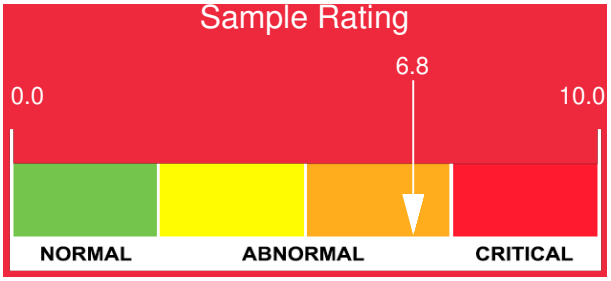
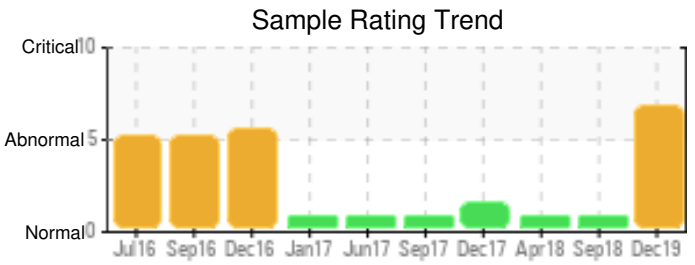
PETRO-CANADA LUBRICANTS





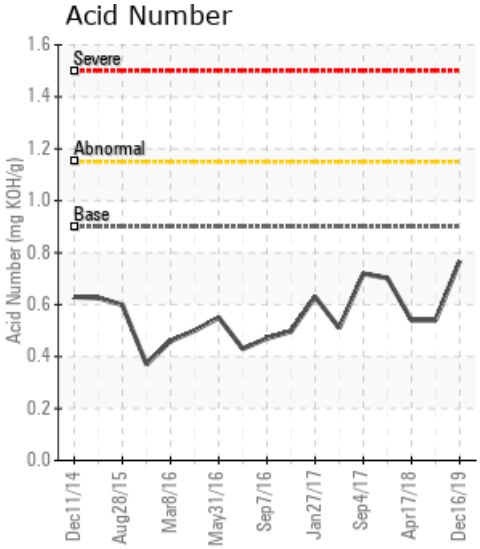
SAINT-VITH PURATOS

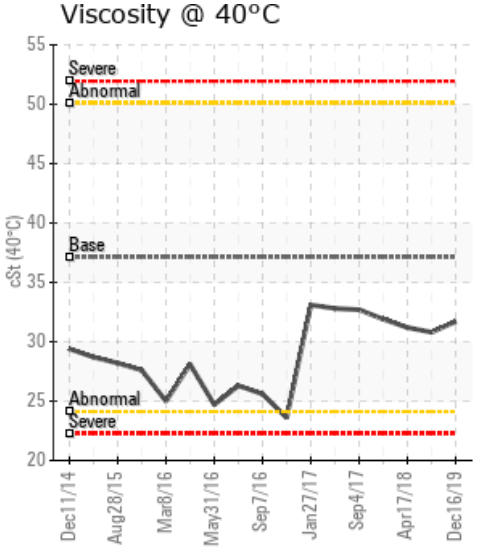
Customer: PTRHTF40077	System Information	Sample Information
BRENNTAG NV NIJVERHFIDSLAAN 38 DEERLIJK, 8540 Belgium Attn: PIETER ACKET Tel: 7(325)678-8404 E-Mail: pieter.acket@brenntag.be	System Volume: 15000 ltr Bulk Operating Temp: 565F / 296C Heating Source: Blanket: Fluid: PETRO CANADA PURITY FG HEAT TRANSFER FLUID Make:	Lab No: 02332065 Analyst: Philip Riley Sample Date: 12/16/19 Received Date: 01/15/20 Completed: 01/22/20

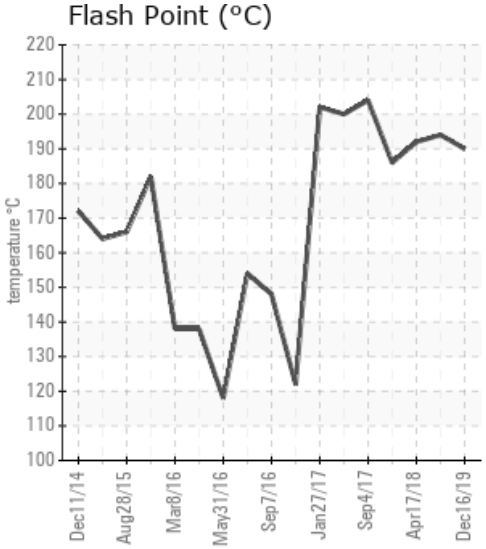
Recommendation: Water can have a detrimental effect on the system, causing fluctuations in pressure and difficult to manage the system. Also need to investigate the source of the water, if the heat transfer system is turning water to steam, there could be a leak that is causing the water to transfer to the oil. This will likely only get worse. Water will also make the way to the bottom of the expansion tank so willalways be fed into the HT system first. Please look to vent off the steam (if safe) or remove the water from the system, normally from the lowest point. Please send a sample once complete and check for water levels. If piping is leaking to the HT Fluid, there will need to be system maintenance and emptying/refill of the HT FLuid

Comments: Water contamination levels are severely high. Water contamination levels are severely high.. ppm Water contamination levels are severely high. COC Flash Point is abnormally 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	%
12/16/19	01/15/20	0m		374 / 190	3026.5	31.7	0.768	0.093	699 / 371	794 / 423	885 / 474	2.64
09/10/18	10/18/18	0m		381 / 194	13.8	30.8	0.54	0.026	719 / 382	798 / 425	890 / 477	0.00
04/17/18	05/01/18	16m		378 / 192	6.5	31.2	0.54	0.060	699 / 371	802 / 428	907 / 486	3.47
12/07/17	01/16/18	12m		367 / 186	11.6	31.9	0.702	0.037	710 / 377	802 / 428	899 / 481	2.22
09/04/17	09/12/17	9m	CHAUDIERE HAUT	399 / 204	0.00	32.7	0.719	0.036	712 / 378	806 / 430	901 / 483	2.38
Baseline Data				459 / 237		37.12	0.90		721 / 383	807 / 431	892 / 478	1.5







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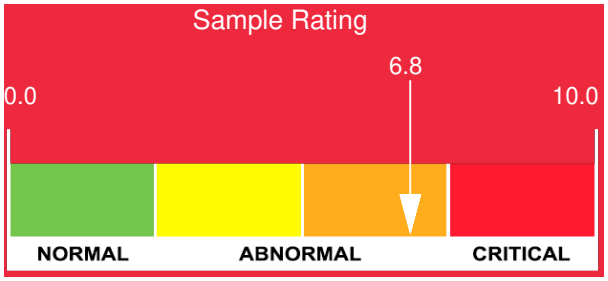
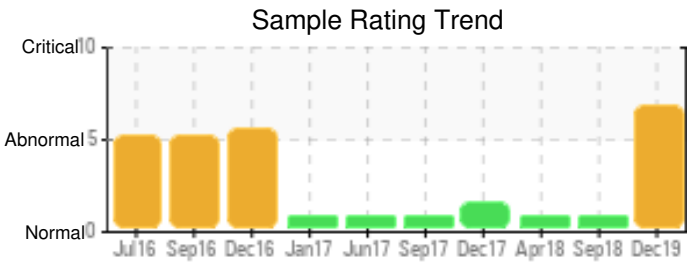
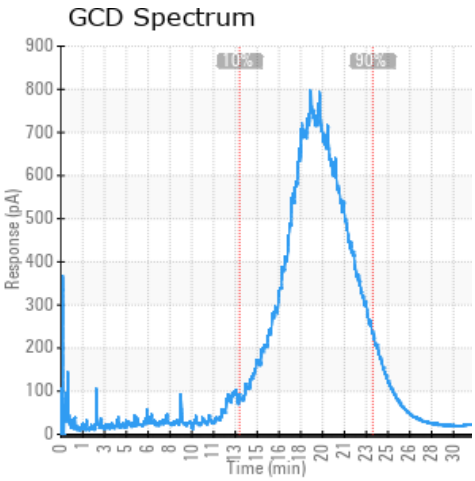
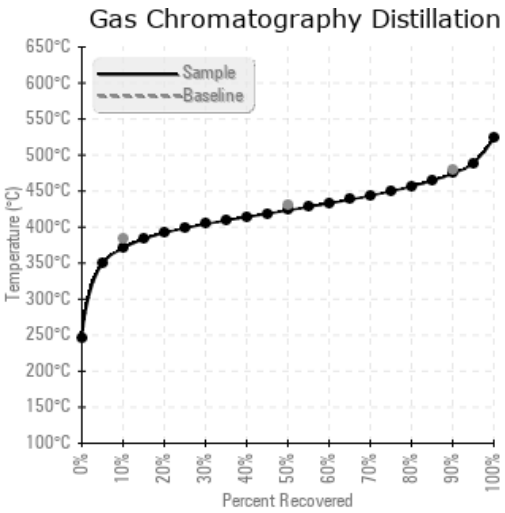


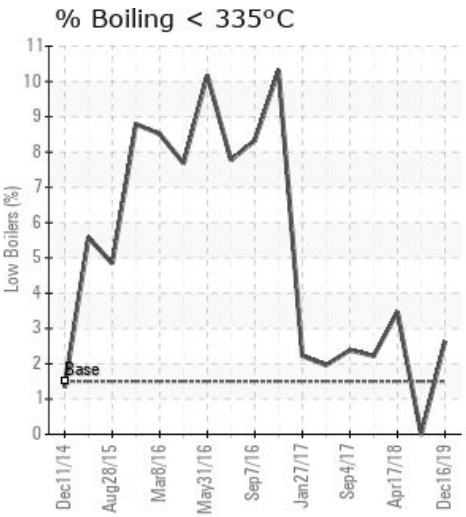


Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
12/16/19	39	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	37	0
09/10/18	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0
04/17/18	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0
12/07/17	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0
09/04/17	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0
Baseline Data			0	0						0			0	0					0				230	

Elemental anaysis results (above) in parts per million (ppm). [10,000 ppm = 1.0%]







Historical Comments

09/10/18	COC Marginally low and evidence of few lighter molecules to support this. Looks to be an oil change in the first place and there may be some slight carry over as part of this. All other fluid parameters hit normal limits. System is sampled 6 monthly so fluid fit for further use until next sample evaluation
04/17/18	All parameters within acceptable limits with exception of COC Flash point that is marginally low, however improved on previous sample. If possible and safe, please try to vent the system to reduce the light molecules and potentially elevate COC Flash Point. COC Flash Point is abnormally low.
12/07/17	marginally low on COC, but light ends look reduced from previous sample on GC trace. Looks to be sampled quarterly so fit for use until next quarter but must sample on time as flash poin has deteriorated in other samples in this system before change-out COC Flash Point is abnormally low.
09/04/17	Acid number creeping upwards from previous sample. Fluid darkened with use. IBP dropped, evidence of increased lighter molecules by GC, must monitor going forwards. Otherwise similar to last sample taken. COC Flash Point is marginally low.