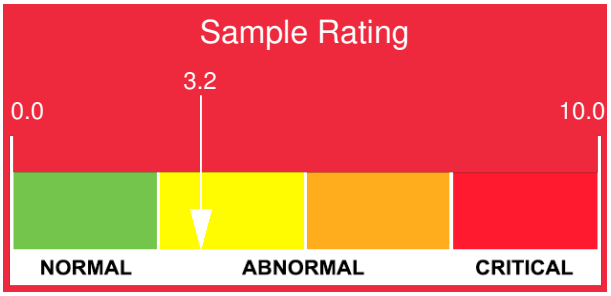
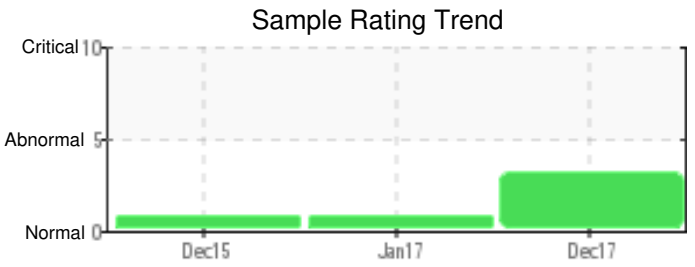




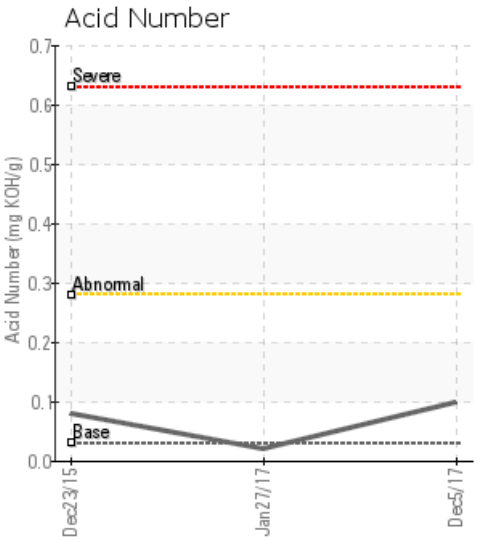
[MANNING FOREST PRODUCTS / OLD ENERGY SYSTEM] SECONDARY OIL/KILNS

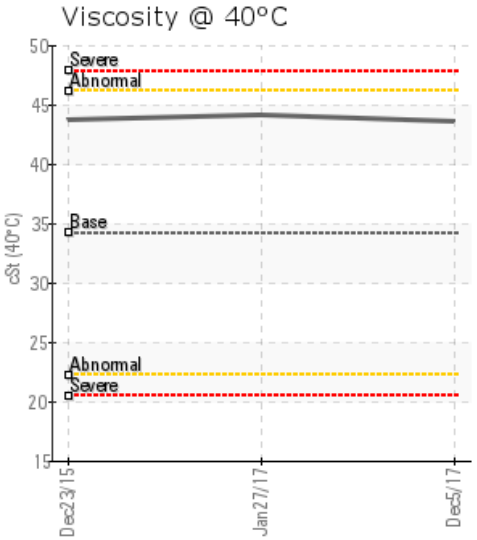
Customer: PTRHTF20170	System Information	Sample Information
MANNING FOREST PRODUCTS DIV OF WEST... 22 KM`S NORTH OF MANNING ON HWY 35 MANNING, AB T0H 2M0 Canada Attn: ARON TUMAMBING Tel: (780)837-4782	System Volume: 5788 ltr Bulk Operating Temp: 482F / 250C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: Wellons	Lab No: 02185912 Analyst: Gordon Susinski Sample Date: 12/05/17 Received Date: 12/05/17 Completed: 12/08/17 To discuss this report contact Gordon Susinski at (587)582-4118

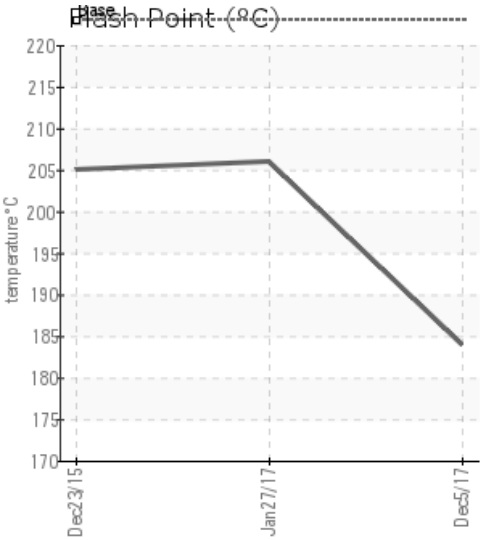
Recommendation: Based on the analysis results, it appears that the oil may have experienced oxidation of the oil and possibly thermal degradation. This may be due in part to the length of service on the oil; however the service time was not indicated

Pentane Insolubles are abnormally high. This analysis determines the amount of contaminants in used heat transfer oils, and is indicative of the amount of insoluble materials such as oxidation by products; dirt, carbonaceous material, and system wear components. These contaminants as a group are called pentane insolubles.

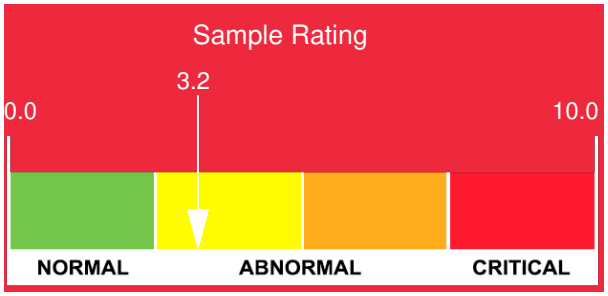
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
12/05/17	12/05/17	0y		363 / 184	33.8	43.6	0.098	0.412	740 / 394	845 / 452	920 / 493	1.55
01/27/17	02/13/17	3y	DOWNSTREAM OF PUMP	403 / 206	24.8	44.1	0.02	0.181	719 / 382	832 / 445	920 / 493	2.68
12/23/15	12/24/15	0y		401 / 205	10.5	43.7	0.08	0.090	708 / 376	830 / 443	910 / 488	4.33
Baseline Data				433 / 223		34.2	0.03		720 / 382	817 / 436	900 / 482	1.00

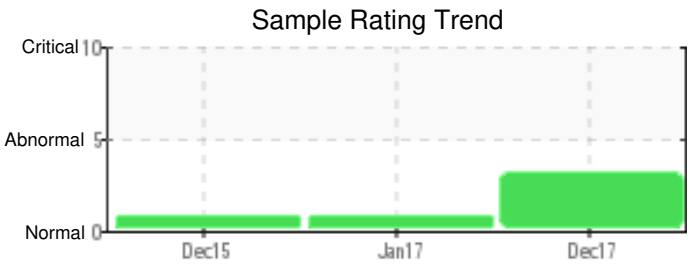






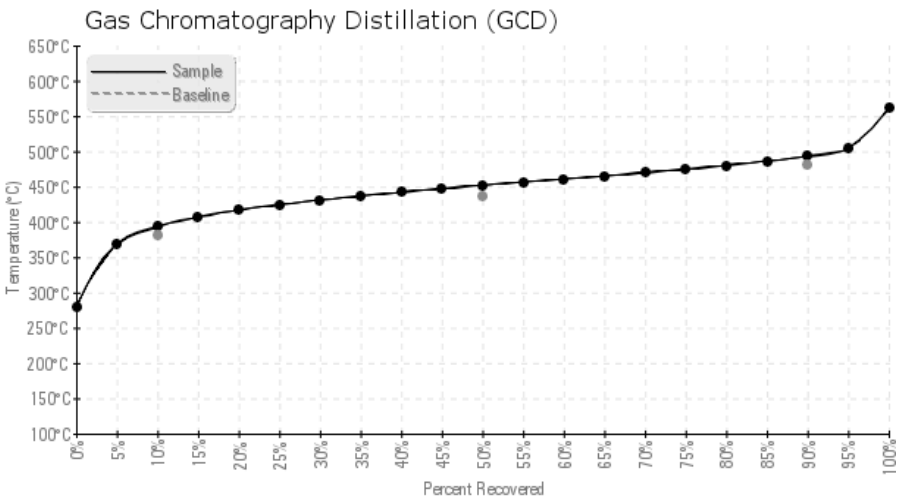
 Copyright 2017 Wearcheck Inc. All Rights Reserved.

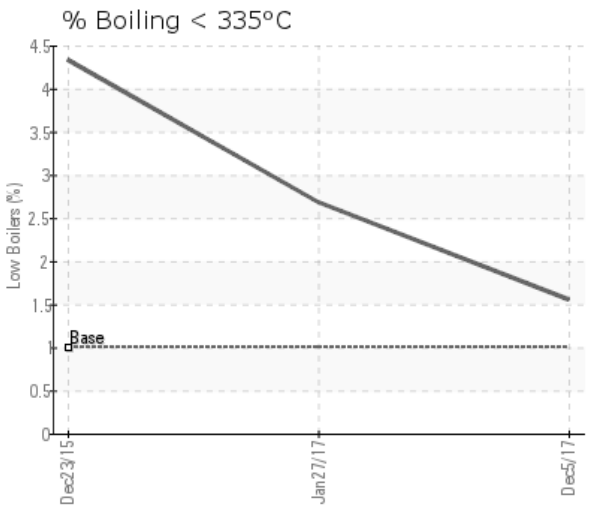




Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
12/05/17	4	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
01/27/17	5	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1
12/23/15	3	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	4	1
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

01/27/17	The 90% distillation point is marginally high. This Increase is associated with high boilers that are normally associated with carbonaceous deposits in the system that can foul heat exchanger surfaces or plug small lines. Also note the viscosity increase. Petro-Therm is an ISO VG 32 and not a 46 as indicated in the result. Viscosity is the fluids ability to resist flow and increases in viscosity in a heat transfer system is normally attributed to the oxidation process but may also be due to a heavier fluid being added? The oxidation is process increase the size of the molecules and increases the oils viscosity. The IBP result is lower than expected as well. A low initial boiling point indicates that low boilers are present. This result can be corroborated by a lower flash point (flash point is lower but still within acceptable guidelines). This result can lead to pump cavitation. Resample to confirm the product viscosity IBP and also ensure that proper sampling techniques are being used so that there is no chance of the sample possibly becoming contaminated. (GCD) 90% Distillation Point is marginally high.
12/23/15	Results are within acceptable guidelines. Continue to monitor unit and resample at the next scheduled interval. (GCD) 90% Distillation Point is marginally low.

Petro-Canada makes no representation or warranty of any kind, either express or implied, as to the accuracy or completeness of the analysis and assumes no responsibility and shall have no liability whatsoever with respect to such analysis, or a party's use of it. Petro-Canada is a division of HollyFrontier Corporation.