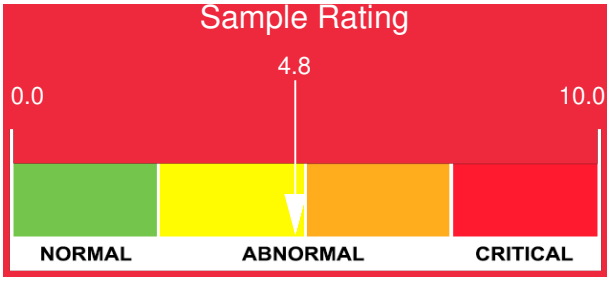
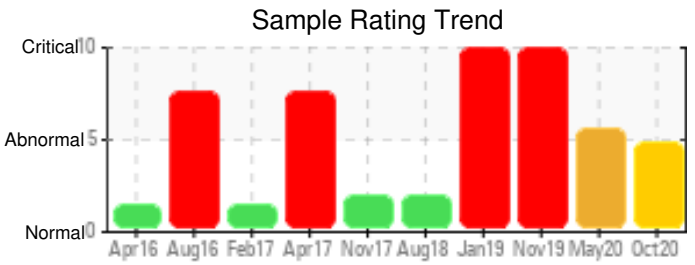




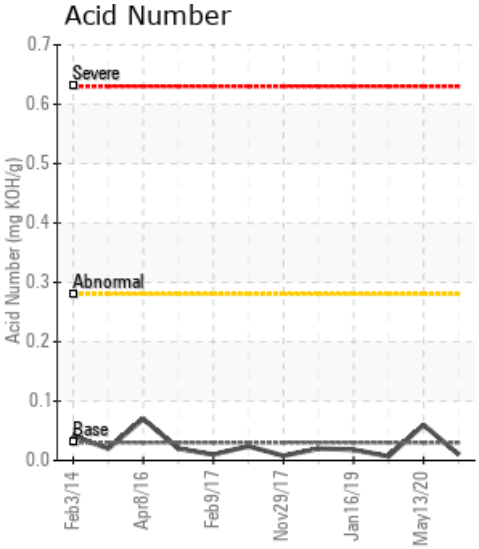
PM #1 STACK HOT OIL SYSTEM

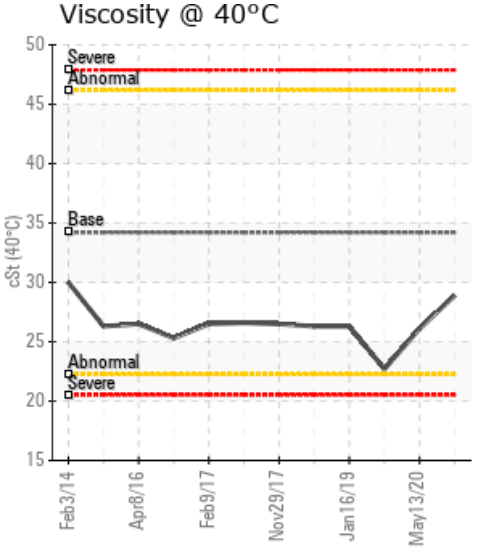
Customer: PTRHTF30073	System Information	Sample Information
IRVING PAPER LTD 435 BAYSIDE DRIVE SAINT JOHN, NB E2L 4K9 Canada Attn: Terry Tomney Tel: (506)650-8435 E-Mail: tomney.terry@irvingpaper.com	System Volume: 3500 ltr Bulk Operating Temp: 536F / 280C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: METSO	Lab No: 02381180 Analyst: Jean Lacharite Sample Date: 10/08/20 Received Date: 10/14/20 Completed: 10/20/20 Jean Lacharite jean.lacharige@petrocanadalsp.com

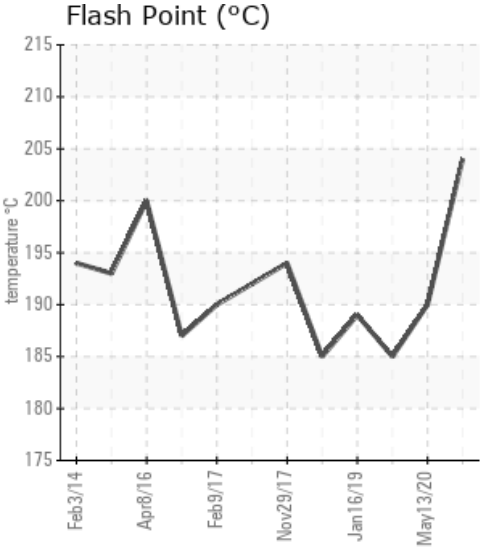
Recommendation: (GCD) 50% Distillation Point is severely low 359.9/436 C = +17.4% difference.(GCD) 90% Distillation Point is very low 461.3/482 C = +4.3% difference. (GCD) 10% Distillation Point is abnormally low 342 /382 C = +10% difference. COC Flash to 204 C Point is marginal. no presence of iron. Pentane insolubles stay in limit. Graphic 10/8/2020, heavily craking low boiler presence and level is high. High boilers are present, the Heat Transfer oil look to be heavily cracked.i recommand to ventilate to remove cracked low boiler, remove 20-25% of the to remove cracked high boilers. And refresh with new heat transfer oil.

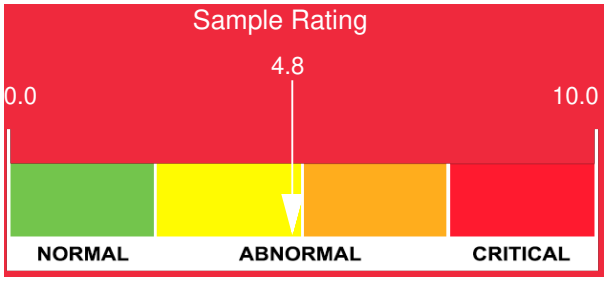
Comments: (GCD) 50% Distillation Point is severely low. (GCD) 90% Distillation Point is severely low. (GCD) 10% Distillation Point is marginally low.

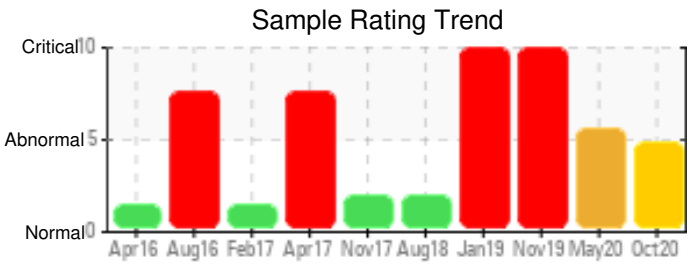
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
10/08/20	10/14/20	7y	MANIFOLD FROM SYSTEM	399 / 204	38.8	28.9	0.01	0.025	648 / 342	680 / 360	862 / 461	5.88
05/13/20	05/20/20	7y	MANIFOLD	374 / 190	31.1	26.1	0.06	0.117	646 / 341	677 / 358	845 / 452	6.07
11/06/19	11/12/19	6y	manifold	365 / 185	16.4	22.7	0.007	0.043	615 / 324	643 / 340	797 / 425	39.10
01/16/19	01/22/19	0y		372 / 189	18.1	26.3	0.018	0.028	613 / 323	645 / 340	812 / 434	35.56
08/09/18	08/15/18	5y	MANIFOLD FROM SYS	365 / 185	49.7	26.3	0.020	0.009	634 / 334	662 / 350	830 / 443	10.49
Baseline Data				433 / 223		34.2	0.03		720 / 382	817 / 436	900 / 482	1.00





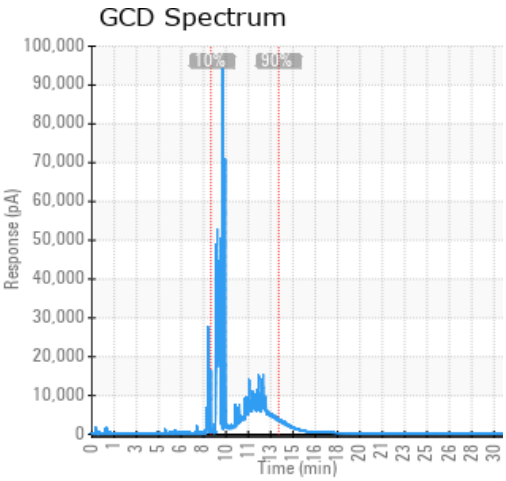


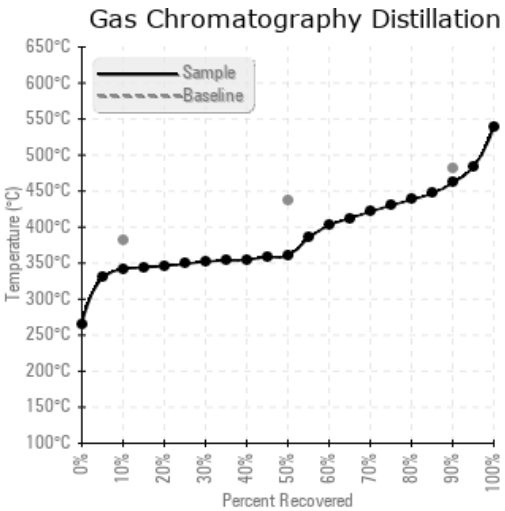


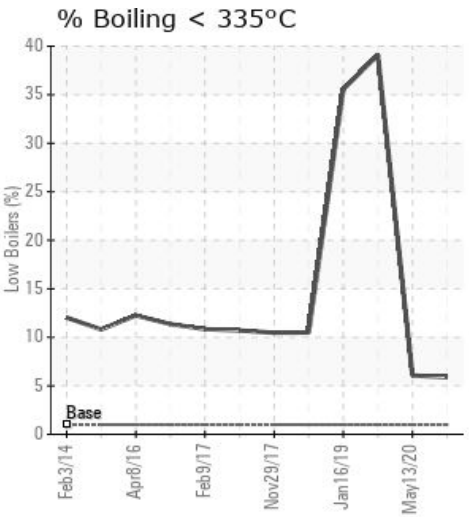


Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
10/08/20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/13/20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/06/19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01/16/19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08/09/18	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 anaysis results (above) in parts per million (ppm). [10,000 ppm = 1.0%]







Historical Comments

05/13/20	(GCD) 50% Distillation Point is severely low. (GCD) 90% Distillation Point is severely low. (GCD) 10% Distillation Point is abnormally low. COC Flash Point is marginally low. no presence of iron. Pentane insolubles increase but stay in limit. Graphic 5/13/2020, low boiler are present and level is high, large boilers are present and level is high, the Heat Transfer oil look to be heavily cracked.i recommand to change it, restart with a new heat transfer oil. flush, clean with cleaner, rinse and restart with a new heat transfer oil. (GCD) 50% Distillation Point is severely low. (GCD) 90% Distillation Point is severely low. (GCD) 10% Distillation Point is abnormally low. COC Flash Point is marginally low.
11/06/19	(GCD) % < 335°C is severely high. (GCD) 10% Distillation Point is severely low. (GCD) 50% Distillation Point is severely low. (GCD) 90% Distillation Point is severely low. COC Flash Point is marginally low.
01/16/19	The (GCD) % < 335°C is extremely high at 35.56%. COC Flash Point is marginally low at 189C. There is a small presence of water (18.1ppm). Their was an increase in the insoluble to pentane compared to the previous oil analysis. As reported before, this system previously had Therminol 66 and is still present in the system which has affected some of the distillation results. Compared to the previous samples, this oil seems to have generated light ends since the last oil analysis. All indicate the fluid is undergoing thermal cracking. The system should be vented and I would suggest that another sample be obtained in 3 months to monitor the condition of this oil. All distillation variances comes from the presence of residual Therminol 66 in the system. The COC Flash Point is marginally low but not alarming. A complete drain of the load is required to eliminate residual Therminol 66 affects.No wear metals detected. Small presence of water (18.1ppm). Insoluble to pentane at 0.028% (GCD) % < 335°C is severely high. (GCD) 10% Distillation Point is severely low. (GCD) 50% Distillation Point is severely low. (GCD) 90% Distillation Point is severely low. COC Flash Point is marginally low.
08/09/18	Small amount of water detected. All distillation variances comes from the presence of residual Therminol 66 in the system. A complete drain of the load is required to eliminate residual Therminol 66 affects. The COC Flash Point is marginally low but not alarming. This results is clearly a sign of a presence of light ends in the oil. The oil must be vented in order to remove these light ends. As reported before, this system previously had Therminol 66 and is still present in the system, which has affected some of the distillation results. Compared to the previous samples, this oil is in good condition and suitable for further service. In order to follow the venting process please submit another sample after the venting cycle to re-evaluate the condition of the oil.No wear metals detected. Small amount of water detected at 49.7PPM. (GCD) 50% Distillation Point is severely low. (GCD) 90% Distillation Point is severely low. (GCD) 10% Distillation Point is abnormally low. (GCD) % < 335°C is marginally high. COC Flash Point is marginally low (185°C). All distillation variances comes from the presence of residual Therminol 66 in the system.