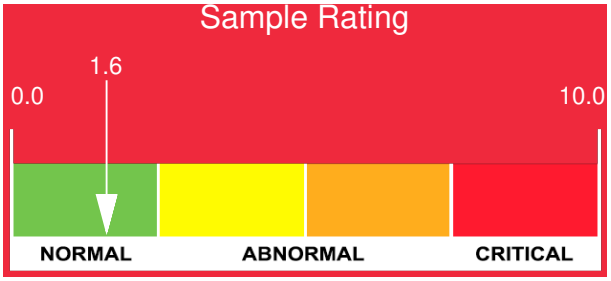
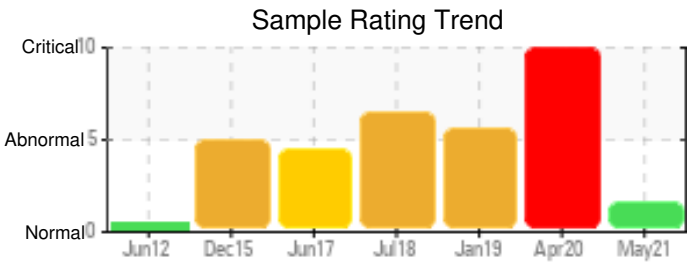




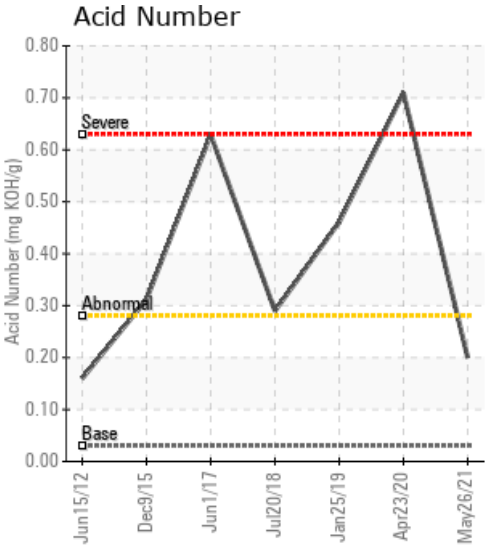
PASTE PLANT 1 HTF

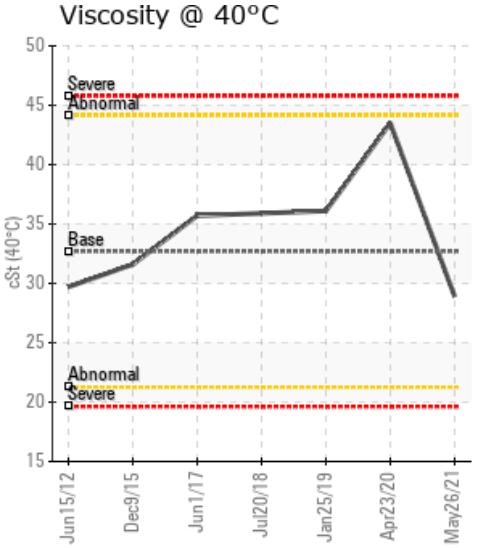
Customer: PTRHTF60012	System Information	Sample Information
TOMAGO ALUMINIUM COMPANY 638 TAMAGO ROAD, TOMAGO NEW SOUTH WALES NEWCASTLE, 2324 Australia Attn: Adam Whiting Tel: 6(140)914-0530 E-Mail: adam.whiting@tomago.com.au	System Volume: 15000 ltr Bulk Operating Temp: 419F / 215C Heating Source: Blanket: Fluid: PETRO CANADA CALFLO AF Make:	Lab No: 02438612 Analyst: Philip Riley Sample Date: 05/26/21 Received Date: 08/13/21 Completed: 09/01/21 Philip Riley philip.riley@hollyfrontier.com

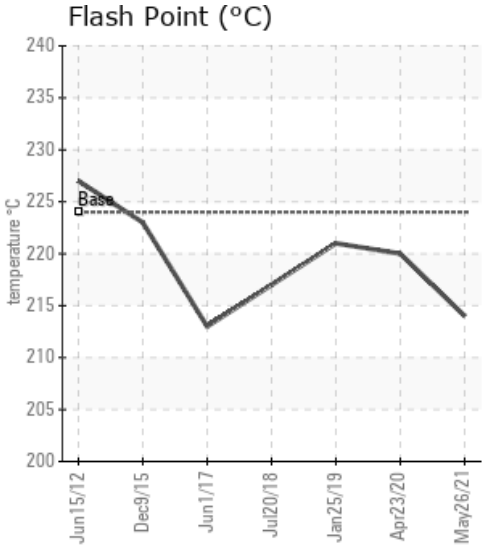
Recommendation: All parameters meet the expected limits with the exception of the pentane insols. These are high and may be carryover from the previous oil charge, despite the clean and flush that was carried out. Consider some form of filtration if they can be removed safely. If not they need to be monitored for the increase over time

Comments: Pentane Insolubles levels are severely high.

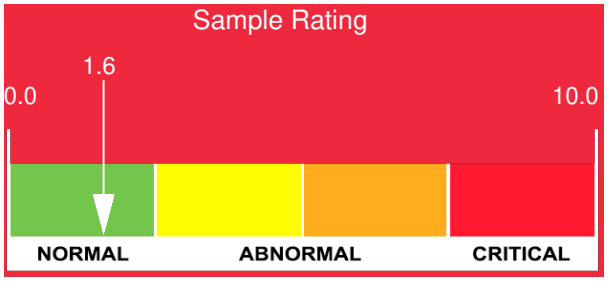
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
05/26/21	08/13/21	0.0h	SAMPLE 2	417 / 214	43.7	28.9	0.20	0.818	670 / 355	793 / 423	896 / 480	5.50
04/23/20	08/14/20	9.0h	PP1 LIST MIXER	428 / 220	3631.0	43.5	0.71	1.42	707 / 375	801 / 427	906 / 486	0.86
01/25/19	04/01/19	0.0h		430 / 221	25.8	36.1	0.461	0.598	694 / 368	792 / 422	897 / 481	1.48
07/20/18	08/08/18	0.0h		423 / 217	2.4	35.9	0.29	0.916	698 / 370	776 / 414	856 / 458	0.00
06/01/17	08/08/17	0.0h	HEATER ROOM	415 / 213	65.2	35.7	0.629	0.547	740 / 393	818 / 437	919 / 493	0.45
Baseline Data				435 / 224		32.7	0.03		693 / 367	790 / 421	887 / 475	2.5

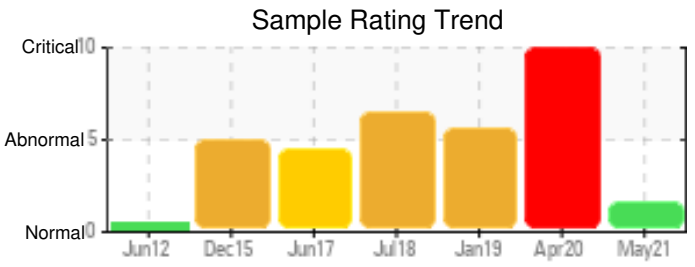






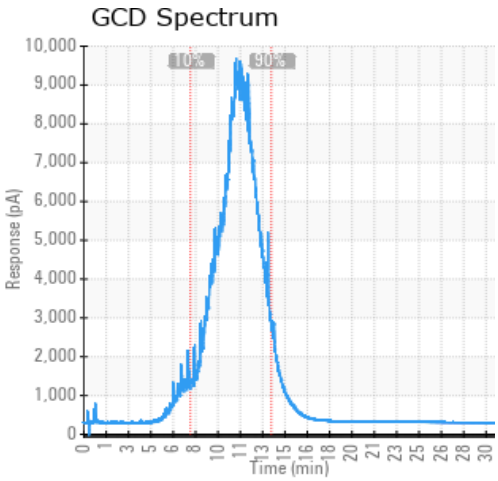
PETRO-CANADA LUBRICANTS

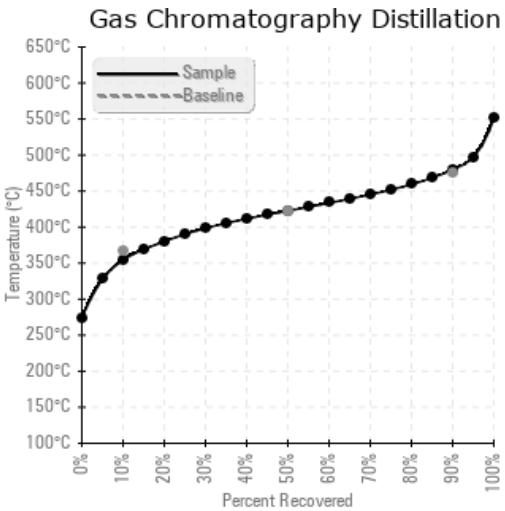


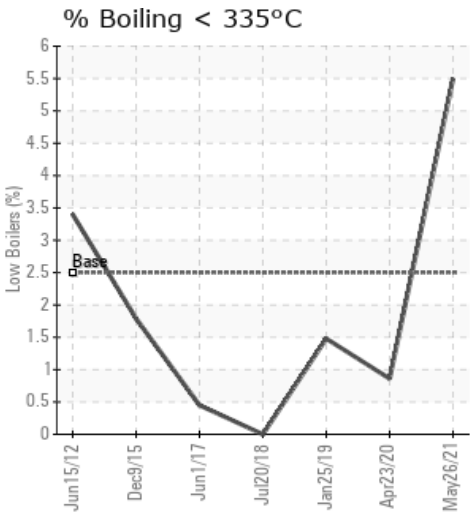


Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
05/26/21	89	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	208	0
04/23/20	593	0	0	0	0	0	4	0	0	0	2	0	0	0	0	0	8	0	0	0	0	0	231	3
01/25/19	256	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	204	1
07/20/18	176	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	207	0
06/01/17	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	199	0
Baseline Data			0	0						0			0	0					0				270	

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







Historical Comments

04/23/20	Several parameters show great concern regarding the condition of the fluid. Iron levels are severely high, and looking at previous reports, has there been some change in service that has potentially introduced this? Acid number is high, insoluble are high and the viscosity is very high and out of range. This translates to the oil being oxidized and with the increase in viscosity for example, to achieve the same effect, you need to put more heat into the system, which will have an accelerated effect on the degradation. Additionally you need to investigate the source of the water in the fluid. Recommend that you look to change the fluid, including a clean and flush as suspect there will be degraded product that needs to be removed at the next convenient opportunity.Iron ppm levels are severe. PQ levels are abnormal. Water contamination levels are severely high. Water contamination levels are severely high.. ppm Water contamination levels are severely high. Pentane Insolubles levels are severely high. Acid Number (AN) is severely high. (GCD) 90% Distillation Point is marginally high.
01/25/19	Please send one email to Yutong Gao to inform the current fluid working hours (or months, years). The current fluid has adequate viscosity, flash point and distillation points. It is suitable for the further operation. The elevated Acid Number and Solid content all indicate the fluid has minor oxidation. The Fe level is extremely high, but I think it is because of the contamination during the sampling process, or the Fe particles are accumulating in the fluid through the system opening areas after years operation. Please take one sample in 12 months to monitor the oil conditions.Iron ppm level is high. Solid level is high. Acid Number (AN) is high.
07/20/18	The current fluid has a moderate oxidation, however it is suitable for further operation. The solid content is high due to the fluid oxidation or third party contamination. The 96ppm Fe reading is also a concern because the system should not have wears and tears. Please continue to run the fluid and take one sample in 6 months to monitor the conditions. Please make sure to flush the sampling line well enough before taking the representative samples.PQ levels are abnormal. Iron ppm levels are abnormal. Solid levels are high. Acid Number (AN) is abnormally high. (GCD) 90% Distillation Point is abnormally low.
06/01/17	The current fluid has moderate oxidation, so that the AN number, viscosity and GCD 10%/50%/90% all have been increased. However, the fluid is still suitable for use. Please take one sample in 12 months to monitor the conditions.