



WEAR	NORMAL
CONTAMINATION	ABNORMAL
FLUID CONDITION	NORMAL

Area

1440

Machine Id

1440-5512-4003 - COPPER REGRIND MILL

Component

Drive End Gear Reducer

Fluid

PETRO CANADA ENDURATEX EP 220 (55 GAL)

RECOMMENDATION

We recommend you service the filters on this component. We recommend an early resample to monitor this condition.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		PC0070732	PC0070133	PC0040489
Sample Date		Client Info		30 Nov 2023	02 Sep 2023	20 Jun 2023
Machine Age	yrs	Client Info		0	0	0
Oil Age	yrs	Client Info		0	0	0
Filter Age	yrs	Client Info		0	0	0
Oil Changed		Client Info		N/A	N/A	N/A
Filter Changed		Client Info		N/A	N/A	N/A
Sample Status				ABNORMAL	ABNORMAL	ABNORMAL

WEAR

All component wear rates are normal.

Iron	ppm	ASTM D5185(m)	>150	20	4	39
Chromium	ppm	ASTM D5185(m)	>10	0	0	<1
Nickel	ppm	ASTM D5185(m)	>10	<1	<1	<1
Titanium	ppm	ASTM D5185(m)		0	0	0
Silver	ppm	ASTM D5185(m)		<1	0	<1
Aluminum	ppm	ASTM D5185(m)	>25	<1	<1	<1
Lead	ppm	ASTM D5185(m)	>100	<1	0	0
Copper	ppm	ASTM D5185(m)	>50	<1	1	2
Tin	ppm	ASTM D5185(m)	>10	0	0	0
Vanadium	ppm	ASTM D5185(m)		0	0	0
White Metal	scalar	Visual*	NONE	NONE	VLITE	NONE
Yellow Metal	scalar	Visual*	NONE	NONE	NONE	NONE

CONTAMINATION

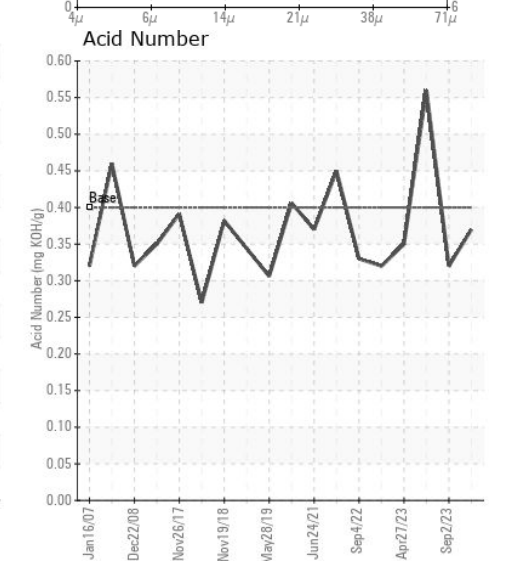
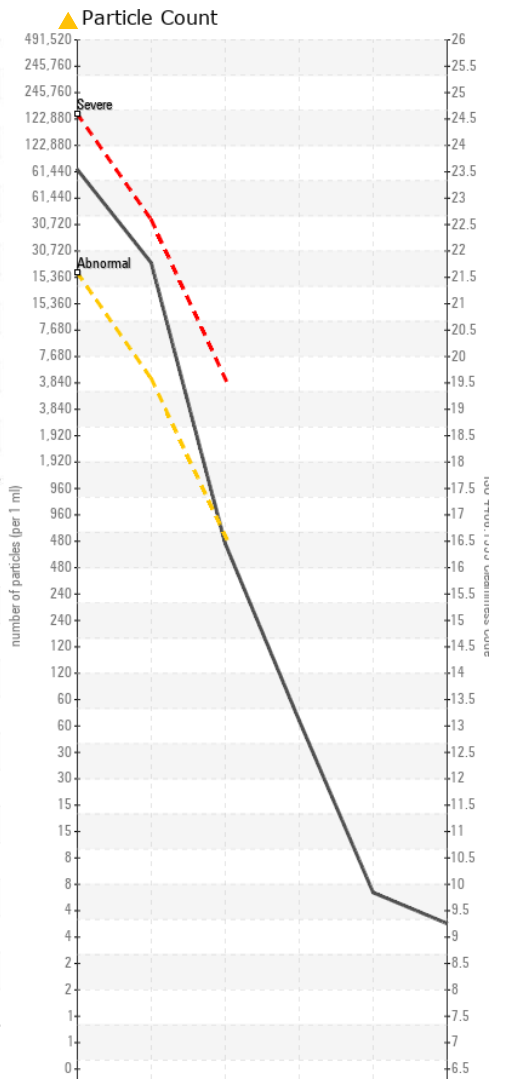
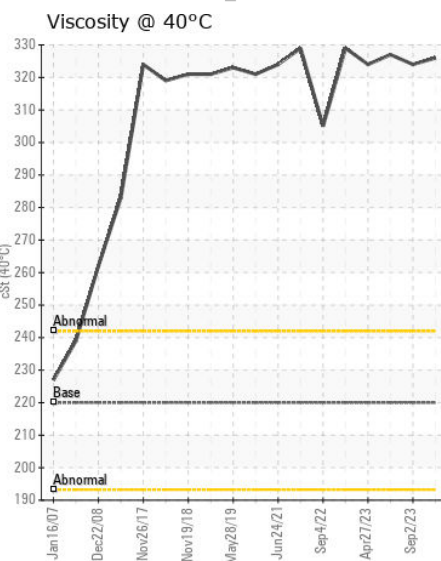
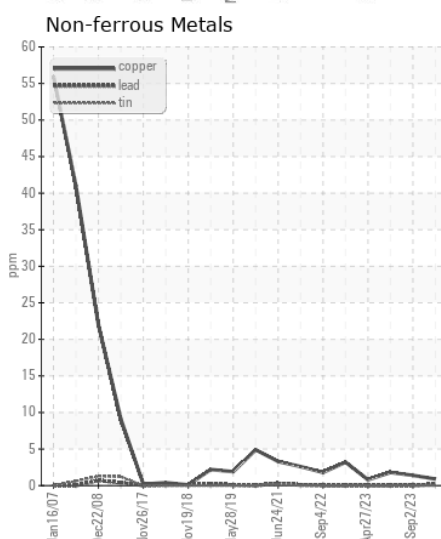
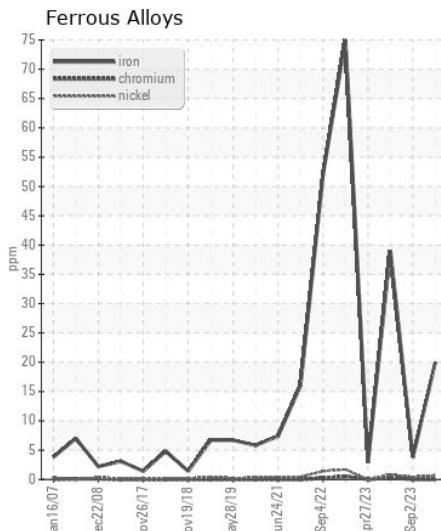
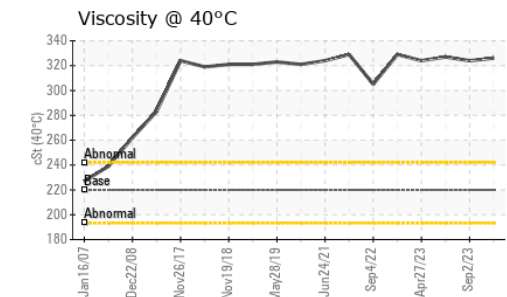
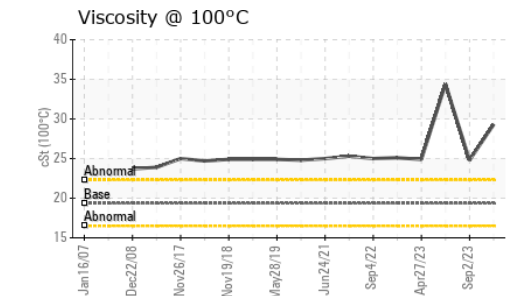
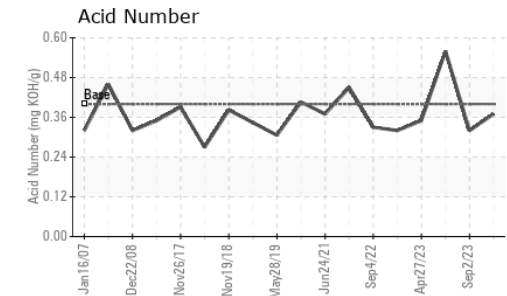
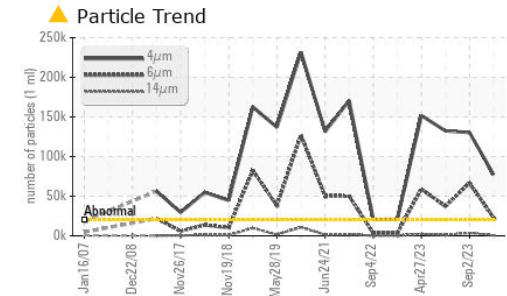
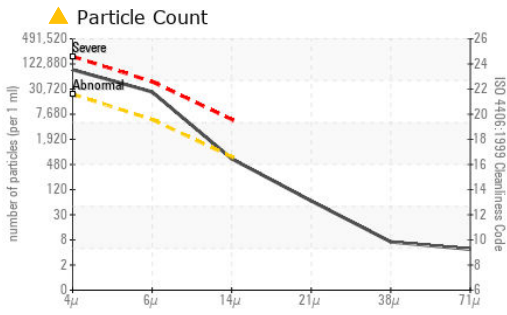
There is a moderate amount of silt (particulates < 14 microns in size) present in the oil.

Silicon	ppm	ASTM D5185(m)	>50	4	7	8
Potassium	ppm	ASTM D5185(m)	>20	0	<1	2
Water		WC Method	>0.1	NEG	NEG	NEG
Particles >4µm		ASTM D7647	>20000	▲ 77124	▲ 130219	▲ 132472
Particles >6µm		ASTM D7647	>5000	▲ 22745	▲ 66632	▲ 37071
Particles >14µm		ASTM D7647	>640	578	▲ 3505	● 1016
Particles >21µm		ASTM D7647	>160	57	▲ 483	82
Particles >38µm		ASTM D7647	>40	6	15	2
Particles >71µm		ASTM D7647	>10	4	9	0
Oil Cleanliness		ISO 4406 (c)	>21/19/16	▲ 23/22/16	▲ 24/23/19	▲ 24/22/17
Silt	scalar	Visual*	NONE	NONE	NONE	NONE
Debris	scalar	Visual*	NONE	NONE	NONE	VLITE
Sand/Dirt	scalar	Visual*	NONE	NONE	NONE	NONE
Appearance	scalar	Visual*	NORML	NORML	NORML	▲ MILKY
Odor	scalar	Visual*	NORML	NORML	NORML	NORML
Emulsified Water	scalar	Visual*	>0.1	NEG	NEG	▲ .2%

FLUID CONDITION

Viscosity of sample indicates oil is within ISO 320 range, advise investigate. The AN level is acceptable for this fluid. The oil is still serviceable provided that the contaminant(s) can be reduced to acceptable levels.

Sodium	ppm	ASTM D5185(m)		<1	<1	1
Boron	ppm	ASTM D5185(m)	60	41	60	52
Barium	ppm	ASTM D5185(m)	0	<1	0	0
Molybdenum	ppm	ASTM D5185(m)	0	0	0	0
Manganese	ppm	ASTM D5185(m)	0	0	0	<1
Magnesium	ppm	ASTM D5185(m)	0	0	<1	<1
Calcium	ppm	ASTM D5185(m)	0	2	2	4
Phosphorus	ppm	ASTM D5185(m)	270	228	257	259
Zinc	ppm	ASTM D5185(m)	0	8	6	6
Sulfur	ppm	ASTM D5185(m)	11200	5520	5645	5811
Acid Number (AN)	mg KOH/g	ASTM D974*	0.40	0.37	0.32	0.56
Visc @ 40°C	cSt	ASTM D7279(m)	220	326	324	327
Visc @ 100°C	cSt	ASTM D7279(m)	19.35	29.3	24.8	34.4
Viscosity Index (VI)	Scale	ASTM D2270*	99	122	98	148



**Laboratory** : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9  
**Sample No.** : PC0070732 **Received** : 08 Dec 2023  
**Lab Number** : 02602037 **Tested** : 09 Dec 2023  
**Unique Number** : 5695122 **Diagnosed** : 11 Dec 2023 - Kevin Marson  
**Test Package** : IND 2 ( Additional Tests: KV100, TAN Man, VI )

**Vale - Voisey's Bay**  
 Voisey's Bay Mine Site, P.O. Box 7001, Stn. C Happy Valley  
 Goose Bay, NL  
 CA A0P 1C0  
 Contact: Robert Feltham  
 robert.feltham@vale.com  
 T:  
 F: x:

To discuss this sample report, contact Customer Service at 1-800-268-2131.  
 Test denoted (\*) outside scope of accreditation, (m) method modified, (e) tested at external lab.  
 Validity of results and interpretation are based on the sample and information as supplied.