

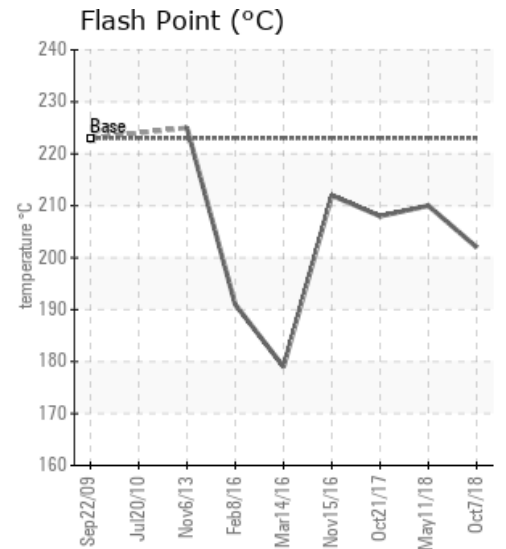
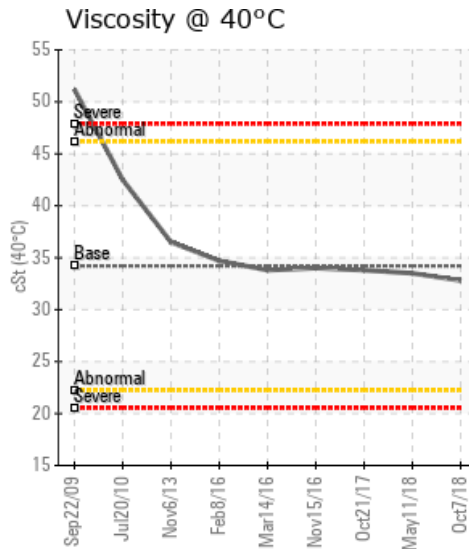
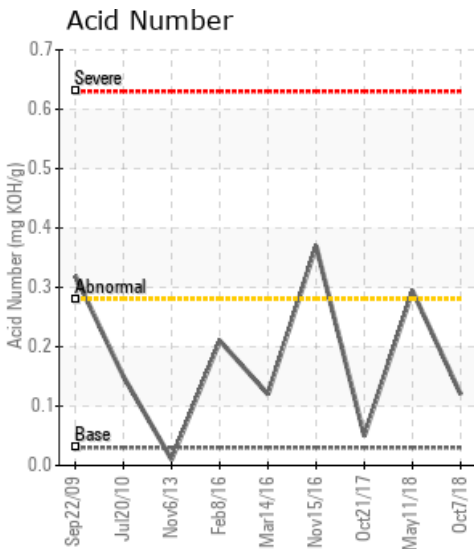
[PEYTO WILDHAY / LSD 4-21-55-23-W5M] HEAT TRANSFER SYSTEM

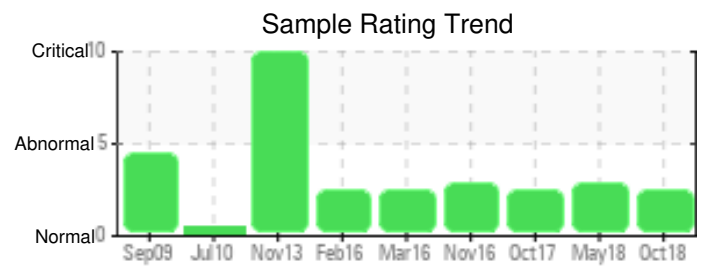
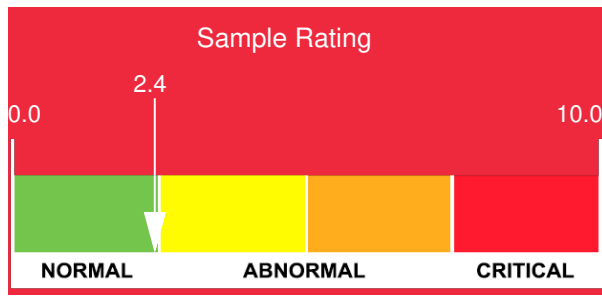
Customer: PTRHTF20089	System Information	Sample Information
PEYTO ENERGY TRUST - WILDHAY WILDHAY 4-21-55-23 , AB T4E 1V4 Canada Attn: STEVE WARREN Tel: (780)712-5616 E-Mail: swarren@peyto.com	System Volume: 15000 ltr Bulk Operating Temp: 347F / 175C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: ALCO OIL AND GAS	Lab No: 02245582 Analyst: Peter Harteveld Sample Date: 10/07/18 Received Date: 10/17/18 Completed: 10/22/18 To discuss this report contact Peter Harteveld at (780)967-4234

Recommendation: The fluid is in a good condition and suitable for further use. A slightly low Flash Point and 10% GCD temperature in combination with 2.27% low boiler vapor indicates normal thermal degradation. 90% GCD temperature is slightly low. This is no problem for system operation at this time. It is recommended to vent low boiler vapor to atmosphere on a regular basis. The Pentane Insoluble (solids) content of the fluid is lower than before but still exceeds the reportable limit of 0.5%. Therefore filtration of the fluid is recommended.

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

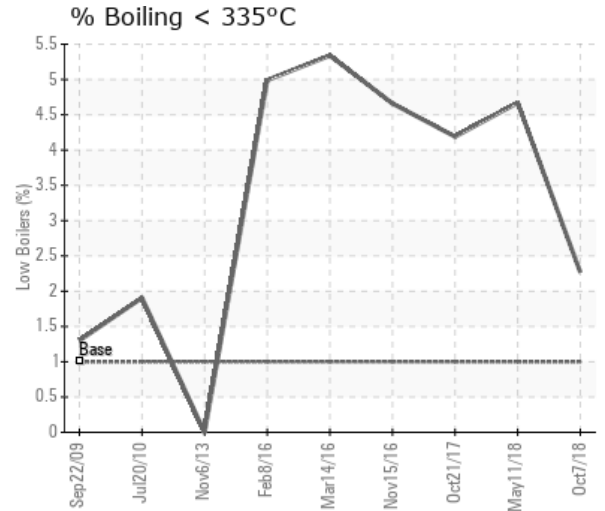
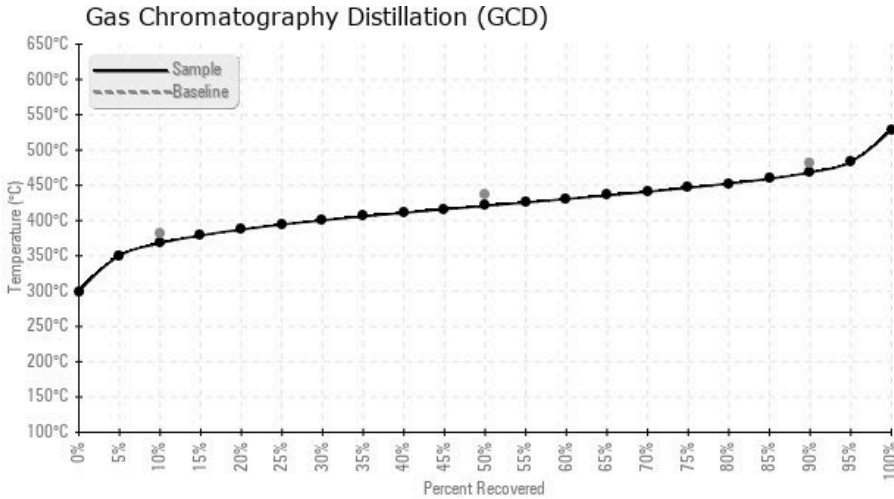
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
10/07/18	10/17/18	0w		396 / 202	17.0	32.8	0.12	0.749	694 / 368	789 / 421	875 / 468	2.27
05/11/18	05/31/18	0w	DISCHARGE SIDE PUMP	410 / 210	23.7	33.5	0.294	1.04	686 / 364	802 / 428	887 / 475	4.67
10/21/17	10/30/17	0w	DOWNSTREAM OF PUMP	406 / 208	6.1	33.8	0.05	1.15	694 / 368	811 / 433	900 / 482	4.19
11/15/16	12/23/16	0w	DOWNSTREAM OF PUMP	414 / 212	0.7	34.0	0.370	0.879	688 / 365	808 / 431	898 / 481	4.66
03/14/16	03/15/16	0w	DISCHRG SIDE OF PUMP	354 / 179	8.7	33.8	0.12	0.926	681 / 360	802 / 428	897 / 480	5.34
02/08/16	02/16/16	0w	DISCHARGE OFF PUMP	376 / 191	15.2	34.7	0.21	1.39	686 / 363	805 / 429	897 / 481	4.99
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
10/07/18	75	0	0	0	0	0	0	0	0	0	2	3	0	0	0	0	1	0	0	0	2	0	1	0
05/11/18	85	0	0	0	0	0	0	0	0	0	2	3	0	0	0	0	1	0	0	0	1	0	0	0
10/21/17	86	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	1	0	0	0	0	0	0	0
11/15/16	84	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	1	0	0	0	0	0	0	0
03/14/16	90	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	1	0	0	0	1	0	1	0
02/08/16	91	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	1	0	0	0	0	0	1	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	
05/11/18	The fluid is in reasonable condition but shows signs of thermal degradation. Fluid is suitable for further use. The low boiler vapor content is high (% boil-off <335C.) and the GCD 10% temperature is low. Pentane Insolubles (solids content) is high at 2x the limit (= 0.5%). It is recommended to vent off the low boiler vapors to atmosphere and start filtration of the fluid to lower the solids content. Please re-sample in 6 months. Pentane Insolubles levels are severely high. Acid Number (AN) is abnormally high.
10/21/17	The fluid is in a reasonable condition and suitable for further use but shows signs of thermal degradation. Indications of this are: Elevated % boil-off below 335 degrees C, slightly low 10% GCD temperature and increase in Pentane Insoluble (solids) content. It is recommended to vent off low boiler vapors to atmosphere on a regular basis and start filtration to lower the solids content. Please re-sample in 6 months and list the service life of the fluid at that time. Pentane Insolubles levels are severely high.
11/15/16	Flash Point is good. TAN has increased. Percentage boil-off <335 degrees C. has remained about the same. The 10% GCD temperature still shows a slight decrease. These are all indications of thermal degradation. Pentane Insoluble (solids) content is high. Filtration of the fluid is required. Please re-sample after 6 months. Indicate oil service life at the next sample !!! Pentane Insolubles levels are severely high. Acid Number (AN) is abnormally high.
03/14/16	Flash Point of the fluid has decreased further. TAN shows a slight decrease. Percentage boil-off <335 degrees C. has remained about the same. The 10% GCD temperature still shows a slight decrease. These are all indications of thermal degradation. Pentane Insoluble (solids) content is high. Filtration of the fluid needs to be continued for a longer period of time. Please re-sample after 6 months. Indicate oil service life at the next sample !!! Pentane Insolubles levels are severely high. COC Flash Point is marginally low.
02/08/16	Flash Point of the fluid has decreased. TAN shows a slight increase. Percentage boil-off <335 degrees C. has increased. These are indications of thermal degradation. Pentane Insoluble (solids) content is high. It is recommended to filter the fluid. Please re-sample after filtration and indicate oil service life at the next sample. Pentane Insolubles levels are severely high. COC Flash Point is marginally low.

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