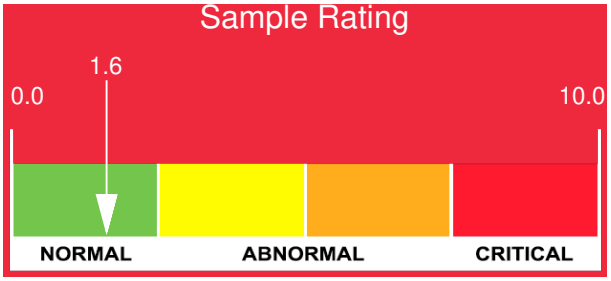
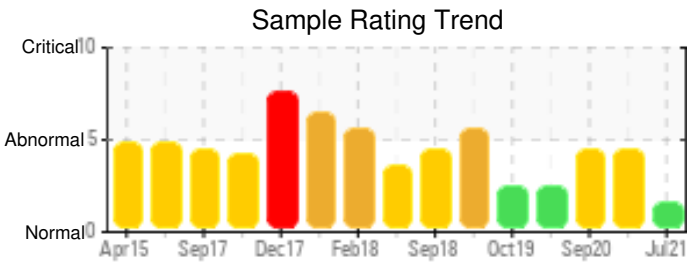




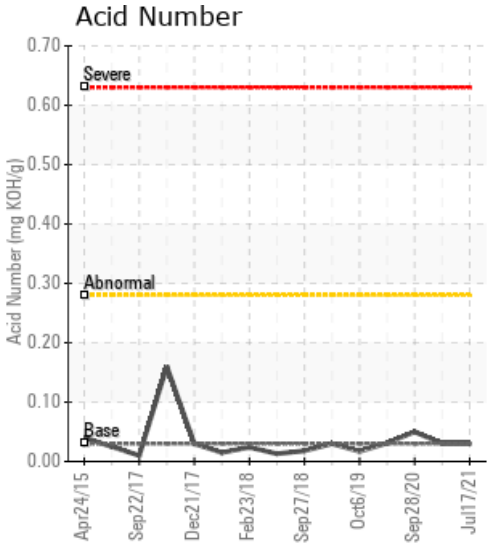
[16-11-54-15W5] BONAVISTA

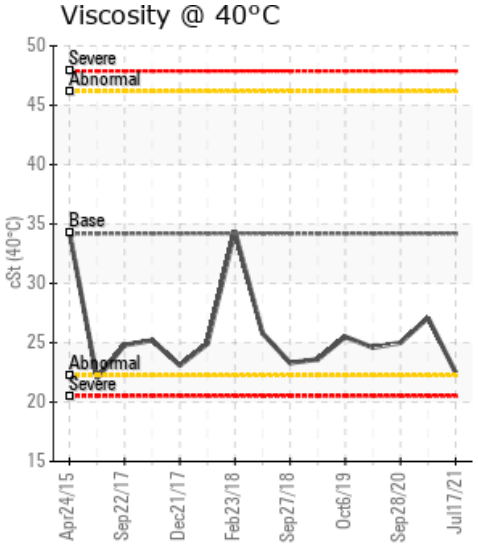
Customer: PTRHTF20158	System Information	Sample Information
BONAVISTA ENERGY 16-11-54-15-W5 PEERS, AB T0E 1W0 Canada Attn: Dan Duriez Tel: (780)728-3552 E-Mail: dan.duriez@bonavistaenergy.com	System Volume: 14000 ltr Bulk Operating Temp: 392F / 200C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make:	Lab No: 02437559 Analyst: Clinton Buhler Sample Date: 07/17/21 Received Date: 08/09/21 Completed: 08/12/21 Clinton Buhler Clinton.Buhler@hollyfrontier.com

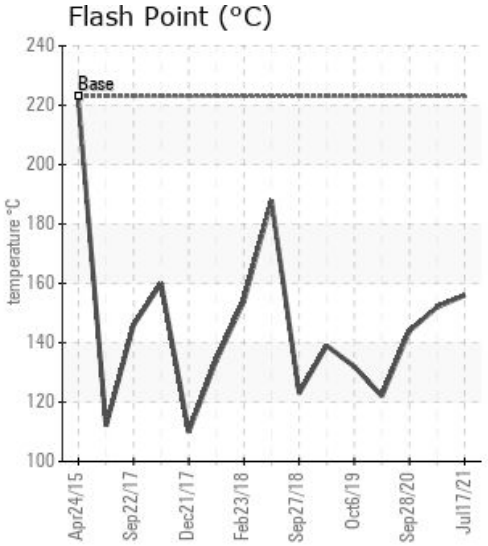
Recommendation: Sample results indicate continued improvement in low boiling vapor content although fluid viscosity has reduced. Continue venting of expansion tank to further reduce low boiling vapor content. Please re-sample in 6 months

Comments:

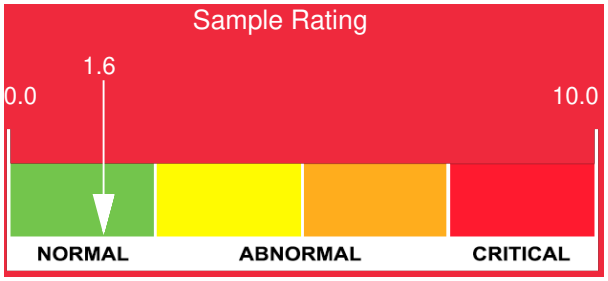
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
07/17/21	08/09/21	0.0y	oil disch. line	313 / 156	16.1	22.5	0.03	0.058	681 / 361	803 / 429	907 / 486	5.95
04/05/21	04/15/21	0.0y		306 / 152	8.7	27.1	0.03	0.052	664 / 351	796 / 425	910 / 488	7.31
09/28/20	10/08/20	6.0y	Filter	291 / 144	17.1	25.0	0.05	0.032	649 / 343	793 / 423	906 / 486	8.59
03/14/20	03/23/20	5.5y	FILTER DRAIN	252 / 122	23.4	24.6	0.031	0.055	715 / 380	811 / 433	919 / 493	1.76
10/06/19	10/23/19	0.0y		270 / 132	3.4	25.5	0.017	0.088	689 / 365	810 / 432	919 / 493	5.31
Baseline Data				433 / 223		34.2	0.03		720 / 382	817 / 436	900 / 482	1.00

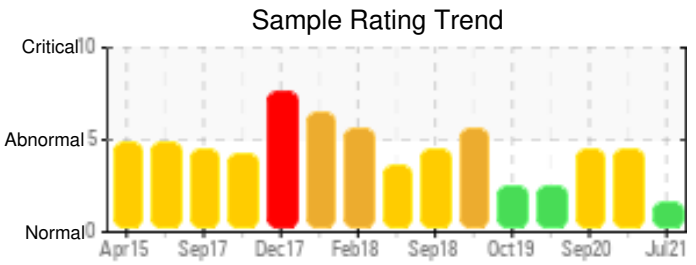






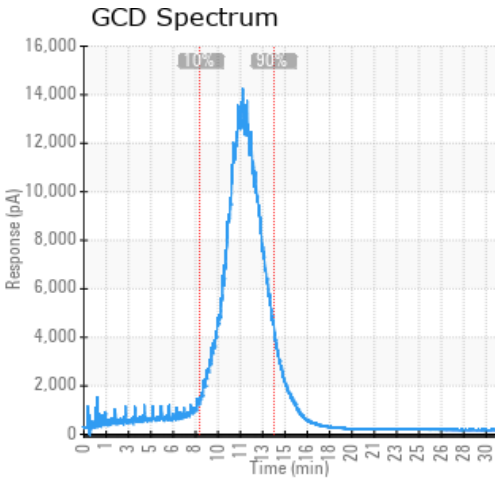
PETRO-CANADA LUBRICANTS

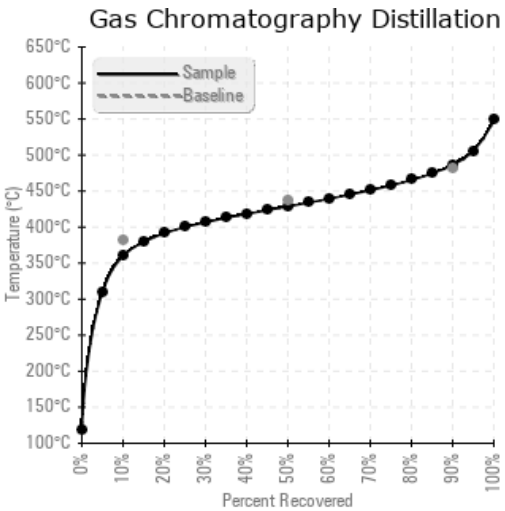


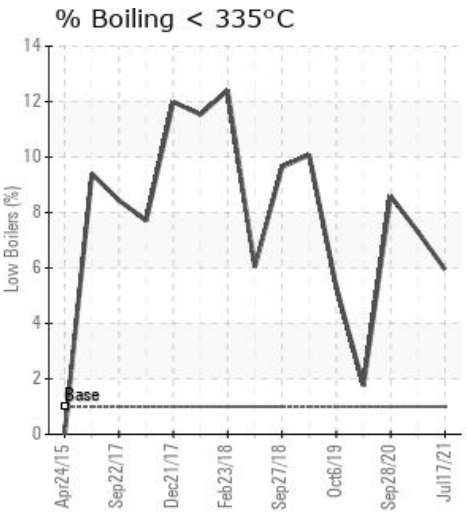


Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
07/17/21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04/05/21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09/28/20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03/14/20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/06/19	0	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 anaysis results (above) in parts per million (ppm). [10,000 ppm = 1.0%]







Historical Comments

04/05/21	sample results indicate a slight improvement since the last sample. Further venting of the system is required as there is still >7% of low boiling vapors, low fluid viscosity and reduced fluid flash point This may be associated to thermal degradation, contamination with process fluids or potentially from a high blanket gas pressure. Please increase venting regime to improve the parameters mentioned above. Please check and record what the expansion tank blanket pressure is set at as this may have a bearing on the dilution of the heating fluid. Please include this information, as well as time on oil, on the next fluid sample that is submitted. After thorough venting of system over the course of several weeks, please re-sample in 6 months
09/28/20	The condition of the fluid has improved compared with the previous analysis. This indicates proper operation of the venting system. Flash Point is still too low however has improved since last sample.Viscosity is low. These are signs of thermal degradation of the fluid. This degradation is however not excessive judging from thePentane Insoluble (solids) content which is low and has been stable over the past two years. The fluid is suitable for further use.Please re-sample in 6 months. COC Flash Point is severely low. (GCD) % < 335°C is marginally high. (GCD) 10% Distillation Point is marginally low.
03/14/20	The condition of the fluid has improved compared with the previous analysis. The low boiler vapor content (%<335C.) is close to that of the fresh fluid. This indicates proper operation of the venting system. Flash Point is still too low. Viscosity is low. These are signs of thermal degradation of the fluid. This degradation is however not excessive judging from the Pentane Insoluble (solids) content which is low and has been stable over the past two years. The fluid is suitable for further use. Please re-sample in 6 months. COC Flash Point is severely low. (GCD) 90% Distillation Point is marginally high.
10/06/19	The fluid is in a good condition and suitable for further use. There are still indications of thermal degradation. These are: Low viscosity, Flash Point, 10% GCD temperature and elevated low boiler vapor content (GCD <335C = 5.31%) Although the condition of the fluid has improved compared with the March 2019 sample, it is important to keep venting off the low boiler vapors. Flash Point should be at a minimum of 150C.Service life of the fluid is listed as 0 years. Has the fluid fill been changed since March or is this a mistake ? Please make sure to list fluid service life when taking the next sample which is recommended to do 6 months from now. COC Flash Point is severely low. (GCD) 90% Distillation Point is marginally high.