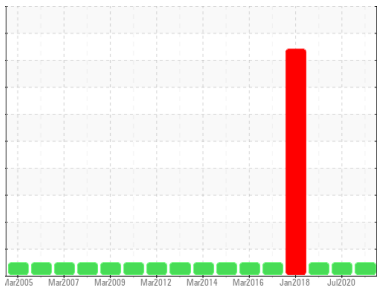
# OIL ANALYSIS REPORT

Sample Rating Trend




**NORMAL**

Area
## MANITOU FALLS GS
Machine Id
## FP2G1
Component
**Thrust Bearing**
Fluid
**R&O OIL ISO 46 (--- GAL)**

## DIAGNOSIS

**Recommendation**

Little or no information is provided as to the component and lubricant being tested. Recommendations are therefore generic in nature and may not apply to the current application. Please forward information as to equipment type, reservoir capacity, lubricant type and any pertinent information to allow for a more accurate assessment. Resample at the next service interval to monitor. The fluid was not specified, however, a fluid match indicates that this fluid is (GENERIC) R&O OIL ISO 46. Please confirm. NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample.

**Wear**

All component wear rates are normal.

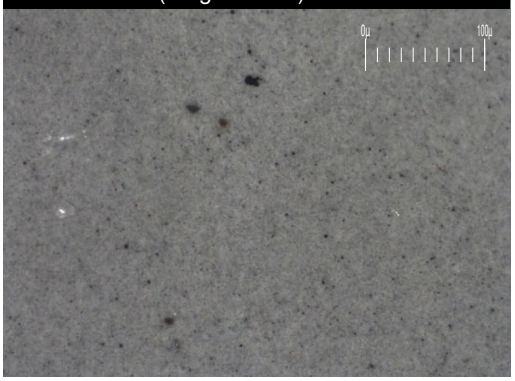
**Contamination**

The system cleanliness is acceptable for your target ISO 4406 cleanliness code. The system and fluid cleanliness is acceptable.

**Fluid Condition**

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

Particle Filter (Magn: 200 x)



| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **WC0560626** | WC0481706 | WC0335060 |
| Sample Date | | Client Info | | **29 Mar 2021** | 08 Jul 2020 | 09 May 2019 |
| Machine Age | hrs | Client Info | | **0** | 0 | 0 |
| Oil Age | hrs | Client Info | | **0** | 0 | 0 |
| Oil Changed | | Client Info | | **N/A** | N/A | N/A |
| Sample Status | | | | **NORMAL** | NORMAL | NORMAL |

| CONTAMINATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Water | | WC Method | >2 | **NEG** | NEG | NEG |

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185(m) | >85 | **2** | 1 | 4 |
| Chromium | ppm | ASTM D5185(m) | | **0** | 0 | 0 |
| Nickel | ppm | ASTM D5185(m) | | **<1** | 0 | 0 |
| Titanium | ppm | ASTM D5185(m) | | **0** | 0 | 0 |
| Silver | ppm | ASTM D5185(m) | | **<1** | 0 | 0 |
| Aluminum | ppm | ASTM D5185(m) | >40 | **<1** | <1 | 0 |
| Lead | ppm | ASTM D5185(m) | >60 | **0** | 0 | 0 |
| Copper | ppm | ASTM D5185(m) | >7 | **<1** | 0 | 0 |
| Tin | ppm | ASTM D5185(m) | >40 | **0** | 0 | 0 |
| Antimony | ppm | ASTM D5185(m) | | **0** | 0 | 0 |
| Vanadium | ppm | ASTM D5185(m) | | **0** | 0 | 0 |
| Beryllium | ppm | ASTM D5185(m) | | **0** | 0 | 0 |
| Cadmium | ppm | ASTM D5185(m) | | **0** | 0 | 0 |

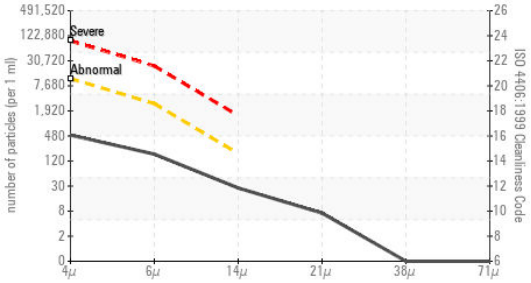
| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185(m) | 5 | **<1** | <1 | <1 |
| Barium | ppm | ASTM D5185(m) | 5 | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185(m) | 5 | **0** | 0 | <1 |
| Manganese | ppm | ASTM D5185(m) | | **0** | 0 | <1 |
| Magnesium | ppm | ASTM D5185(m) | 5 | **0** | <1 | <1 |
| Calcium | ppm | ASTM D5185(m) | 5 | **<1** | <1 | <1 |
| Phosphorus | ppm | ASTM D5185(m) | 100 | **3** | 2 | 4 |
| Zinc | ppm | ASTM D5185(m) | 25 | **1** | 1 | 2 |
| Sulfur | ppm | ASTM D5185(m) | 1500 | **1880** | 1742 | 2140 |
| Lithium | ppm | ASTM D5185(m) | | **<1** | <1 | 0 |

| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185(m) | >20 | **6** | 3 | 12 |
| Sodium | ppm | ASTM D5185(m) | | **0** | <1 | 0 |
| Potassium | ppm | ASTM D5185(m) | >20 | **<1** | <1 | <1 |

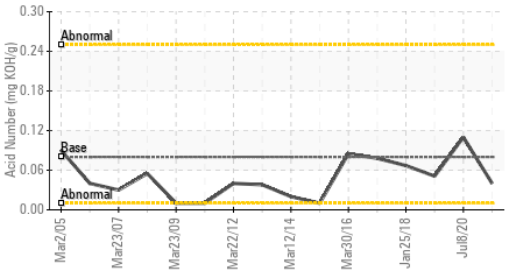
| FLUID CLEANLINESS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Particles >4µm | | ASTM D7647 | >10000 | **443** | 305 | 571 |
| Particles >6µm | | ASTM D7647 | >2500 | **155** | 92 | 54 |
| Particles >14µm | | ASTM D7647 | >160 | **24** | 14 | 6 |
| Particles >21µm | | ASTM D7647 | >40 | **6** | 5 | 2 |
| Particles >38µm | | ASTM D7647 | >10 | **0** | 0 | 0 |
| Particles >71µm | | ASTM D7647 | >3 | **0** | 0 | 0 |
| Oil Cleanliness | | ISO 4406 (c) | >20/18/14 | **16/14/12** | 15/14/11 | 16/13/10 |

# OIL ANALYSIS REPORT

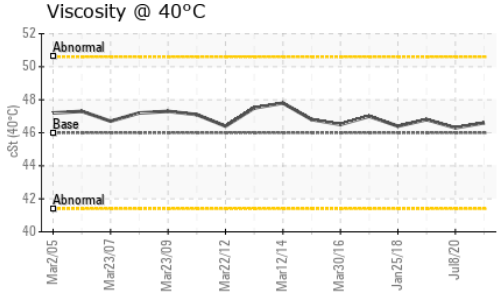
Particle Count



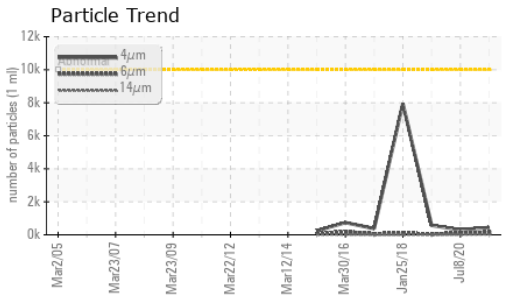

Acid Number




Viscosity @ 40°C



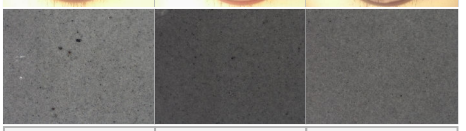

Particle Trend




| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Acid Number (AN) | mg KOH/g | ASTM D974* | 0.08 | **0.04** | 0.11 | 0.051 |

| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | Visual* | NONE | **NONE** | NONE | NONE |
| 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* | >2 | **NEG** | NEG | NEG |
| Free Water | scalar | Visual* | | **NEG** | NEG | NEG |

| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 40°C | cSt | ASTM D7279(m) | 46 | **46.6** | 46.3 | 46.8 |

| SAMPLE IMAGES | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|
| Color | | |  | | |
| Bottom | | |  | | |
| PrtFilter | | |  | | |
| MPC | | | *no image* | *no image* | *no image* |

ISO 17025:2017 Accredited Laboratory

**Laboratory** : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
**Sample No.** : WC0560626 **Received** : 26 May 2021
**Lab Number** : 02423550 **Diagnosed** : 27 May 2021
**Unique Number** : 5227050 **Diagnostician** : Kevin Marson
**Test Package** : IND 2 ( Additional Tests: BottomAnalysis, FilterPatch, PrtCount )

*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.*

**Ontario Power Generation**
KENORA PRODUCTION CENTRE, 200-60 FOURTEENTH ST N.
KENORA, ON
CA P9N 4M9
Contact: Josh Robinson
josh.robinson@opg.com
T:
F: