

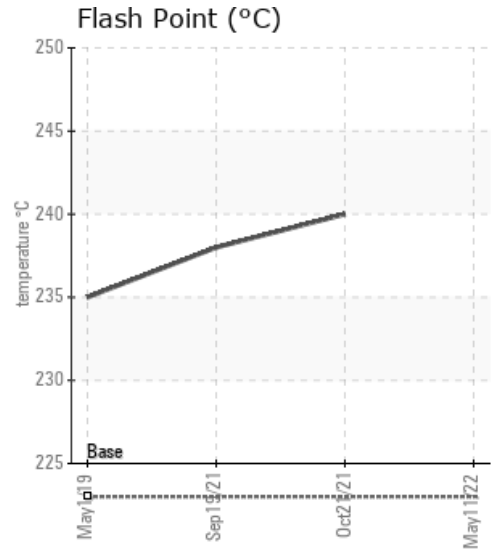
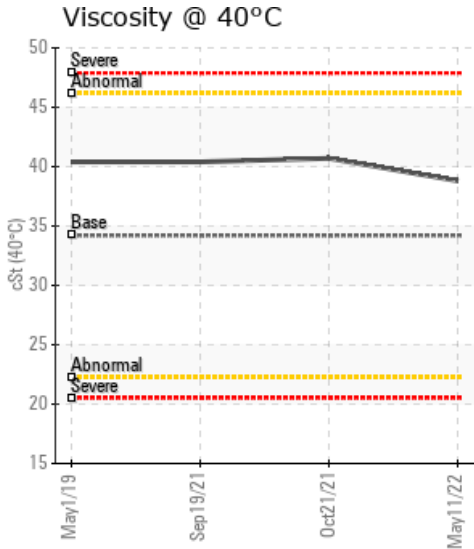
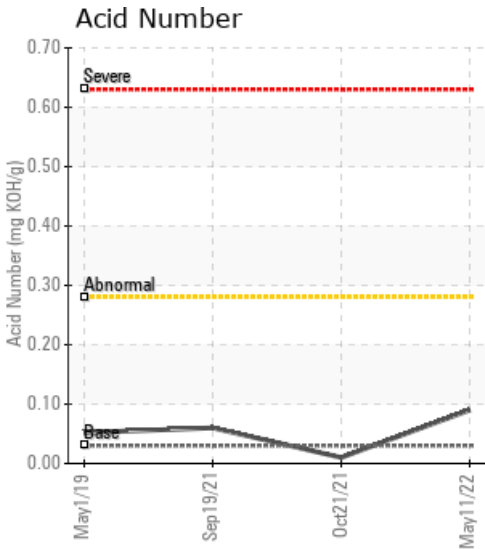
[CNRL Ferrier 7-18-40-09w5] H-633

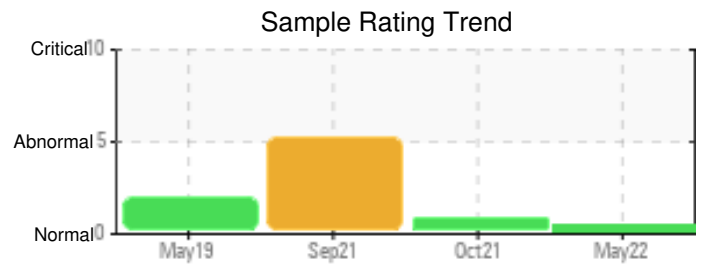
Customer: PTRHTF20046	System Information	Sample Information
QUADRA CHEMICALS 12925 146TH STREET EDMONTON, AB T5L 2H6 CANADA Attn: Quadra Samples Tel: E-Mail: quadra_samples@quadra.ca	System Volume: 5000 ltr Bulk Operating Temp: 352F / 178C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: PROPAK SYSTEMS	Lab No: 02488173 Analyst: Lyle Dach Sample Date: 05/11/22 Received Date: 05/11/22 Completed: 05/16/22 Lyle Dach lyle.dach@hollyfrontier.com

Recommendation: Sample is showing very high water again. When samples are being collected the sample line needs to be purged for several seconds minimum, longer time maybe necessary if there is a long sample line or if the sample point is at the very bottom of the vessel. The collected fluid should be at system operating temperature. Please resample to confirm the fluid condition. *** NOTE: The sample contained too much water to perform COC Flash Point ***

Comments: ppm Water contamination levels are severely high. Water contamination levels are severely high. (GCD) 90% Distillation Point is abnormally high.

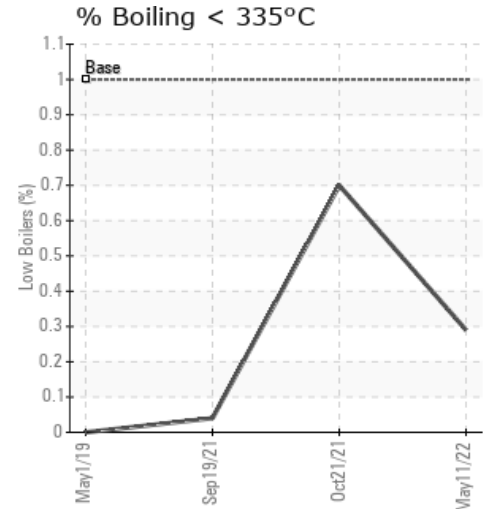
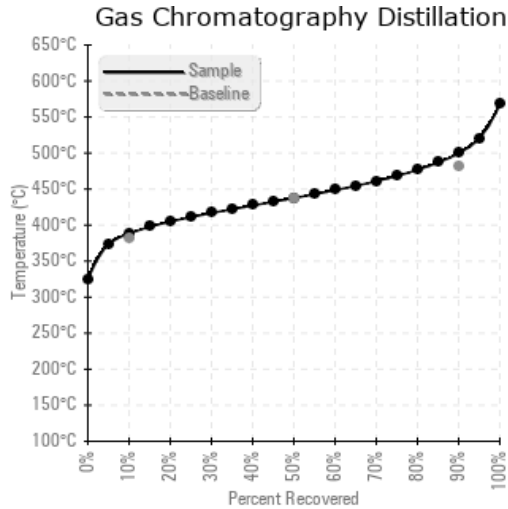
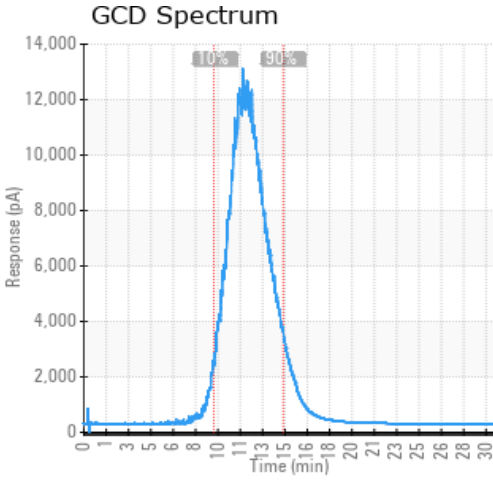
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
05/11/22	05/11/22	0.0y	bath drain plug		2062.5	38.8	0.09	0.111	731 / 388	820 / 438	931 / 500	0.29
10/21/21	11/01/21	0.0y	BATH DRAIN PLUG	464 / 240	23.6	40.7	0.01	0.044	729 / 387	820 / 438	935 / 502	0.70
09/19/21	10/08/21	10.0y	de-eth line heater	460 / 238	3412.3	40.4	0.06	0.170	730 / 388	821 / 438	936 / 502	0.04
05/01/19	05/14/19	657.0y		455 / 235	43.8	40.4	0.052	0.041	723 / 384	828 / 442	958 / 514	0.00
Baseline Data				433 / 223		34.2	0.03		720 / 382	817 / 436	900 / 482	1.00





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
05/11/22	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	6	0	0	0	0	0
10/21/21	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
09/19/21	1	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	3	0	0	0	0	0
05/01/19	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Baseline Data			0	0						0		0	0					0				0		

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



Historical Comments

10/21/21	Sample results indicate that the fluid is in suitable condition for continued service. Metals, contamination and water are all very low. Viscosity and flashpoint are in spec and acid # and pentane insolubles are low. GCD 90% distillation point is marginally high but is trending down slightly. Resample in 6 months. (GCD) 90% Distillation Point is abnormally high.
09/19/21	Water very high - resample to confirm water content in system. If water content is correct filter or centrifuge system to remove water. Water contamination levels are severely high. ppm Water contamination levels are severely high. (GCD) 90% Distillation Point is severely high.
05/01/19	Oil looks to be a blend of older pre-2006 Petrotherm and newer Petrotherm which explains the higher slightly higher viscosity and GCD @ 90%. Resample in 6 months and confirm the age of the fluid in the system. (GCD) 90% Distillation Point is severely high.

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