

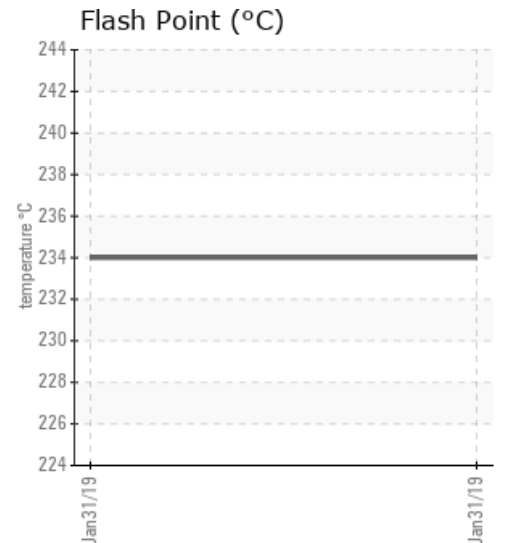
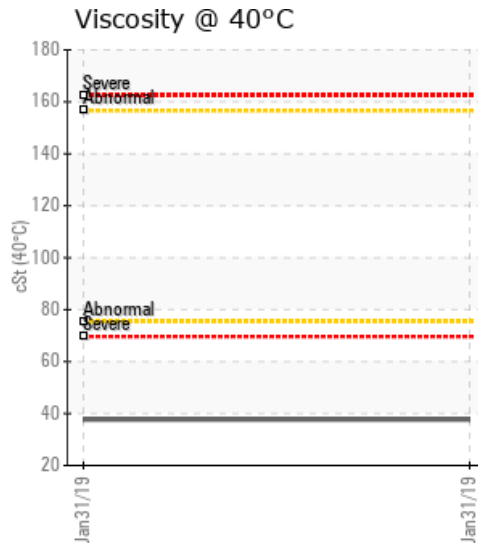
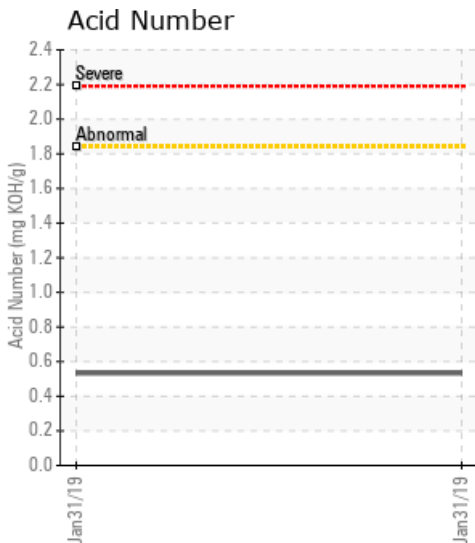
HEAT TRANSFER

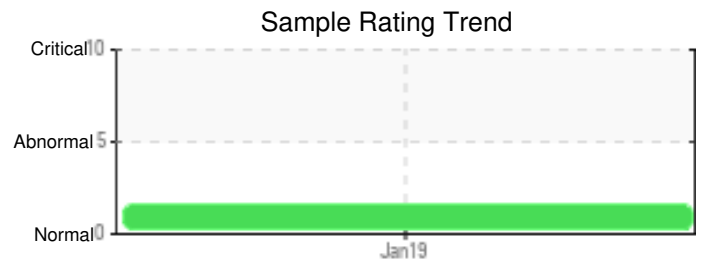
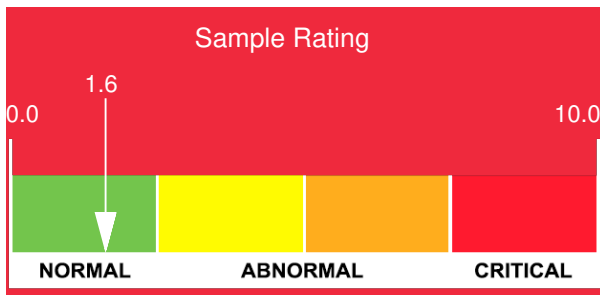
Customer: PTRHTF10190	System Information	Sample Information
HOLLY FRONTIER ASPHALT 7110 W. NORTHERN AVENUE GLENDALE, AZ 85303 USA Attn: MARK NIELSON Tel: (602)617-7010 E-Mail: mark.nielson@hollyfrontier.com	System Volume: 7200 gal Bulk Operating Temp: 450F / 232C Heating Source: Blanket: Fluid: N/A Make: ARIZONA BOILER	Lab No: 02267989 Analyst: Steven Slanker Sample Date: 01/31/19 Received Date: 02/14/19 Completed: 02/19/19

Recommendation: Note, because of the levels of calcium and sulfur they thought this sample was Paratherm LC. The high calcium and sulfur levels show it still contains cleaner in it. Acid number and viscosity are high. All of these are a result of not flushing the fluid. Overall the fluid is in ok condition considering the quick changeout.

Comments: Calcium ppm levels are severely high. Visc @ 40°C is abnormally low.

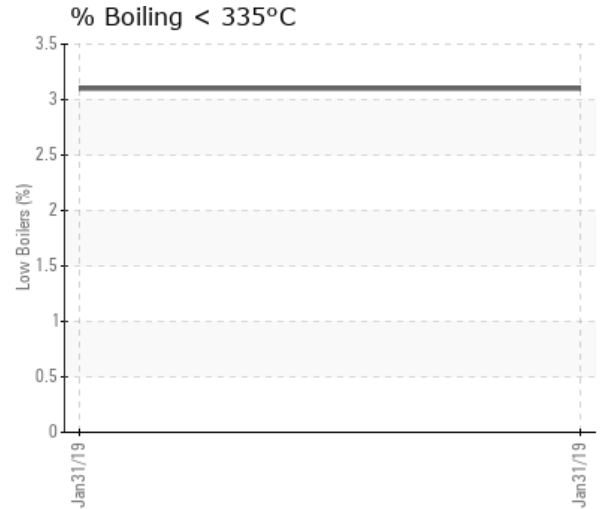
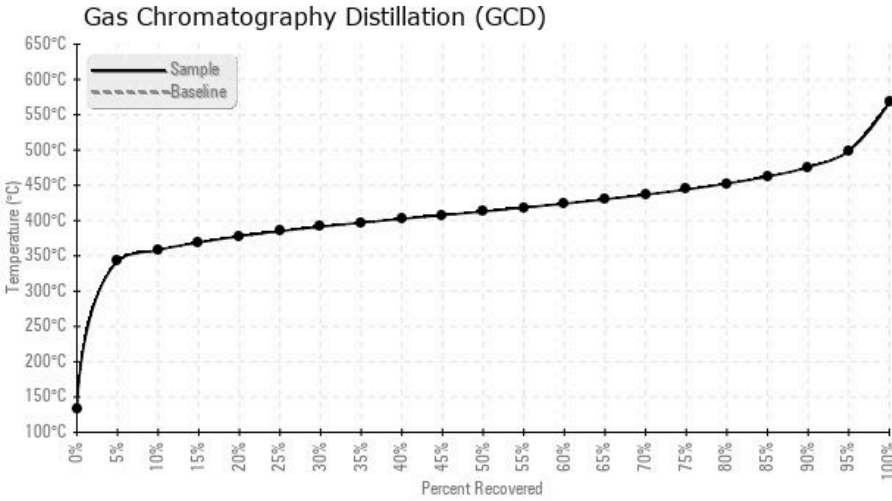
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
01/31/19	02/14/19	34d	AT THE HEATER	453 / 234	117.7	37.7	0.533	0.301	677 / 358	775 / 413	888 / 476	3.10
Baseline Data				32 / 0								





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
01/31/19	26	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	229	0	5	1
Baseline Data													0						0			0		

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



Historical Comments
