

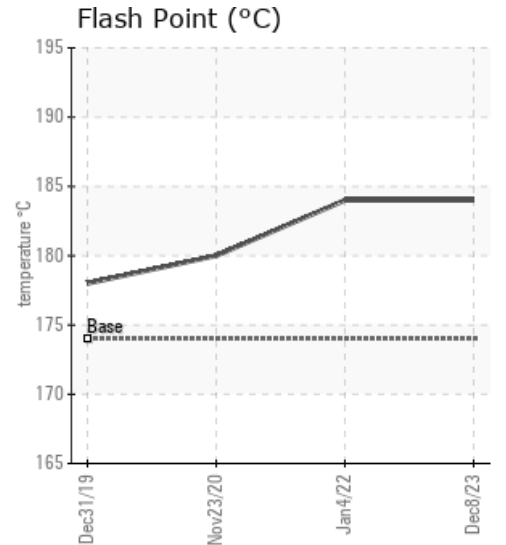
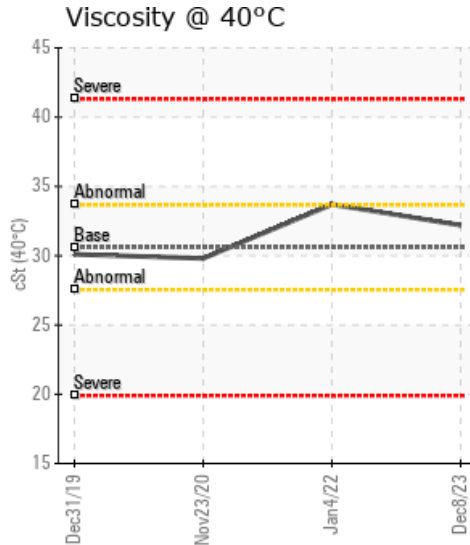
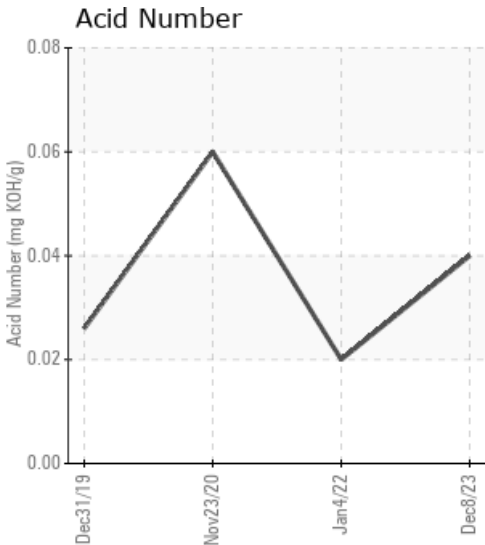
[LSD 11-21-66-03W6] PHASE 1/2 HEAT MEDIUM

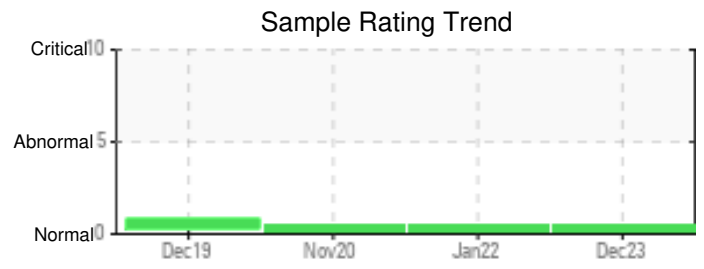
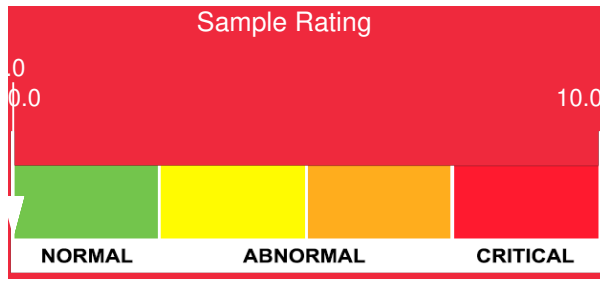
Customer: PTRHTF20236	System Information	Sample Information
Pembina - Petterson Creek	System Volume: 10000 ltr	Lab No: 02605134
Grande Prairie, AB CA	Bulk Operating Temp: 482F / 250C	Analyst: Clinton Buhler
Attn: Ryan Solheim	Heating Source:	Sample Date: 12/08/23
Tel:	Blanket:	Received Date: 12/22/23
E-Mail: rsolheim@pembina.com	Fluid: BRENNTAG CHEMTHERM 550	Completed: 01/05/24
	Make: HEAT TECH	Clinton Buhler
		Clinton.Buhler@HFSinclair.com

Recommendation: Sample results indicate the heat transfer fluid is in suitable condition for continued service. Please re-sample in 12 months

Comments:

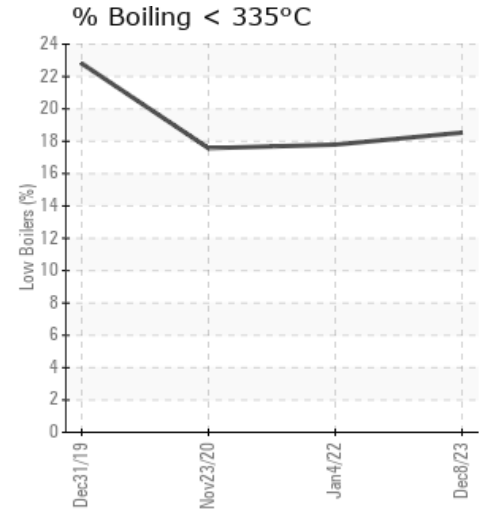
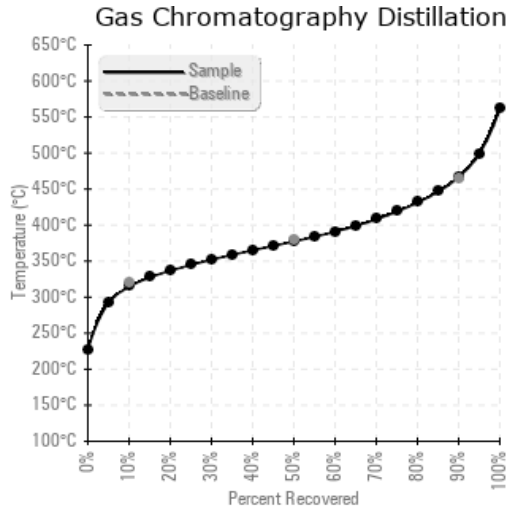
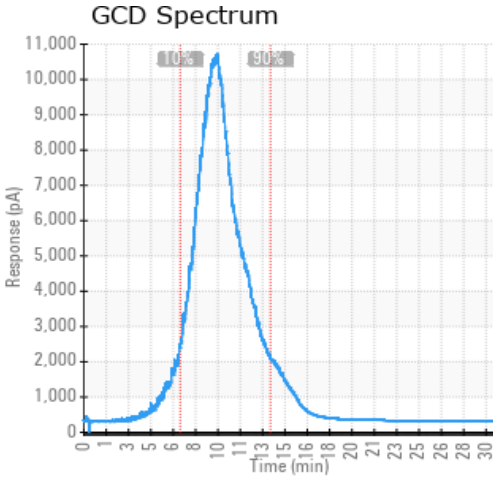
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
12/08/23	12/22/23	0.0y		363 / 184	23	32.2	0.04	0.021	598 / 315	711 / 377	872 / 467	18.53
01/04/22	01/24/22	5.0y	Pump discharge	363 / 184	44.8	33.7	0.02	0.048	601 / 316	712 / 378	872 / 467	17.79
11/23/20	12/14/20	4.0y	Pump discharge	356 / 180	24.6	29.8	0.06	0.068	603 / 317	712 / 378	871 / 466	17.57
12/31/19	02/03/20	2.3y	UPSTREAM OF PUMP	352 / 178	0.00	30.1	0.026	0.045	592 / 311	695 / 368	843 / 450	22.81
Baseline Data				345 / 174		30.6			609 / 321	714 / 379	867 / 464	





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
12/08/23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01/04/22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/23/20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12/31/19	0	0	0	0	0	0	0	0	0	0	2	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

01/04/22	Sample results indicate the heat transfer fluid is in suitable condition for continued service. Please re-sample in 12 months
11/23/20	Sample results indicate that the thermal fluid is suitable for continued service. Please re-sample in 12 months.
12/31/19	Sample results indicate that the fluid is suitable for continued service. GCD 90% Distillation Point is marginally low. Please re-sample in 12 months

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