

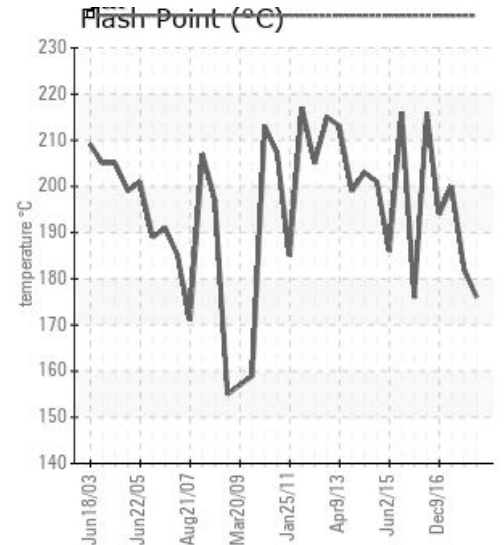
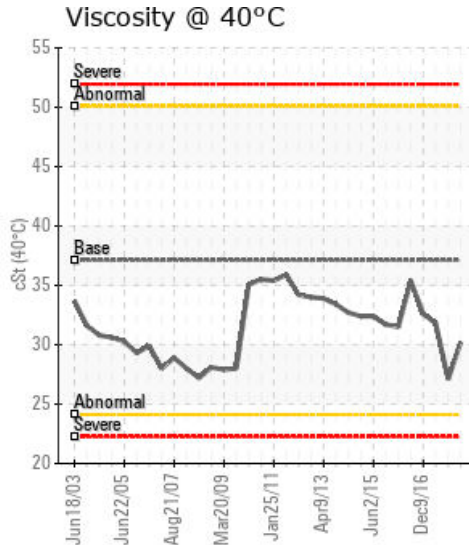
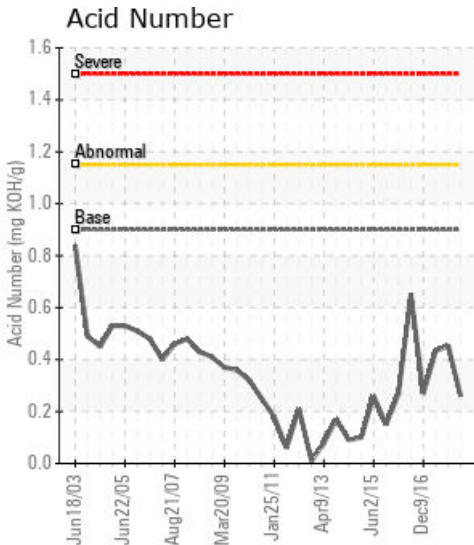
RELUTHERM RTAG-14

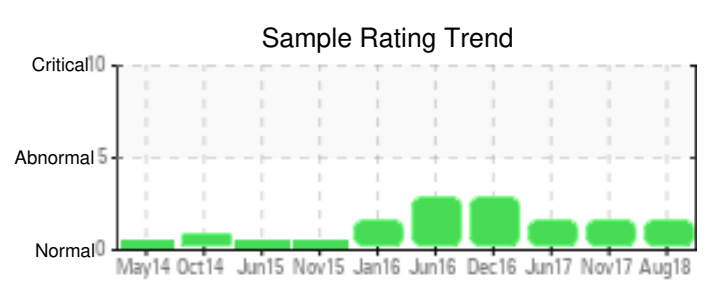
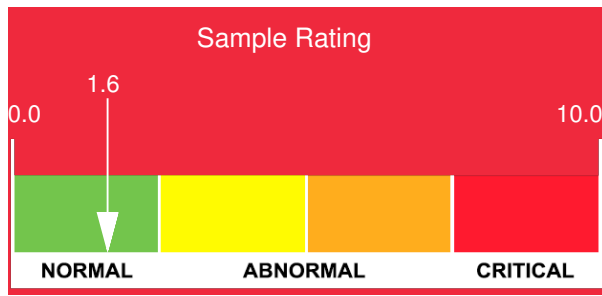
Customer: PTRHTF40043	System Information	Sample Information
MORA PRODUCTIE BV FREGATWEG 53 MAASTRICHT 6222NZ MAASTRICHT, 6222NZ Netherlands Attn: WILBERT SNIJERS Tel: E-Mail: w.snijers@klt.nl	System Volume: 10000 ltr Bulk Operating Temp: 275F / 135C Heating Source: Blanket: Fluid: PETRO CANADA PURITY FG HEAT TRANSFER FLUID Make: RELUTHERM	Lab No: 02236313 Analyst: Philip Riley Sample Date: 08/23/18 Received Date: 08/28/18 Completed: 08/31/18 To discuss this report contact Philip Riley at (440)124-4378171

Recommendation: Flash Point (COC) continued decline to a point at which the fluid needs to be changed. The GCD shows increased number of light molecules also supporting this. If the system can be safely vented then it may prolong the service life by raised the flash point. If it cannot then the fluid should be changed

Comments: COC Flash Point is severely low.

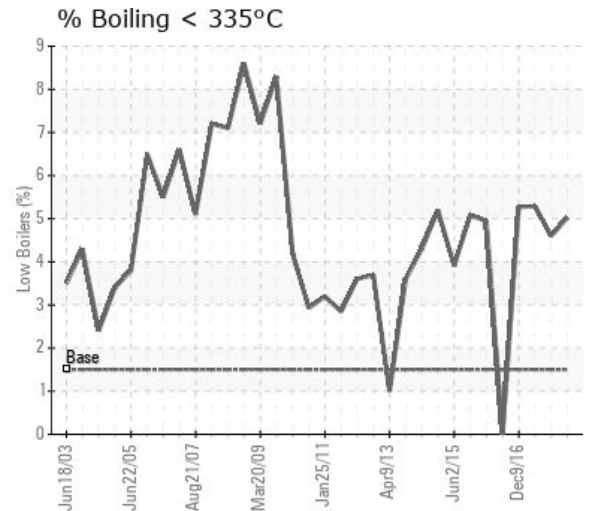
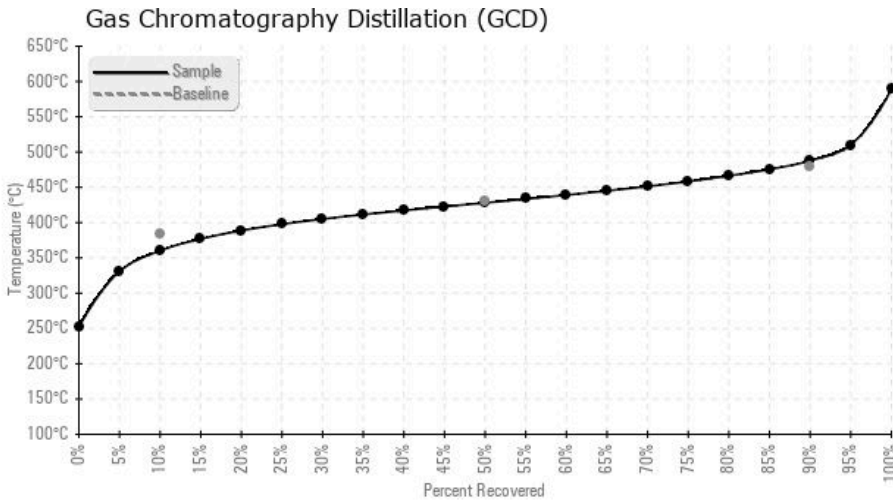
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
08/23/18	08/28/18	15y		349 / 176	0.00	30.2	0.26	0.156	680 / 360	802 / 428	910 / 488	5.02
11/24/17	11/29/17	15y		360 / 182	69.6	27.1	0.452	0.070	688 / 364	809 / 432	915 / 491	4.60
06/20/17	06/26/17	14y		392 / 200	21.3	31.8	0.434	0.085	681 / 360	809 / 432	928 / 498	5.29
12/09/16	12/16/16	14y		381 / 194	9.6	32.6	0.27	0.115	682 / 361	808 / 431	935 / 502	5.27
06/21/16	06/27/16	13y		421 / 216	45.5	35.4	0.65	0.077	729 / 387	799 / 426	891 / 477	0.00
01/22/16	01/28/16	13y	PTRHTF 40043	349 / 176	54.6	31.5	0.270	0.111	683 / 362	805 / 430	910 / 488	4.94
Baseline Data				459 / 237		37.12	0.90		721 / 383	807 / 431	892 / 478	1.5





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	
08/23/18	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	5	
11/24/17	6	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	36	2
06/20/17	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	4
12/09/16	11	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	38	4
06/21/16	144	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	0	88	12
01/22/16	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	31	0
Baseline Data			0	0						0			0	0					0					230	

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



Historical Comments	
11/24/17	COC flash very low, and significant drop in viscosity. Evidence of increased light molecules in the GC. If safe to do so, should consider venting the system to remove light end molecules which should raise the flash point. If this cannot be done, consider oil change as the fluid is deteriorating. COC Flash Point is abnormally low. (GCD) 90% Distillation Point is marginally high.
06/20/17	Oil is fit for further service. Suggest sample at next scheduled maintenance interval. (GCD) 90% Distillation Point is abnormally high. COC Flash Point is marginally low.
12/09/16	Oil appears to be fit for further service. Suggest sample at next scheduled maintenance interval. (GCD) 90% Distillation Point is severely high. COC Flash Point is marginally low.
06/21/16	Higher than expected levels of Iron have been identified. Suggest find why high levels of Iron are present and remove if possible. Oil is fit for further service, sample at next scheduled maintenance interval. PQ levels are abnormal. Iron ppm levels are abnormal.
01/22/16	NOTE: Flashpoint test performed twice, 172°C and 176°C. Oil is fit for further service. Sample at next scheduled maintenance interval. COC Flash Point is severely low.

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