

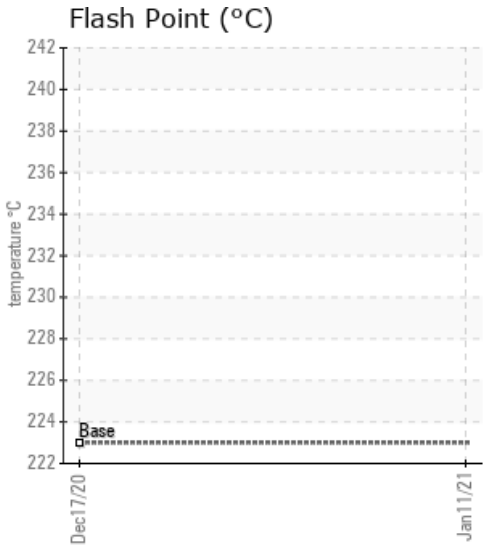
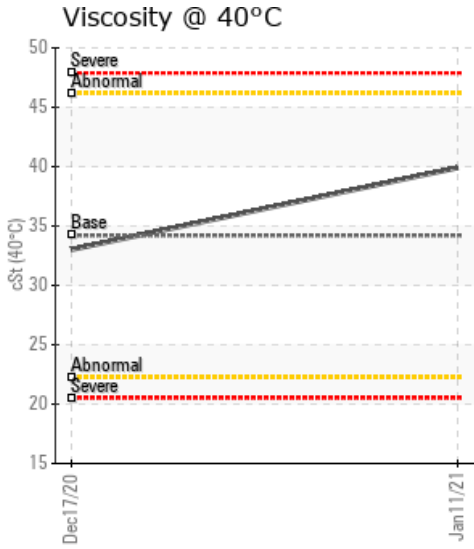
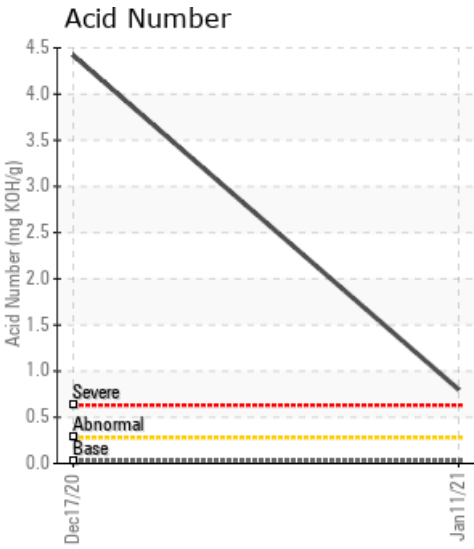
THERMAL ENERGY PLANT

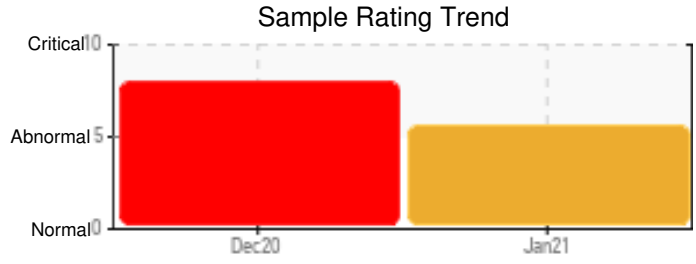
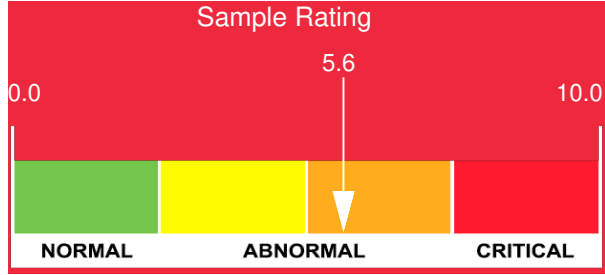
Customer: PTRHTF20179	System Information	Sample Information
Canfor - Polar 36654 Hart Highway General Delivery Bear Lake, BC V0J 3G0 Canada Attn: Kevin Meise Tel: (250)552-5028 E-Mail: kevin.meise@canfor.com	System Volume: 0 gal Bulk Operating Temp: 446F / 230C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: DELTECH	Lab No: 02398419 Analyst: Ray Rolston Sample Date: 01/11/21 Received Date: 01/19/21 Completed: 01/20/21 Ray Rolston Ray.Rolston@petrocanadalsp.com

Recommendation: This January 11, 2021 sample appears to be similar to the last sample dated November 19, 2020. The Acid Number (AN) is 0.80 mg KOH/g which is essentially unchanged since the last sample which was 0.89 mg KOH/g. The Pentane Insolubles (solids) content has increased from 1.85% on the previous sample to 2.46%. Both test results are beyond condemning guidelines. All other test results are normal and typical for the age of this fluid.

Comments: Pentane Insolubles levels are severely high. Acid Number (AN) is severely high. (GCD) 90% Distillation Point is marginally high.

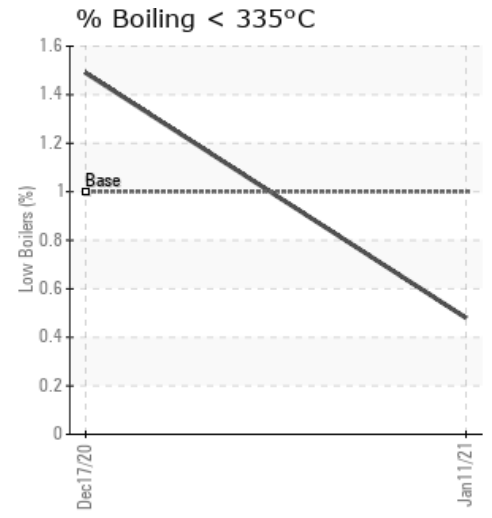
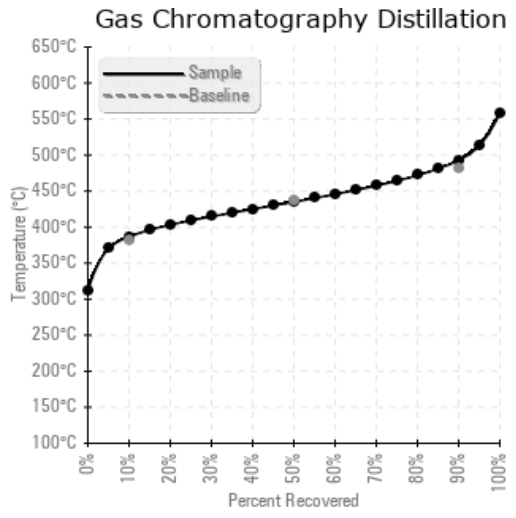
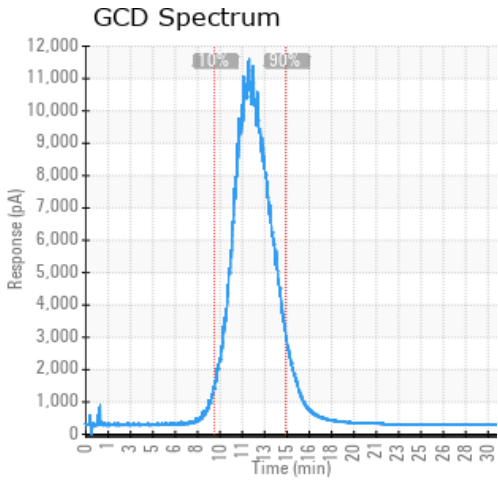
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
01/11/21	01/19/21	0h		450 / 232	83.3	39.9	0.80	2.46	728 / 387	815 / 435	919 / 493	0.48
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
01/11/21	69	0	0	0	0	0	0	0	0	0	2	13	0	0	0	0	2	0	0	0	24	0	3	6
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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