

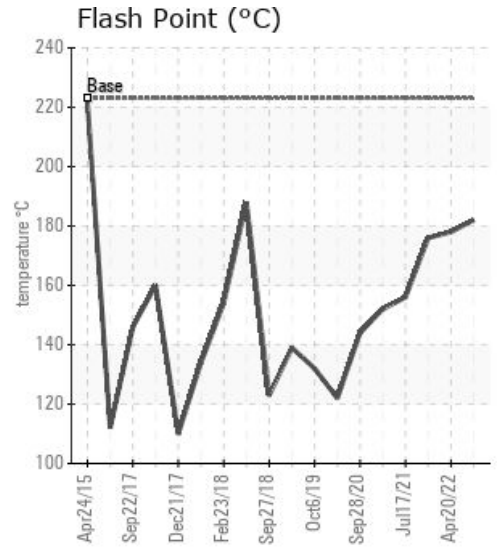
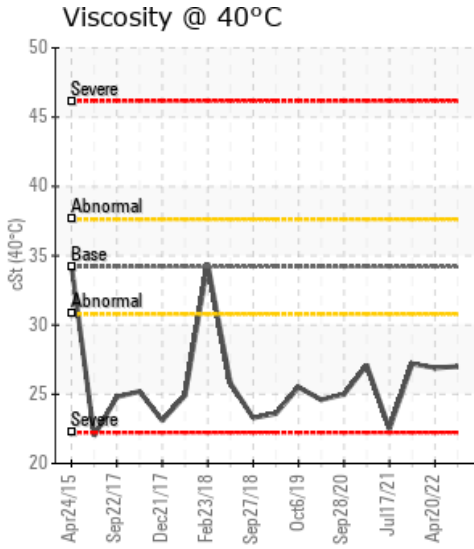
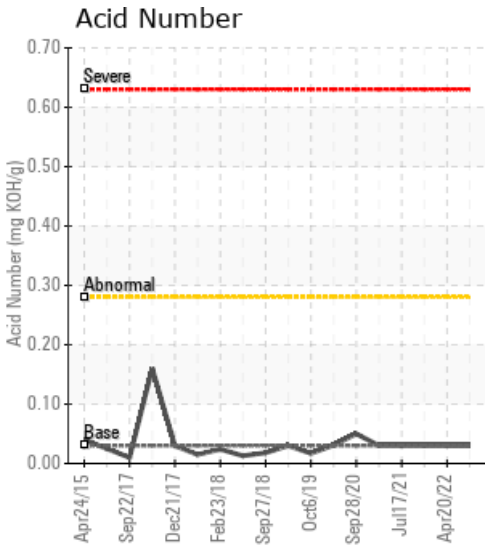
## [16-11-54-15W5] BONAVIDA

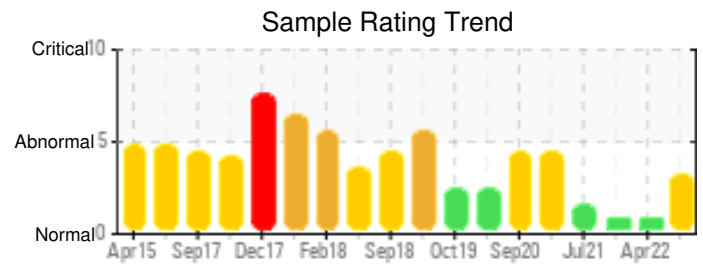
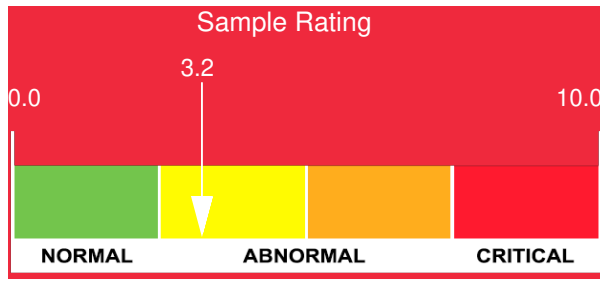
Customer: PTRHTF20158	System Information	Sample Information
BONAVIDA ENERGY	System Volume: 14000 ltr	Lab No: 02526543
PEERS, AB T0E 1W0 Canada	Bulk Operating Temp: 392F / 200C	Analyst: Clinton Buhler
Attn: David Chaput	Heating Source:	Sample Date: 10/12/22
Tel:	Blanket:	Received Date: 12/02/22
E-Mail:	Fluid: PETRO CANADA PETRO-THERM	Completed: 12/05/22
david.chaput@bonavistaenergy.com	Make:	Clinton Buhler
		Clinton.Buhler@HFSinclair.com

Recommendation: Sample results indicate fluid condition remains similar over the last couple samples. Continue REGULAR venting of expansion tank to further reduce low boiling vapor content and to help increase flash point. Please wait at least 12 months before re-sampling again and ensure venting is happening regularly.

Comments:

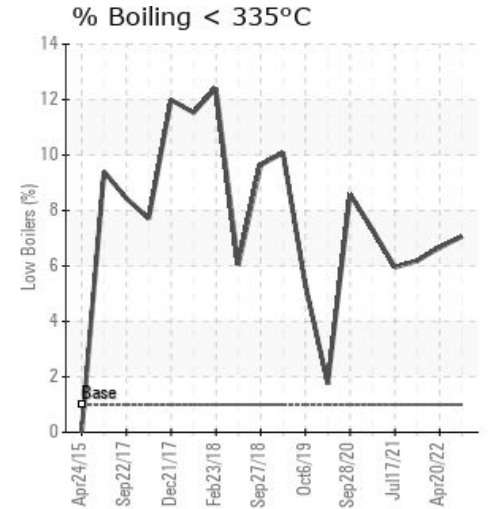
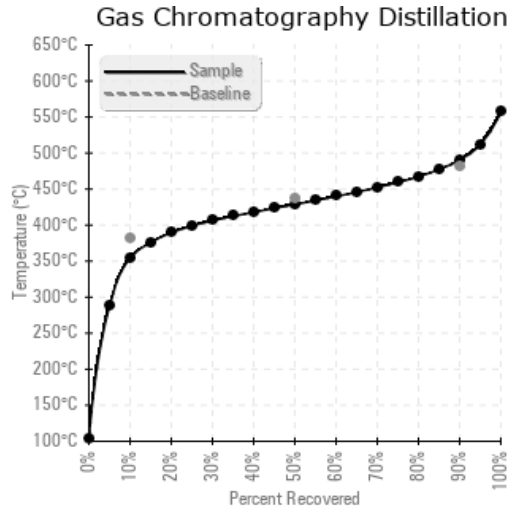
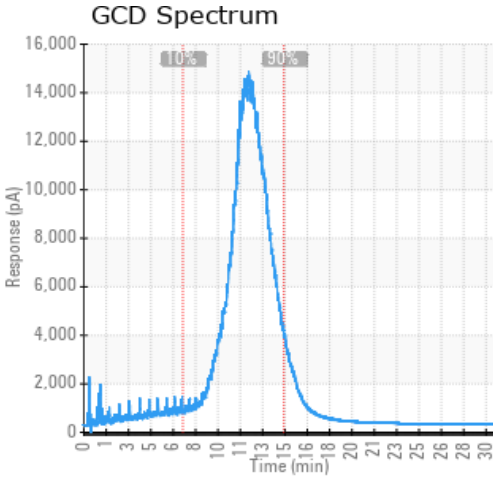
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
10/12/22	12/02/22	0.0y	Pump discharge	360 / 182	12.1	27.0	0.03	0.019	670 / 355	804 / 429	915 / 490	7.06
04/20/22	06/02/22	0.0y	pump discharge	352 / 178	1.8	26.9	0.03	0.043	673 / 356	803 / 428	912 / 489	6.66
09/29/21	10/21/21	0.0y	pump discharge	349 / 176	10.4	27.2	0.03	0.016	678 / 359	803 / 429	912 / 489	6.19
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
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
10/12/22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04/20/22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09/29/21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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
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

04/20/22	Sample results again indicate a small improvement in Flash Point. Continue regular venting of expansion tank to further reduce low boiling vapor content and to help increase flash point. Please wait at least 6 months before re-sampling again and ensure venting is happening regularly.
09/29/21	Sample results indicate small improvement in Flash Point. Low boiling vapor content remains fairly flat. Continue regular venting of expansion tank to further reduce low boiling vapor content and to help increase flash point. Please wait at least 6 months before re-sampling again
07/17/21	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
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