



# OIL ANALYSIS REPORT

WEAR	<b>NORMAL</b>
CONTAMINATION	<b>ABNORMAL</b>
FLUID CONDITION	<b>NORMAL</b>



Machine Id  
**ENG 4C**  
Component  
**Biogas Engine**  
Fluid  
**AMERICAN REFINING GROUP LOW ASH 40 (110 GAL)**

## RECOMMENDATION

No corrective action is recommended at this time. Resample at the next service interval to monitor.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		<b>WC0935611</b>	WC0935606	WC0935601
Sample Date		Client Info		<b>06 May 2024</b>	29 Apr 2024	22 Apr 2024
Machine Age	hrs	Client Info		<b>84565</b>	84397	84229
Oil Age	hrs	Client Info		<b>938</b>	770	602
Filter Age	hrs	Client Info		<b>938</b>	770	602
Oil Changed		Client Info		<b>N/A</b>	N/A	N/A
Filter Changed		Client Info		<b>N/A</b>	N/A	N/A
Sample Status				<b>ABNORMAL</b>	ABNORMAL	NORMAL

## WEAR

All component wear rates are normal.

Iron	ppm	ASTM D5185m	>45	<b>5</b>	3	3
Chromium	ppm	ASTM D5185m	>2	<b>&lt;1</b>	<1	<1
Nickel	ppm	ASTM D5185m	>2	<b>&lt;1</b>	0	0
Titanium	ppm	ASTM D5185m		<b>&lt;1</b>	0	<1
Silver	ppm	ASTM D5185m	>5	<b>0</b>	0	0
Aluminum	ppm	ASTM D5185m	>10	<b>4</b>	4	3
Lead	ppm	ASTM D5185m	>5	<b>2</b>	0	<1
Copper	ppm	ASTM D5185m	>14	<b>3</b>	2	2
Tin	ppm	ASTM D5185m	>13	<b>6</b>	4	2
Vanadium	ppm	ASTM D5185m		<b>&lt;1</b>	0	0
White Metal	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE

## CONTAMINATION

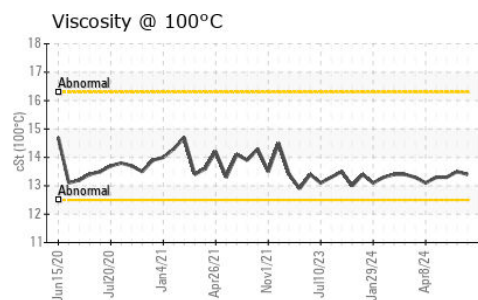
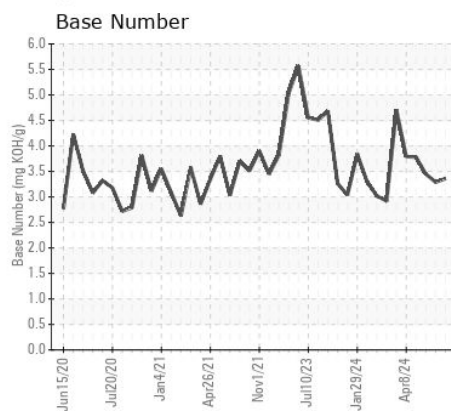
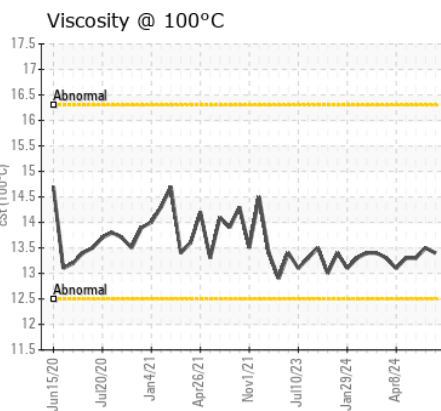
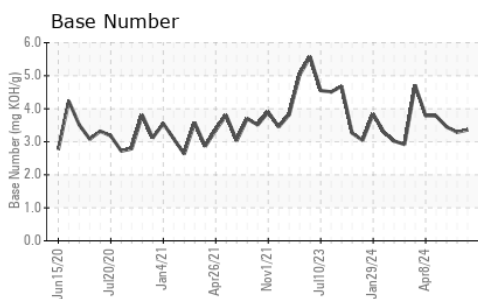
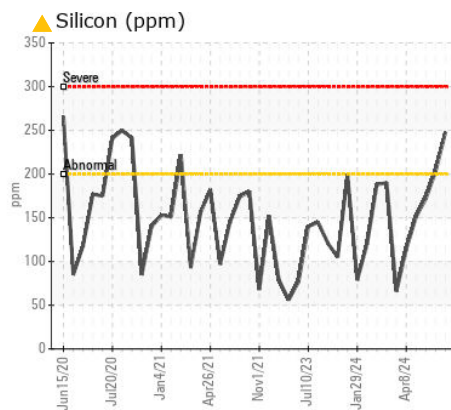
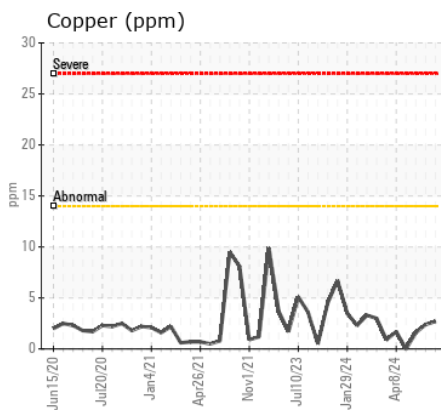
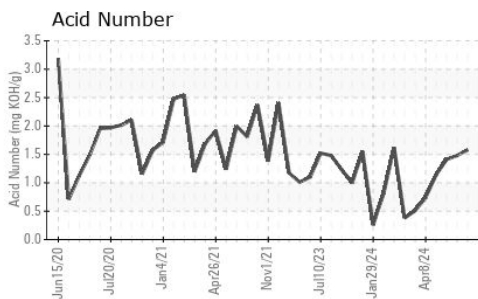
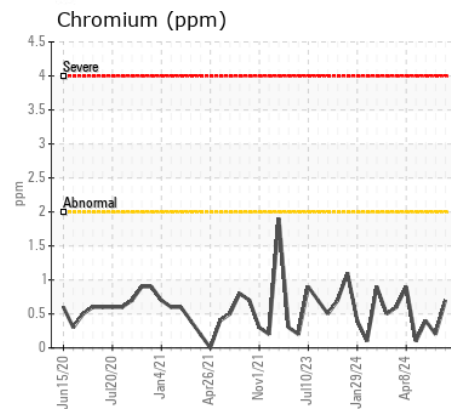
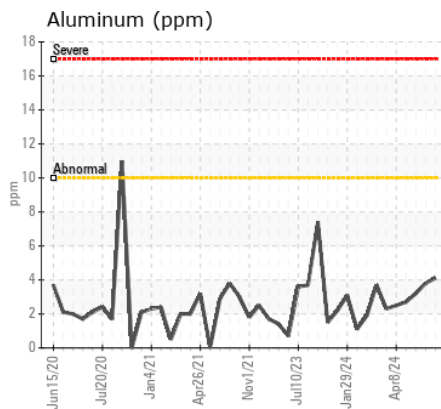
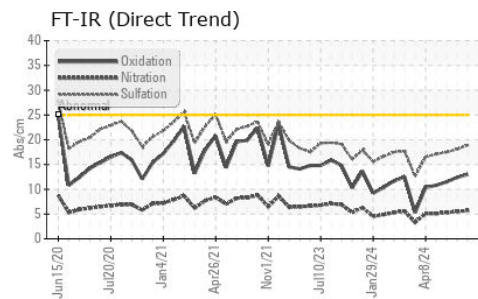
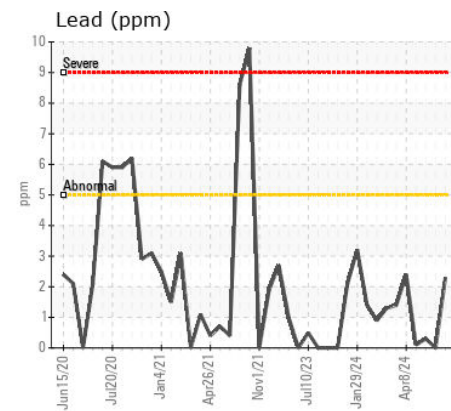
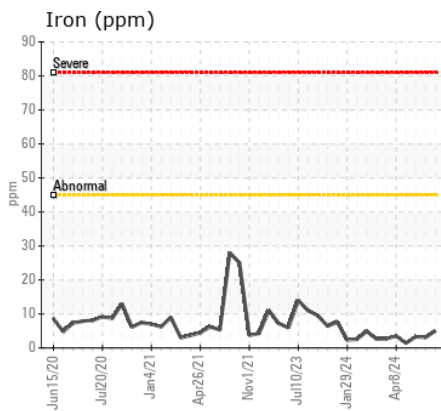
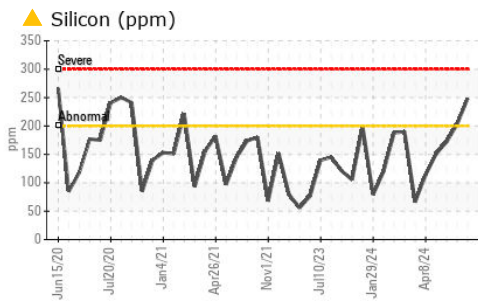
Elemental level of silicon (Si) above normal.

Silicon	ppm	ASTM D5185m	>200	<b>▲ 248</b>	▲ 203	172
Potassium	ppm	ASTM D5185m	>20	<b>2</b>	0	0
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
Soot %	%	*ASTM D7844		<b>0</b>	0	0
Nitration	Abs/cm	*ASTM D7624	>20	<b>5.7</b>	5.5	5.3
Sulfation	Abs/.1mm	*ASTM D7415	>30	<b>18.9</b>	18.1	17.5
Silt	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Debris	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Appearance	scalar	*Visual	NORML	<b>NORML</b>	NORML	NORML
Odor	scalar	*Visual	NORML	<b>NORML</b>	NORML	NORML
Emulsified Water	scalar	*Visual	>0.1	<b>NEG</b>	NEG	NEG

## FLUID CONDITION

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

Sodium	ppm	ASTM D5185m		<b>0</b>	<1	2
Boron	ppm	ASTM D5185m		<b>0</b>	0	0
Barium	ppm	ASTM D5185m		<b>1</b>	0	0
Molybdenum	ppm	ASTM D5185m		<b>5</b>	2	4
Manganese	ppm	ASTM D5185m		<b>&lt;1</b>	<1	<1
Magnesium	ppm	ASTM D5185m		<b>20</b>	18	18
Calcium	ppm	ASTM D5185m		<b>1623</b>	1551	1495
Phosphorus	ppm	ASTM D5185m		<b>459</b>	380	362
Zinc	ppm	ASTM D5185m		<b>521</b>	468	435
Sulfur	ppm	ASTM D5185m		<b>3929</b>	3593	3512
Oxidation	Abs/.1mm	*ASTM D7414	>25	<b>13.0</b>	12.4	11.5
Acid Number (AN)	mg KOH/g	ASTM D8045		<b>1.58</b>	1.48	1.41
Base Number (BN)	mg KOH/g	ASTM D2896		<b>3.36</b>	3.29	3.45
Visc @ 100°C	cSt	ASTM D445		<b>13.4</b>	13.5	13.3



Certificate L2367

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

Sample No. : WC0935611

Lab Number : 06177372

Unique Number : 11023425

Test Package : MOB 2

Received : 13 May 2024

Tested : 14 May 2024

Diagnosed : 15 May 2024 - Don Baldrige

**BROOME ENERGY**

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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)