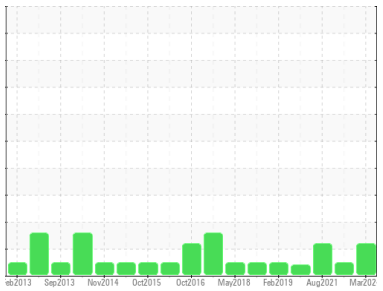
# OIL ANALYSIS REPORT

Sample Rating Trend



ISO

Area
## EVA CREEK
Machine Id
## WEC 3 - 92031 (S/N 25230)
Component
**Wind Turbine Gearbox**
Fluid
**CASTROL OPTIGEAR SYNTHETIC A ISO 320 (475 GAL)**

## DIAGNOSIS

**Recommendation**
The oil change at the time of sampling has been noted. Resample at the next service interval to monitor.

**Wear**
Gear wear is indicated.

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

**Fluid Condition**
The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **WC0634824** | WC0634816 | WC0544196 |
| Sample Date | | Client Info | | **21 Mar 2024** | 12 May 2022 | 03 Aug 2021 |
| Machine Age | hrs | Client Info | | **30115** | 76133 | 72294 |
| Oil Age | hrs | Client Info | | **0** | 0 | 72294 |
| Oil Changed | | Client Info | | **Changed** | N/A | Not Changd |
| Sample Status | | | | **ABNORMAL** | NORMAL | ABNORMAL |

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| PQ | | ASTM D8184 | >80 | **20** | 25 | 19 |
| Iron | ppm | ASTM D5185m | >70 | **81** | 85 | 86 |
| Chromium | ppm | ASTM D5185m | >3 | **<1** | 1 | 1 |
| Nickel | ppm | ASTM D5185m | >2 | **0** | 0 | 0 |
| Titanium | ppm | ASTM D5185m | >10 | **0** | 0 | <1 |
| Silver | ppm | ASTM D5185m | | **0** | <1 | 0 |
| Aluminum | ppm | ASTM D5185m | >9 | **13** | 2 | 1 |
| Lead | ppm | ASTM D5185m | >9 | **0** | <1 | <1 |
| Copper | ppm | ASTM D5185m | >25 | **<1** | 3 | 3 |
| Tin | ppm | ASTM D5185m | >9 | **<1** | 0 | <1 |
| Antimony | ppm | ASTM D5185m | >5 | **---** | --- | 0 |
| Vanadium | ppm | ASTM D5185m | | **<1** | <1 | <1 |
| Cadmium | ppm | ASTM D5185m | | **<1** | 0 | <1 |

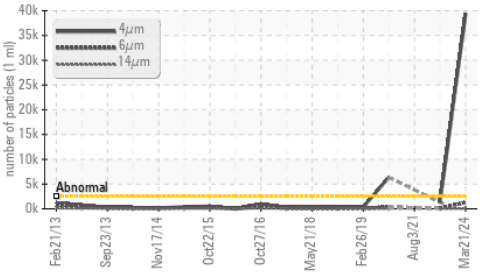
| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | 0 | **29** | 2 | 5 |
| Barium | ppm | ASTM D5185m | 0 | **5** | 4 | 0 |
| Molybdenum | ppm | ASTM D5185m | 1150 | **1054** | 1164 | 1272 |
| Manganese | ppm | ASTM D5185m | | **2** | 2 | 2 |
| Magnesium | ppm | ASTM D5185m | 1800 | **1811** | 1802 | 1929 |
| Calcium | ppm | ASTM D5185m | 20 | **14** | 14 | 15 |
| Phosphorus | ppm | ASTM D5185m | 1450 | **1554** | 1413 | 1517 |
| Zinc | ppm | ASTM D5185m | 1650 | **1662** | 1675 | 1757 |
| Sulfur | ppm | ASTM D5185m | 4900 | **7060** | 5702 | 5563 |

| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >33 | **13** | 16 | 16 |
| Sodium | ppm | ASTM D5185m | >20 | **9** | 6 | 7 |
| Potassium | ppm | ASTM D5185m | >20 | **<1** | 0 | 2 |
| Water | % | ASTM D6304 | >.110 | **0.018** | 0.061 | 0.029 |
| ppm Water | ppm | ASTM D6304 | >1100 | **186** | 610.8 | 295.3 |

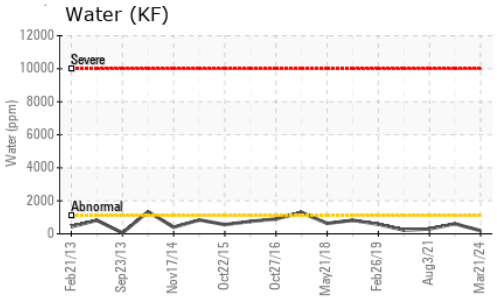
| FLUID CLEANLINESS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Particles >4µm | | ASTM D7647 | >2500 | ▲ **39361** | 1298 | --- |
| Particles >6µm | | ASTM D7647 | >640 | ● **1252** | 97 | --- |
| Particles >14µm | | ASTM D7647 | >80 | **5** | 8 | --- |
| Particles >21µm | | ASTM D7647 | >20 | **2** | 2 | --- |
| Particles >38µm | | ASTM D7647 | >4 | **0** | 1 | --- |
| Particles >71µm | | ASTM D7647 | >3 | **0** | 1 | --- |
| Oil Cleanliness | | ISO 4406 (c) | >18/16/13 | ▲ **22/17/10** | 17/14/10 | --- |

# OIL ANALYSIS REPORT

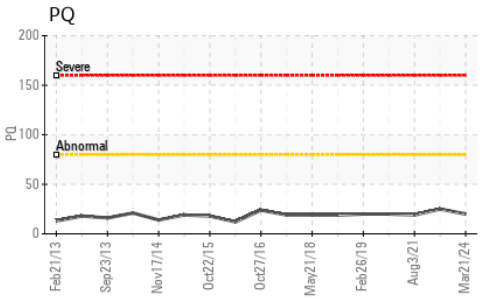
Particle Trend



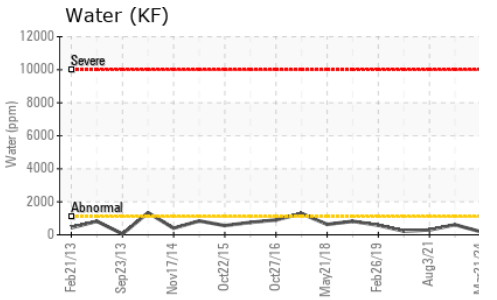

Water (KF)



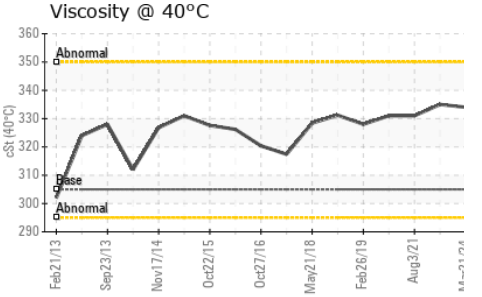

PQ




Water (KF)



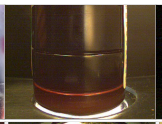
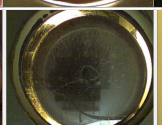

Viscosity @ 40°C




| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Acid Number (AN) | mg KOH/g | ASTM D8045 | 3.3 | **2.34** | 2.06 | 2.205 |

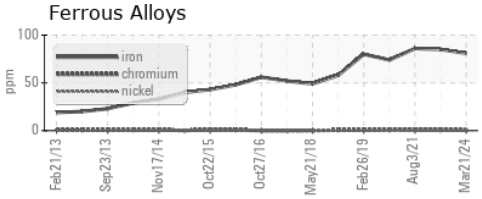
| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | ▲ MODER |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Silt | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Debris | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Sand/Dirt | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Appearance | scalar | *Visual | NORML | **NORML** | NORML | NORML |
| Odor | scalar | *Visual | NORML | **NORML** | NORML | NORML |
| Emulsified Water | scalar | *Visual | >.110 | **NEG** | NEG | NEG |
| Free Water | scalar | *Visual | | **NEG** | NEG | NEG |

| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 40°C | cSt | ASTM D445 | 305 | **334** | 335 | 331 |

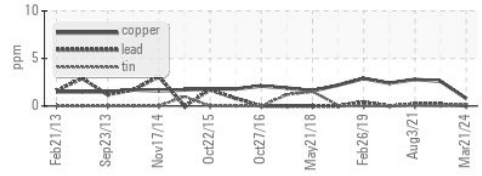
| SAMPLE IMAGES | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|
| Color | | |  |  |  |
| Bottom | | |  |  |  |

## GRAPHS

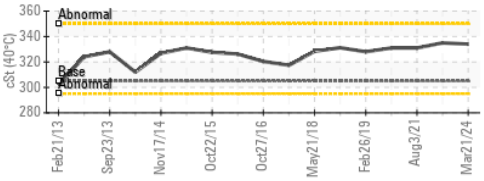
Ferrous Alloys



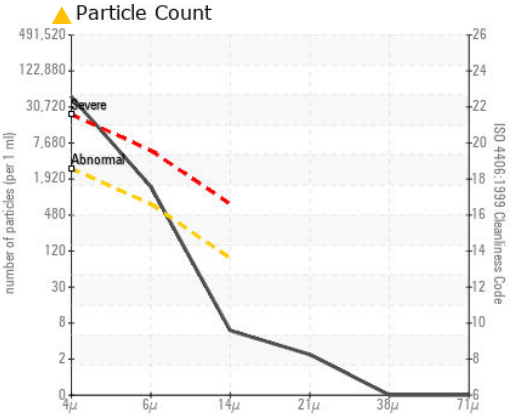

Non-ferrous Metals



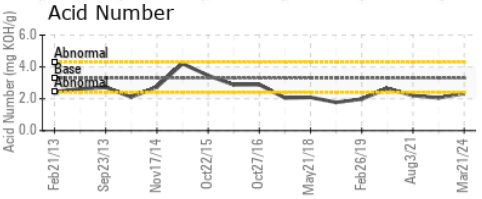

Viscosity @ 40°C




Particle Count




Acid Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : WC0634824 **Received** : 10 May 2024
**Lab Number** : 06176149 **Tested** : 16 May 2024
**Unique Number** : 11022202 **Diagnosed** : 16 May 2024 - Angela Borella
**Test Package** : IND 2 ( Additional Tests: KF, PQ, PrtCount )

*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)*

**GOLDEN VALLEY ELECTRIC**
MILE 2.5 HEALY SPUR RD
HEALY, AK
US 99743
Contact: RYAN DEWITT
rjdewitt@gvea.com
T:
F: