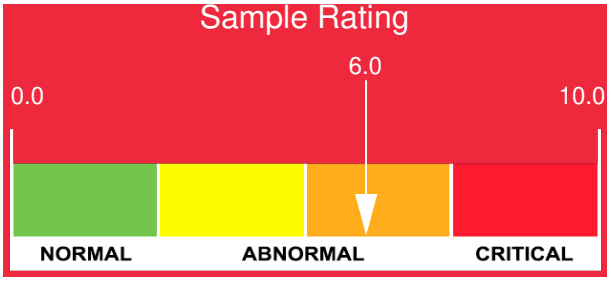
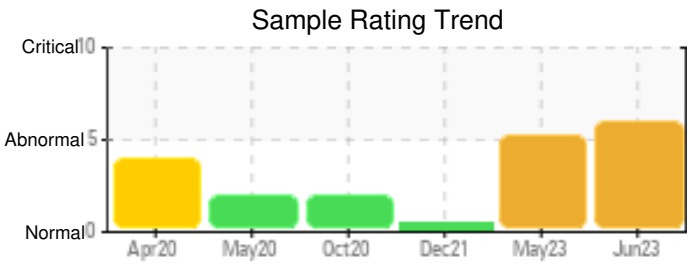




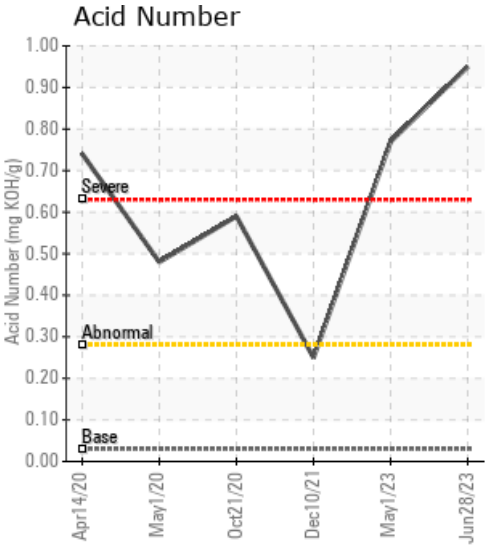
ASPHALTPLANT

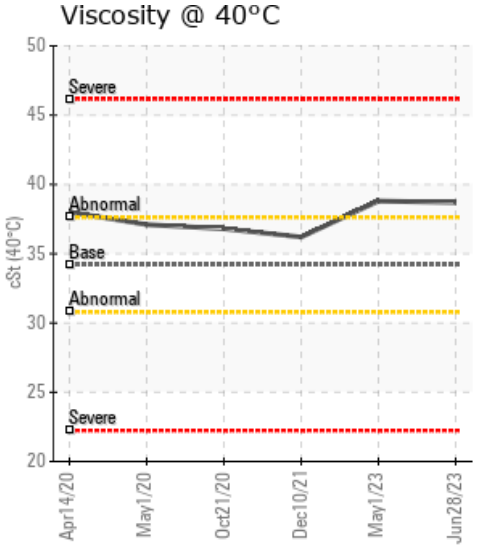
Customer: PTRHTF10232	System Information	Sample Information
LINDAHL BROTHERS INC 6525 99TH ST CHICAGO RIDGE, IL 60415 US Attn: Scott Schneider Tel: E-Mail: sschneider@lindahlbros.com	System Volume: 400 ltr Bulk Operating Temp: 626F / 330C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: HY-WAY	Lab No: 02568098 Analyst: Yvette Trzcinski Sample Date: 06/28/23 Received Date: 07/05/23 Completed: 07/10/23 Yvette Trzcinski yvette.trzcinski@HFSinclair.com

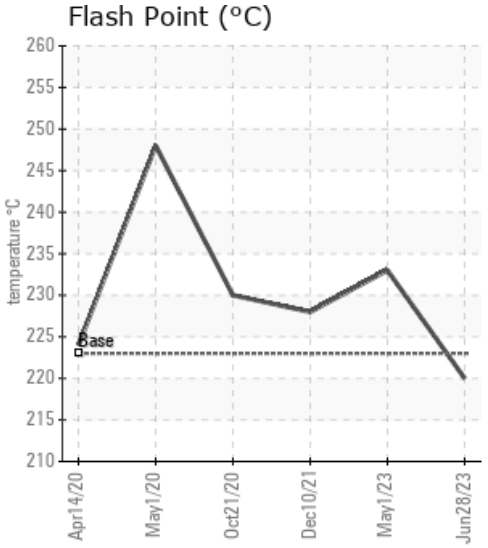
Recommendation: Acid number and solids have increased from the sample taken in May fluid appears to be degraded and oxidized which explains the increase in viscosity, acid number and solids and the increase in the GCD boiling point at 90%. The degradation and solids in the system will reduce system efficiency. If there is a system filter in place recommend changing the system filter more often to help clean up some of the solids. Recommend draining and flushing the system when possible

Comments:

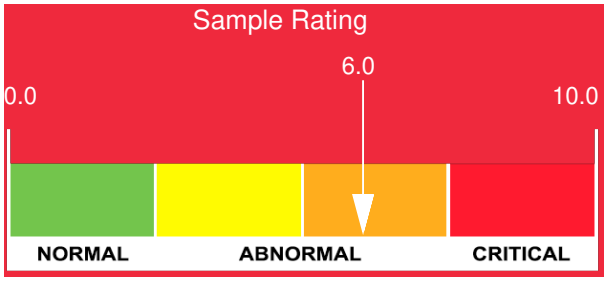
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
06/28/23	07/05/23	2.0y		428 / 220	48.1	38.7	0.95	1.15	728 / 387	820 / 438	919 / 493	1.36
05/01/23	05/03/23	0.0y		451 / 233	59.5	38.8	0.77	1.03	725 / 385	818 / 437	917 / 492	2.01
12/10/21	12/21/21	1.0y		442 / 228	5.1	36.2	0.25	0.074	737 / 392	822 / 439	915 / 491	1.26
10/21/20	11/03/20	0.5y	Jumper line to drum	446 / 230	17.0	36.8	0.59	0.109	739 / 393	827 / 442	925 / 496	0.39
05/01/20	05/15/20	1.0y	JUMPER LINE	478 / 248	30.4	37.1	0.48	0.208	736 / 391	828 / 442	930 / 499	0.49
Baseline Data				433 / 223		34.2	0.03		720 / 382	817 / 436	900 / 482	1.00

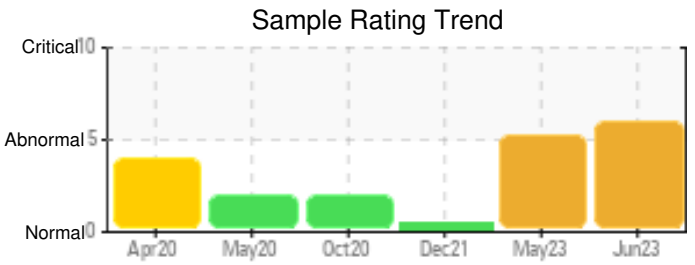






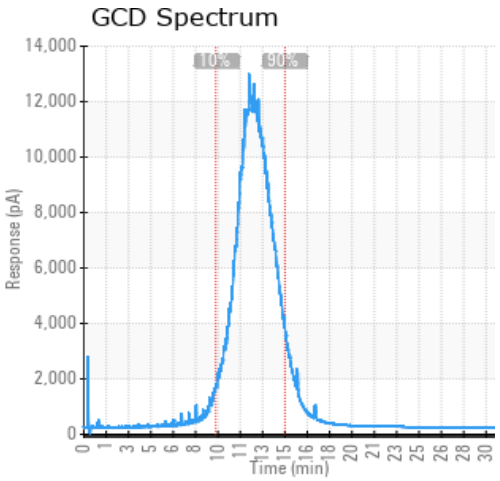
PETRO-CANADA LUBRICANTS

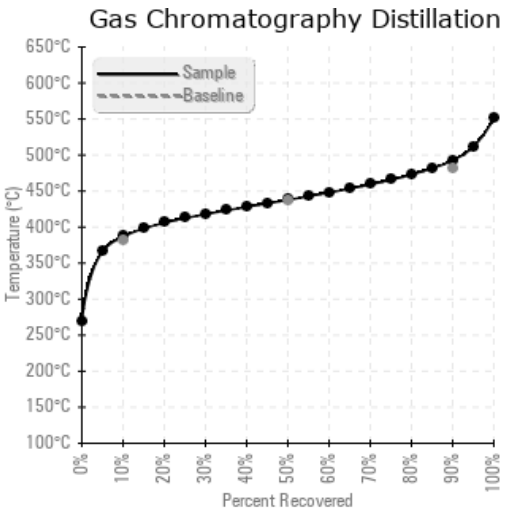


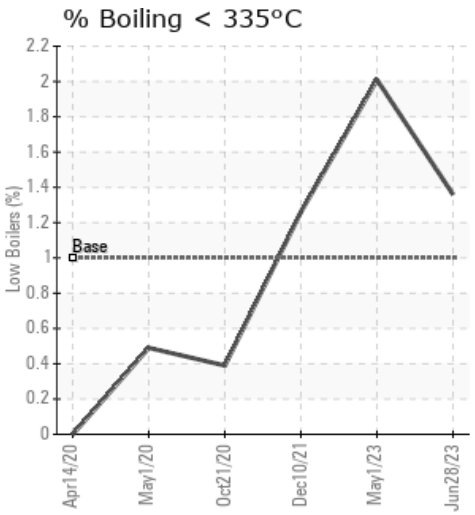


Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
06/28/23	63	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	13	0	13	13
05/01/23	70	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	6	15	0	16	15
12/10/21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/21/20	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
05/01/20	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	4
Baseline Data			0	0						0			0	0					0				0	

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







Historical Comments

05/01/23	This 600 gallon system showing signs of degradation acid number is very high at 0.77 with an increased viscosity of over 13% from new oil and extremely high solids of 1.03. Recommend draining and flushing the system to remove deposits and solids and recharge with new fluid Pentane Insolubles levels are severely high. Acid Number (AN) is severely high. Visc @ 40°C is abnormally high.
12/10/21	Heat Transfer sample specification are all at acceptable levels viscosity, acid number and GCD 10%, 50 %, 90% and insolubles. resample at the next recommended sampling interval 9-12 months
10/21/20	The fluid shows signs of degradation the AN total acid number is high and there is oxidation and large molecules apparent in the system.Recommend draining and flushing the system within the next 6-12 months and then resample the new fluid at 6 months. Acid Number (AN) is abnormally high. (GCD) 90% Distillation Point is marginally high.
05/01/20	The Acid number is high and the fluid does show signs of oxidation but the flash point and viscosity are acceptable for continued service. Re sample in 6 months Acid Number (AN) is abnormally high. (GCD) 90% Distillation Point is abnormally high.