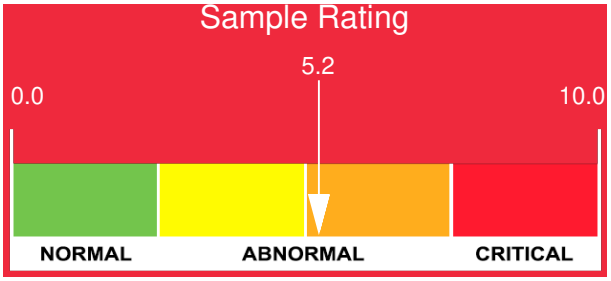
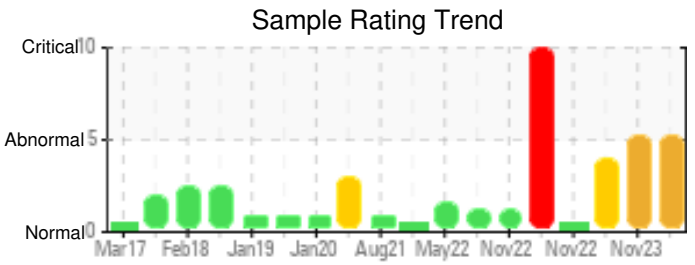




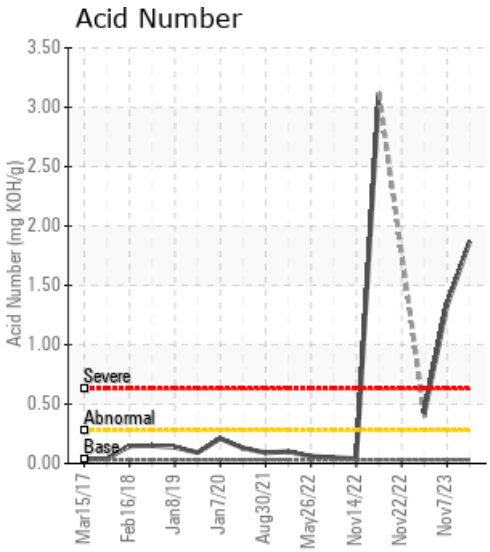
TFS H/O SYSTEM #2

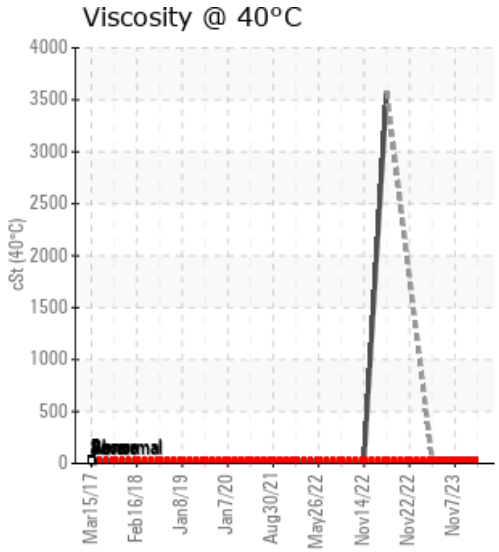
Customer: PTRHTF10176	System Information	Sample Information
CERTAINTEED ROOFING 100 CERTAINTEED DR JONESBURG, MO 63351 US Attn: Jeff Montgomery Tel: (952)261-9532 E-Mail: jeffrey.d.montgomery@saint-gobain.com	System Volume: 4244 gal Bulk Operating Temp: 525F / 274C Heating Source: Blanket: Fluid: PETRO CANADA CALFLO AF Make: FSE	Lab No: 02613836 Analyst: Neil Buchanan Sample Date: 01/30/24 Received Date: 02/06/24 Completed: 02/08/24 Neil Buchanan neil.buchanan@HFSinclair.com

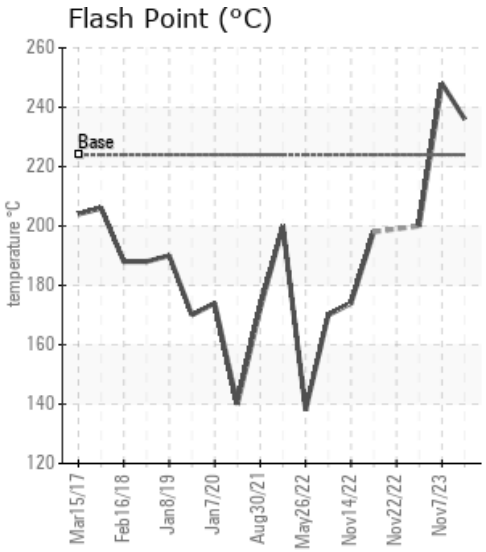
Recommendation: Acid Number (AN) continues to increase well above the condemning limit of >1.0. This indicates oxidative degradation of the fluid. Check or install an inert gas blanket over the reservoir. Unknown calcium contamination still exists. A full or partial change of the fluid should be considered.

Comments: Acid Number (AN) is severely high. Calcium ppm levels are severely high. (GCD) 90% Distillation Point is marginally high.

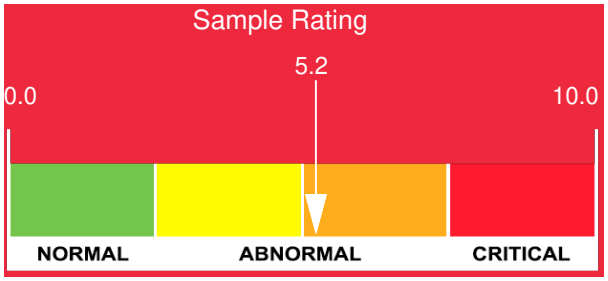
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
01/30/24	02/06/24	0.0m	sidestream filter	457 / 236	98	31.5	1.87	0.290	699 / 370	801 / 427	906 / 485	3.42
11/07/23	11/16/23	0.0m	SIDE STREAM FILTER	478 / 248	295.8	33.4	1.33	0.296	706 / 374	803 / 428	906 / 486	2.56
01/11/23	01/24/23	0.0m	sidestream filter	392 / 200	52.7	36.9	0.42	1.05	713 / 379	808 / 431	910 / 488	2.26
11/22/22	11/23/22	0.0m										
11/22/22	11/25/22	0.0m	SIDESTREAM FILTER	388 / 198	116.5	3578	3.12	7.53	661 / 349	795 / 424	925 / 496	7.48
Baseline Data				435 / 224		32.7	0.03		693 / 367	790 / 421	887 / 475	2.5

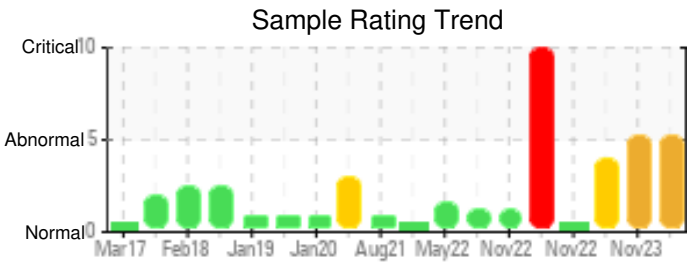






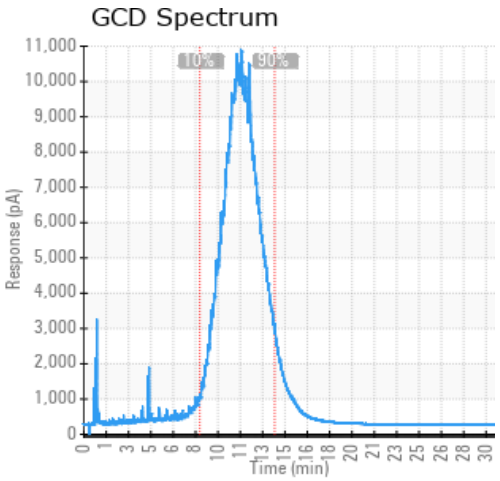
PETRO-CANADA LUBRICANTS

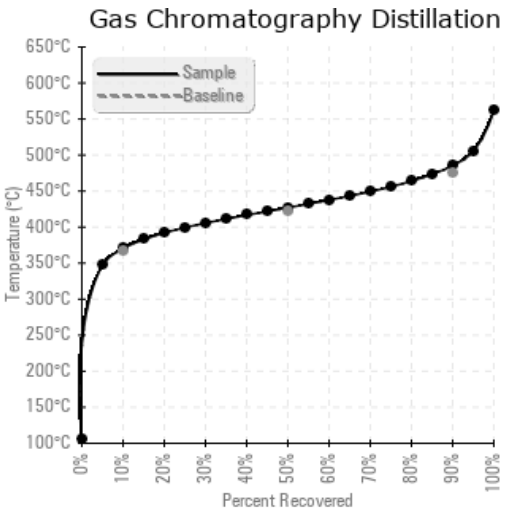


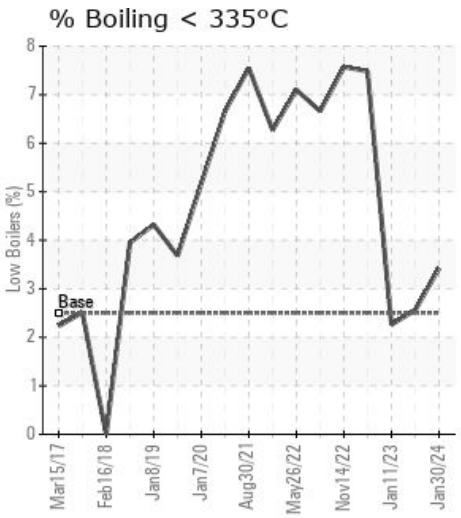


Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
01/30/24	37	0	0	0	0	0	1	0	0	0	3	5	1	0	0	0	0	0	0	0	891	0	183	0
11/07/23	28	0	0	0	0	0	0	0	0	1	3	2	0	0	0	0	0	0	0	0	1039	0	187	1
01/11/23	35	0	3	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	83	2
11/22/22	117	0	17	1	0	0	1	0	0	36	1	5	0	0	2		0		0	0	0	0	91	18
11/22/22	200	0	30	0	0	0	0	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	80	2
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

11/07/23	Large amounts of calcium are showing up at 1039 ppm and it is not part of the fluid formulation. Moisture levels are higher than normal at 295 ppm but still within acceptable range. Acid Number has suddenly increased to above the condemning limit of 1.0 to 1.3. Viscosity and GCD do not show high levels of oxidation. Investigate the source of the high levels of calcium contaminant. Acid Number (AN) is severely high. Calcium ppm levels are severely high. (GCD) 90% Distillation Point is marginally high.
01/11/23	Sample is in reasonable shape given the history except for the high level of pentane insolubles. Continue to monitor and change filters as required. Pentane Insolubles levels are severely high. Acid Number (AN) is abnormally high. (GCD) 90% Distillation Point is marginally high. Visc @ 40°C is marginally high.
11/22/22	We recommend that you drain the fluid from the component if this has not already been done. We recommend an early resample to monitor this condition. Please note that the fluid was too thick to perform some of the normal laboratory tests.{not applicable} There is no indication of any contamination in the fluid. The fluid viscosity is higher than normal. The fluid is no longer serviceable.
11/22/22	* Heavy asphalt contamination as indicated by all parameters*. Viscosity too high to measure, high levels of nickel and vanadium, very high pentane insolubles. Immediate system restoration work required.Iron and nickel ppm levels are abnormal. Vanadium ppm levels are marginal. Pentane Insolubles levels are severely high. Acid Number (AN) is severely high. (GCD) 90% Distillation Point is severely high. Visc @ 40°C is severely high.