

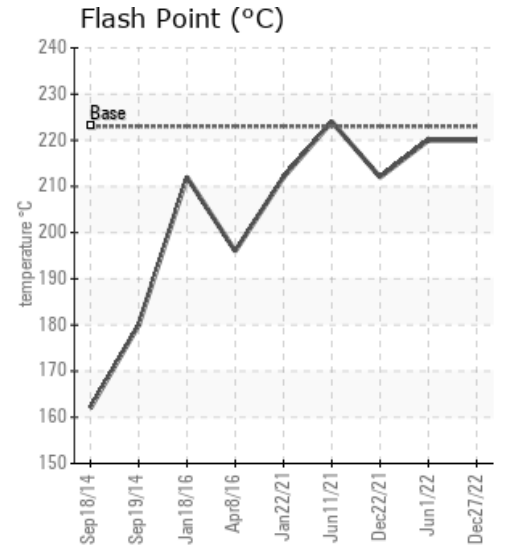
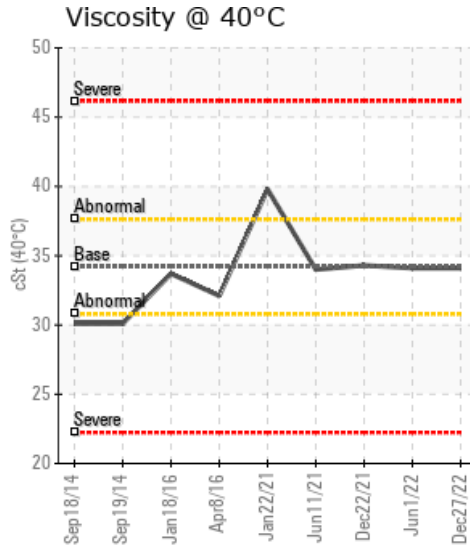
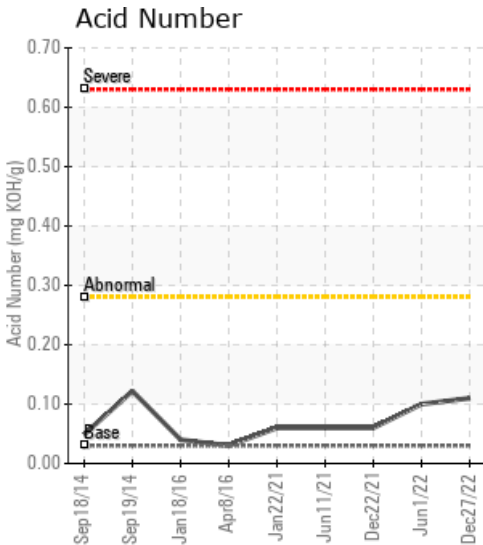
[1-24-52-20W5] H4010 (H500)-DISCHARGE OF PUMP

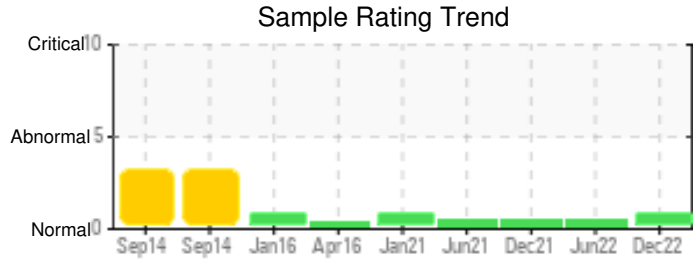
Customer: PTRHTF20103	System Information	Sample Information
CANADIAN NATURAL RESOURCES (CNRL) P.O. BOX 6808 EDSON, AB T7E 1L5 Canada Attn: Rodney Marcichiw Tel: (780)517-3542 E-Mail: rodney.marcichiw@cnrl.com	System Volume: 17000 ltr Bulk Operating Temp: 500F / 260C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: ALCO	Lab No: 02531589 Analyst: Clinton Buhler Sample Date: 12/27/22 Received Date: 01/05/23 Completed: 01/09/23 Clinton Buhler Clinton.Buhler@HFSinclair.com

Recommendation: Sample results indicate that the fluid is in suitable condition for continued service. Ensure that blanket gas remains operational. Please re-sample after 12 more months of fluid service.

Comments:

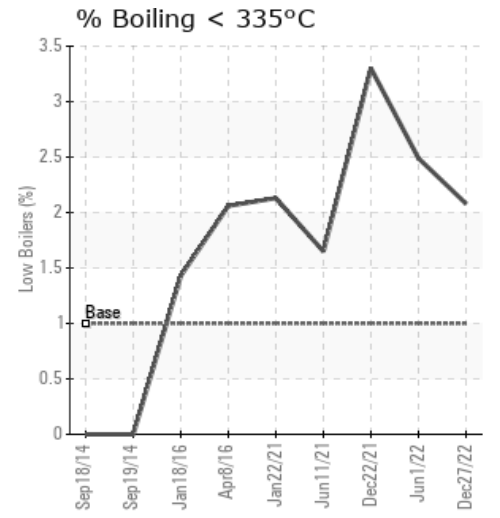
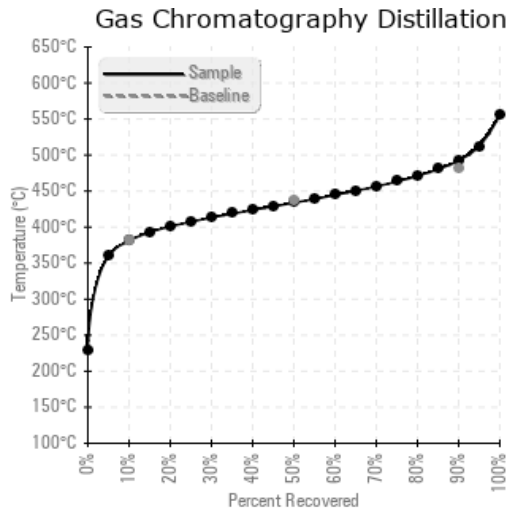
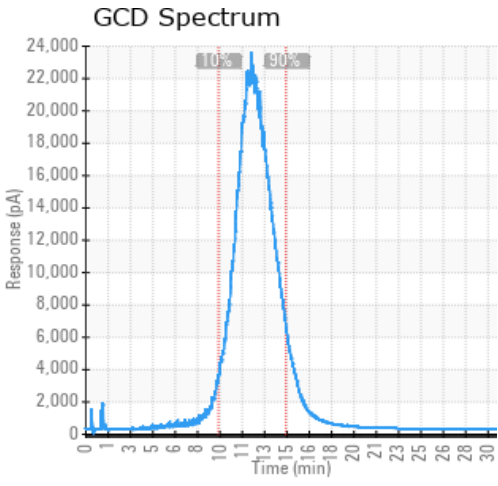
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
12/27/22	01/05/23	0.0y	PUMP DISCHARGE	428 / 220	7.7	34.1	0.11	0.160	718 / 381	813 / 434	918 / 492	2.08
06/01/22	06/20/22	4.0y	SITE GLASS	428 / 220	0.00	34.1	0.10	0.059	713 / 378	810 / 432	916 / 491	2.49
12/22/21	01/13/22	0.0y	Pump discharge	414 / 212	10.2	34.3	0.06	0.054	708 / 375	807 / 431	913 / 490	3.30
06/11/21	06/18/21	0.0y	PUMP DISCHARGE	435 / 224	2.0	34.0	0.06	0.056	717 / 381	810 / 432	915 / 491	1.65
01/22/21	01/27/21	0.0y		414 / 212	9.7	39.8	0.06	0.468	715 / 379	810 / 432	916 / 491	2.13
Baseline Data				433 / 223		34.2	0.03		720 / 382	817 / 436	900 / 482	1.00





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
12/27/22	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
06/01/22	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
12/22/21	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
06/11/21	4	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0
01/22/21	0	0	0	0	0	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Baseline Data			0	0						0			0	0					0				0	

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. Please re-sample after 12 more months of fluid service.
12/22/21	Sample results indicate that the fluid is in suitable condition for continued service. Please re-sample in 12 months
06/11/21	This fluid is in good condition and suitable for further use. Resample in 6 months.
01/22/21	The fluid is in a good condition but slightly elevated viscosity at 40C combined with a high 90% GCD temperature indicates the onset of oxidation. Please ensure the blanket gas system is in good working order. Pentane Insoluble (solids) content is getting close the reportable limit of 0.5%. Please consider fluid filtration in the near future. Resample in 12 months. Pentane Insolubles levels are abnormally high.

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