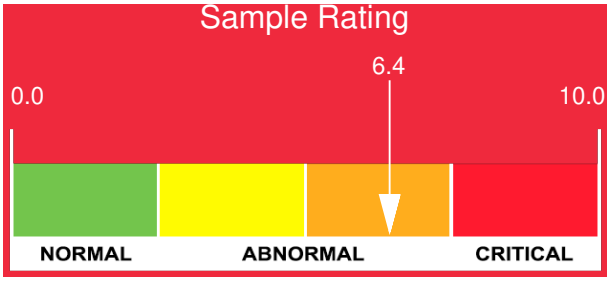
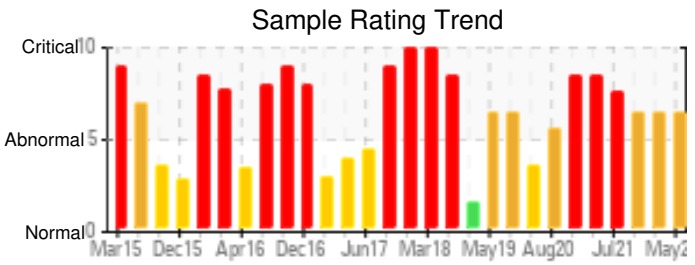
PETRO-CANADA LUBRICANTS





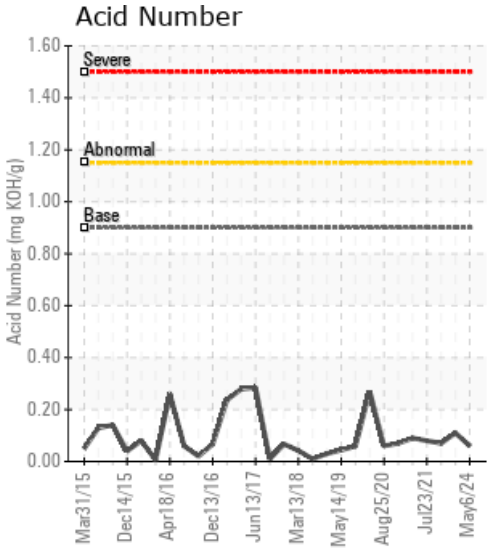
VTA HOT OIL PUMP

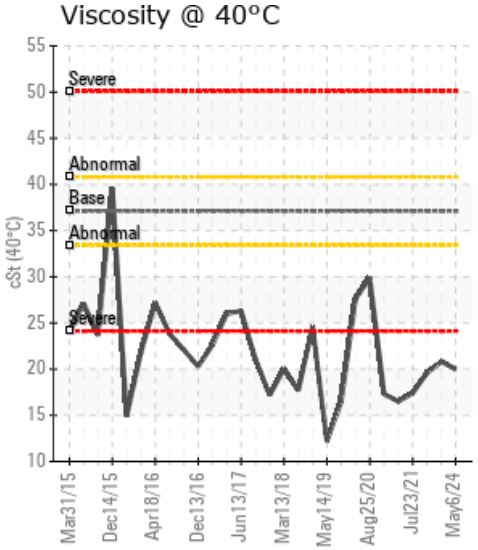
Customer: PTRHTF10004	System Information	Sample Information
ADM VITAMIN E PLANT 3700 EAST DIVISION STREET DECATUR, IL 62526 US Attn: Rick Cluck Tel: (217)451-7770 E-Mail: ricky.cluck@adm.com	System Volume: 1800 gal Bulk Operating Temp: 650F / 343C Heating Source: Blanket: Fluid: PETRO CANADA PURITY FG HEAT TRANSFER FLUID Make: AMERICAN HEATING	Lab No: 02635434 Analyst: Joe Goecke Sample Date: 05/06/24 Received Date: 05/14/24 Completed: 05/16/24 Joe Goecke Joe.goecke@HFSinclair.com

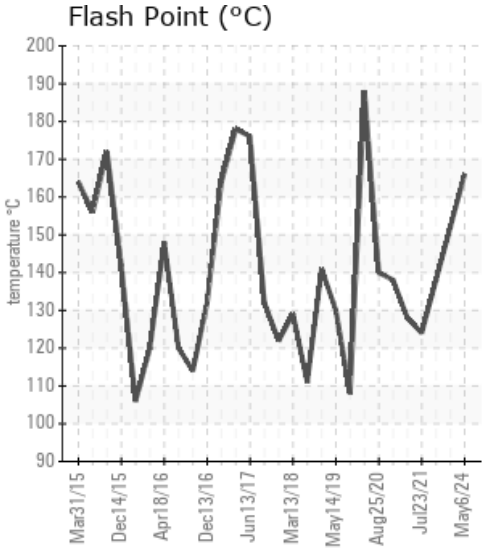
Recommendation: This system is in critical condition. The viscosity is almost one half of the original spec. the flash point is in the dangerous range of <175C. The lower viscosity is caused by the oil being cracked and producing light ends that are indicated by the 15% distilled <335C and the multiple peaks seen in the graph on the upslope. This oil should be scheduled for change in the next 90-120 days to reduce fire hazard and improve system efficiency.

Comments: (GCD) 10% Distillation Point is severely low. COC Flash Point is severely low. Visc @ 40°C is severely low. (GCD) % < 335°C is abnormally 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	%
05/06/24	05/14/24	0.0y		331 / 166	10	20.0	0.06	0.091	562 / 294	787 / 420	905 / 485	15.15
02/22/23	03/10/23	0.0y		306 / 152	22.2	20.8	0.11	0.089	581 / 305	794 / 424	907 / 486	12.54
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
Baseline Data				459 / 237		37.12	0.90		721 / 383	807 / 431	892 / 478	1.5







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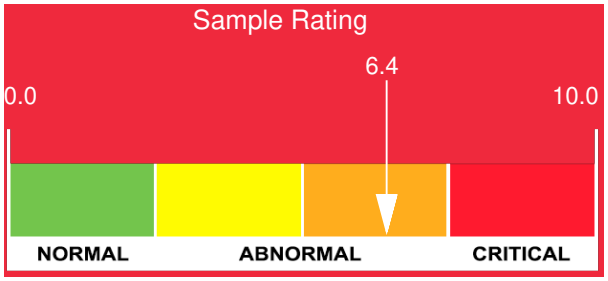
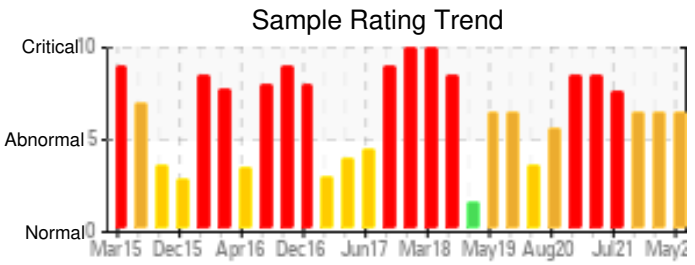
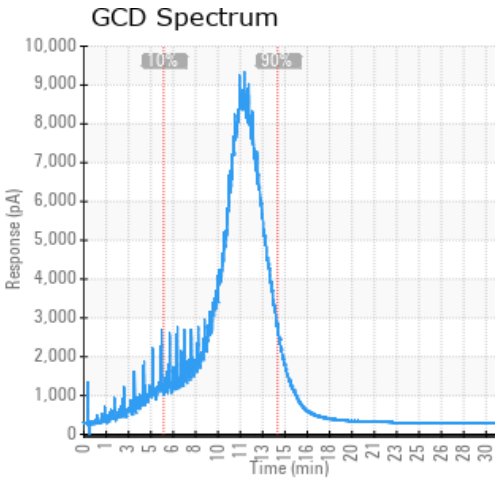
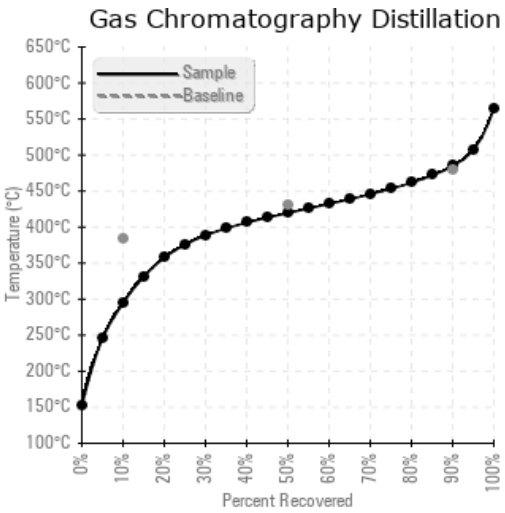


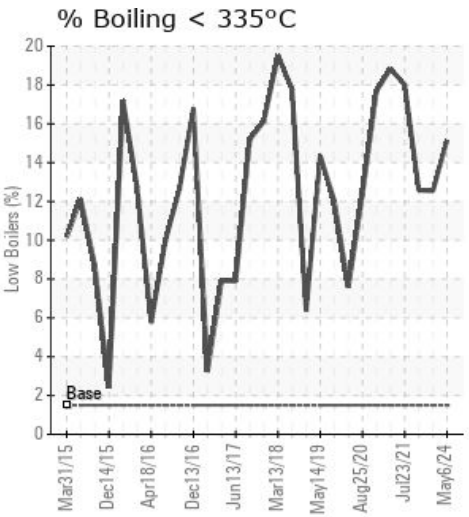


Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
05/06/24	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	61	0
02/22/23	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45	0
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
Baseline Data			0	0						0			0	0				0	0				230	

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







Historical Comments

02/22/23	Flash point and viscosity have increased slightly since the last sample but are both still very low as is the GCD % <335 C which all point to thermal degradation cracking the oil creating low viscosity molecules or low boilers consider sweetening the system with new oil at least a minimum of 30% Resample in 3 - 6 months (GCD) 10% Distillation Point is severely low. COC Flash Point is severely low. Visc @ 40°C is severely low. (GCD) % < 335°C is abnormally high.
05/02/22	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.
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