

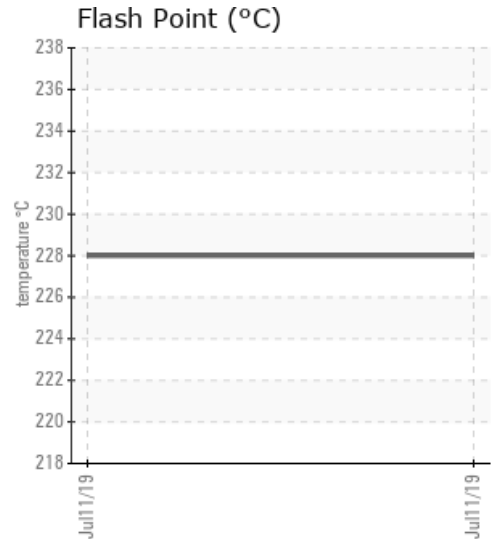
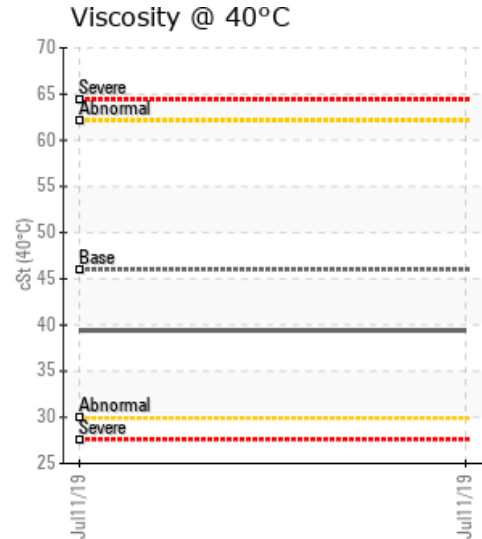
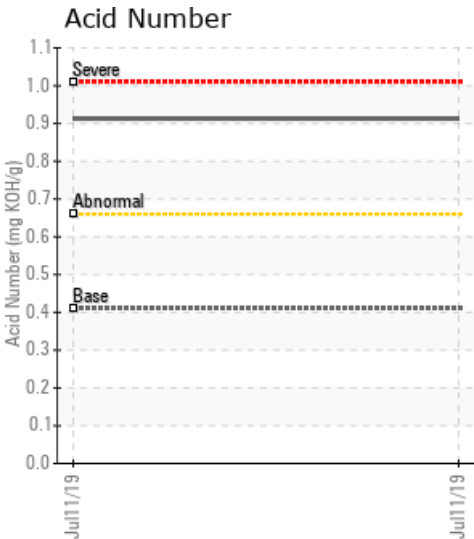
# #1 INLET TO TANK 104] HEAT TRANSFER

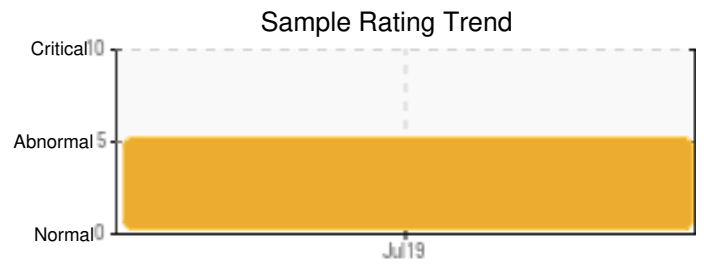
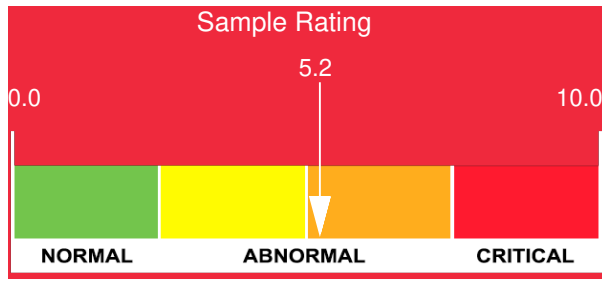
Customer: PTRHTF10217	System Information	Sample Information
HOLLY FRONTIER ASPHALT 2411 N FREEMAN ARTESIA, NM 88210 USA Attn: Roger Kilpatrick Tel: (575)748-1368 E-Mail: roger.kilpatrick@hollyfrontier.com	System Volume: 0 gal Bulk Operating Temp: 380F / 193C Heating Source: Blanket: Fluid: HEAT TRANSFER FLUID ISO 46 Make: AMERICAN HEAT	Lab No: 02298211 Analyst: Gaston Arseneault Sample Date: 07/11/19 Received Date: 07/19/19 Completed: 07/20/19

Recommendation: The fluid was described as a mixture of various products over the last 10 years. It does not appear to have been contaminated with asphalt since the viscosity is somewhat within an acceptable range and Vanadium is not present. The oil is heavily oxidized (degraded) however as the Acid Number is very high and the amount of solids (insoluble) is high. We don't think the system will need a full cleaning unless you see signs of obstructed jackets or pipes or reduced furnace efficiency. If no actions are to be taken before the 2020 shut down, we suggest to plan for a drain, flush and refill in 2020. If there is money in the budget for a partial fluid replacement in 2019 this would help reduce the need for a flush in 2020. In this case we recommend to replace 30% of the oil with fresh Petro-Therm in order to reduce the acidity level and concentration of debris in the oil.

Comments: Pentane Insolubles levels are severely high. COC Flash Point is severely high. Acid Number (AN) is severely high.

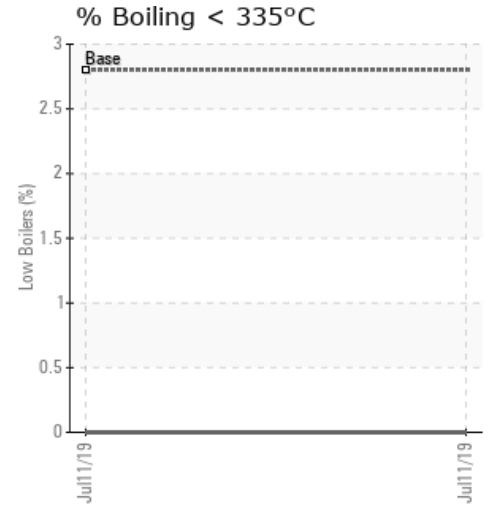
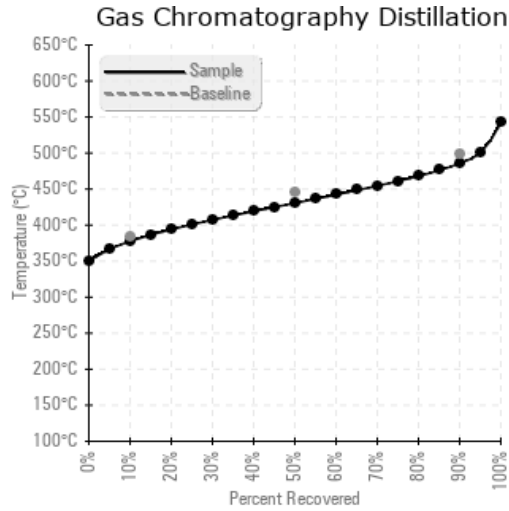
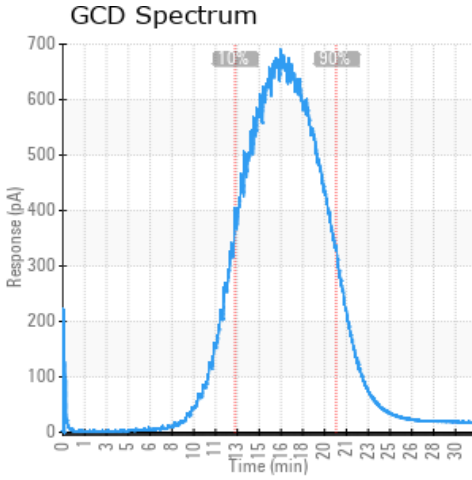
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
07/11/19	07/19/19	0h		442 / 228	158.6	39.4	0.913	1.88	712 / 378	807 / 431	906 / 486	0.00
Baseline Data				32 / 0		46	0.41		721 / 383	835 / 446	930 / 499	2.8





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
07/11/19	64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	2	0	0
<b>Baseline Data</b>			0	0						0			0	0					5				250	

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



### Historical Comments


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