

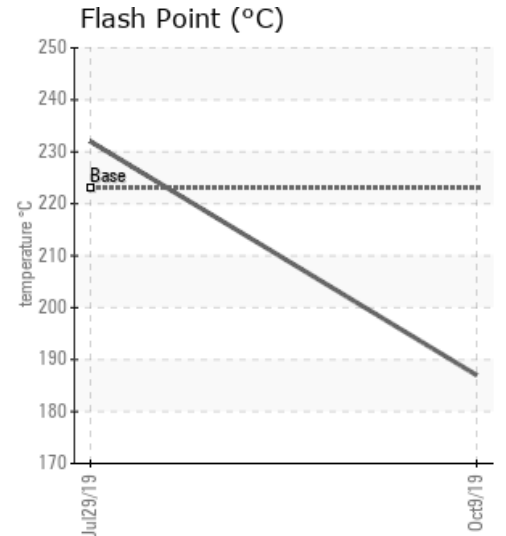
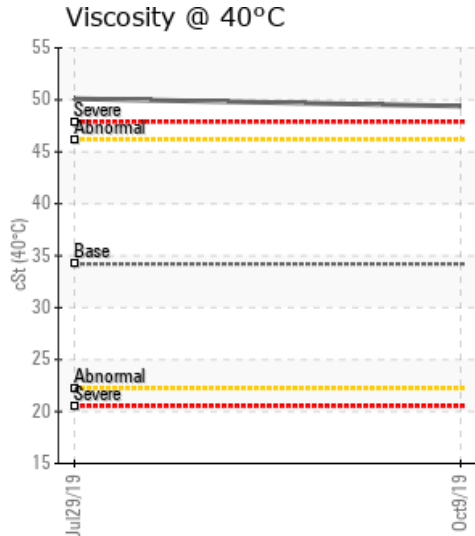
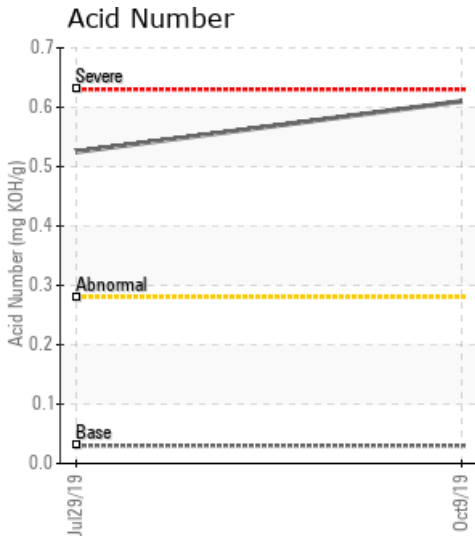
438-HO-003

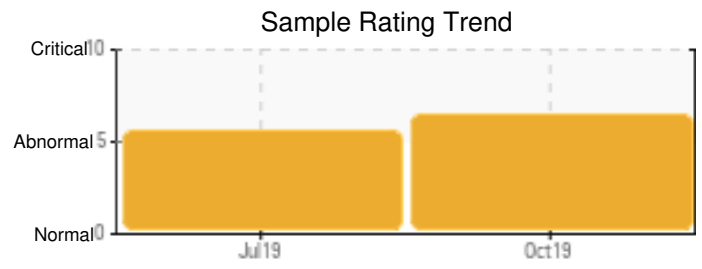
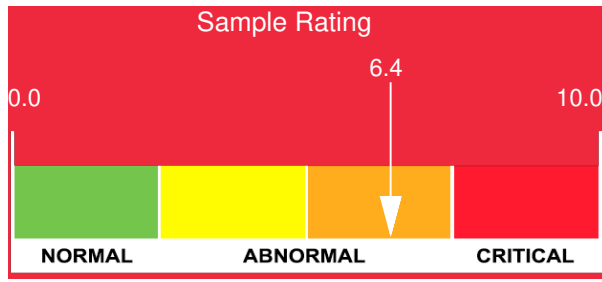
Customer: PTRHTF20217	System Information	Sample Information
McAsphalt Industries LTD 4529 Industrial Park Rd Macklin, SK S0L 2C0 Canada Attn: Nick Lovell Tel: (306)753-2717 E-Mail: nlovell@mcasphalt.com	System Volume: 7000 ltr Bulk Operating Temp: 392F / 200C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: HEATEC	Lab No: 02313734 Analyst: Behshad Sabah Sample Date: 10/09/19 Received Date: 10/10/19 Completed: 10/21/19

Recommendation: High Viscosity and TAN show partially oxidation. no issue on Pentane Insoluble. the GCD at 90% is high which shows the evaporation of short chain hydro carbons. please monitor the oil. no sign of internal corrosion

Comments: (GCD) 90% Distillation Point is severely high. Visc @ 40°C is severely high. Acid Number (AN) is abnormally high. (GCD) 10% Distillation Point is marginally high. (GCD) 50% Distillation Point is marginally high. COC Flash Point is marginally low.

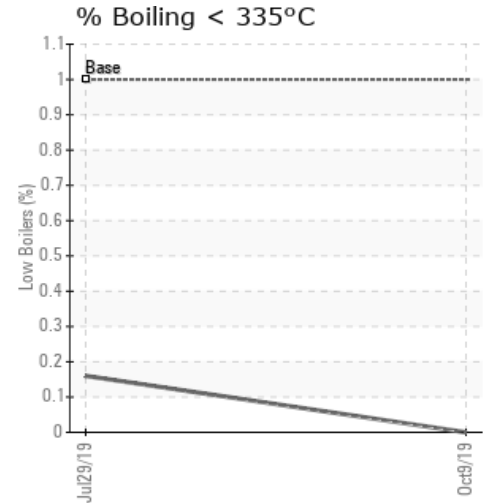
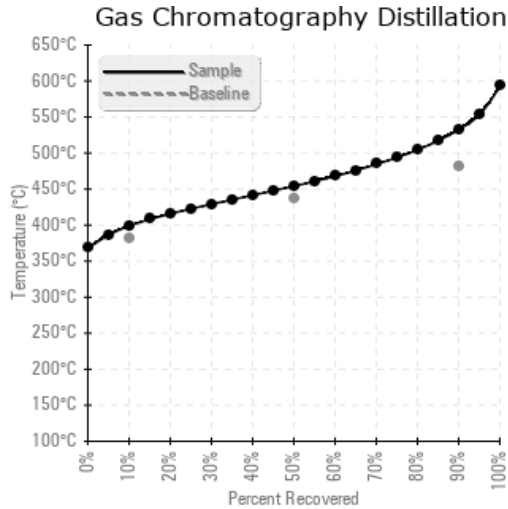
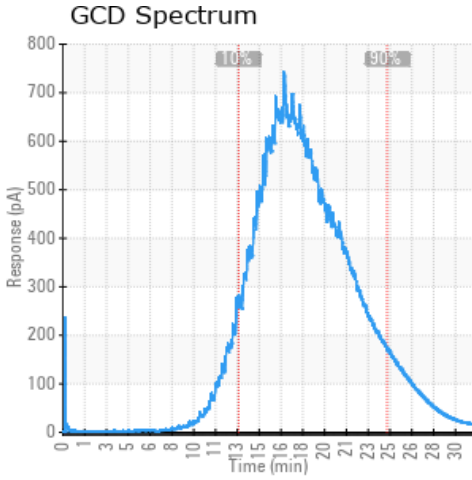
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
10/09/19	10/10/19	7y		369 / 187	44.6	49.4	0.610	0.358	750 / 399	849 / 454	990 / 532	0.00
07/29/19	07/31/19	7y	MN DISTRIBU DISCHARG	450 / 232	51.4	50.1	0.525	0.755	719 / 382	823 / 440	960 / 516	0.16
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
10/09/19	6	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
07/29/19	7	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	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

07/29/19	High Viscosity at 40 C, High Pentane Insoluble, and close to high TAN all indicate the oil oxidation. the high viscosity will reduce the heat transfer capacity of the oil. please monitor the oil. very high distillation temperature at 90% indicates the high percentage of oil is cracked. Pentane Insolubles levels are severely high. (GCD) 90% Distillation Point is severely high. Visc @ 40°C is severely high. Acid Number (AN) is abnormally high.

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.