

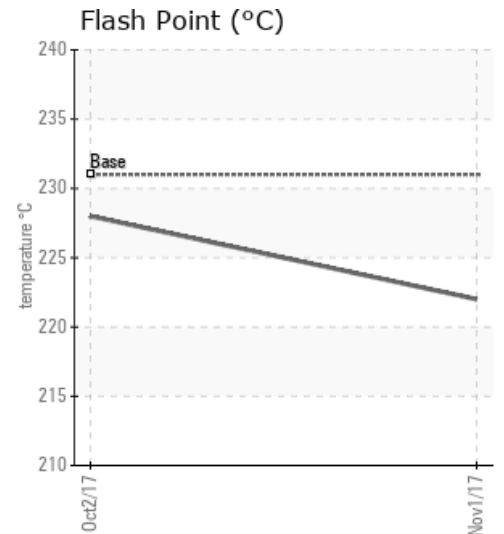
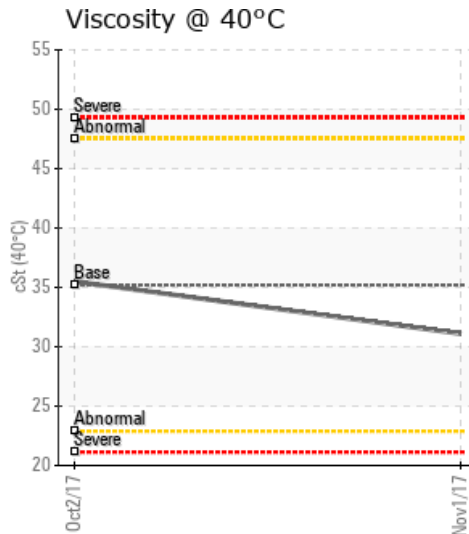
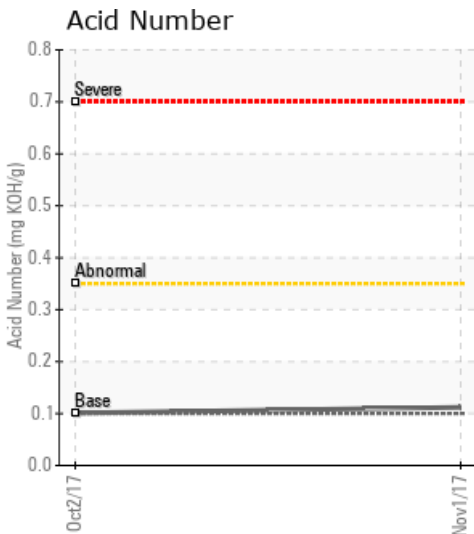
## LN01 Filled Sealdown Loop Hot Oil System

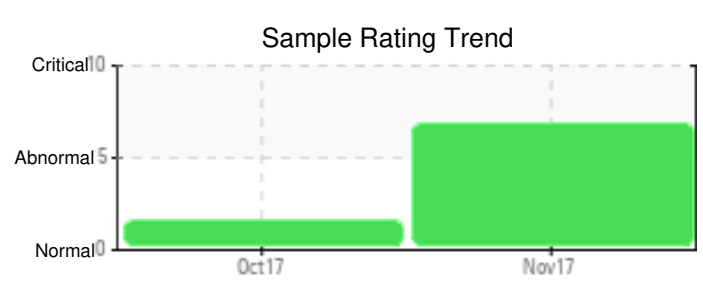
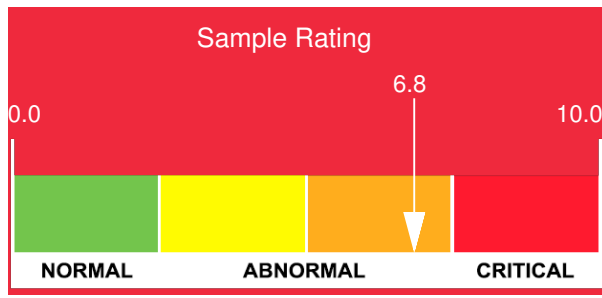
Customer: PTRHTF10141	System Information	Sample Information
TAMKO BUILDING PRODUCTS 2300 35TH ST TUSCALOOSA, AL 35401 USA Attn: Greg Colburn Tel: (205)752-3555 E-Mail: gregory_colburn@tamko.com	System Volume: 110 gal Bulk Operating Temp: 350F / 177C Heating Source: Blanket: Fluid: PETRO CANADA CALFLO HTF Make: Heat Exchanger And T	Lab No: 02193414 Analyst: Manny Garcia Sample Date: 11/01/17 Received Date: 01/18/18 Completed: 01/25/18 To discuss this report contact Manny Garcia at 954-384-7259

**Recommendation:** This sample has significantly changed negatively since the previous sample 1 month prior. This fluid may be a candidate for a drain, flush and fill with virgin Calflo HTF only because of the rate of change noticed between samples.

**Comments:** Pentane Insolubles have increased from .02 to .2 which is a big leap in the 'solids' found in the oil. Oil oxidation may be occurring as witnessed in the severe increase in the distillation curve <335oC (GCD) 50% Distillation Point is severely low. (GCD) 90% Distillation Point is severely low. (GCD) 10% Distillation Point is abnormally low. (GCD) % < 335°C is marginally high.

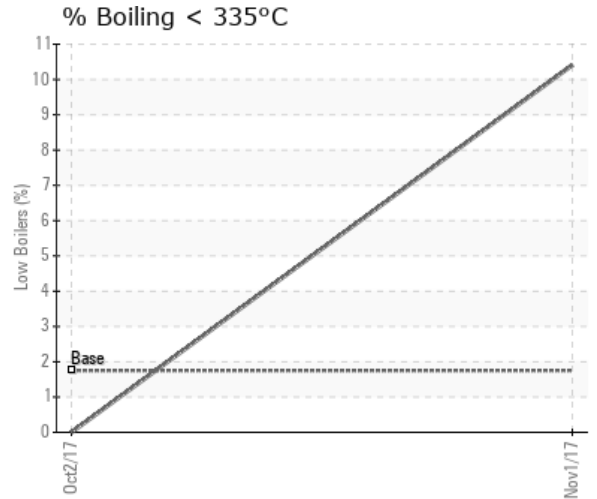
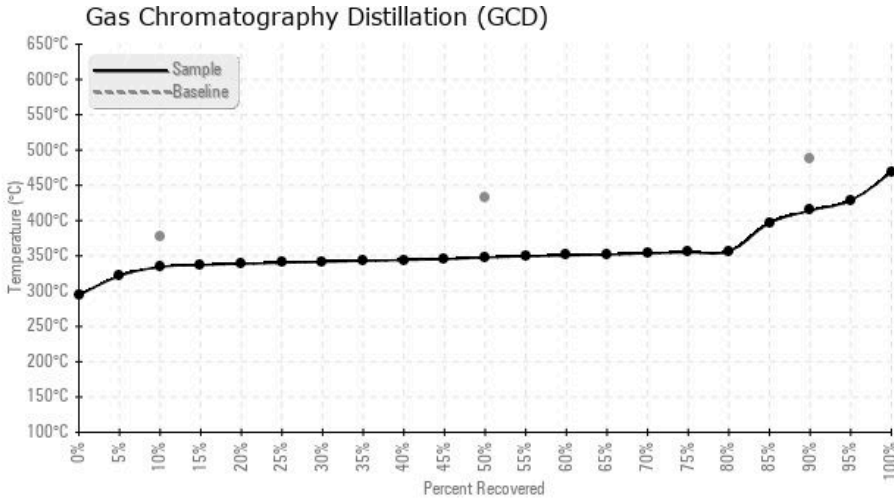
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
11/01/17	01/18/18	6m		432 / 222	14.9	31.1	0.112	0.275	634 / 334	658 / 348	778 / 414	10.41
10/02/17	10/10/17	0m		442 / 228	9.9	35.5	0.101	0.023	740 / 393	807 / 431	890 / 477	0.00
<b>Baseline Data</b>				448 / 231		35.20	.1		712 / 378	810 / 432	910 / 488	1.75





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
11/01/17	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
10/02/17	1	0	0	0	0	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	46	0
<b>Baseline Data</b>			0	0						0			0	0					0				280	

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



Historical Comments	
10/02/17	The distillation points may be mitigated by 'venting' the heat transfer system. Oil is suitable for continued use. Please send any samples in immediately after any maintenance has been completed to rectify the distillation points. Wear Metals are satisfactory; Contamination levels are in check; Water is low at 9.9ppm; Acid number is low; Viscosity of the fluid is satisfactory at 35.5 Cst; COC Flash Point is good; (GCD) 10% Distillation Point is marginally high. (GCD) 90% Distillation Point is marginally low. Pentane insolubles are low; No visible debris detected.