

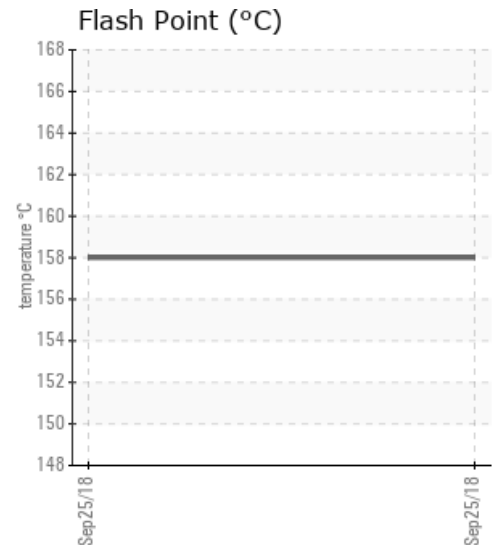
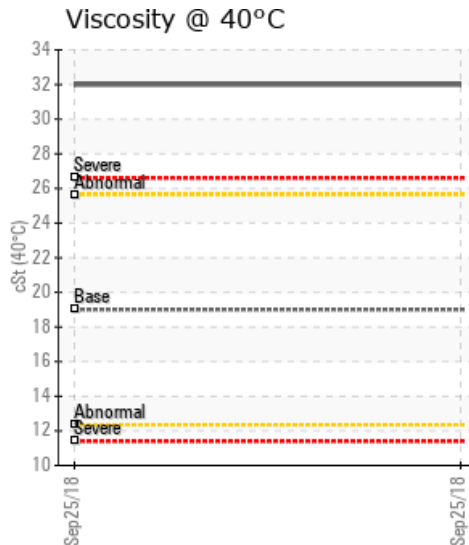
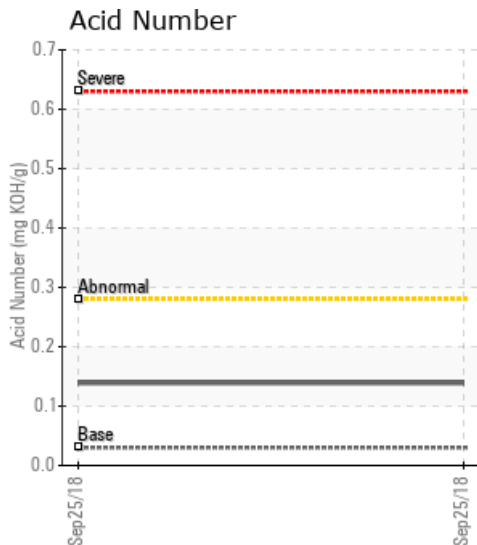
## [LSD 11-02-38-08 W5M] CNRL SEPTIMUS PHASE 2 H-8300

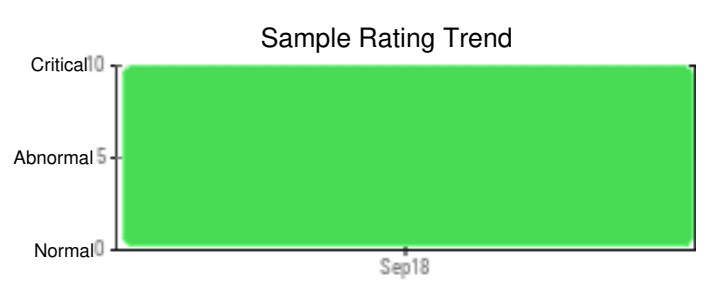
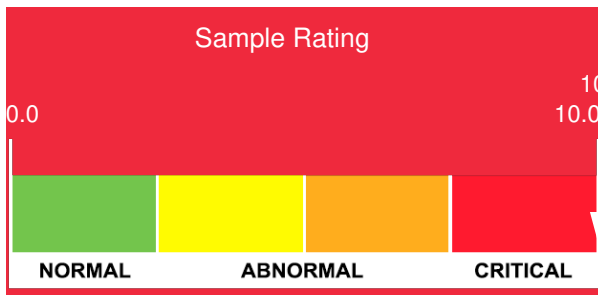
Customer: PTRHTF20046	System Information	Sample Information
QUADRA CHEMICALS 12925 146TH STREET EDMONTON, AB T5L 2H6 CANADA Attn: Quadra Samples Tel: E-Mail: quadra_samples@quadra.ca	System Volume: 48000 ltr Bulk Operating Temp: Not Specified Heating Source: Blanket: Fluid: MONSANTO THERMINOL 55 Make:	Lab No: 02243235 Analyst: Clinton Buhler Sample Date: 09/25/18 Received Date: 10/04/18 Completed: 10/11/18 To discuss this report contact Clinton Buhler at 780-516-9920

Recommendation: Sample results indicate that the heat transfer fluid is degraded and should be replaced. Pentane insoluble (solids) content of 1%, boil off level of 32.32% (nearly 10x of fresh fluid), reduced flash point and reduced 10% distillation value of 270°C indicate excessive thermal degradation. System requires a clean and flush before fill of fresh heat transfer fluid. It is also possible that some fluid thickening from oxidation is ongoing based on a measured viscosity of 32 cSt vs the 19cSt of fresh fluid. Please consult Petro-Canada Lubricants Technical Services for further support.

Comments: Pentane Insolubles levels are severely high. Water contamination levels are marginally high. (GCD) % < 335°C is severely high. (GCD) 10% Distillation Point is severely low. Visc @ 40°C is severely high.

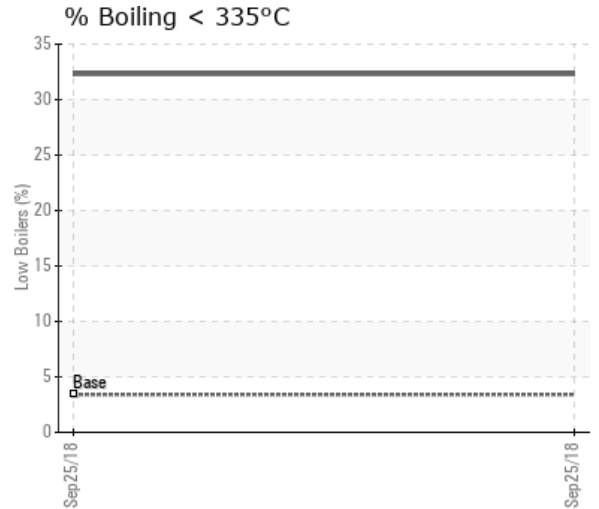
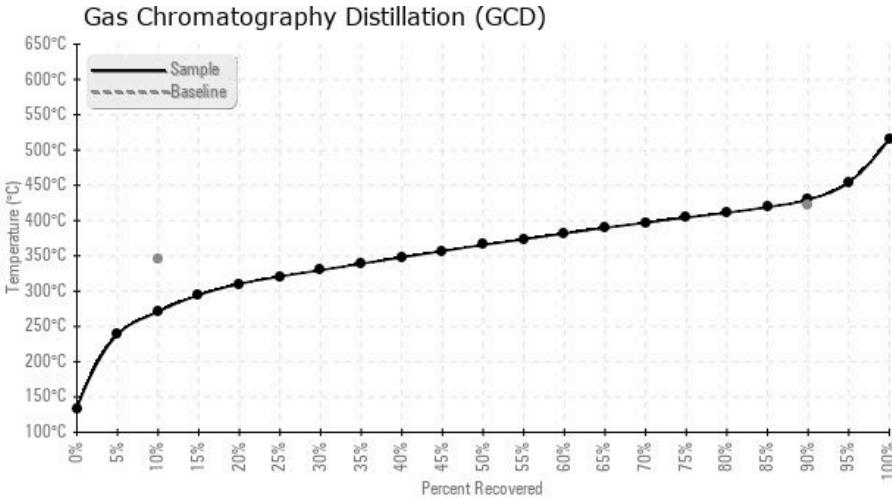
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
09/25/18	10/04/18	0y		316 / 158	378.5	32.0	0.139	1.09	519 / 271	690 / 366	805 / 430	32.32
Baseline Data				349 / 176		19.0	0.03		655 / 346		790 / 421	3.40





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
09/25/18	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 analysis results (above) in parts per million (ppm). [10,000 ppm = 1.0%]



### Historical Comments


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