

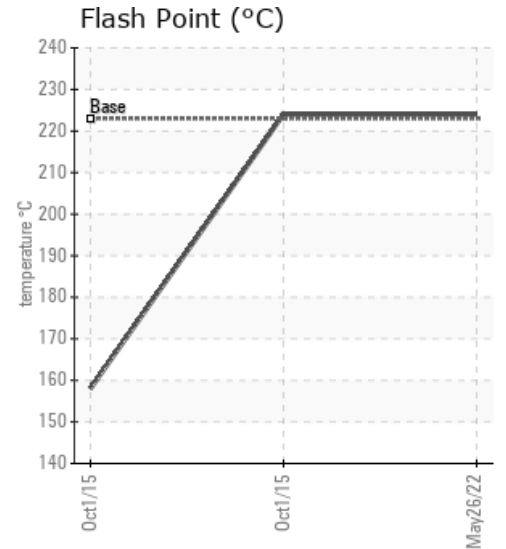
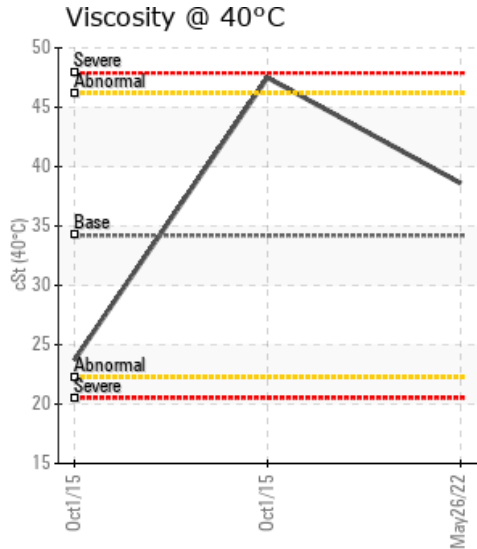
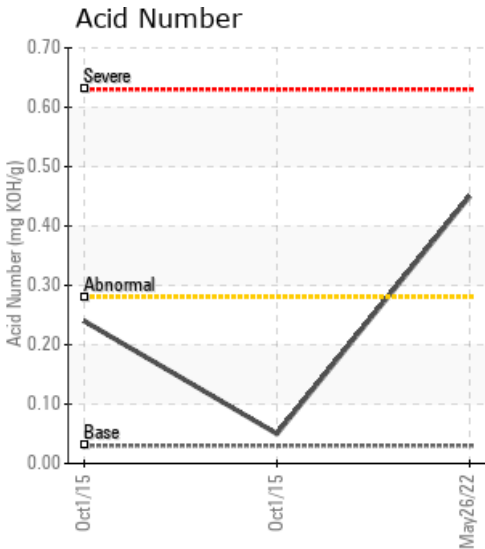
## [5-11-029-04W5] U510 ORLEN UPSTREAM

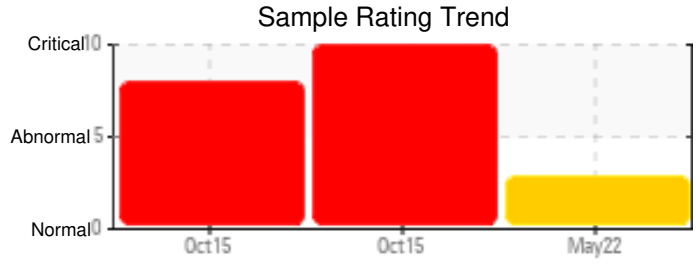
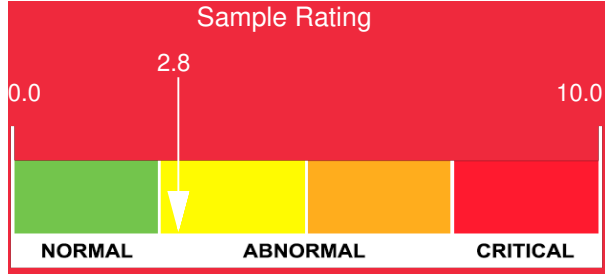
Customer: PTRHTF20071	System Information	Sample Information
ORLEN UPSTREAM PO BOX 488 CREMONA, AB T0M 0R0 Canada Attn: Maintenance Manager Tel: E-Mail:	System Volume: 1300 ltr Bulk Operating Temp: 225F / 107C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make:	Lab No: 02492194 Analyst: Lyle Dach Sample Date: 05/26/22 Received Date: 06/02/22 Completed: 06/10/22 Lyle Dach lyle.dach@hollyfrontier.com

Recommendation: Viscosity, flash and GCD are in spec. Water and metals are very low. Pentane insolubles are high enough that filtration should be considered. Acid number has also climbed, if there is blanket gas ensure it is functioning properly. After the fluid is filtered sweetening may be required to reduce the acid number. Resample after fluid is filtered.

Comments: Pentane Insolubles levels are severely high. Acid Number (AN) is abnormally high.

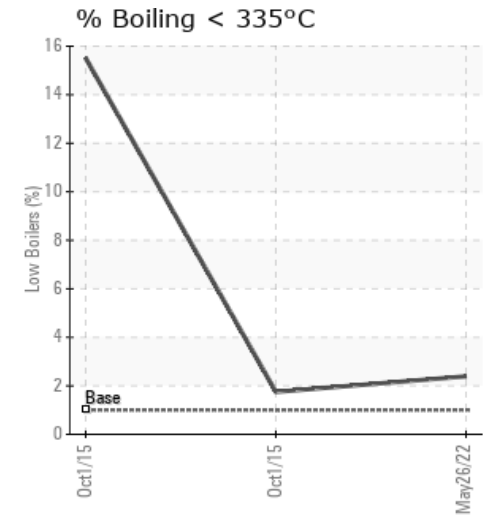
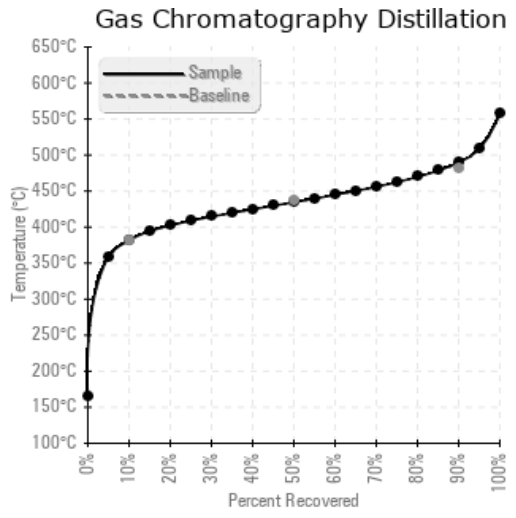
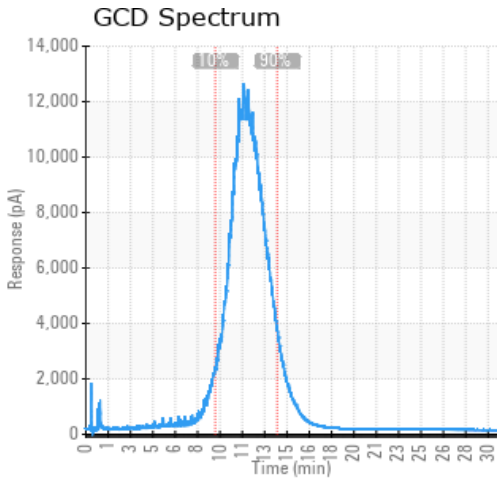
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
05/26/22	06/02/22	0.1y	sight glass	435 / 224	44.8	38.6	0.45	0.689	719 / 382	814 / 435	913 / 490	2.39
10/01/15	10/06/15	0.0y		435 / 224	33.5	47.5	0.05	0.610	721 / 383	828 / 442	950 / 510	1.75
10/01/15	10/06/15	0.0y		316 / 158	1334.6	23.7	0.24	1.73	577 / 303	764 / 407	872 / 467	15.51
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
05/26/22	45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
10/01/15	605	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	8	0	0	0	1	0	0	0
10/01/15	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	
10/01/15	Very high iron count indicating that corrosion is or has been taking place. Also viscosity is high. Fluid should be cleaned up or changed out. Iron ppm levels are severe. PQ levels are abnormal. Water contamination levels are severely high. Pentane Insolubles levels are severely high. (GCD) 90% Distillation Point is severely high. Visc @ 40°C is abnormally high.
10/01/15	Fluid shows low viscosity and flash point. Also very high water content. Suggest venting of the system fluid and resampling. Water contamination levels are severely high. Pentane Insolubles levels are severely high. (GCD) 10% Distillation Point is severely low. COC Flash Point is severely low. (GCD) % < 335°C is abnormally high. (GCD) 90% Distillation Point is abnormally low.

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