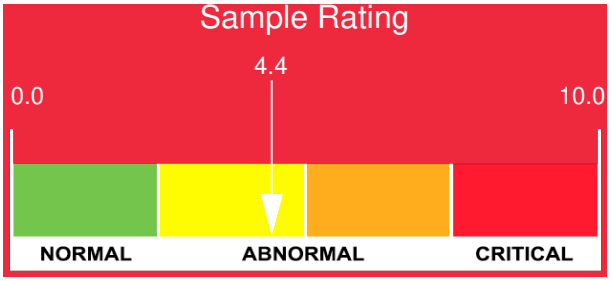
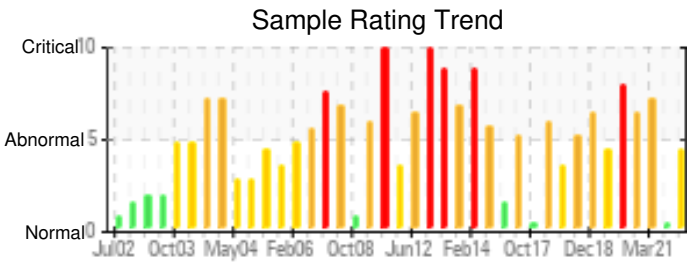




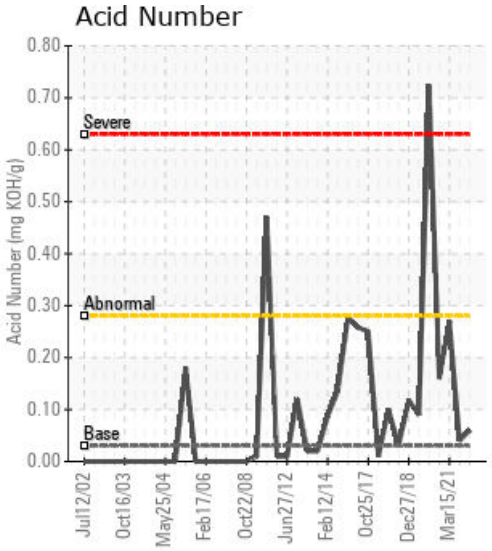
P1 HOT OIL BOILER

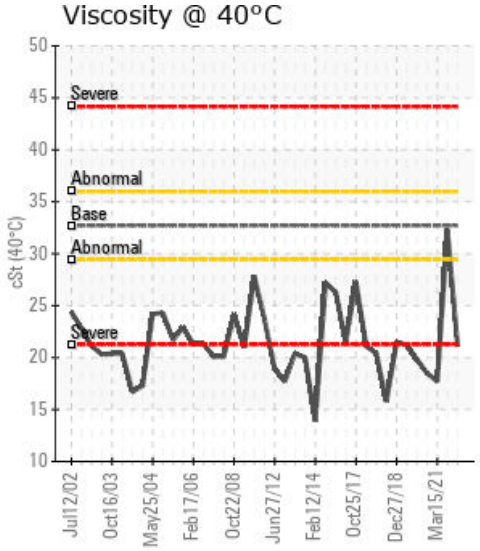
Customer: PTRHTF10083	System Information	Sample Information
KAO SPECIALTIES AMERICAS LLC 243 WOODBINE ST/PO BOX 2316 HIGH POINT, NC 27260 USA Attn: ROBERT WILLIAMS Tel: (336)878-4225 E-Mail: rwilliams@ksallc.com	System Volume: 7000 gal Bulk Operating Temp: 550F / 288C Heating Source: Blanket: Fluid: PETRO CANADA CALFLO AF Make: FIRST THERMAL	Lab No: 02515587 Analyst: Manny Garcia Sample Date: 09/29/22 Received Date: 10/11/22 Completed: 10/19/22 Manny Garcia manuel.garcia@HFSinclair.com

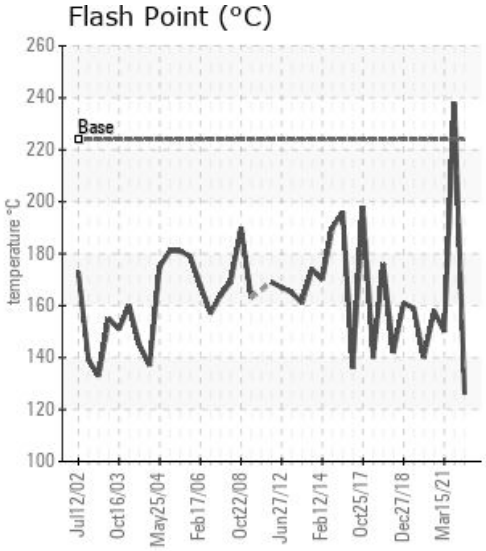
Recommendation: Lab has received 2 fluid samples from this same system. Phosphorous levels should be in the 280 ppm range and this fluid is down in the 20 ppm range. The viscosity of the fluid is down 1 full grade, which is not satisfactory and very uncommon for a relatively new fluid. The COC flash point is VERY dangerously low at 126oC whereby the fluid by design is supposed to be in the 217oC range. This flash point needs to be addressed and mitigated immediately! Can we confirm this is a fluid sample from the system in the month of September, please?

Comments: These results appear to look like the 'old' fluid before it was changed out in 2021. The previous results on Nov, 2021 were perfect.

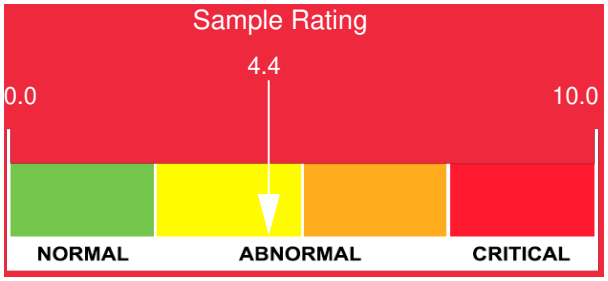
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
09/29/22	10/11/22	0.0y	HOT OIL PUMP	259 / 126	11.9	21.1	0.06	0.104	643 / 340	784 / 418	891 / 477	8.93
11/19/21	11/26/21	0.0y		460 / 238	4.8	32.3	0.04	0.049	705 / 374	799 / 426	900 / 482	0.71
03/15/21	03/22/21	0.0y		302 / 150	17.3	17.7	0.27	0.224	568 / 298	772 / 411	906 / 485	15.49
11/02/20	11/06/20	0.0y	Main hot oil pumps	316 / 158	18.0	18.5	0.16	0.344	588 / 309	770 / 410	886 / 475	13.87
03/03/20	03/11/20	0.0y	MAIN HOT OIL PUMP	284 / 140	16.4	19.8	0.724	0.243	610 / 321	775 / 413	894 / 479	12.12
Baseline Data				435 / 224		32.7	0.03		693 / 367	790 / 421	887 / 475	2.5

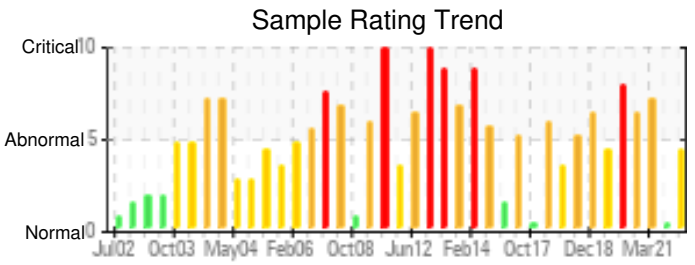






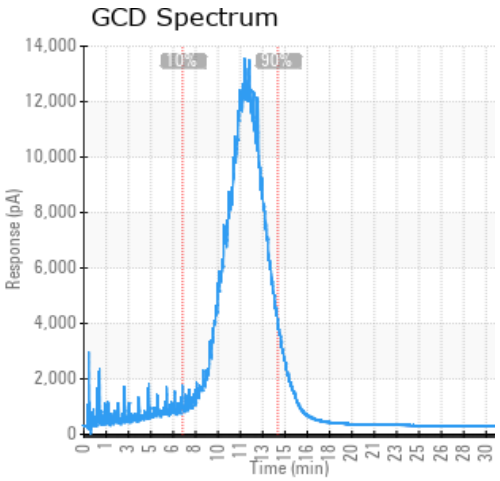
PETRO-CANADA LUBRICANTS

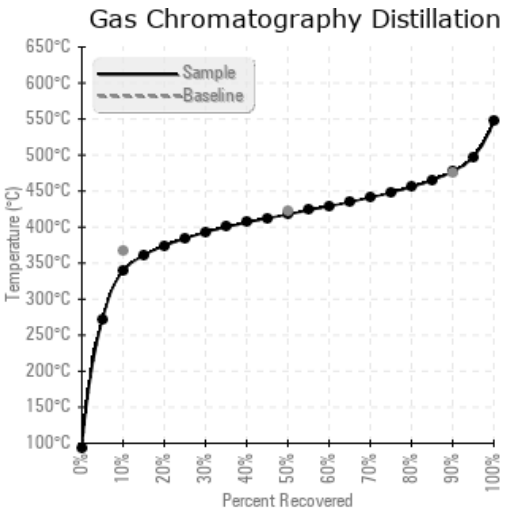


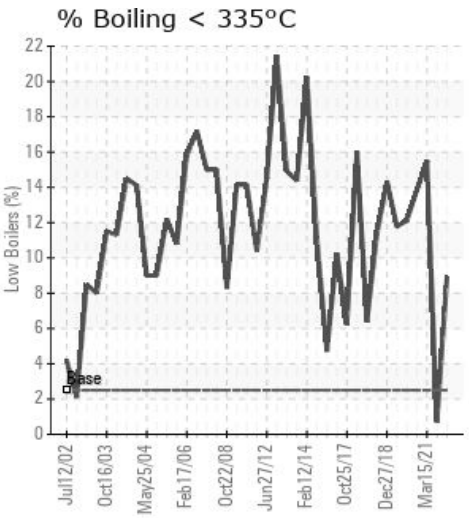


Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
09/29/22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0
11/19/21	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	285	4
03/15/21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0
11/02/20	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	24	5
03/03/20	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	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

11/19/21	Please re-submit sample in November 2022 to confirm status.Sample of Calflo AF looks perfect across all parameters for this system.
03/15/21	The past samples for this Fluid charge have consistently shown that the useful life of the fluid has been exceeded & should be considered for a fluid change-out.(GCD) 10% Distillation Point is severely low. COC Flash Point is severely low. Visc @ 40°C is severely low. (GCD) % < 335°C is abnormally high. (GCD) 90% Distillation Point is marginally high.
11/02/20	In the past we have recommended this system be vented to 'potentially correct/mitigate the issues mentioned with the fluid. Our records don't indicate the age of the fluid, but the product may have worked thru its useful life. Our recommendation is to drain, flush and re-charge the heat transfer system for improved efficiencies, safety and production levels.(GCD) 10% Distillation Point is severely low & has been trending this way for the last 4 years. COC Flash Point is severely low & this could cause a fire in your facilities if not corrected - has been dangerously low for the last 4 years. Visc @ 40°C is severely low & has been for the last 4 years. (GCD) % < 335°C is abnormally high.
03/03/20	This fluid should be scheduled for a change-out as it has reached its useful life.Acid Number (AN) is severely high. COC Flash Point is severely low and at very dangerous levels of 140oC vs the design parameter of 217oC. (GCD) 10% Distillation Point is abnormally low. Visc @ 40°C is abnormally low at 19.8 CsT @ 40oC vs design parameter of 32.3 csT @ 40oC. (GCD) % < 335°C is marginally high.