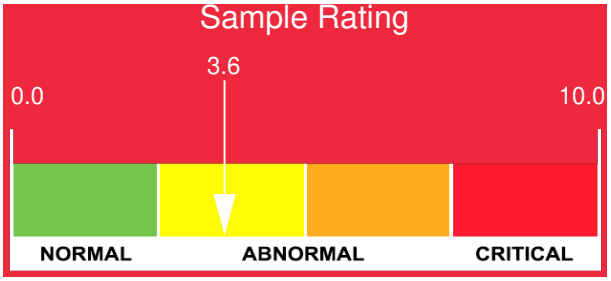
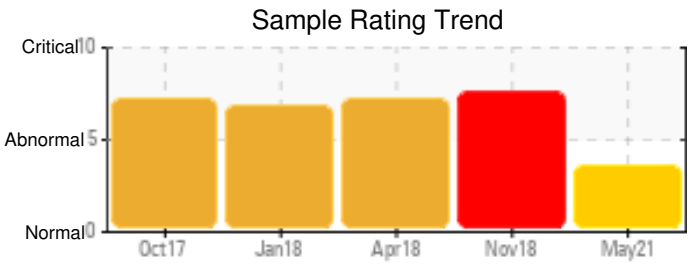




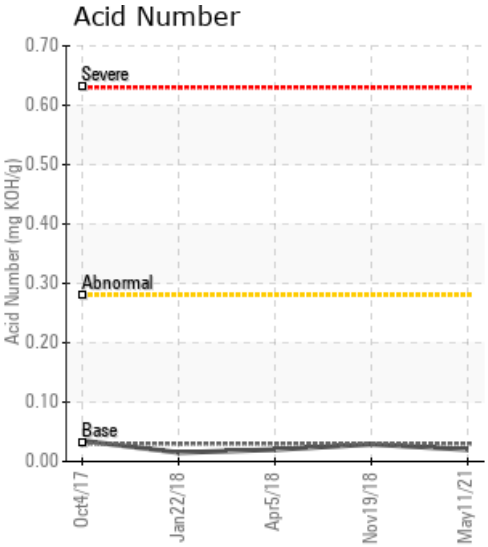
[SIMONETTE GAS PLANT / LSD: 9-6-63-25-W5] H620 STABILIZER SIMONETTE

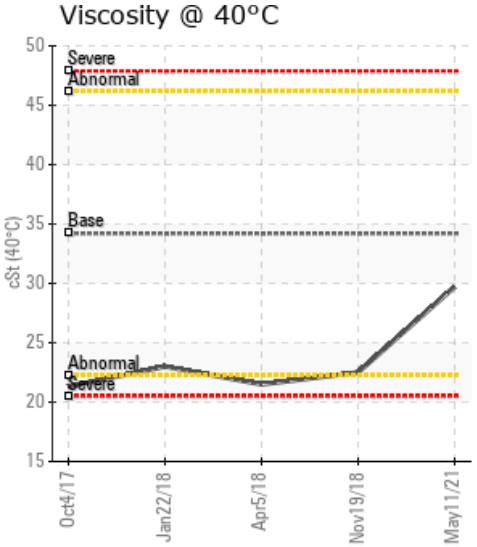
Customer: PTRHTF20187	System Information	Sample Information
KEYERA ENERGY- SIMONETTE GAS PLANT PO BOX 58 VALLEYVIEW, AB T0H 3N0 Canada Attn: Brody Shilka Tel: (780)835-1861 E-Mail: brody_shilka@keyera.com	System Volume: 18000 ltr Bulk Operating Temp: 446F / 230C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: PETROTECH	Lab No: 02421971 Analyst: Clinton Buhler Sample Date: 05/11/21 Received Date: 05/18/21 Completed: 05/28/21 Clinton Buhler Clinton.Buhler@hollyfrontier.com

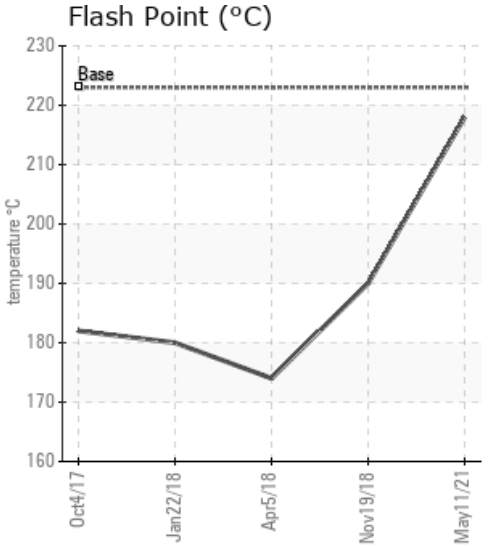
Recommendation: Sample results indicate that the fluid is in suitable condition for continued service. Results do show potential contamination with process fluid and/or thermal degradation as indicated by 9.48% low boiling vapor content and elevated solids content. Venting of the system is advised to reduce the low boiling vapor content of the fluid. Solids at 0.511% may be associated with thermal degradation (fouling) Filtering can be beneficial in reducing solids content. Please make sure the next sample is taken from pump discharge and that the sample valve and tubing is thoroughly purged so we have confidence that the solids content is representative. After thorough venting, please re-sample in 6 months.

Comments: Pentane Insolubles levels are abnormally high. (GCD) 10% Distillation Point is abnormally low. (GCD) % < 335°C is marginally high.

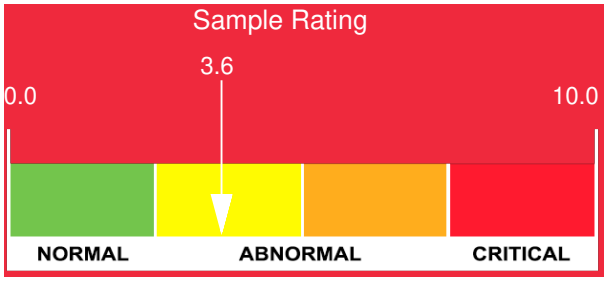
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
05/11/21	05/18/21	45.0m	Pump discharge	424 / 218	0.00	29.7	0.02	0.511	635 / 335	794 / 423	897 / 481	9.48
11/19/18	11/29/18	15.0m		374 / 190	187.7	22.5	0.029	0.019	609 / 321	737 / 392	842 / 450	12.71
04/05/18	04/16/18	7.0m		345 / 174	10.3	21.5	0.02	0.014	556 / 291	803 / 428	915 / 490	16.47
01/22/18	01/29/18	5.0m		356 / 180	4.2	23.0	0.015	0.036	550 / 288	789 / 421	906 / 485	19.74
10/04/17	10/17/17	42.0m		360 / 182	23.3	21.3	0.035	0.043	551 / 288	793 / 423	908 / 486	18.43
Baseline Data				433 / 223		34.2	0.03		720 / 382	817 / 436	900 / 482	1.00

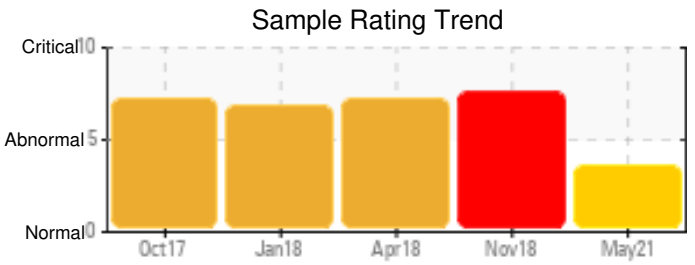






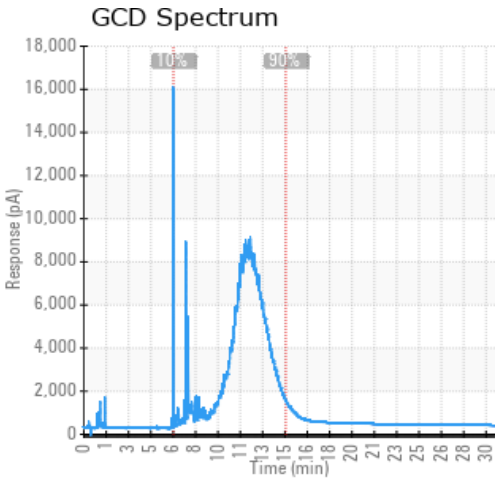
PETRO-CANADA LUBRICANTS

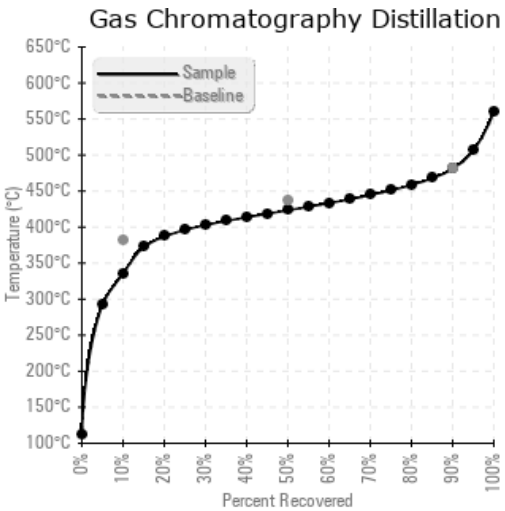


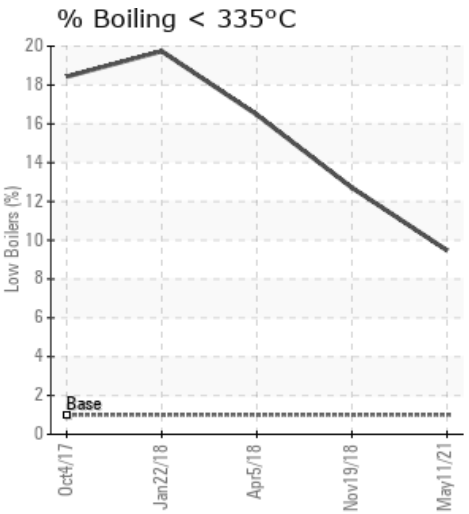


Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
05/11/21	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
11/19/18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04/05/18	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01/22/18	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/04/17	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Baseline Data			0	0						0			0	0					0				0	

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







Historical Comments

11/19/18	Compared with the previous condition of the fluid there are improvements in Flash Point and low boiler vapor content. Viscosity and distillation curve temperatures are still low. The fluid is suitable for further use. Please keep venting on a regular basis and re-sample in 6 months. (GCD) 10% Distillation Point is severely low. (GCD) 90% Distillation Point is severely low. (GCD) % < 335°C is abnormally high. (GCD) 50% Distillation Point is abnormally low. COC Flash Point is marginally low.
04/05/18	Condition of the fluid is similar to condition in January. Viscosity is very low, Flash Point is low, % boil-off below 335C. is high. The condition is believed to be the result of mixing with a low viscosity fluid (Therminol 59) with some additional thermal degradation indicated by the low 10% GCD temperature. Please vent off low boiler vapor to atmosphere and resample in 3 months. (GCD) % < 335°C is severely high. (GCD) 10% Distillation Point is severely low. COC Flash Point is abnormally low. Visc @ 40°C is abnormally low.
01/22/18	Like the fluid in the Refridge system, the condition has remained the same. Viscosity, Flash Point and 10% GCD temp are low and low boiler vapor content is high. (% boil-off <335C) A low boiler vapor content of almost 20% is a problem for circulation of the fluid through the system. Pumps can vapor lock and damage due to cavitation. It's recommended to top-up with 10% of the total volume to lower the low boiler vapor content. This will take several steps of topping-up which can take place at a 6 months interval followed by taking a sample. The fluid is suitable for use. (GCD) % < 335°C is severely high. (GCD) 10% Distillation Point is severely low. COC Flash Point is marginally low.
10/04/17	A combination of low viscosity, Flash Point and 10% GCD temperature plus a very high low boiler vapor content (% boil-off <335C.) would normally indicate thermal degradation but since fluid service life has only been 42 days this condition could be the result of one of the following: 1. Mixing with another (low viscosity) heat transfer fluid. 2. Contamination with a process fluid. 3. Ingress of blanket gas when blanket gas pressure is too high and natural gas is in use. Please identify the problem and rectify (GCD) % < 335°C is severely high. (GCD) 10% Distillation Point is severely low. Visc @ 40°C is abnormally low. COC Flash Point is marginally low.