

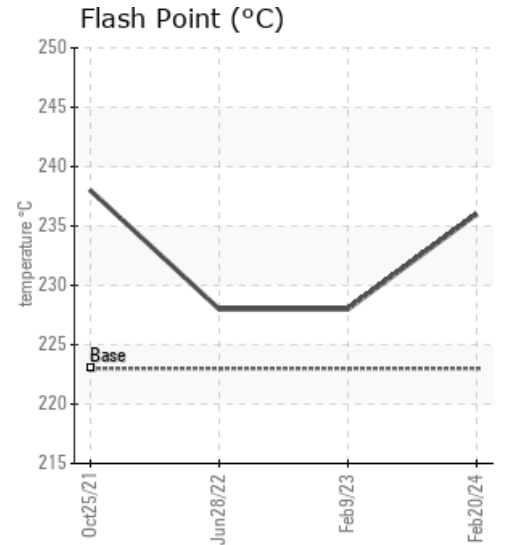
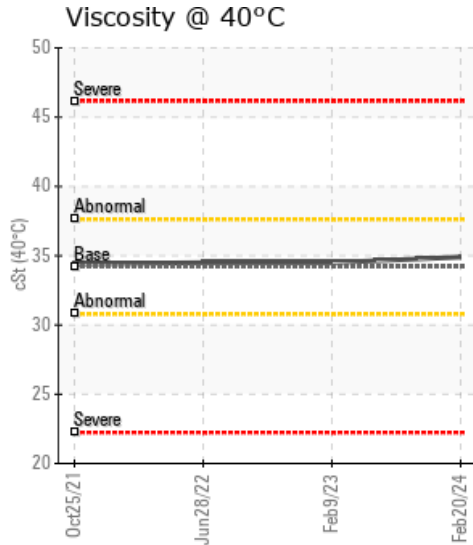
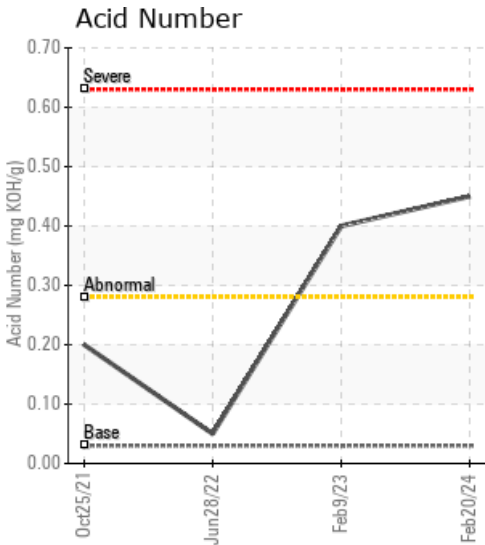
45 TANK HOT OIL HEATER

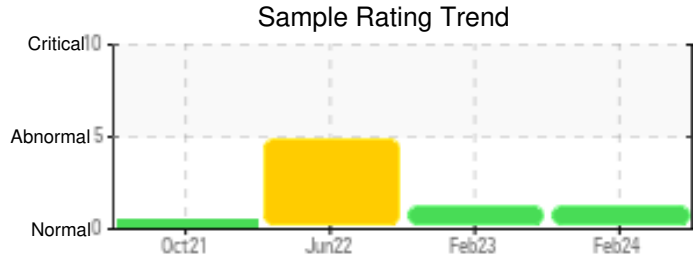
Customer: PTRHTF20033	System Information	Sample Information
Moose Jaw Refinery 641 Manitoba St. E, Box 2000 Moose Jaw, SK S6H 6E3 CA Attn: GILBERT GRIFFIN Tel: (603)691-7823 E-Mail: gil.griffin@gibsonenergy.com	System Volume: 1918 gal Bulk Operating Temp: 350F / 177C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make:	Lab No: 02618183 Analyst: Nick Finelli Sample Date: 02/20/24 Received Date: 02/26/24 Completed: 03/19/24 Nick Finelli nick.finelli@hfsinclair.com

Recommendation: The acid number is elevated but everything else looks ok. Oil is suitable for further use. We will continue to monitor and see if there are other changes in the future.

Comments: Acid Number (AN) is abnormally high.

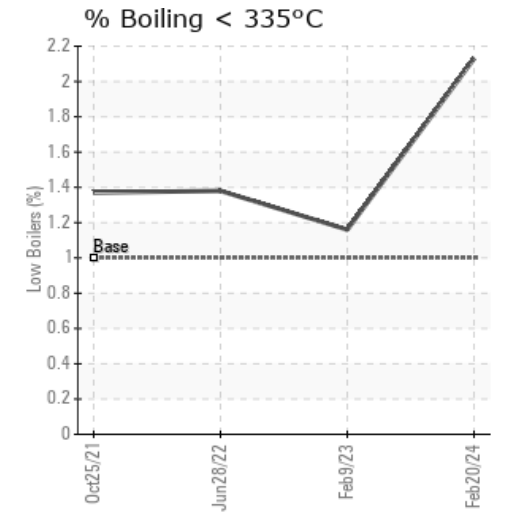
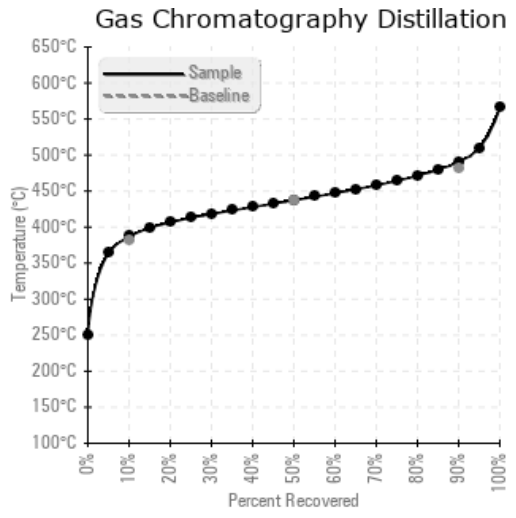
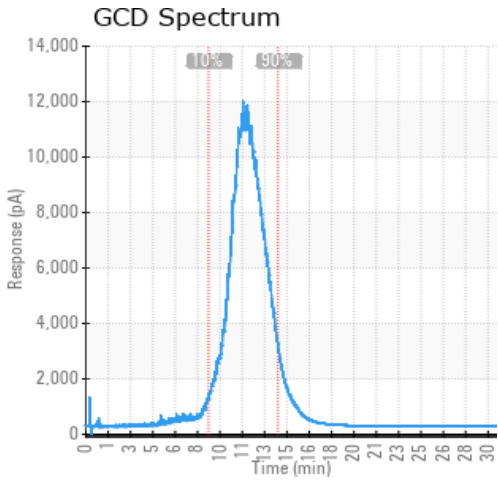
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
02/20/24	02/26/24	48.0m		457 / 236	26	34.9	0.45	0.379	728 / 387	819 / 437	915 / 491	2.13
02/09/23	02/16/23	38.0m	discharge piping	442 / 228	23.3	34.5	0.40	0.232	736 / 391	820 / 438	913 / 489	1.16
06/28/22	07/06/22	0.0m	suction piping	442 / 228	0.00	34.5	0.05	0.319	734 / 390	819 / 437	910 / 488	1.38
10/25/21	11/02/21	35.0m	SUCTION PIPING	460 / 238	20.5	34.4	0.20	0.251	734 / 390	820 / 438	913 / 489	1.37
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
02/20/24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02/09/23	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/28/22	0	0	0	0	0	0	0	0	0	0	94	0	0	0	0	0	0	0	0	0	0	0	0	0
10/25/21	0	0	0	0	0	0	0	0	0	0	0	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	
02/09/23	Acid number has increased marginally. We will monitor during its next sample interval. Acid Number (AN) is marginally n/a.
06/28/22	The fluid is in a good condition and suitable for further use. The Si (dirt) content is high. Pentane Insoluble (solids) content is slightly elevated. At this time the level of contamination is a minor concern but please consider filtration of the fluid. Re-sample in 6 months. Silicon ppm levels are severely high.
10/25/21	The fluid is in a good condition and suitable for further use. The bulk fluid temperature is listed as 350 degrees C. Considering fluid service life of 35 months and the condition of the fluid this temperature must be incorrect. Please correct this and re-sample in 12 months.

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