

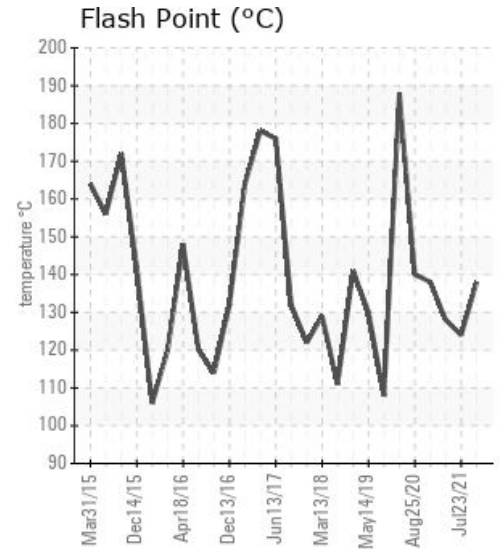
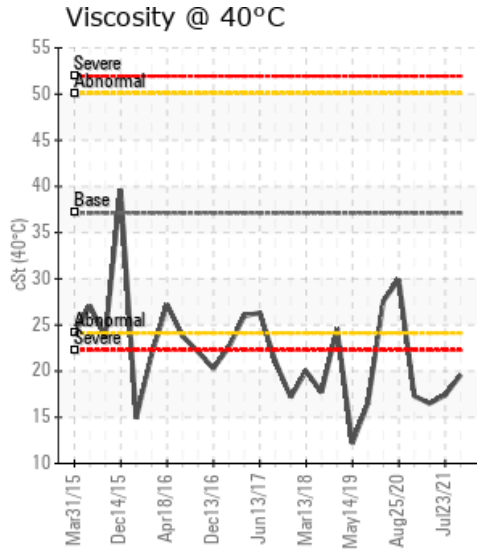
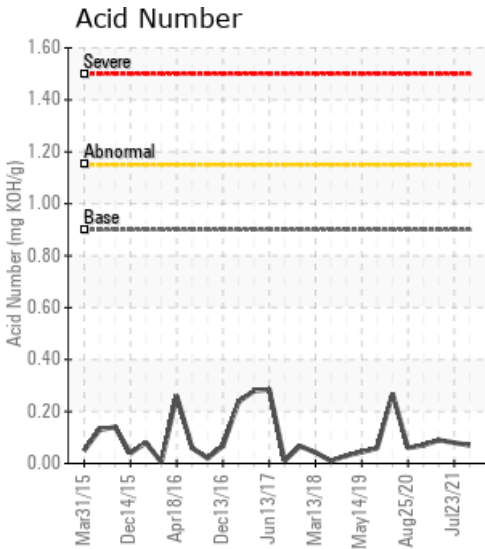
## VTA HOT OIL PUMP

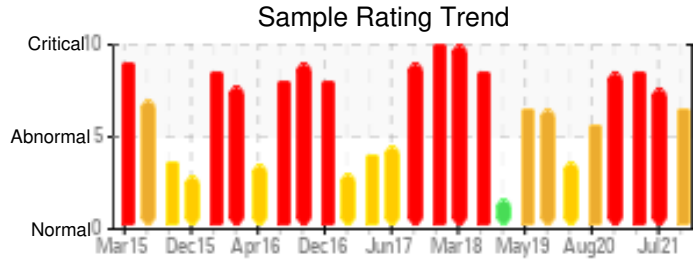
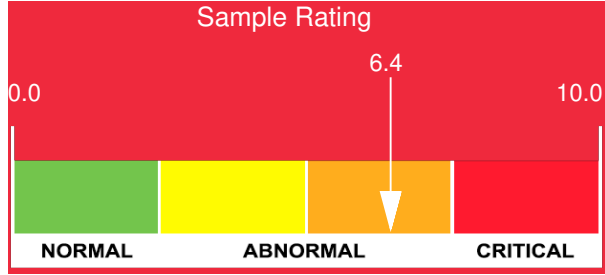
Customer: PTRHTF10004	System Information	Sample Information
ADM VITAMIN E PLANT 3700 EAST DIVISION STREET DECATUR, IL 62526 USA Attn: Rian Campbell Tel: (217)451-7770 E-Mail: rian.campbell@adm.com	System Volume: 1800 gal Bulk Operating Temp: 650F / 343C Heating Source: Blanket: Fluid: PETRO CANADA PURITY FG HEAT TRANSFER FLUID Make: AMERICAN HEATING	Lab No: 02487804 Analyst: Yvette Trzcinski Sample Date: 05/02/22 Received Date: 05/10/22 Completed: 05/17/22 Yvette Trzcinski yvette.trzcinski@hollyfrontier.com

Recommendation: The sample shows signs of thermal degradation, need to monitor the low boilers they are in a cautionary level continue use of fluid but resample in 6 months to monitor the low boilers (GCD % < 335 C) and the flash point.

Comments:

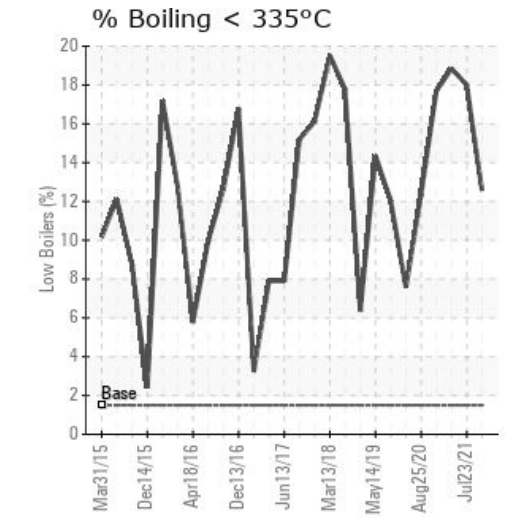
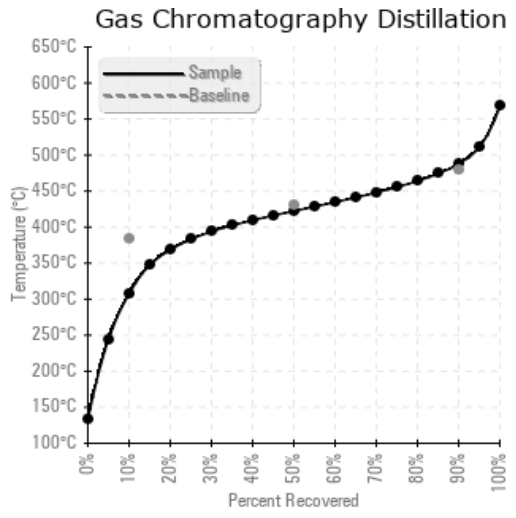
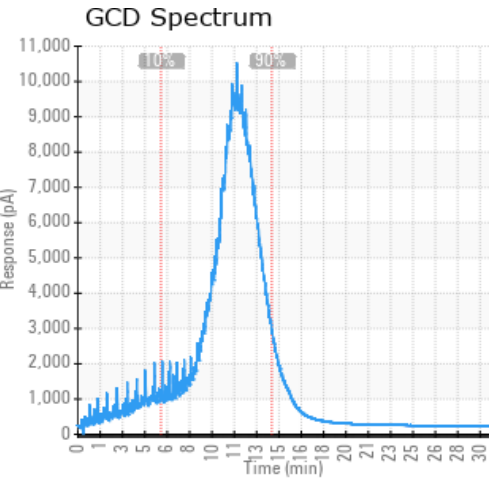
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
05/02/22	05/10/22	0.0y		280 / 138	13.7	19.6	0.07	0.030	585 / 307	792 / 422	910 / 488	12.57
07/23/21	08/04/21	0.0y		255 / 124	14.4	17.4	0.08	0.050	506 / 263	777 / 414	884 / 473	18.00
03/03/21	03/09/21	0.0y	B3 hot oil pump	262 / 128	9.4	16.5	0.09	0.046	519 / 271	777 / 414	893 / 478	18.84
11/25/20	12/08/20	0.0y	Pump	280 / 138	10.1	17.3	0.07	0.082	514 / 268	780 / 416	892 / 478	17.70
08/25/20	09/03/20	0.0y		284 / 140	10.4	29.9	0.06	0.036	586 / 308	795 / 424	902 / 483	12.35
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
05/02/22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0
07/23/21	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56	0
03/03/21	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59	0
11/25/20	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54	0
08/25/20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	0
<b>Baseline Data</b>			0	0						0			0	0				0	0				230	

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



Historical Comments	
07/23/21	System is in critical condition and has been for the last 3 samples. The low boilers are very high at 18% well above the 15% max limit which causes the flash point to drop as well as the viscosity all signs of severe degradation of the system. Recommend changing this unit out. (GCD) % < 335°C is severely high. (GCD) 10% Distillation Point is severely low. COC Flash Point is severely low. Visc @ 40°C is severely low.
03/03/21	This system is in critical condition - similar to the last analysis 3 months ago. The flash point has dropped to 128 C the fluid continues to degrade the loss in viscosity has continued it is now 16.5 cSt and the low boilers % has increased to 18.84% Recommend changing out the system as soon as it can be scheduled
11/25/20	System in critical condition. Flash point very low at 138 C. Viscosity is also very low at 17.3 Cst and will affect heat transfer and lubrication of system. The low boilers have passed the 15% mark at 17.7%. This system should be scheduled to be changed in the next 30 days. (GCD) % < 335°C is severely high. (GCD) 10% Distillation Point is severely low. COC Flash Point is severely low. Visc @ 40°C is severely low.
08/25/20	We are starting to see signs of significant cracking with low boilers passing the 12% mark and flash point at 140 C. Once the GCD <335 exceed 15% we recommend changing. I would shorten the sampling cycle by half to see what the oil looks like in mid October. Should look to change by November or do a partial exchange. (GCD) 10% Distillation Point is severely low. COC Flash Point is severely low. (GCD) % < 335°C is abnormally high.

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