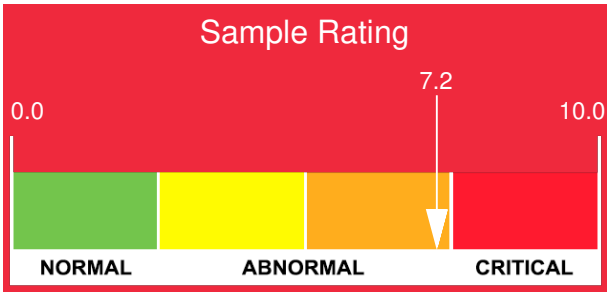
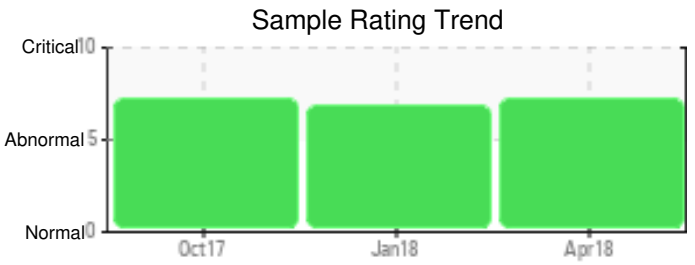




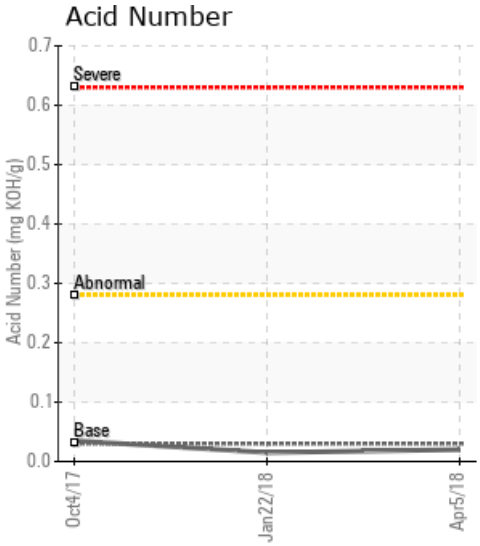
[SIMONETTE GAS PLANT / LSD: 9-6-63-25-W5] STABILIZER SIMONETTE PLANT

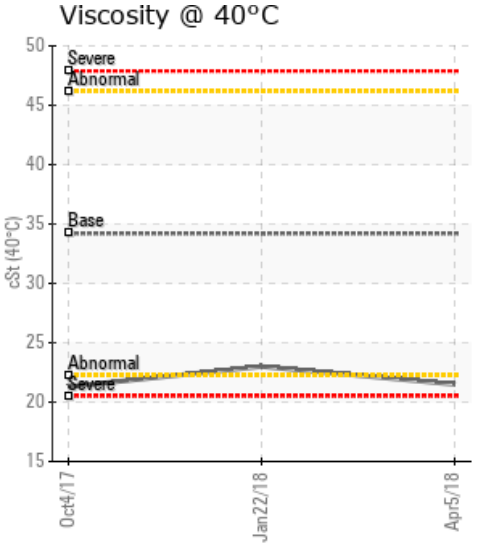
Customer: PTRHTF20187	System Information	Sample Information
KEYERA ENERGY- SIMONETTE GAS PLANT PO BOX 58 VALLEYVIEW, AB T0H 3N0 Canada Attn: Justin Clark Tel: (780)524-8940 E-Mail: justin_clarke@keyera.com	System Volume: 18000 ltr Bulk Operating Temp: 446F / 230C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: PETROTECH	Lab No: 02210086 Analyst: Peter Harteveld Sample Date: 04/05/18 Received Date: 04/16/18 Completed: 04/18/18 To discuss this report contact Peter Harteveld at (780)967-4234

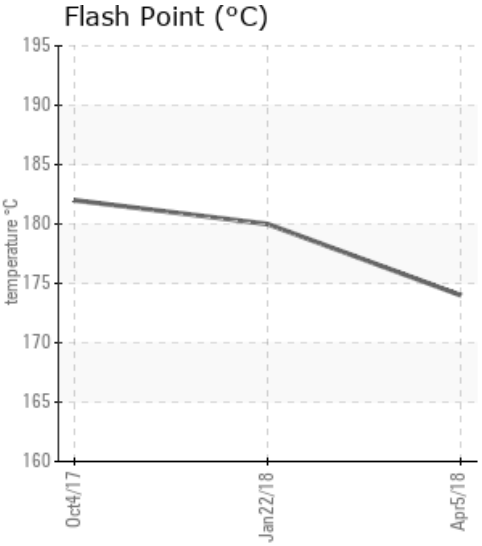
Recommendation: Condition of the fluid is similar to condition in January. Viscosity is very low, Flash Point is low, % boil-off below 335C. is high. The condition is believed to be the result of mixing with a low viscosity fluid (Therminol 59) with some additional thermal degradation indicated by the low 10% GCD temperature. Please vent off low boiler vapor to atmosphere and resample in 3 months.

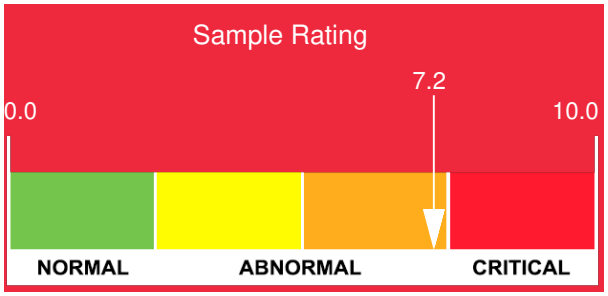
Comments: (GCD) % < 335°C is severely high. (GCD) 10% Distillation Point is severely low. COC Flash Point is abnormally low. Visc @ 40°C is abnormally low.

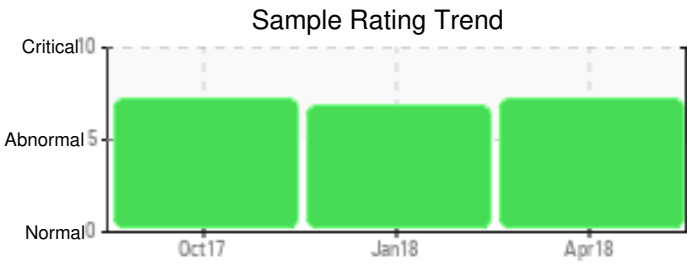
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
04/05/18	04/16/18	7m		345 / 174	10.3	21.5	0.02	0.014	556 / 291	803 / 428	915 / 490	16.47
01/22/18	01/29/18	5m		356 / 180	4.2	23.0	0.015	0.036	550 / 288	789 / 421	906 / 485	19.74
10/04/17	10/17/17	42m		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





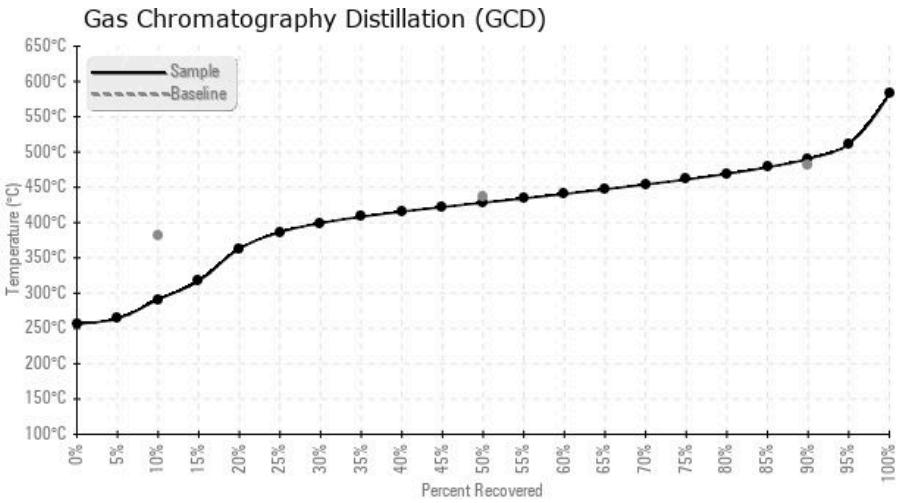


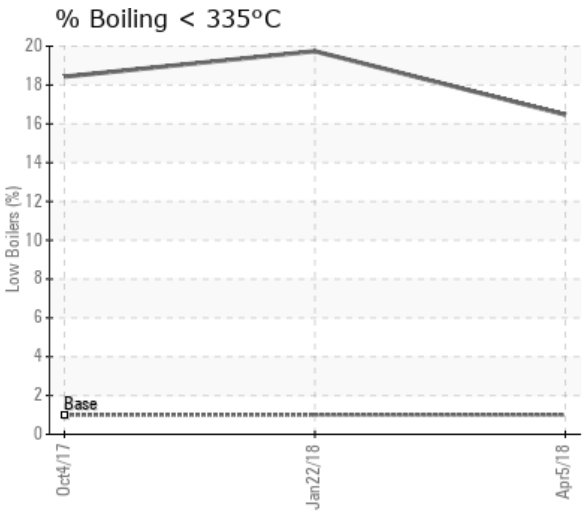




Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
04/05/18	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01/22/18	4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/04/17	2	0	0	0	0	0	1	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

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.