

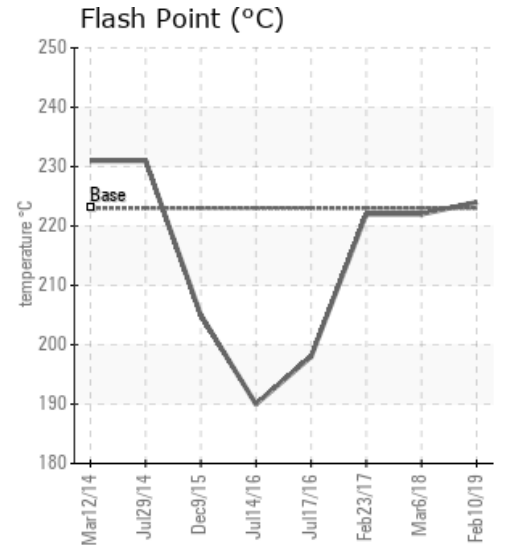
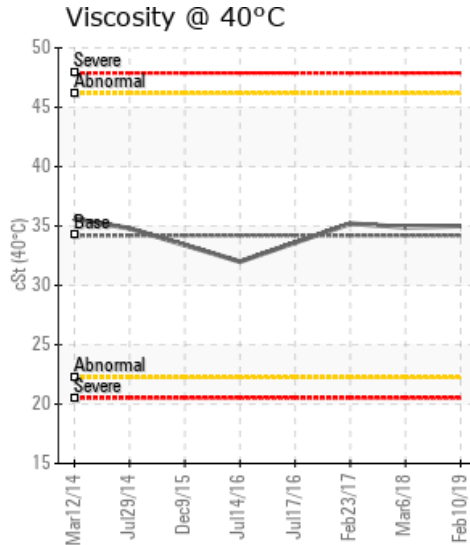
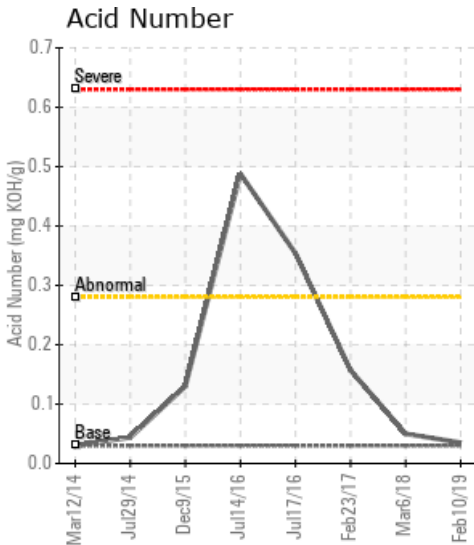
[TOURMALINE OIL CORP / LSD 15-12-50-21W5] TOURMALINE BANSHEE 5500-2

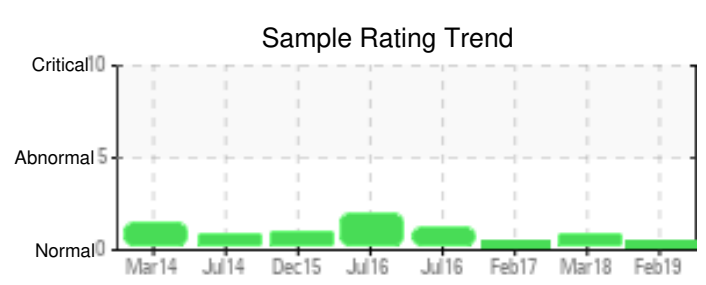
Customer: PTRHTF20046	System Information	Sample Information
QUADRA CHEMICALS 12925 146TH STREET EDMONTON, AB T5L 2H6 CANADA Attn: Quadra Samples Tel: E-Mail: quadra_samples@quadra.ca	System Volume: 20000 ltr Bulk Operating Temp: 482F / 250C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make:	Lab No: 02268425 Analyst: Peter Harteveld Sample Date: 02/10/19 Received Date: 02/19/19 Completed: 02/25/19

Recommendation: The fluid is in good condition and suitable for further use. Please re-sample in 12 months. When filling in the analysis request form please enter the service life of the fluid.

Comments:

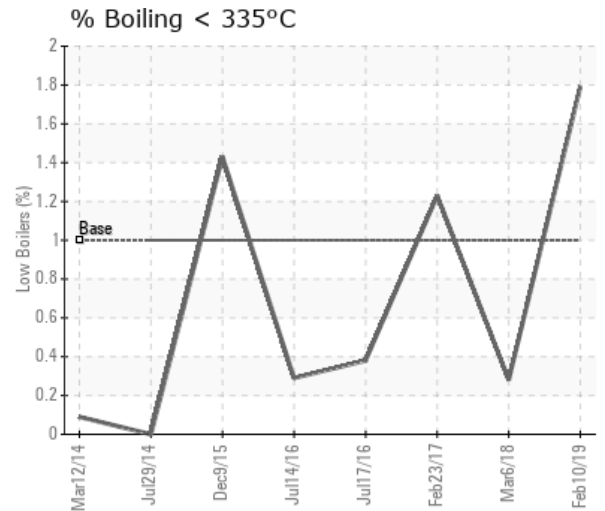
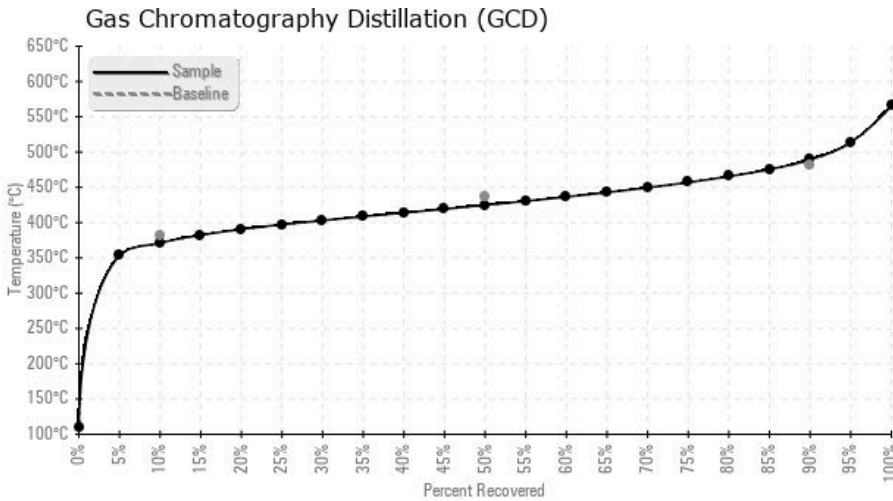
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
02/10/19	02/19/19	0y	15-12-50-21WS	435 / 224	8.9	35.0	0.035	0.047	700 / 371	797 / 425	913 / 489	1.79
03/06/18	03/13/18	6y		432 / 222	5.8	34.9	0.05	0.140	729 / 387	823 / 440	923 / 495	0.28
02/23/17	03/03/17	0y		432 / 222	9.9	35.2	0.157	0.155	719 / 381	810 / 432	910 / 488	1.23
07/17/16	07/18/16	0y	PUMP SUCTION	388 / 198	0.00	33.6	0.354	0.054	720 / 382	817 / 436	915 / 491	0.38
07/14/16	07/18/16	2y	EXPANSION TANK	374 / 190	48.1	32.0	0.488	0.057	711 / 377	795 / 424	888 / 475	0.29
12/09/15	12/14/15	2y		401 / 205	8.7	33.4	0.13	0.062	712 / 378	806 / 430	910 / 488	1.43
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	
02/10/19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
03/06/18	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
02/23/17	4	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
07/17/16	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07/14/16	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12/09/15	3	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	
03/06/18	The fluid is in good condition and suitable for further use. The 90% GCD temperature is elevated indicating fluid degradation by oxidation. Ensure blanket gas is in place. Please re-sample in 12 months. (GCD) 90% Distillation Point is marginally high.
02/23/17	The fluid is in good condition and suitable for further use. Please re-sample in 12 months.
07/17/16	TAN is elevated but other than that the fluid is in good condition and suitable for further use. Please re-sample in 6 months. Acid Number (AN) is abnormally high.
07/14/16	TAN is elevated but acceptable. The fluid is in good condition and suitable for further use. Please re-sample in 6 months. Acid Number (AN) is abnormally high. COC Flash Point is marginally low.
12/09/15	The fluid is in good condition and suitable for further use. A slight drop of Flash Point in combination with a marginal increase in GCD% <335C. indicates initial thermal degradation of the fluid. This is not a concern at this time. Please re-sample in 12 months.

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