

[CENOVUS / LSD 1-8-70-11W6M] WHRU HOT OIL

Customer: PTRHTF20131
 CENOVUS
 9701 - 116ST
 1-8-70-11W6
 ELMWORTH, AB T8W 6H6 CA
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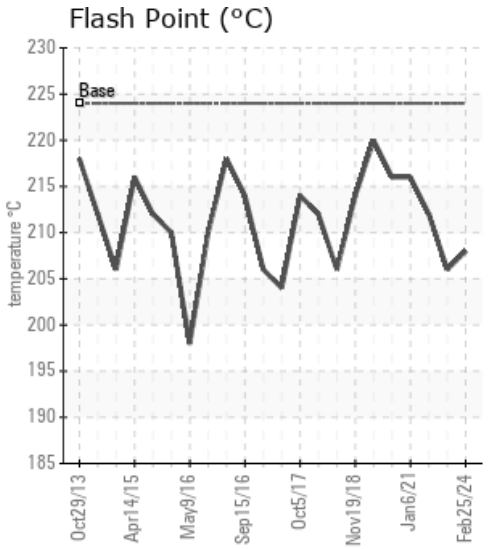
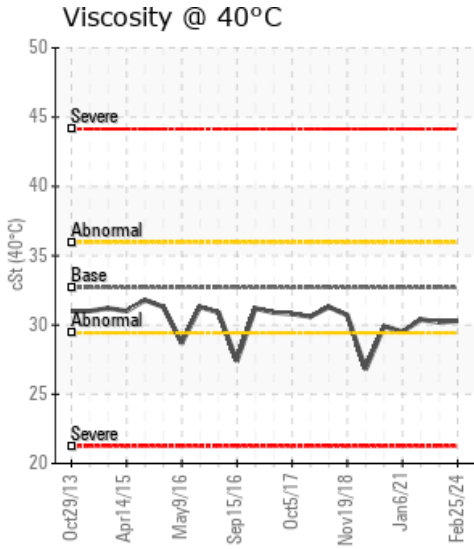
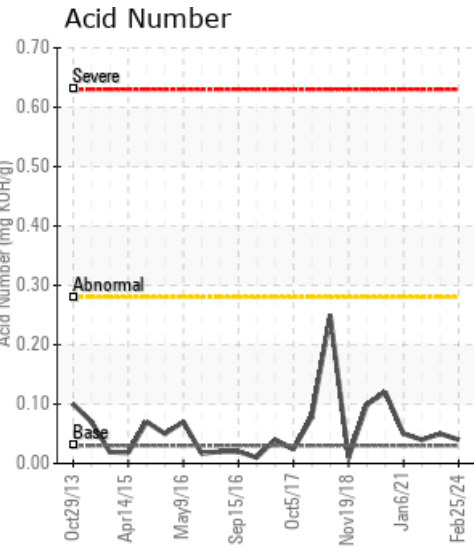
System Information
 System Volume: 75000 ltr
 Bulk Operating Temp: 424F / 218C
 Heating Source:
 Blanket:
 Fluid: PETRO CANADA CALFLO AF
 Make: OPTIMIZED PROCESS

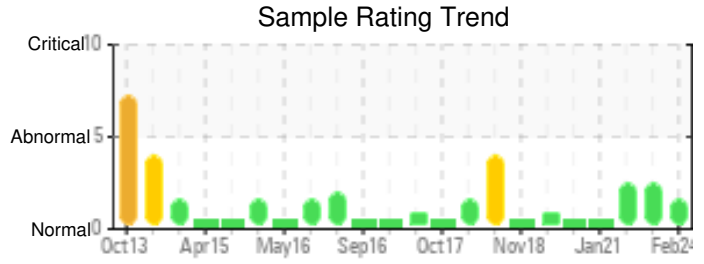
Sample Information
 Lab No: 02622487
 Analyst: Clinton Buhler
 Sample Date: 02/25/24
 Received Date: 03/15/24
 Completed: 03/18/24
 Clinton Buhler
 Clinton.Buhler@HFSinclair.com

Recommendation: Sample results indicate that the fluid is in suitable condition for continued service. Water content remains slightly elevated at 433 ppm and low boiling vapor content has increased to 3.95%. Both of these conditions can be improved through venting of the expansion tank. Regular venting is part of system maintenance. Please ensure blanket gas is operational after venting of the system. Please re-sample in 12 months

Comments:

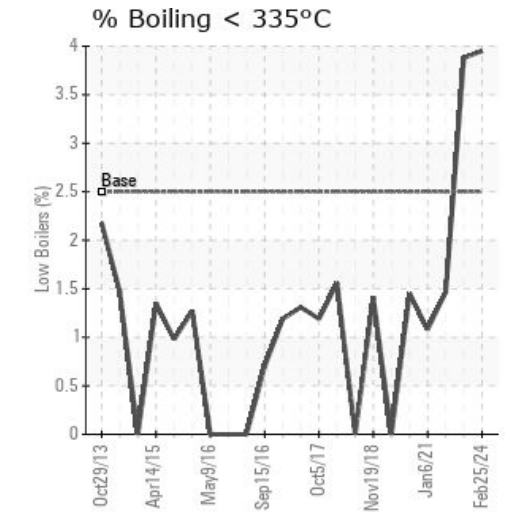
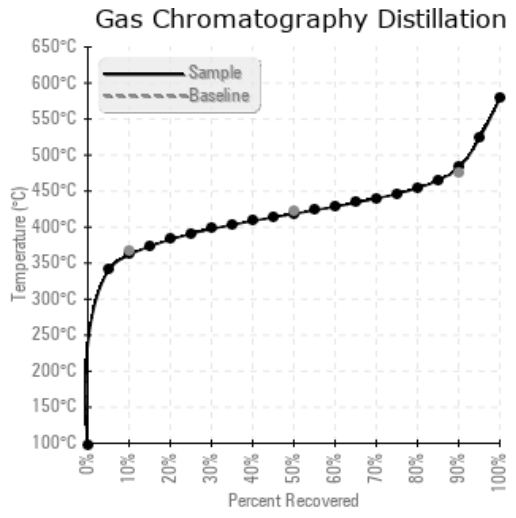
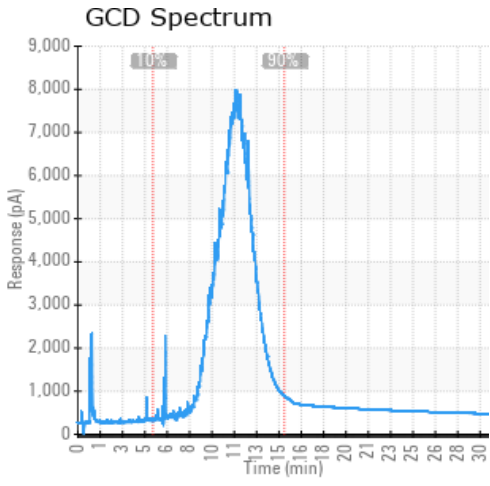
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
02/25/24	03/15/24	35.0y		406 / 208	433	30.3	0.04	0.051	682 / 361	785 / 418	900 / 482	3.95
06/01/22	06/13/22	11.0y	MAIN INLET TO SURGE	403 / 206	383.8	30.2	0.05	0.106	669 / 354	765 / 407	853 / 456	3.88
12/15/21	01/06/22	0.0y		414 / 212	238.2	30.4	0.04	0.076	704 / 374	800 / 427	891 / 477	1.47
01/06/21	01/25/21	10.0y		421 / 216	112.8	29.5	0.05	0.094	706 / 375	800 / 427	890 / 477	1.08
08/24/20	09/23/20	9.3y	MAIN INLET TO DRUM	421 / 216	245.2	29.9	0.12	0.163	706 / 374	801 / 427	890 / 477	1.45
Baseline Data				435 / 224		32.7	0.03		693 / 367	790 / 421	887 / 475	2.5





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
02/25/24	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	6	0	0	0	2	0
06/01/22	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	0
12/15/21	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	8	0	0	0	9	0
01/06/21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	4	0
08/24/20	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	4	0
Baseline Data			0	0						0			0	0					0				270	

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



Historical Comments	
06/01/22	Sample results indicate that the fluid is in suitable condition for continued service. Water content is at 383 ppm and low boiling vapor content has increased to 3.88%. Both of these conditions can be improved through venting of the expansion tank. Regular venting is part of system maintenance. Please ensure blanket gas is operational after venting of the system. Please re-sample in 12 months
12/15/21	Sample results indicate that the fluid is in suitable condition for continued service. Please re-sample in 12 months (GCD) 90% Distillation Point is marginally low.
01/06/21	Fluid analysis results indicate that the fluid is in very good condition and suitable for continued service. Please re-sample in one year.
08/24/20	Sample results indicate that the heat transfer fluid is suitable for continued service. Please re-sample in 12 months and please ensure sample valve and piping is thoroughly purged prior to taking the sample

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