

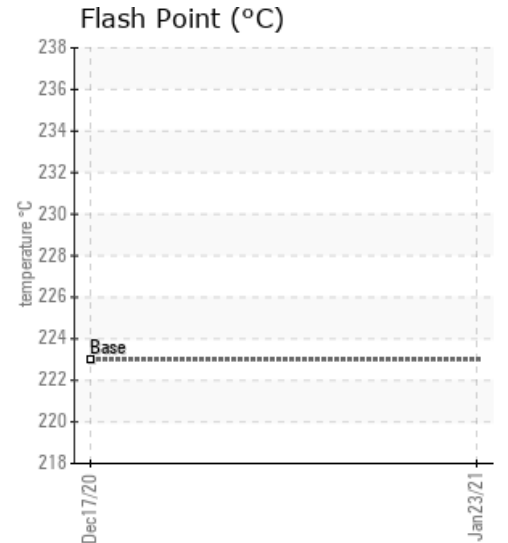
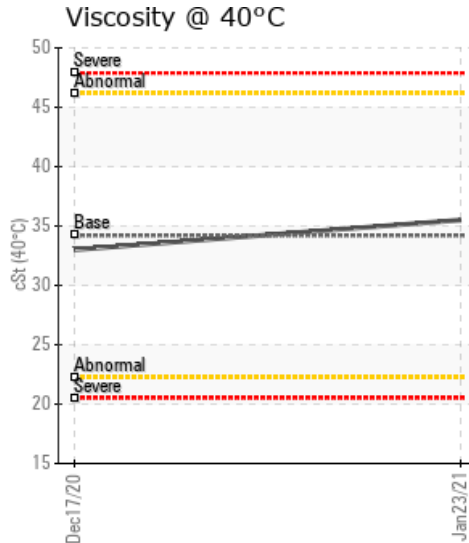
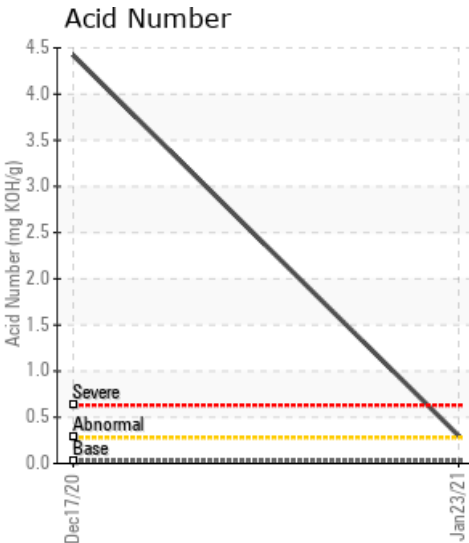
THERMAL ENERGY PLANT

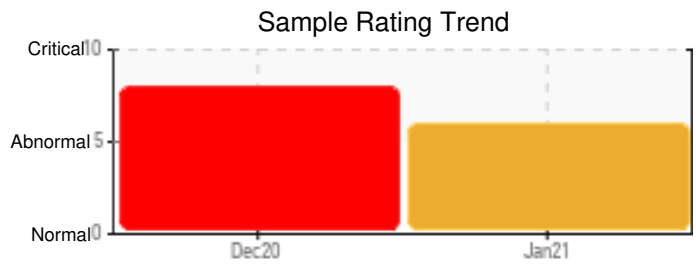
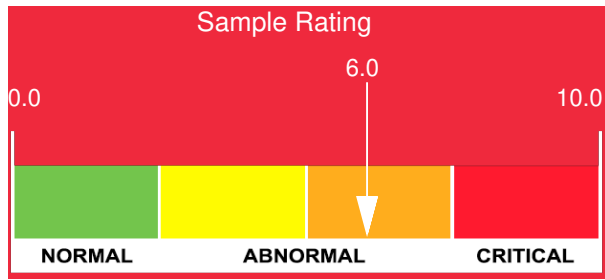
Customer: PTRHTF20246	System Information	Sample Information
CANFOR - PRINCE GEORGE SAWMILL 6988 LANDOOZ ROAD PRINCE GEORGE, BC V2L 4W2 Canada Attn: Cory Bleich Tel: E-Mail: cory.bleich@canfor.com	System Volume: 0 gal Bulk Operating Temp: 446F / 230C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: DELTECH	Lab No: 02400093 Analyst: Ray Rolston Sample Date: 01/23/21 Received Date: 01/27/21 Completed: 02/02/21 Ray Rolston Ray.Rolston@petrocanadalsp.com

Recommendation:

Comments: This is a re-sample due to the extreme water contamination and very high Acid Number (AN) reported on the December 17, 2020 sample. The water content is still quite high at 0.309% (3090 ppm). The Acid Number was tested twice to validate the result of 0.30 mg KOH/g, approximately 50% of the AN condemning guideline of 0.60 mg KOH/g. Pentane Insolubles (solids) content is much lower than the previous sample at 0.142% which is within a typical range for a HTF of this age. Petro-Therm heat transfer fluid is suitable for continued use. Recommend re-sampling in one year to monitor fluid condition, and re-examine sampling method to properly reflect the condition and water content of the fluid that is circulating through the system. Water contamination levels are severely high. Water contamination levels are severely high.. ppm Water contamination levels are severely high. Acid Number (AN) is abnormally high (test conducted twice, 0.30 / 0.33 mg KOH/g).

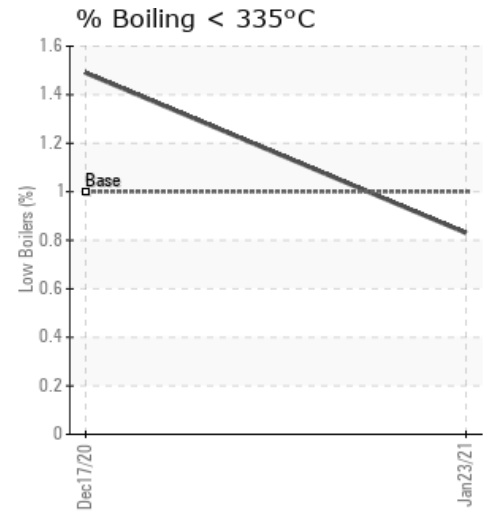
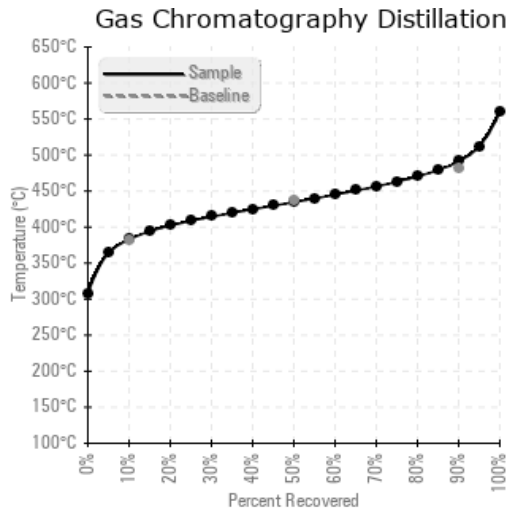
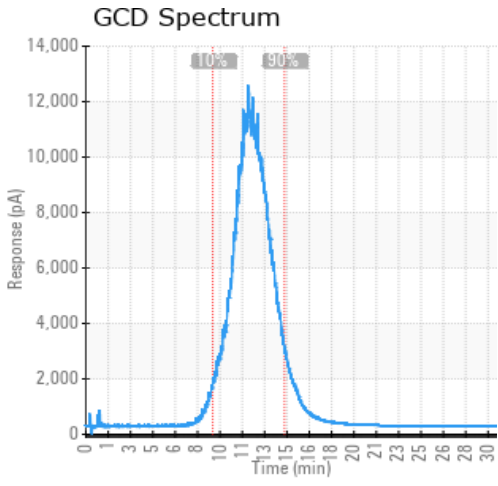
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
01/23/21	01/27/21	0h	Pump	442 / 228	3090.9	35.5	0.30	0.142	721 / 383	814 / 435	916 / 491	0.83
12/17/20	12/29/20	0h			96972.7	33.0	4.42	0.365	716 / 380	812 / 434	914 / 490	1.49
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
01/23/21	36	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	1
12/17/20	18	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

12/17/20	<p>Petro-Therm fluid age is reported to be 10 years. System volume is unknown. There are no previous sample results available to monitor trends. The water content is extremely high at 9.697% which is 96972 ppm. Free water is reported to be 0.2% or 2000 ppm, and emulsified water is >10%. Recommend that another more representative sample be drawn and submitted to the lab for analysis. The AN (Acid Number) is extremely high at 4.42 mg KOH/g. AN test was re-run to verify accuracy; the results were 4.42 and 4.21 mg KOH/g. Once again, please obtain a sample that is representative of the Petro-Therm that is circulating through the heat transfer system and submit for analysis. All other test results appear to be normal. Water contamination levels are severely high. Water contamination levels are severely high. ppm Water contamination levels are severely high. Acid Number (AN) is severely high.</p>
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