower the fluid temperature in the expansion tank and provide a N2 blanket to prevent contact with air (oxygen)

Comments: Acid Number (AN) is abnormally 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 | % |
| 12/11/13 | 01/15/14 | 2.0y | DISCHARGE PIPING | 349 / 176 | 133.7 | 7.5 | 0.642 | 0.137 | 610 / 321 | 655 / 346 | 743 / 395 | 36.42 |
| Baseline Data | | | | 349 / 176 | | 7.52 | 0.1 | | 604 / 318 | | 734 / 390 | 58 |

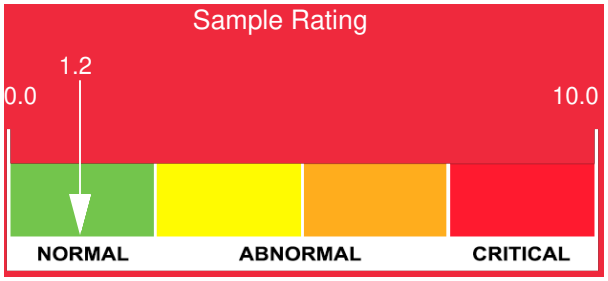


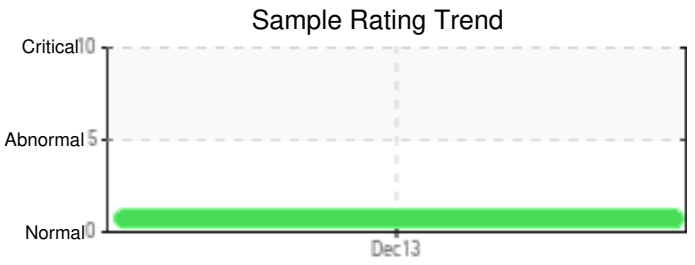



PETRO-CANADA LUBRICANTS

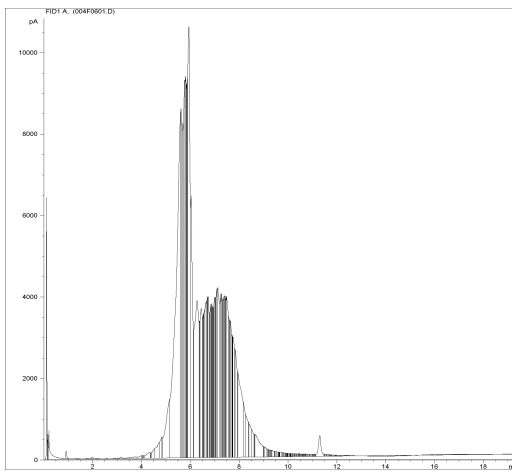


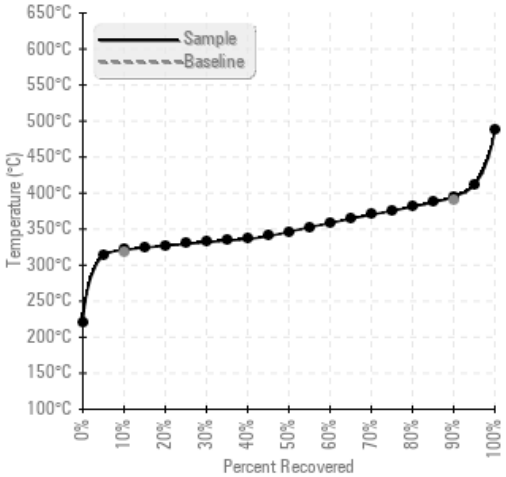

| Sample Date | Iron | Chromium | Nickel | Aluminum | Copper | Lead | Tin | Cadmium | Silver | Vanadium | Silicon | Sodium | Potassium | Titanium | Molybdenum | Antimony | Manganese | Lithium | Boron | Magnesium | Calcium | Barium | Phosphorus | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12/11/13 | 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 227 | 0 |
| Baseline Data | | | 0 | 0 | | | | | | 0 | | | 0 | 0 | | | | | 0 | | | | 270 | |

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

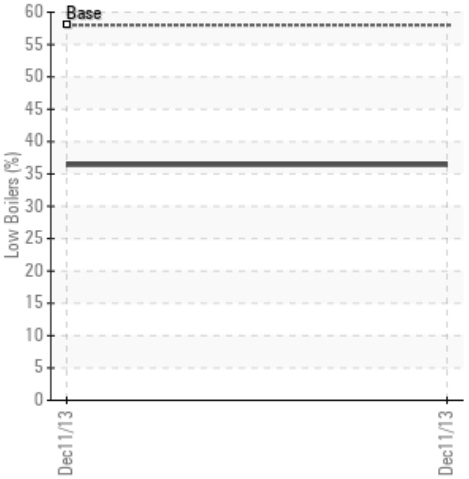
GCD Spectrum



Gas Chromatography Distillation




% Boiling < 335°C




## Historical Comments

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