

## [LSD-3-36-65-6W6 Bilbo] H801

**Customer: PTRHTF20245**  
 NUVISTA ENERGY LTD  
 RR 93  
 WEMBLY, AB T8W 0H6 CA  
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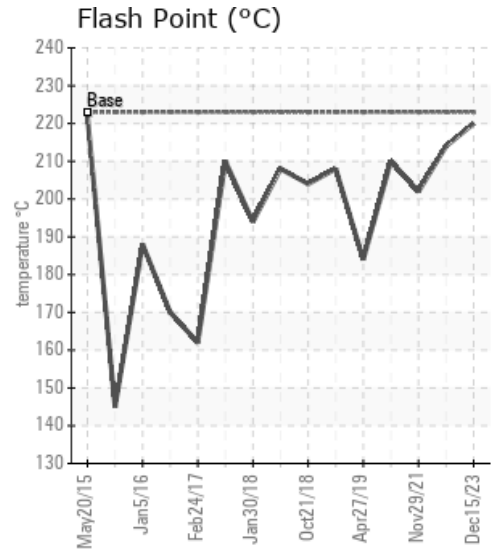
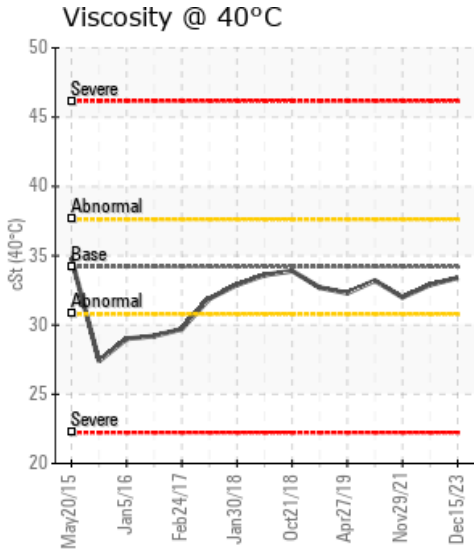
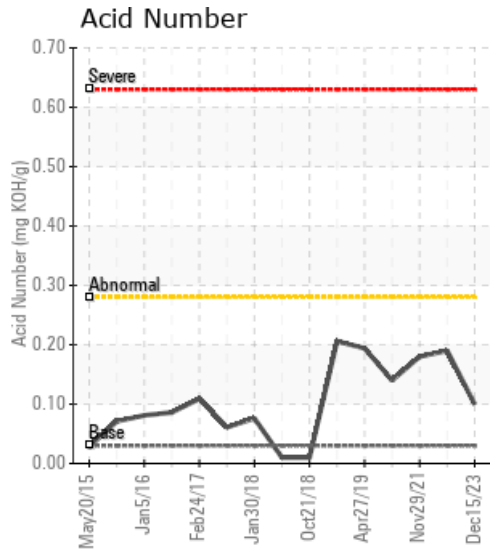
**System Information**  
 System Volume: 40000 gal  
 Bulk Operating Temp: 446F / 230C  
 Heating Source:  
 Blanket:  
 Fluid: PETRO CANADA PETRO-THERM  
 Make: ALCOE

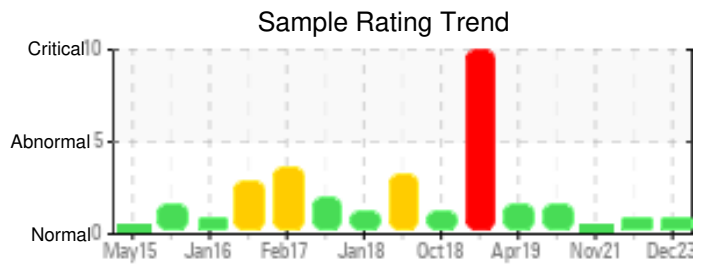
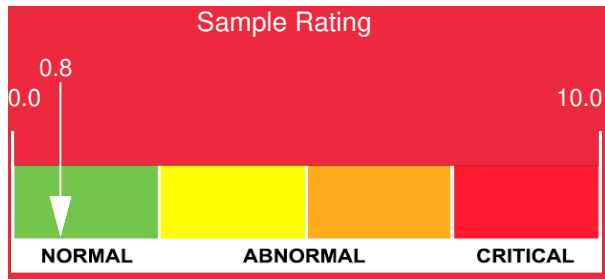
**Sample Information**  
 Lab No: 02614847  
 Analyst: Clinton Buhler  
 Sample Date: 12/15/23  
 Received Date: 02/09/24  
 Completed: 02/20/24  
 Clinton Buhler  
 Clinton.Buhler@HFSinclair.com

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

Comments:

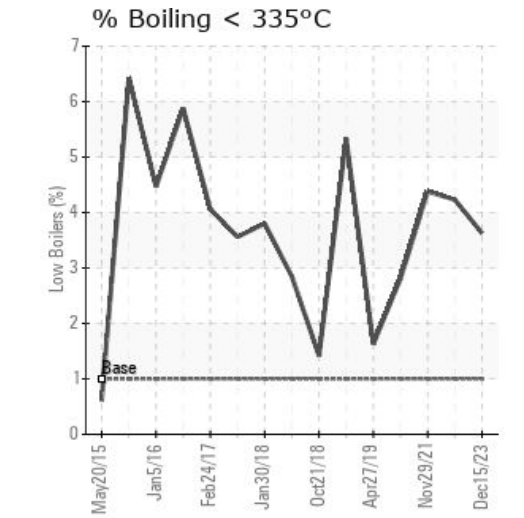
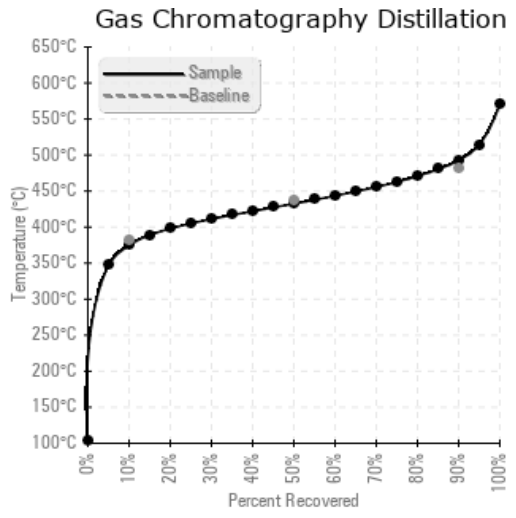
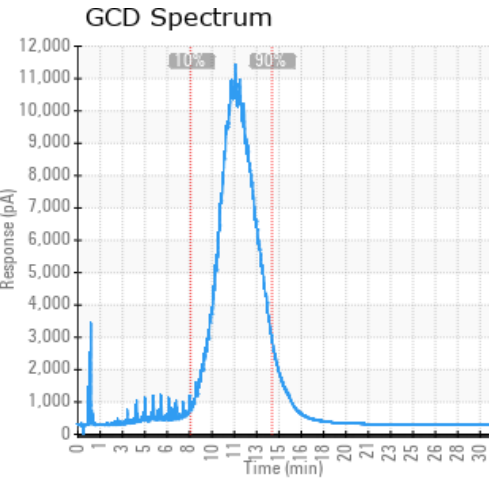
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
12/15/23	02/09/24	10.0y		428 / 220	65	33.4	0.10	0.160	707 / 375	811 / 433	919 / 493	3.63
11/29/22	03/10/23	8.0y		417 / 214	84.3	32.9	0.19	0.299	703 / 373	811 / 433	920 / 493	4.23
11/29/21	01/06/22	0.0y	at pump	396 / 202	19.6	32.0	0.18	0.367	703 / 373	810 / 432	917 / 492	4.38
10/10/20	01/14/21	7.0y	PUMP OUTLET	410 / 210	5.8	33.2	0.14	0.503	713 / 378	812 / 433	919 / 493	2.81
04/27/19	05/09/19	5.0y		363 / 184	13.5	32.3	0.194	0.077	723 / 384	820 / 438	928 / 498	1.63
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
12/15/23	23	0	0	0	0	0	0	0	0	0	0	5	12	0	0	0	0	0	0	4	15	0	0	0
11/29/22	9	0	0	0	0	0	0	0	0	0	2	6	12	0	0	0	0	0	1	4	11	0	0	0
11/29/21	10	0	0	0	0	0	0	0	0	0	0	6	16	0	0	0	0	0	1	4	6	0	0	0
10/10/20	11	0	0	0	0	0	0	0	0	0	0	7	18	0	0	0	0	0	0	4	6	0	0	0
04/27/19	11	0	0	0	0	0	0	0	0	0	0	7	20	0	0	0	0	0	0	1	5	0	0	0
<b>Baseline Data</b>			0	0						0			0	0					0				0	

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



Historical Comments	
11/29/22	Sample results indicate the fluid is in suitable condition for continued service. Low boiling vapor content remains just at 4.23% which can be associated with thermal degradation. Please vent expansion tank to help release the low boilers. Please re-sample in 12 months
11/29/21	Sample results indicate the fluid is in suitable condition for continued service. Low boiling vapor content has increased slightly to 4.38% which can be associated with mild thermal degradation. Please vent expansion tank to help release the low boilers. Please re-sample in 12 months
10/10/20	Fluid analysis results would appear to indicate that the heating fluid is in suitable condition for continued service. Remnants of sodium, potassium and calcium remain from previous contamination. Solids content up from last sample. Please ensure that sample valve and related tubing or piping is thoroughly purged prior to obtaining sample. Please re-sample in 6 months to monitor solids content. (GCD) 90% Distillation Point is abnormally high. COC Flash Point is marginally low.
04/27/19	Sample results are much improved compared to the previous analysis and indicate the fluid is suitable for continued service. This may indicate that the previous sample was drawn from a low spot in the system with little turbulence and the sampling piping and valves may not have been purged thoroughly. Continue periodic venting of expansion tank as part of good maintenance practices and ensure blanket gas in the expansion tank is operational except for while venting. Please re-sample in 6 months (GCD) 90% Distillation Point is abnormally high. COC Flash Point is marginally low.

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