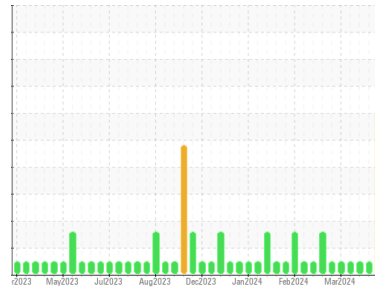




# OIL ANALYSIS REPORT

Sample Rating Trend



WEAR



Machine Id

**LGS00181**

Component

**Middle Biogas Engine**

Fluid

**CITGO PACEMAKER GAS ENGINE LFG LA 40 (--- GAL)**

## DIAGNOSIS

### ▲ Recommendation

We advise that you inspect for the source(s) of wear. We recommend an early resample to monitor this condition.

### ▲ Wear

The lead level is severe.

### Contamination

There is no indication of any contamination in the oil.

### Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil. The AN level is acceptable for this fluid.

## SAMPLE INFORMATION

	method	limit/base	current	history1	history2
Sample Number	Client Info		<b>WC0803463</b>	WC0803407	WC0803406
Sample Date	Client Info		<b>22 Apr 2024</b>	15 Apr 2024	08 Apr 2024
Machine Age	hrs	Client Info	<b>66963</b>	66882	66712
Oil Age	hrs	Client Info	<b>67</b>	287	116
Oil Changed	Client Info		<b>N/A</b>	N/A	N/A
Sample Status			<b>SEVERE</b>	NORMAL	NORMAL

## CONTAMINATION

	method	limit/base	current	history1	history2
Fuel	WC Method	>4.0	<b>&lt;1.0</b>	<1.0	<1.0
Water	WC Method	>0.1	<b>NEG</b>	NEG	NEG
Glycol	WC Method		<b>NEG</b>	NEG	NEG

## WEAR METALS

	method	limit/base	current	history1	history2	
Iron	ppm	ASTM D5185m	>45	<b>3</b>	6	2
Chromium	ppm	ASTM D5185m	>2	<b>&lt;1</b>	<1	0
Nickel	ppm	ASTM D5185m	>2	<b>0</b>	0	<1
Titanium	ppm	ASTM D5185m		<b>&lt;1</b>	0	0
Silver	ppm	ASTM D5185m	>5	<b>0</b>	0	0
Aluminum	ppm	ASTM D5185m	>10	<b>&lt;1</b>	1	2
Lead	ppm	ASTM D5185m	>5	<b>▲ 64</b>	<1	0
Copper	ppm	ASTM D5185m	>14	<b>3</b>	1	2
Tin	ppm	ASTM D5185m	>13	<b>2</b>	3	2
Vanadium	ppm	ASTM D5185m		<b>0</b>	<1	0
Cadmium	ppm	ASTM D5185m		<b>0</b>	0	0

## ADDITIVES

	method	limit/base	current	history1	history2	
Boron	ppm	ASTM D5185m		<b>3</b>	0	<1
Barium	ppm	ASTM D5185m		<b>0</b>	0	0
Molybdenum	ppm	ASTM D5185m		<b>7</b>	2	1
Manganese	ppm	ASTM D5185m		<b>&lt;1</b>	0	1
Magnesium	ppm	ASTM D5185m		<b>22</b>	29	15
Calcium	ppm	ASTM D5185m		<b>1481</b>	1462	1469
Phosphorus	ppm	ASTM D5185m		<b>290</b>	284	302
Zinc	ppm	ASTM D5185m		<b>333</b>	312	360
Sulfur	ppm	ASTM D5185m		<b>2900</b>	3191	3294

## CONTAMINANTS

	method	limit/base	current	history1	history2	
Silicon	ppm	ASTM D5185m	>200	<b>63</b>	181	91
Sodium	ppm	ASTM D5185m		<b>100</b>	1	2
Potassium	ppm	ASTM D5185m	>20	<b>0</b>	0	2

## INFRA-RED

	method	limit/base	current	history1	history2	
Soot %	%	*ASTM D7844		<b>0</b>	0	0
Nitration	Abs/cm	*ASTM D7624	>20	<b>3.2</b>	3.3	3.2
Sulfation	Abs/.1mm	*ASTM D7415	>30	<b>15.4</b>	16.8	15.6

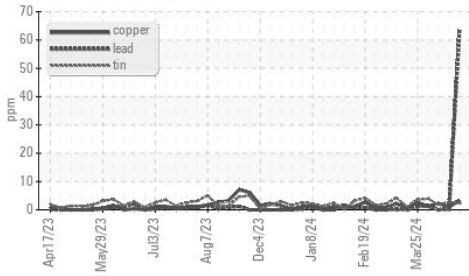
## FLUID DEGRADATION

	method	limit/base	current	history1	history2	
Oxidation	Abs/.1mm	*ASTM D7414	>25	<b>7.0</b>	7.2	6.9
Acid Number (AN)	mg KOH/g	ASTM D8045	1.16	<b>0.68</b>	0.87	0.75
Base Number (BN)	mg KOH/g	ASTM D2896	5	<b>3.65</b>	3.03	3.47

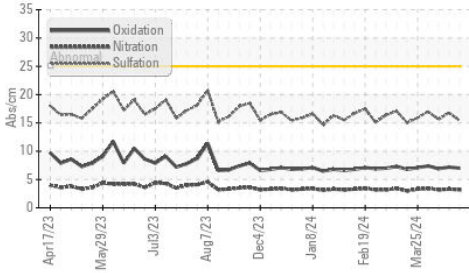


# OIL ANALYSIS REPORT

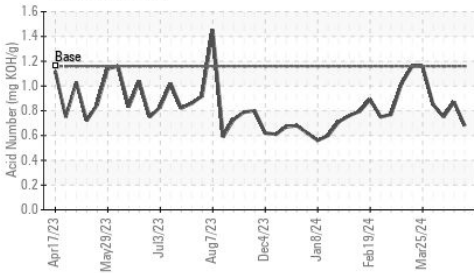
## ▲ Non-ferrous Metals



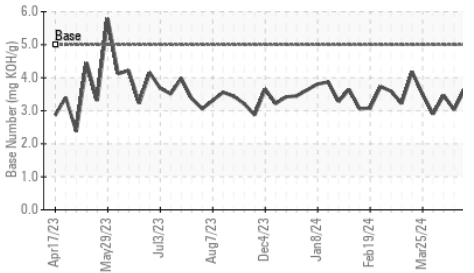
## FT-IR (Direct Trend)



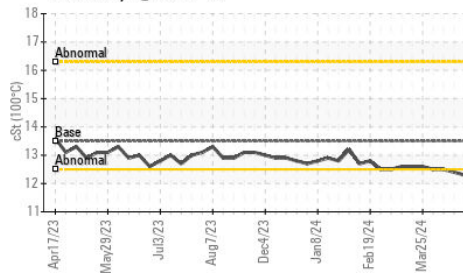
## Acid Number



## Base Number



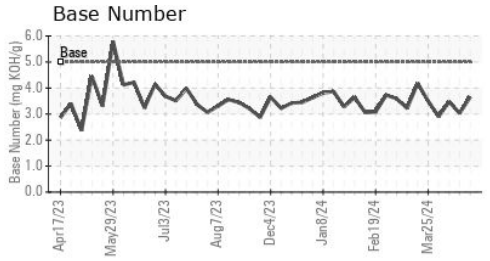
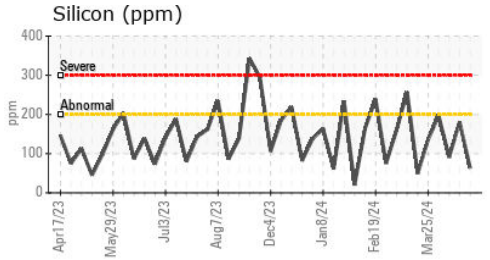
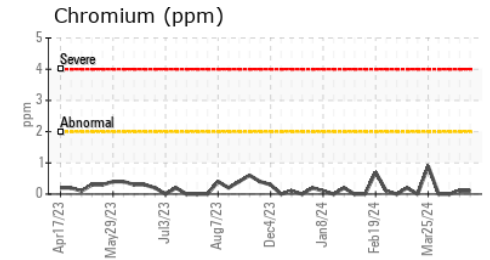
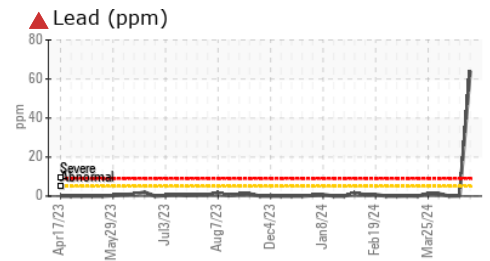
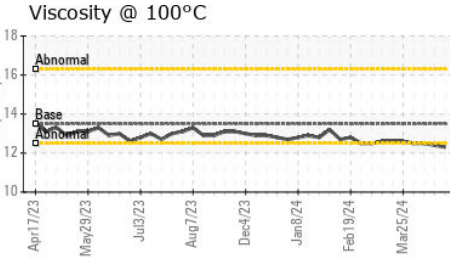
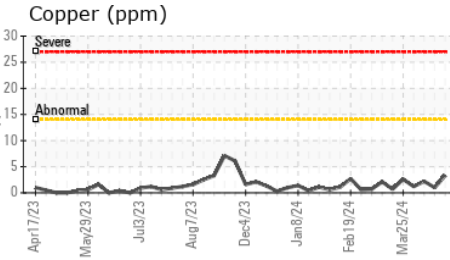
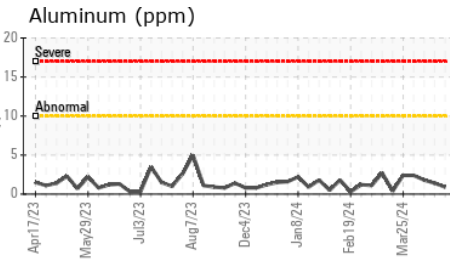
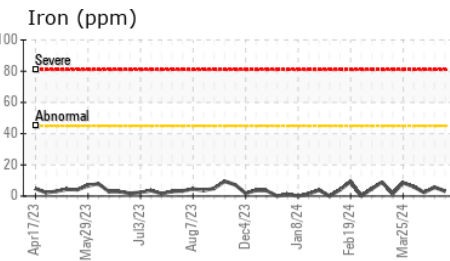
## Viscosity @ 100°C



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	>0.1	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG

FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	13.5	12.3	12.4

## GRAPHS



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513

Sample No. : WC0803463

Lab Number : 06161695

Unique Number : 10997118

Test Package : MOB 2

Received : 26 Apr 2024

Tested : 29 Apr 2024

Diagnosed : 01 May 2024 - Jonathan Hester

BLACK OAK

5054 HWY HH

HARTVILLE, MO

US 65667

Contact: CHIP MATHEWS

chip.matthews@cubedistrictenergy.com

T:

F:

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)