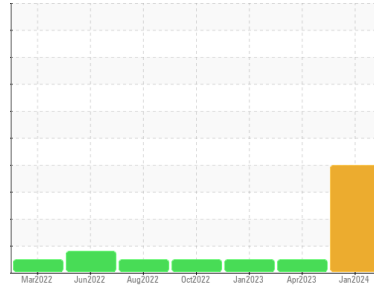


OIL ANALYSIS REPORT



Area
KEMP QUARRIES / RIVER VALLEY BACKBONE
Machine Id
WL147
Component
Diesel Engine
Fluid
PETRO CANADA DURON SHP 15W40 (--- GAL)

Sample Rating Trend



DIRT



DIAGNOSIS

Recommendation

We advise that you check the air filter, air induction system, and any areas where dirt may enter the component. Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.

Wear

Exhaust valve wear is indicated. Cylinder, crank, or cam shaft wear is indicated.

Contamination

Elemental levels of silicon (Si) and aluminum (Al) indicate alumina-silicate (coarse dirt) ingress.

Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is acceptable for the time in service.

SAMPLE INFORMATION

method	limit/base	current	history1	history2
Sample Number	Client Info	PCA0069951	PCA0085823	PCA0037164
Sample Date	Client Info	30 Jan 2024	06 Apr 2023	13 Jan 2023
Machine Age	hrs	29627	28770	28425
Oil Age	hrs	312	345	214
Oil Changed	Client Info	Changed	Changed	Changed
Sample Status		ABNORMAL	NORMAL	NORMAL

CONTAMINATION

method	limit/base	current	history1	history2
Fuel	WC Method >5	<1.0	<1.0	<1.0
Water	WC Method >0.2	NEG	NEG	NEG
Glycol	WC Method	NEG	NEG	NEG

WEAR METALS

method	limit/base	current	history1	history2
Iron	ppm ASTM D5185m >100	▲ 186	24	6
Chromium	ppm ASTM D5185m >20	8	1	<1
Nickel	ppm ASTM D5185m >2	▲ 6	<1	0
Titanium	ppm ASTM D5185m >2	1	<1	0
Silver	ppm ASTM D5185m >2	<1	0	0
Aluminum	ppm ASTM D5185m >25	▲ 17	3	0
Lead	ppm ASTM D5185m >40	17	3	<1
Copper	ppm ASTM D5185m >330	96	11	<1
Tin	ppm ASTM D5185m >15	4	<1	<1
Vanadium	ppm ASTM D5185m	<1	0	0
Cadmium	ppm ASTM D5185m	<1	0	0

ADDITIVES

method	limit/base	current	history1	history2
Boron	ppm ASTM D5185m 0	2	4	0
Barium	ppm ASTM D5185m 0	0	0	0
Molybdenum	ppm ASTM D5185m 60	75	63	55
Manganese	ppm ASTM D5185m 0	2	<1	0
Magnesium	ppm ASTM D5185m 1010	1097	943	864
Calcium	ppm ASTM D5185m 1070	1404	1194	1006
Phosphorus	ppm ASTM D5185m 1150	1308	1109	948
Zinc	ppm ASTM D5185m 1270	1528	1283	1137
Sulfur	ppm ASTM D5185m 2060	3300	2987	2580

CONTAMINANTS

method	limit/base	current	history1	history2
Silicon	ppm ASTM D5185m >25	▲ 49	7	3
Sodium	ppm ASTM D5185m	23	4	0
Potassium	ppm ASTM D5185m >20	16	2	<1

INFRA-RED

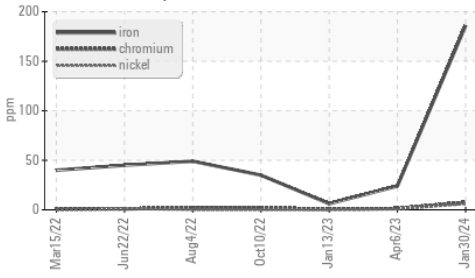
method	limit/base	current	history1	history2
Soot %	% *ASTM D7844 >3	1	0.5	0.5
Nitration	Abs/cm *ASTM D7624 >20	12.7	8.8	8.4
Sulfation	Abs/.1mm *ASTM D7415 >30	27.2	19.5	19.9

FLUID DEGRADATION

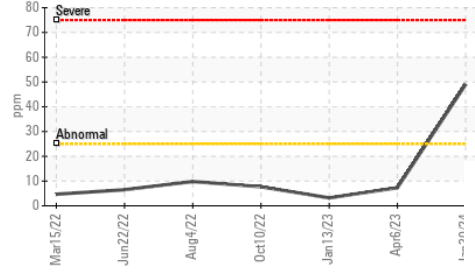
method	limit/base	current	history1	history2
Oxidation	Abs/.1mm *ASTM D7414 >25	20.7	15.8	15.0
Base Number (BN)	mg KOH/g ASTM D2896 9.8	9.8	8.0	8.8

OIL ANALYSIS REPORT

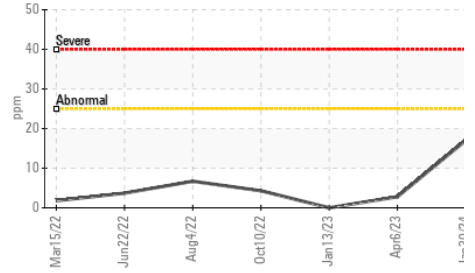
▲ Ferrous Alloys



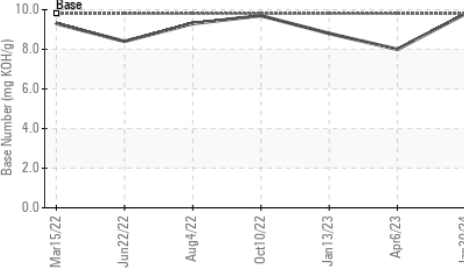
▲ Silicon (ppm)



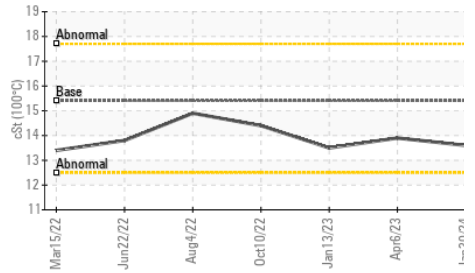
▲ Aluminum (ppm)



Base Number



Viscosity @ 100°C

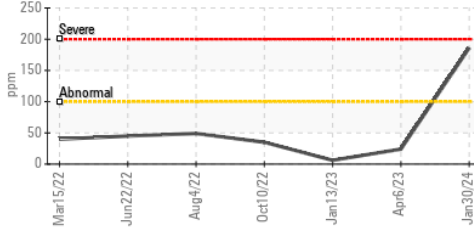


VISUAL	method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG

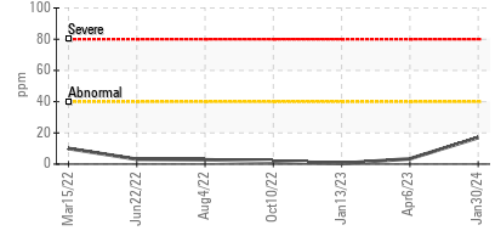
FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.4	13.6	13.9

GRAPHS

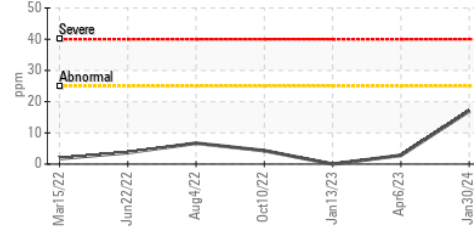
▲ Iron (ppm)



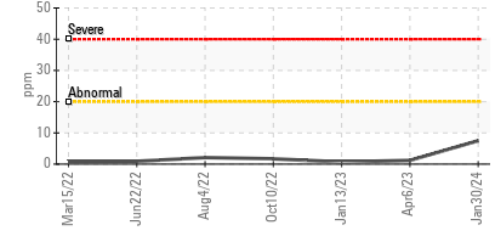
Lead (ppm)



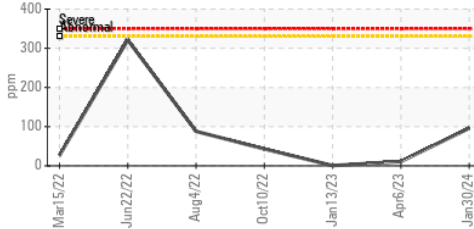
▲ Aluminum (ppm)



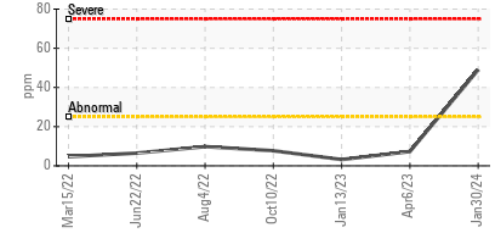
Chromium (ppm)



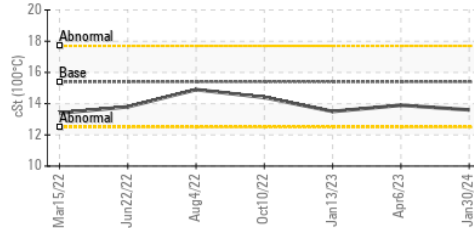
▲ Copper (ppm)



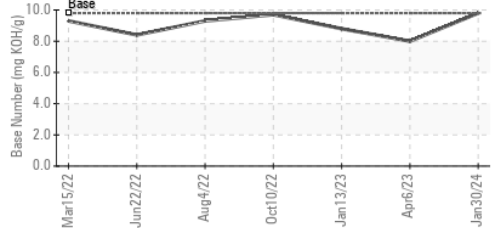
▲ Silicon (ppm)



Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
 Sample No. : PCA0069951 Received : 06 Feb 2024
 Lab Number : 06081921 Tested : 07 Feb 2024
 Unique Number : 10869366 Diagnosed : 08 Feb 2024 - Sean Felton
 Test Package : MOB 1 (Additional Tests: TBN)

Kemp Quarries - River Valley - Backbone
 5600 S Hwy 253
 Huntington, AR
 US 72940
 Contact:

To discuss this sample report, contact Customer Service at 1-800-237-1369.

* - Denotes test methods that are outside of the ISO 17025 scope of accreditation.

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

backbone@rivervalleyquarries.com

T:

F: