

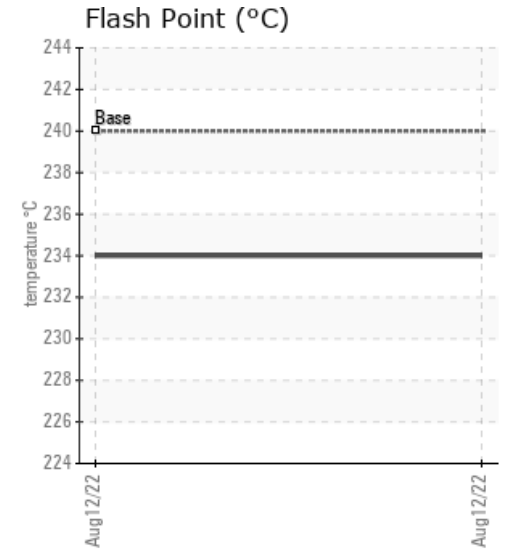
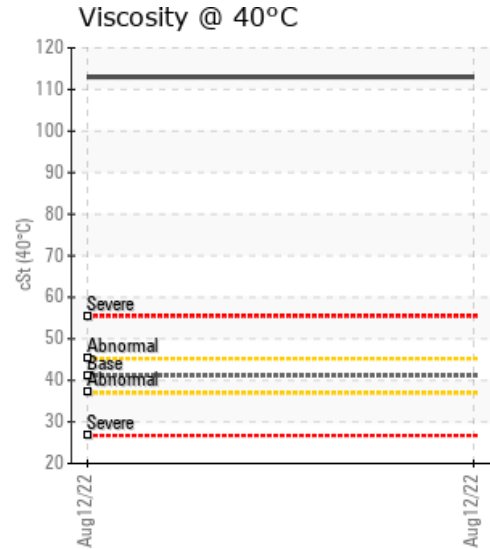
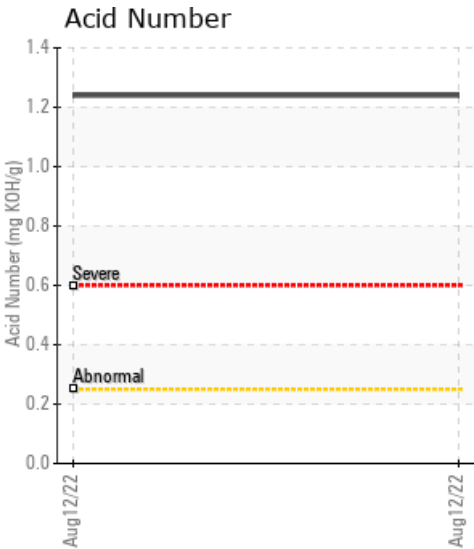
HEAT TRANSFER

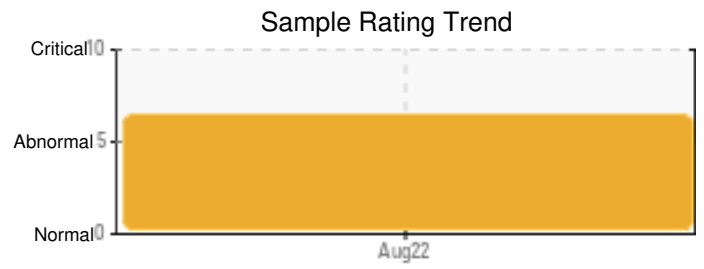
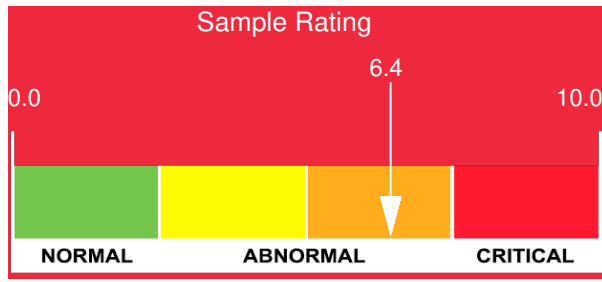
Customer: PTRHTF10259	System Information	Sample Information
HELENA SAND AND GRAVEL 2802 LAKE HELENA DR HELENA, MT 59602 USA Attn: Josh Mix Tel: (406)410-0009 E-Mail: josh.mix@helenasg.com	System Volume: 0 ltr Bulk Operating Temp: 340F / 171C Heating Source: Blanket: Fluid: CHEVRON HEAT TRANSFER OIL 46 Make: CEI	Lab No: 02510960 Analyst: Ron LeBlanc Sample Date: 08/12/22 Received Date: 09/15/22 Completed: 09/28/22 Ron LeBlanc Ronald.LeBlancSr@HFSinclair.com

Recommendation: *** NOTE: viscosity tested twice (113 cSt and 113 cSt). The sample appears very thick ***An increase in viscosity :indicates presence of high boilers (oxidation)reduces the fluid's ability to transfer heatTAN: Measure of the extent to which the fluid has been oxidized into acidic componentsIncreases exponentiallyNew oil TAN < 0.2 typical, condemning limit > 1.0Tendency for sludge deposits and system corrosion if fluid used beyond condemning limit.Overall results indicate Oxidation and solids showing up in the oil. Viscosity is extremely high. TAN confirms oxidation causing acids to degrade the oil. The system should e cleaned, flushed and refilled with new Petrotherm oil.

Comments: Vanadium ppm levels are marginal. Pentane Insolubles levels are severely high. Acid Number (AN) is severely high. Visc @ 40°C is severely high.

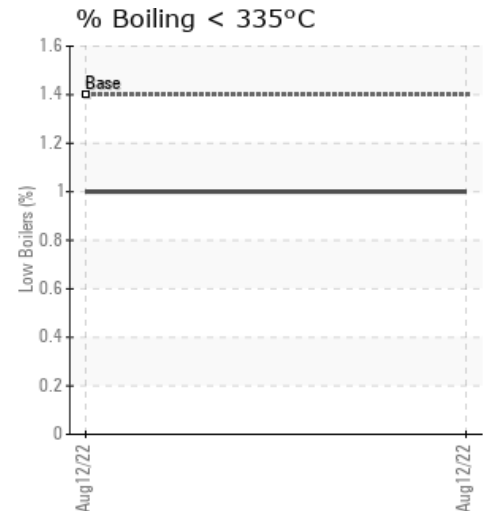
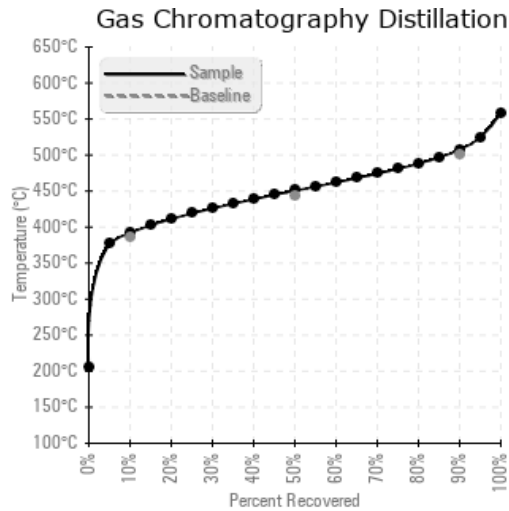
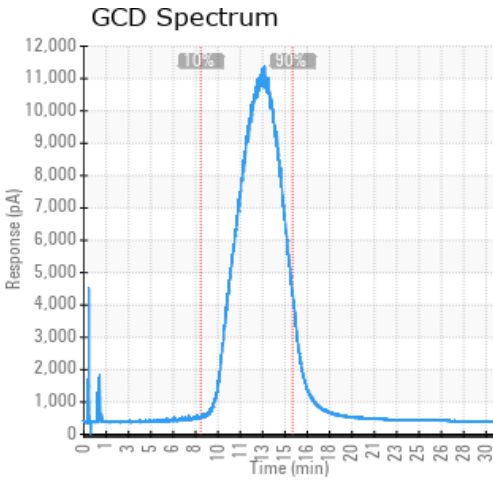
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
08/12/22	09/15/22	12.0y	at strainer	453 / 234	152.5	113	1.24	5.18	737 / 392	843 / 450	946 / 508	1.00
Baseline Data				464 / 240		41.1			727 / 386	828 / 442	932 / 500	1.4





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
08/12/22	120	0	8	0	0	0	1	0	0	22	0	0	0	0	0	0	1	0	1	0	0	0	0	2
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

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