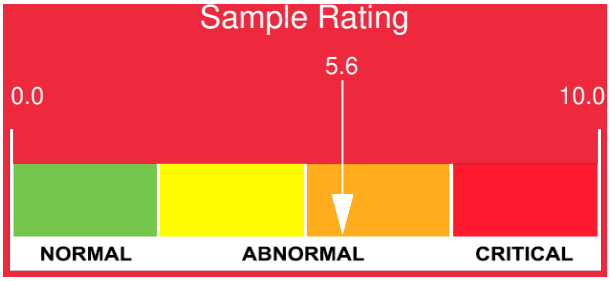
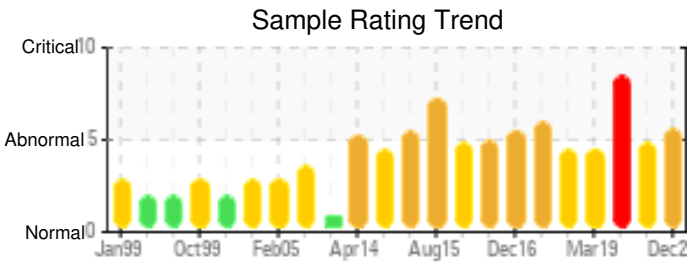




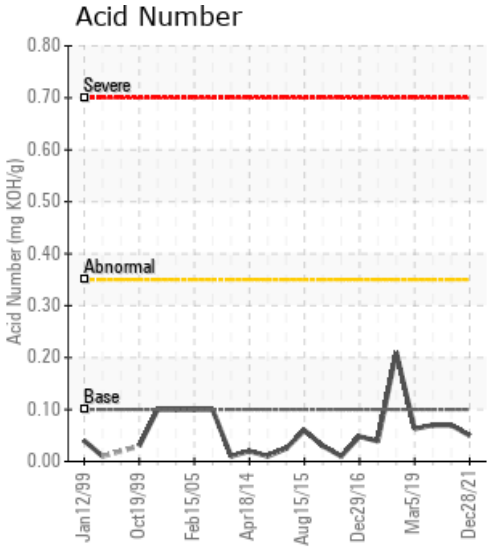
LINE 2

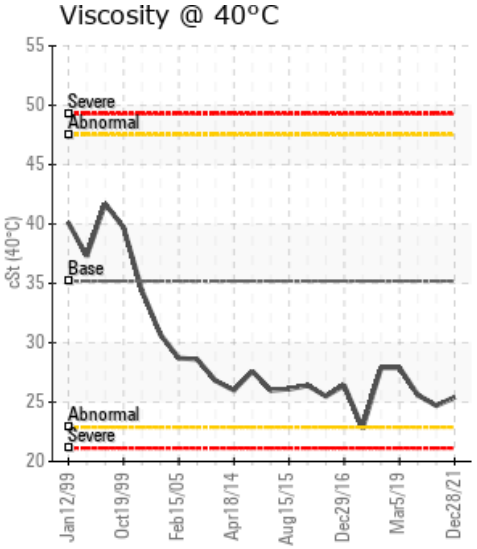
Customer: PTRHTF20031	System Information	Sample Information
MCCAIN FOODS PORTAGE PO BOX 220 1 Mccain Avenue PORTAGE LA PRARIE, MB R1N 3B5 Canada Attn: Mike Weissig Tel:	System Volume: 62000 ltr Bulk Operating Temp: 540F / 282C Heating Source: Blanket: Fluid: PETRO CANADA CALFLO HTF Make: VOLCANO	Lab No: 02470280 Analyst: Peter Harteveld Sample Date: 12/28/21 Received Date: 02/04/22 Completed: 02/07/22 Peter Harteveld peter.harteveld@hollyfrontier.com

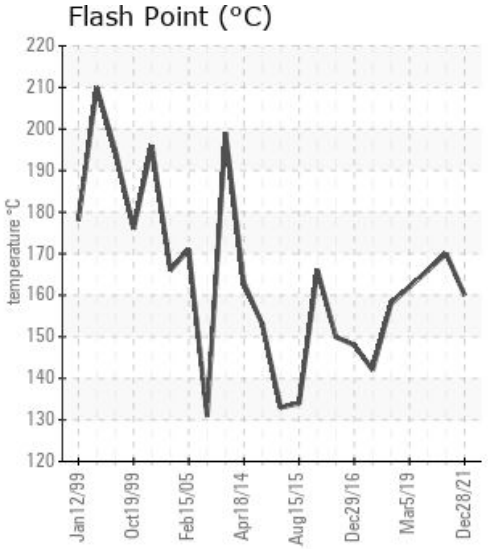
Recommendation: Thermal degradation of the fluid has resulted in viscosity, Flash Point and 10% GCD temperature becoming low. Another indication of thermal degradation is an elevated low boiler vapor content. (GCD% <335C = 11.06%). Please vent off low boiler vapor to atmosphere as part of regular fluid maintenance. Re-sample in 3 months to see the effect of venting.

Comments: (GCD) 10% Distillation Point is severely low. COC Flash Point is severely low. (GCD) % < 335°C is marginally high.

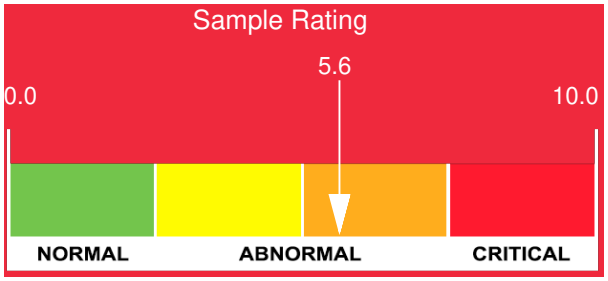
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
12/28/21	02/04/22	6.0y	#3 toh drop leg	320 / 160	11.1	25.4	0.05	0.031	617 / 325	789 / 420	901 / 483	11.06
08/08/21	08/12/21	5.0y		338 / 170	27.8	24.7	0.07	0.091	616 / 325	791 / 422	904 / 485	10.98
07/30/19	08/06/19	10.0y	2ND PUMP	331 / 166	8.2	25.6	0.070	0.051	530 / 276	755 / 402	868 / 465	18.68
03/05/19	03/07/19	9.5y	2 SECONDARY PUMP TOP	324 / 162	7.0	27.9	0.063	0.094	631 / 333	782 / 417	893 / 478	9.90
08/12/18	08/15/18	9.0y	#1 SECONDARY PUMP	316 / 158	26.4	27.9	0.21	0.016	655 / 346	792 / 422	900 / 482	7.85
Baseline Data				448 / 231		35.20	.1		712 / 378	810 / 432	910 / 488	1.75

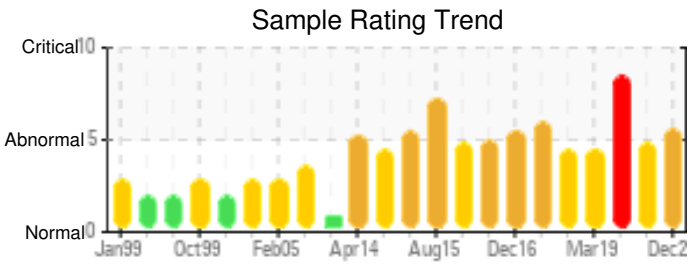






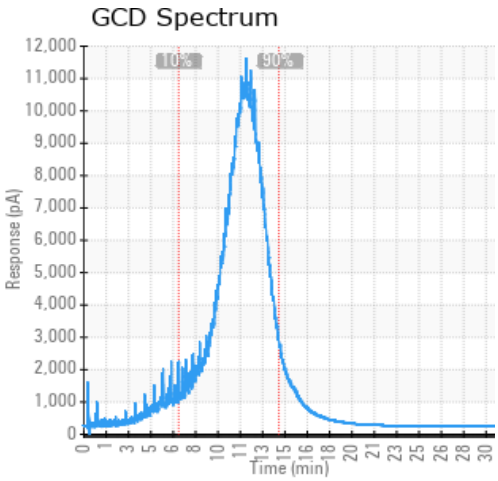
PETRO-CANADA LUBRICANTS

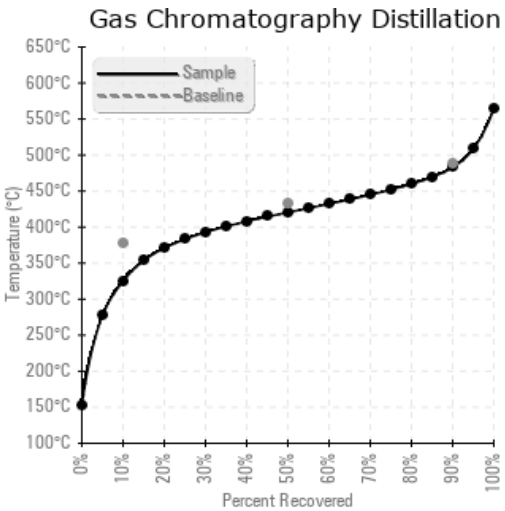


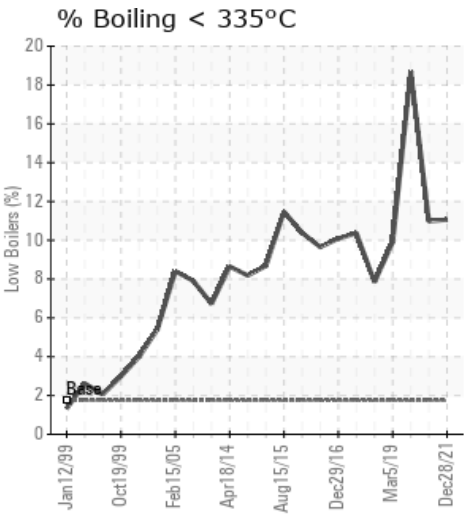


Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
12/28/21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08/08/21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07/30/19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03/05/19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
08/12/18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
Baseline Data			0	0						0			0	0				0	0				280	

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







Historical Comments

08/08/21	The fluid is in a reasonable condition and suitable for further use but shows signs of thermal degradation. Indications of this are low viscosity, Flash Point and 10% GCD temperature. As a result of this the low boiler vapor content (GCD% <335C.) is high with 11%. It is recommended to vent off the low boiler vapors on a regular basis as part of fluid maintenance. Please do this weekly for a period of 3 months and after that submit another sample. (GCD) 10% Distillation Point is severely low. COC Flash Point is abnormally low. (GCD) % < 335°C is marginally high.
07/30/19	The current fluid has reduced viscosity and flash point due to the severe thermal cracking, which is reflected by the extremely high reading of 18.68% GCD<335C. Please schedule a long and effective system venting to release the low boiler. Please send one sample to a lab to confirm the AIT (Auto Ignition Temperature). If the system venting cannot be conducted, please drain 5000L fluid and top up the fresh PetroTherm to restore the fluid physical properties. (GCD) % < 335°C is severely high. (GCD) 10% Distillation Point is severely low. COC Flash Point is abnormally low.
03/05/19	The current fluid condition is very similar to the sample in Summer 2018. The system venting in the last week of Feb helped maintain the fluid properties. The viscosity is normal, the contaminants such as water, dirt are minimum. The acid number is extremely low indicating minimum oil oxidation. The flash point is much lower than the fresh fluid due to the thermal cracking at high bulk fluid temperature. Please continue to run the fluid and conduct a longer and more frequent system venting, take one sample in 6 months to monitor the conditions. In general, the 10 years old Petro-Therm performs well, we just need to find ways to bleed the low boiler out of the system efficiently. COC Flash Point is severely low. (GCD) 10% Distillation Point is abnormally low. (GCD) % < 335°C is marginally high.
08/12/18	The current fluid has improved flash point, viscosity, and the distillation points. However, the fluid still has high content of the low boiler due to the thermal cracking at the 285 C bulk working temperature. Please continue to conduct the routine system venting and take one sample in 6 months to monitor the conditions. COC Flash Point is severely low. (GCD) % < 335°C is marginally high. (GCD) 10% Distillation Point is marginally low.