

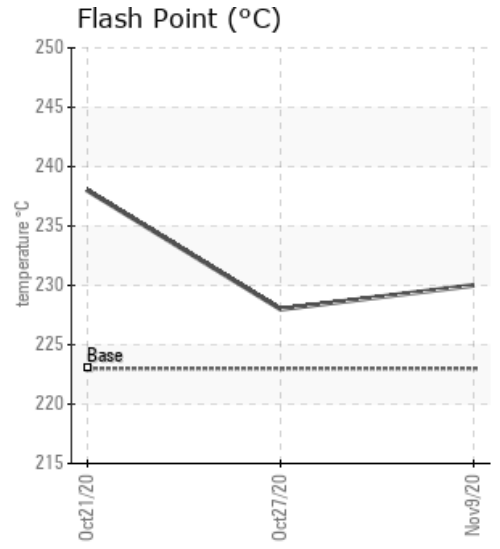
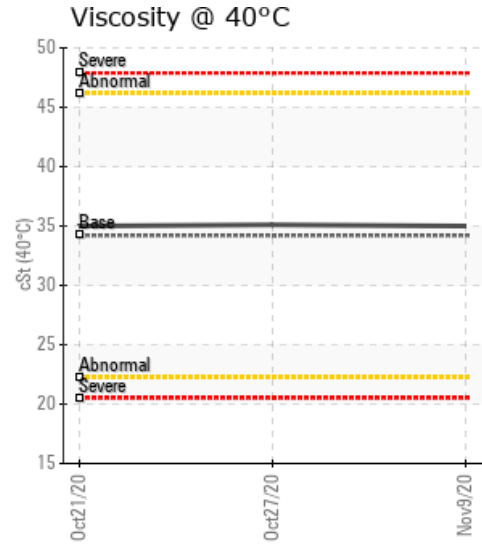
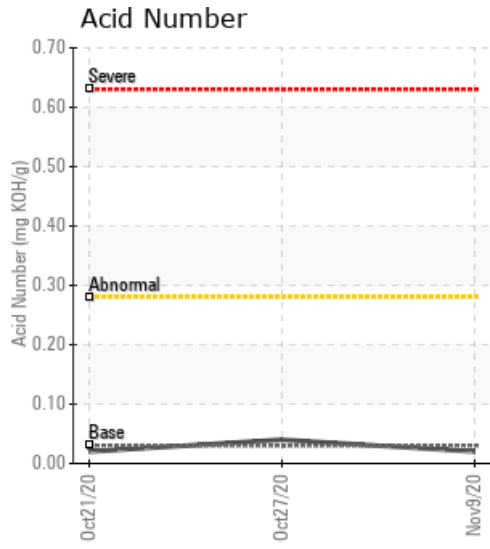
## [16-28-71-9 W6M] PIPESTONE NORTH

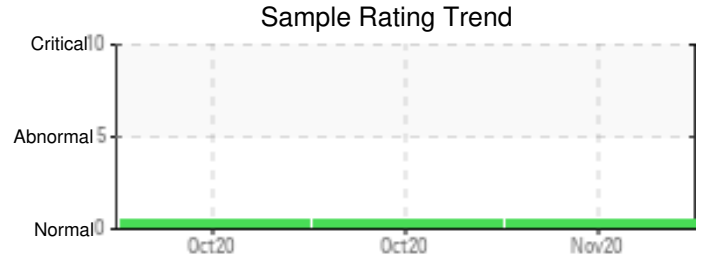
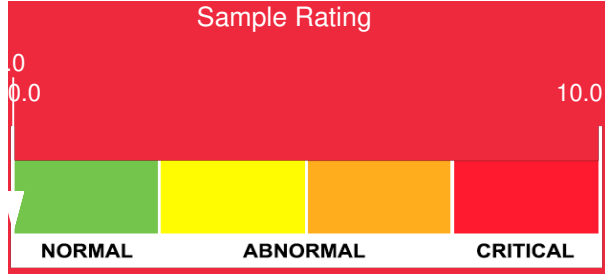
Customer: PTRHTF20245	System Information	Sample Information
NUVISTA ENERGY LTD RR 93 WEMBLY, AB T8W 0H6 Canada Attn: Eldon Weaver Tel: (780)831-5603 E-Mail: eweaver@nvaenergy.com	System Volume: 65000 ltr Bulk Operating Temp: 392F / 200C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: HEATECH	Lab No: 02387520 Analyst: Clinton Buhler Sample Date: 11/09/20 Received Date: 11/16/20 Completed: 11/25/20 Clinton Buhler Clinton.Buhler@hollyfrontier.com

Recommendation: Final sample of the fluid after filtering has been completed. ISO particle count remains at 23/21/14 yet solids has gone from 0.069% to 0.046% which is also an indication of efficient filtering. Please re-sample once system is operational at normal operating temperatures.

Comments:

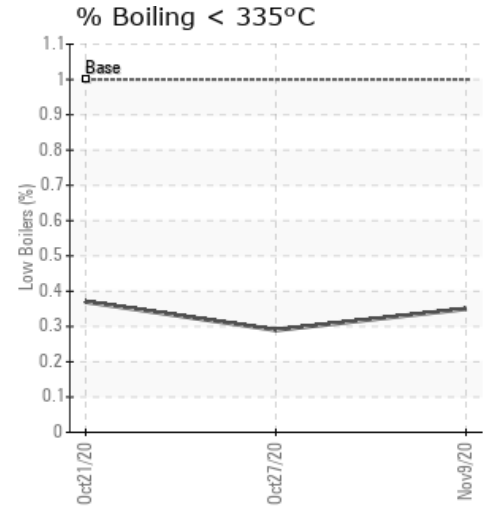
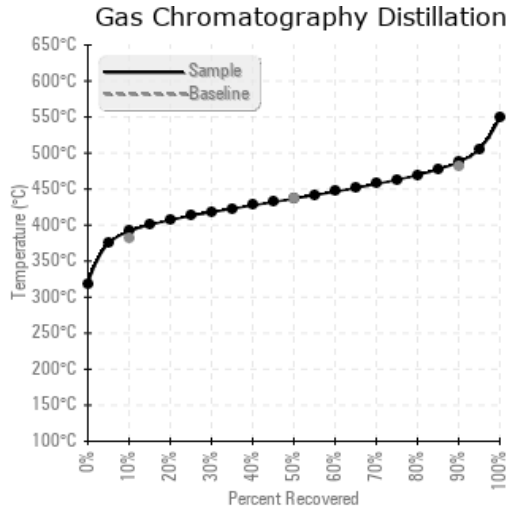
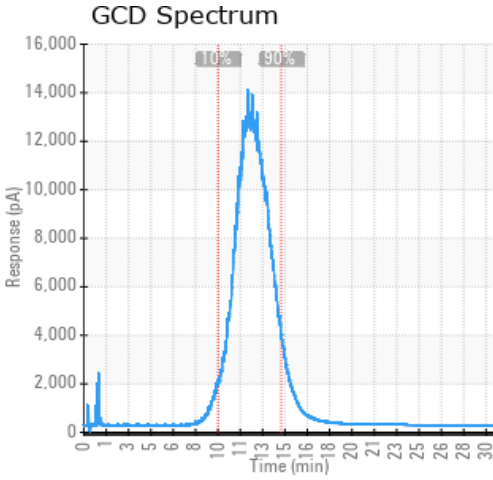
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
11/09/20	11/16/20	20.0d	PUMP DISCHARGE	446 / 230	13.0	35.0	0.02	0.046	736 / 391	818 / 437	910 / 488	0.35
10/27/20	11/04/20	7.0d	Piping from heater	442 / 228	22.0	35.1	0.04	0.069	735 / 391	818 / 436	909 / 487	0.29
10/21/20	10/28/20	0.0d		460 / 238	39.0	35.0	0.02	0.104	735 / 390	814 / 435	901 / 483	0.37
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
11/09/20	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
10/27/20	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
10/21/20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
<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**

10/27/20	Sample is after filtering of the fluid has began. Filtering is improving cleanliness as ISO particle count has gone from 24/22/17 to 23/21/14; solids has gone from 0.104% to 0.069%.Please re-sample once system is operational at normal operating temperatures.
10/21/20	This sample is of new Petro-Therm in the Pipestone facility heater circulating without full system temperature. ISO particle count (Fluid Cleanliness) is at 24/22/17. All other parameters indicate fresh and healthy Petro-Therm.Please re-sample fluid after filtering is complete and after it has ran at operating temperature for at least 24 hours.For future samples, please indicate blanket gas pressure and time on oil.

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