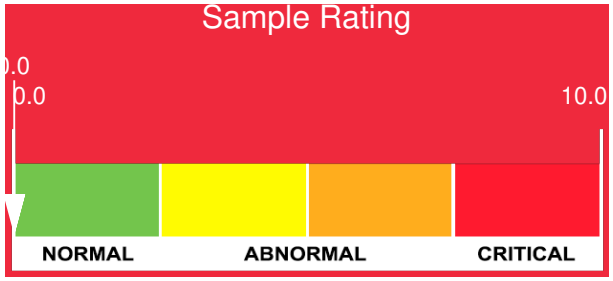
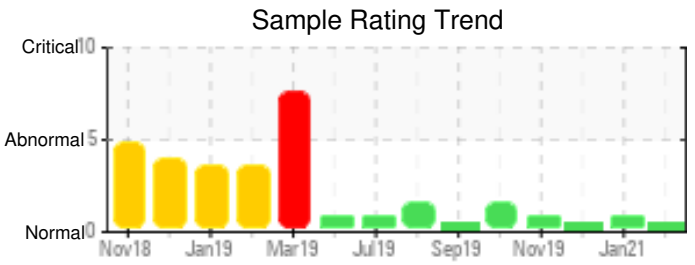




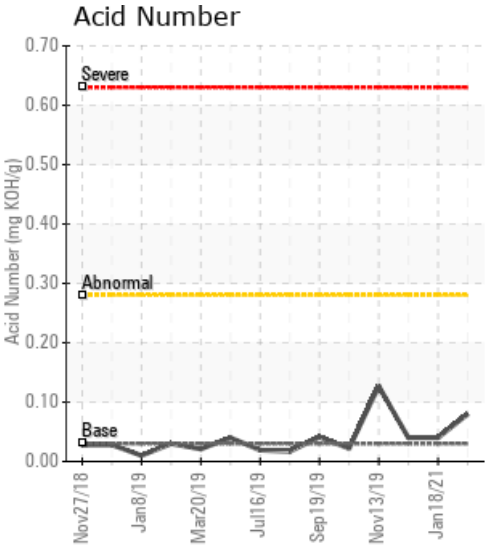
[7-11-064-04W6M] KARR HEAT MEDIUM

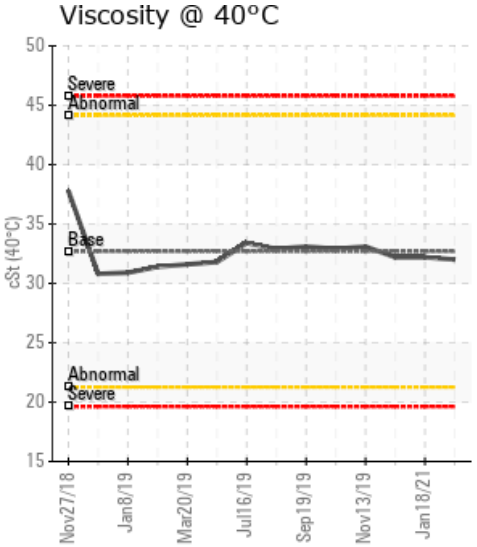
Customer: PTRHTF20207	System Information	Sample Information
Arc Resources Grande Prairie, AB T8V 8H7 CA Attn: Vernon Bonwick Tel: E-Mail: vbonwick@arcresources.com	System Volume: 230000 ltr Bulk Operating Temp: 302F / 150C Heating Source: Blanket: Fluid: PETRO CANADA CALFLO AF Make: BROACH	Lab No: 02470476 Analyst: Clinton Buhler Sample Date: 01/24/22 Received Date: 02/08/22 Completed: 02/09/22 Clinton Buhler Clinton.Buhler@HFSinclair.com

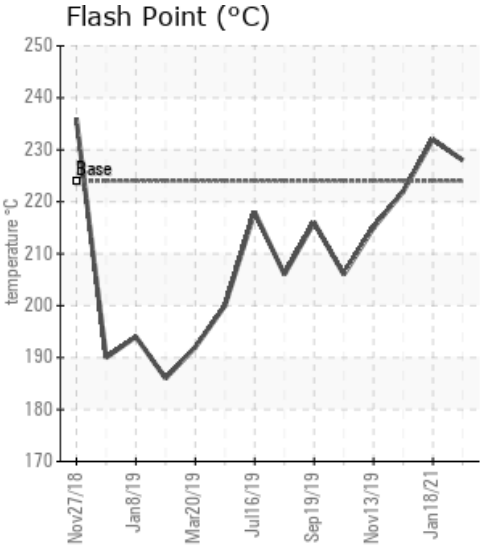
Recommendation: Sample results indicate that the fill of Calflo AF is in suitable condition for continued service. Please note slight increase in Fe content. Fluid parameters do not appear to indicate any proclivity towards corrosion. Please re-sample in 6 months

Comments:

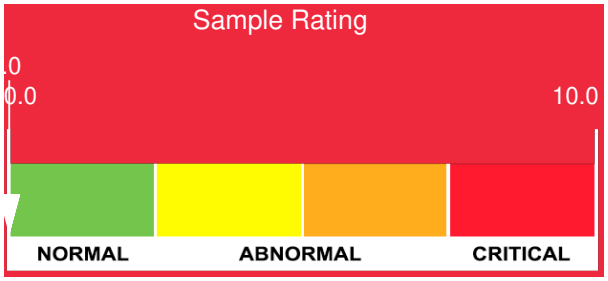
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
01/24/22	02/08/22	16.0m	discharge of pumps	442 / 228	6.5	32.0	0.08	0.051	699 / 371	800 / 426	899 / 482	2.10
01/18/21	01/28/21	5.0m		450 / 232	42.8	32.2	0.04	0.060	706 / 375	802 / 428	900 / 482	0.38
10/19/20	10/26/20	3.0m		432 / 222	113.1	32.2	0.04	0.052	708 / 376	803 / 428	900 / 482	0.29
11/13/19	11/25/19	2.0m	RETURN	419 / 215	316.0	33.1	0.127	0.187	703 / 373	815 / 435	906 / 486	4.03
10/17/19	10/30/19	2.0m	RETURN HEADER	403 / 206	37.3	32.9	0.022	0.099	702 / 372	810 / 432	902 / 483	4.16
Baseline Data				435 / 224		32.7	0.03		693 / 367	790 / 421	887 / 475	2.5

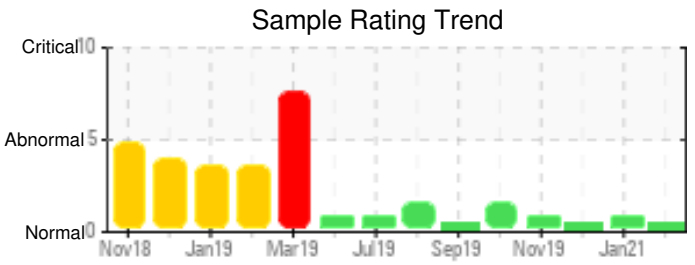






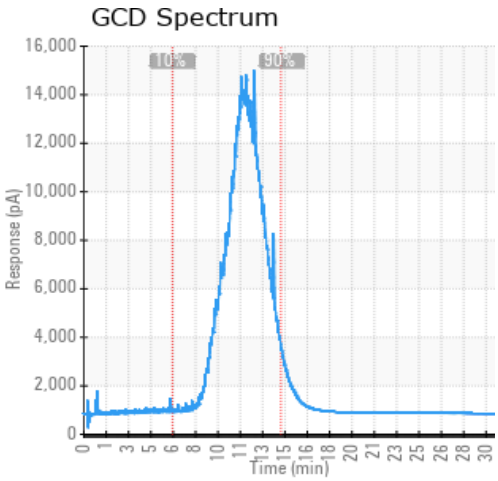
PETRO-CANADA LUBRICANTS

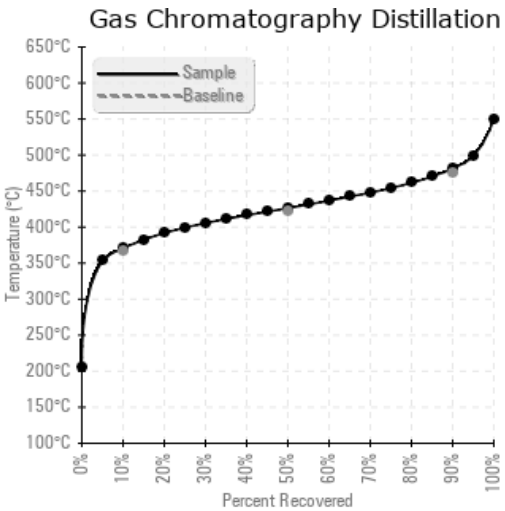


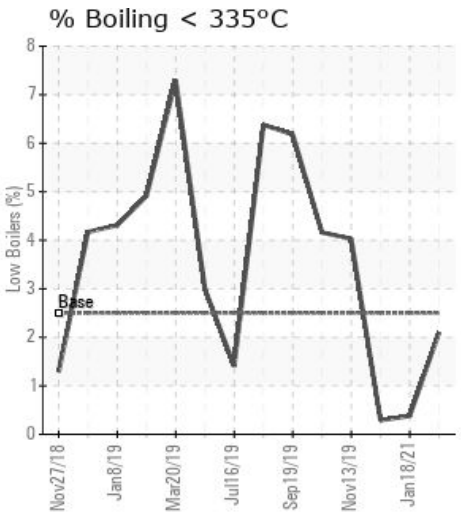


Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
01/24/22	39	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	1	0	245	2
01/18/21	16	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	1	0	248	0
10/19/20	17	0	0	0	0	0	0	0	0	0	3	5	0	0	0	0	0	0	0	0	1	0	240	1
11/13/19	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
10/17/19	3	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Baseline Data			0	0						0			0	0					0				270	

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







Historical Comments

01/18/21	Sample results indicate that the fluid is in suitable condition for continued service. Please re-sample in 6 months.
10/19/20	sample results indicate the fluid is suitable for continued service. Iron at 17 ppm which may be related to new construction. Silicon and Sodium are very low, but may represent dirt/dust and water from construction. Please re-sample in 1-3 months to build a trend on the new fluid.
11/13/19	Sample results indicate that the heat transfer fluid is suitable for continued service. Increase in water content, solids and Acid Number may indicate a sample drawn from a low spot. Please purge sample valve and piping thoroughly each time before taking a sample. Consider venting of system of low boiling vapors when site conditions allow. Please re-sample at next interval. (GCD) 90% Distillation Point is marginally low.
10/17/19	Sample results indicate that the heat transfer fluid is suitable for continued service. % boil-off of 4.16%, may indicate low boiling vapors. These vapors should be vented from the system when it is suitable to de-activate system blanket gas. Resample fluid once low boiling vapors have been vented.