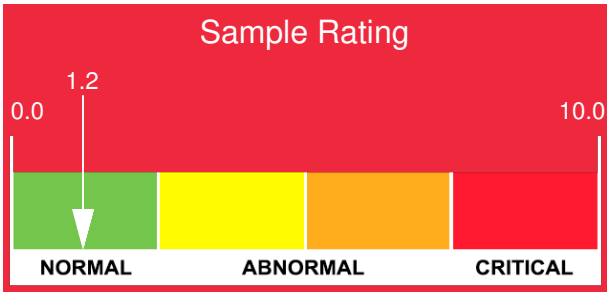
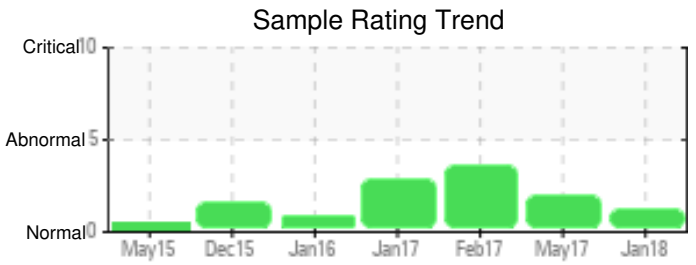




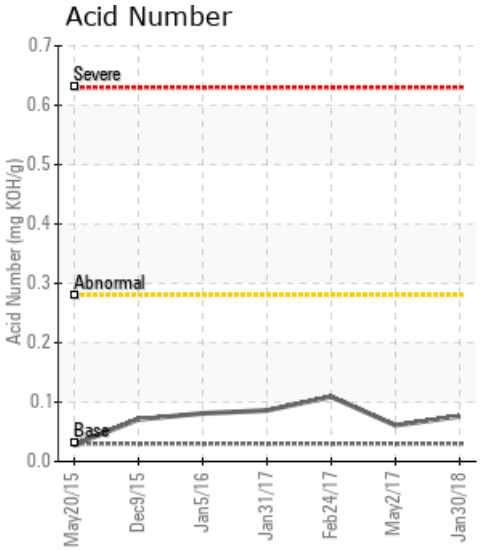
NUVISTA ENERGY BILBO 03-36-65-06W6 CL1802015801

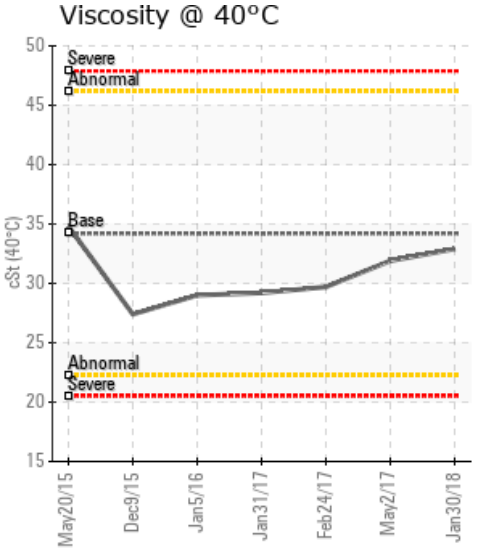
Customer: PTRHTF20039	System Information	Sample Information
BRENNTAG CANADA INC 3124-54TH AVENUE SE CALGARY, AB T2A 0A8 CANADA Attn: Ghassan Mahran Tel: (403)720-5656 E-Mail: gmahran@brenntag.ca	System Volume: 40000 ltr Bulk Operating Temp: 446F / 230C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: ALCOE	Lab No: 02201239 Analyst: Clinton Buhler Sample Date: 01/30/18 Received Date: 02/28/18 Completed: 03/19/18 To discuss this report contact Clinton Buhler at 780-516-9920

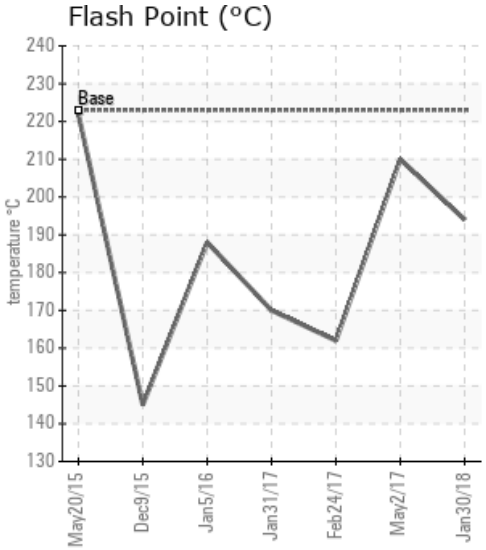
Recommendation: Sample results indicate fluid is suitable for continued service. GCD % < 335C value of 3.8 indicates low boiling vapors in the fluid. This can be an indication of thermal degradation or possible cross contamination with another fluid. Continue venting of system to release low boiling vapors after which time, ensure that blanket as is in operation. Sodium and Potassium indicates possible contamination with glycol or similar product. Investigate and resolve source of ingression.Re-sample in 12 months

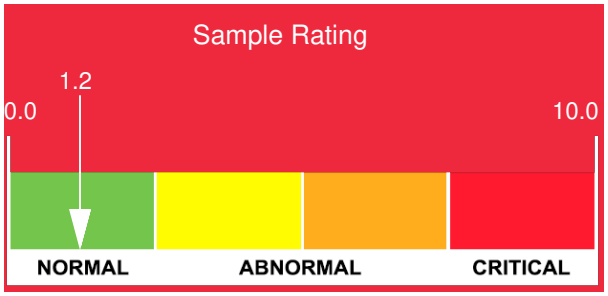
Comments: Potassium ppm levels are abnormally high.

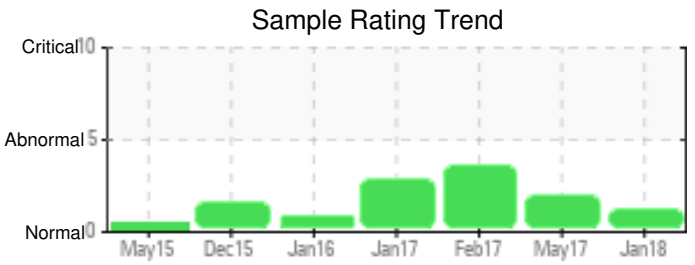
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
01/30/18	02/28/18	36m		381 / 194	6.9	32.9	0.076	0.173	700 / 371	805 / 429	915 / 490	3.80
05/02/17	05/26/17	0m		410 / 210	113.8	31.9	0.061	0.198	703 / 373	813 / 434	924 / 496	3.56
02/24/17	03/10/17	0m		324 / 162	208.1	29.7	0.109	0.127	700 / 371	809 / 432	937 / 503	4.06
01/31/17	03/10/17	0m		338 / 170	13.0	29.2	0.086	0.097	685 / 363	806 / 430	940 / 504	5.88
01/05/16	01/08/16	0m	CIRCULATING LINE	370 / 188	36.4	29.0	0.081	0.109	695 / 368	805 / 429	916 / 491	4.47
12/09/15	12/11/15	0m	CIRCULATING LINE	293 / 145	1.7	27.4	0.071	0.050	675 / 357	797 / 425	907 / 486	6.43
Baseline Data				433 / 223		34.2	0.03		720 / 382	817 / 436	900 / 482	1.00





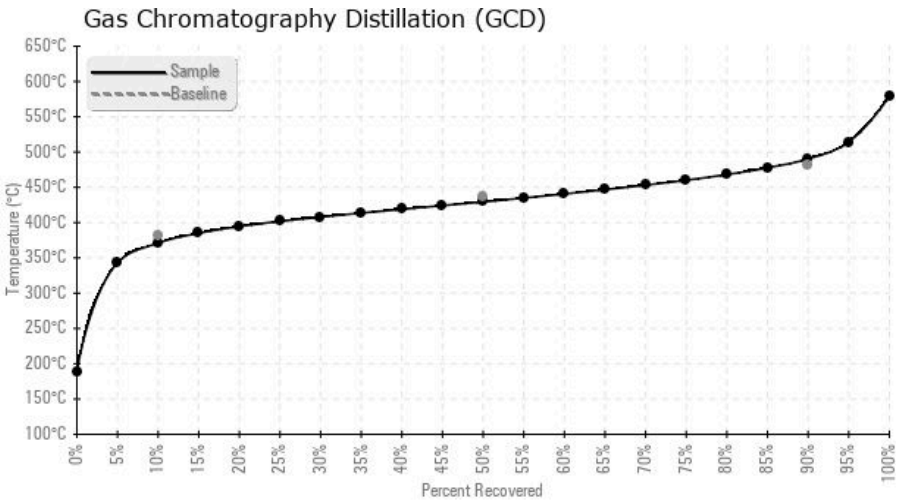


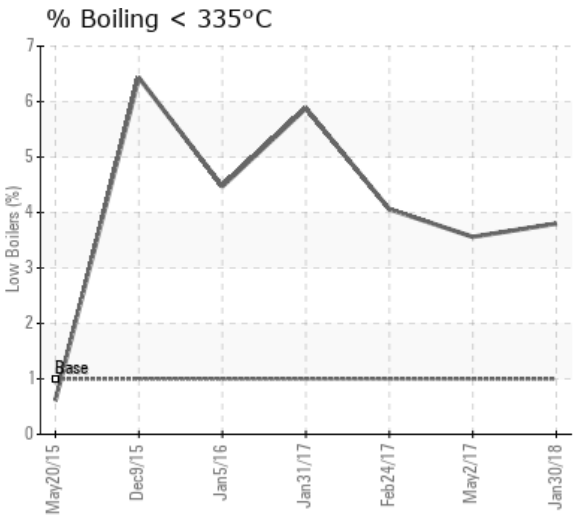




Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
01/30/18	14	0	0	0	0	0	3	3	0	0	1	10	29	0	0	0	0	0	0	1	3	0	0	0
05/02/17	31	0	0	0	0	0	1	2	0	0	0	3	26	0	0	0	0	0	0	0	2	0	0	0
02/24/17	7	0	0	0	0	0	1	1	0	0	0	2	0	0	0	0	0	0	0	0	1	0	0	0
01/31/17	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
01/05/16	15	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
12/09/15	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Baseline Data			0	0						0			0	0					0				0	

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





Historical Comments

05/02/17	Please include system volume, bulk temperature and fluid service time with sample registration.90% distillation point level can indicate oxidation of the fluid. Please ensure blanket gas is operational in expansion tank.GCD %<335°C and 10% distillation point can indicate thermal degradation (cracking), which means low boiling vapors are present. Continue periodic yet thorough venting of expansion tank to release the low boilers.26 ppm of Potassium may indicate contamination with outside sources. Please investigate possible sources of contamination (water/glycol, etc.).Re-sample fluid in 6 months. Potassium ppm levels are abnormally high. (GCD) 90% Distillation Point is marginally high.
02/24/17	Please list system volume, bulk oil temperature and fluid service life on the sample label. The blank areas are there for a reason !Low Flash Point, decreased viscosity and elevated low boiler vapor content (% boil-off below 335C.) are indications of thermal degradation. At the same time oxidation is taking place. (90% GCD temp is high). Please vent off low boiler vapors to atmosphere but make sure that the fluid is not exposed to outside air (oxygen) for too long when the fluid temp is high. After venting please ensure that blanket gas is applied. (GCD) 90% Distillation Point is severely high. COC Flash Point is severely low.
01/31/17	Please ensure sample label is completely filled out including system volume, service life and bulk oil temperature. Increased 90% GCD can indicate oxidation. Please check for functioning gas blanket.Reduced COC flash point and increased %<335°C indicates thermal degradation. Please ensure system is thoroughly vented to release the low boiling vapors (GCD) 90% Distillation Point is severely high. COC Flash Point is abnormally low.
01/05/16	Flash is still low but has greatly improved over the December Sample. Continue to operate and resample in 6 months COC Flash Point is marginally low.
12/09/15	Sample indicated 0.2% Water in the Oil and the Flash point is down at 145 DEG C. COC Flash Point is severely low.