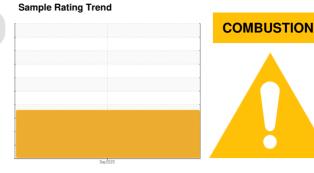


# **OIL ANALYSIS REPORT**

Area
2GS **2GS-T2** Transformer Oil

{not provided} (--- GAL)



### DIAGNOSIS

### Recommendation

We recommend that you check the operating temperatures of the transformer. We recommend an early resample to monitor this condition.

### Contamination

Ethylene >=50 (0.005%): Overload, operating hot, or localized overheating. Carbon Monoxide >=350 (0.035%), Carbon Dioxide >=2500 (0.25%): General conductor overheating.

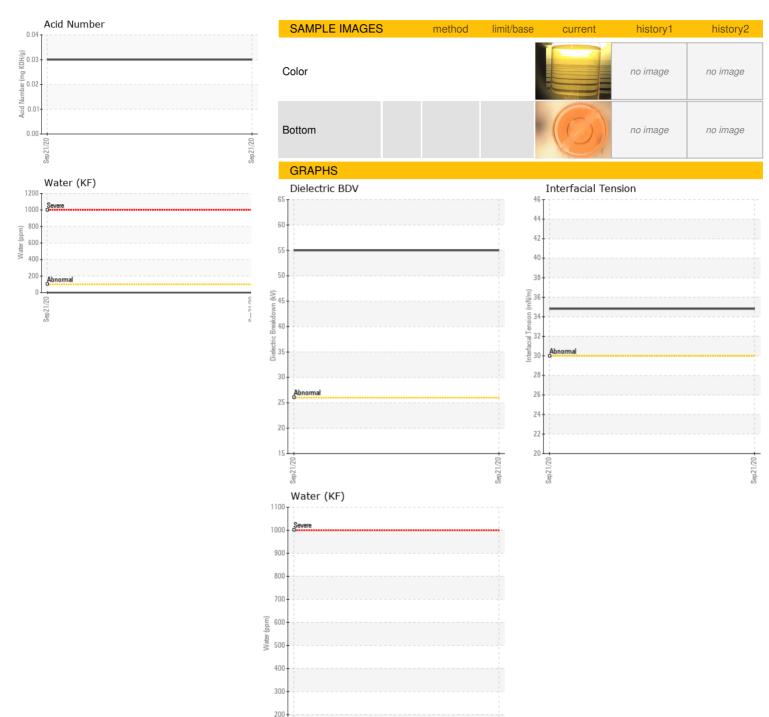
#### Fluid Condition

The condition of the transformer oil is suitable for further service.

Sample Number   Client Info   WC0475694							
Sample Date         Client Info         21 Sep 2020             Machine Age         hrs         Client Info         0              Oil Age         hrs         Client Info         0              Oil Changed         Client Info         N/A              Sample Status         ABNORMAL              CONTAMINANTS         method         limit/base         current         history1         history2           Water         %         ASTM D6304*         0              ppm Water         ppm         ASTM D6304*         0              DGA - H2         ppm         ASTM D6312(e)*         12               DGA - DGA         O2         ppm         ASTM D6312(e)*         16632	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age         hrs         Client Info         0	Sample Number		Client Info		WC0475694		
Oil Age         hrs         Client Info         N/A             Oil Changed         Client Info         N/A             Sample Status         ABNORMAL             CONTAMINANTS         method         limit/base         current         history1         history2           Water         %         ASTM D6304*         0.001             ppm Water         ppm         ASTM D6304*         0             DISSOLVED GAS ANALYSIS (DGA)         method         limit/base         current         history1         history2           DGA - H2         ppm         ASTM D3612(e)*         12             DGA - O2         ppm         ASTM D3612(e)*         46632             DGA - CO         ppm         ASTM D3612(e)*         4508             DGA - CO2         ppm         ASTM D3612(e)*         4473             DGA - Ethylene         ppm         ASTM D3612(e)*         0             DGA - Ethylene         ppm         ASTM D3612(e)*         1 <td>Sample Date</td> <td></td> <td>Client Info</td> <td></td> <td>21 Sep 2020</td> <td></td> <td></td>	Sample Date		Client Info		21 Sep 2020		
Cilient Info	Machine Age	hrs	Client Info		0		
ABNORMAL	Oil Age	hrs	Client Info		0		
CONTAMINANTS	Oil Changed		Client Info		N/A		
Water         %         ASTM D6304*         0.001             ppm Water         ppm         ASTM D6304*         0             DISSOLVED GAS ANALYSIS (DGA)         method         limit/base         current         history1         history2           DGA - H2         ppm         ASTM D6312[e]*         12              DGA - O2         ppm         ASTM D6312[e]*         16632              DGA - N2         ppm         ASTM D6312[e]*         4 508             DGA - CO         ppm         ASTM D6312[e]*         4 4473             DGA - Methane         ppm         ASTM D6312[e]*         4             DGA - Ethylene         ppm         ASTM D6312[e]*         0             DGA - Ethylene         ppm         ASTM D6312[e]*         56             DGA - Total Gas Content         %         ASTM D6312[e]*         92169             DGA - Total Combustible Gas         ppm         ASTM D6312[e]*         581	Sample Status				ABNORMAL		
Dissolved Gas Analysis (DGA)   method   limit/base   current   history1   history2	CONTAMINANTS		method	limit/base	current	history1	history2
DISSOLVED GAS ANALYSIS (DGA)   method   limit/base   current   history1   history2	Water	%	ASTM D6304*		0.001		
DGA - H2	ppm Water	ppm	ASTM D6304*		0		
DGA - O2	DISSOLVED GAS ANALY	YSIS (DGA)	method	limit/base	current	history1	history2
DGA - N2	DGA - H2	ppm	ASTM D3612(e)*		12		
DGA - CO	DGA - O2	ppm	ASTM D3612(e)*		16632		
DGA - CO2	DGA - N2	ppm	ASTM D3612(e)*		70483		
DGA - Methane         ppm         ASTM D3612(e)*         4             DGA - Acetylene         ppm         ASTM D3612(e)*         0             DGA - Ethylene         ppm         ASTM D3612(e)*         56             DGA - Ethane         ppm         ASTM D3612(e)*         92169             DGA - Total Gas Content         %         ASTM D3612(e)*         581             DGA - Total Combustible Gas         ppm         ASTM D3612(e)*         581             DGA - Total Combustible Gas         ppm         ASTM D3612(e)*         581             DGA - Total Combustible Gas         ppm         ASTM D3612(e)*         581             DGA - Total Combustible Gas         ppm         ASTM D3612(e)*         581             DGA - Total Combustible Gas         ppm         ASTM D3612(e)*         581             FLUID DEGRADATION         method         limit/base         current         history1         history2           White Metal         scalar         Visual*         NONE         NO	DGA - CO	ppm	ASTM D3612(e)*		<b>△</b> 508		
DGA - Acetylene         ppm         ASTM D3612(e)*         0             DGA - Ethylene         ppm         ASTM D3612(e)*         ▲ 56             DGA - Ethane         ppm         ASTM D3612(e)*         92169             DGA - Total Gas Content         %         ASTM D3612(e)*         92169             DGA - Total Combustible Gas         ppm         ASTM D3612(e)*         581             DGA - Total Combustible Gas         ppm         ASTM D3612(e)*         581             DGA - Total Combustible Gas         ppm         ASTM D3612(e)*         581             DGA - Total Combustible Gas         ppm         ASTM D3612(e)*         581             DGA - Total Combustible Gas         ppm         ASTM D3612(e)*         581             DGA - Total Combustible Gas         ppm         ASTM D3612(e)*         0.03             FLUID DEGRADATION         method         limit/base         current         history1         history2           White Metal         scalar         Visual*         NON	DGA - CO2	ppm	ASTM D3612(e)*		<b>4473</b>		
DGA - Acetylene   ppm   ASTM D3612(e)*   0	DGA - Methane	ppm	ASTM D3612(e)*		4		
DGA - Ethane         ppm         ASTM D3612(e)*         1             DGA - Total Gas Content         %         ASTM D3612(e)*         92169             DGA - Total Combustible Gas         ppm         ASTM D3612(e)*         581             FLUID DEGRADATION         method         limit/base         current         history1         history2           Acid Number (AN)         mg KOH/g         ASTM D974*         0.03             VISUAL         method         limit/base         current         history1         history2           White Metal         scalar         Visual*         NONE         NONE            Yellow Metal         scalar         Visual*         NONE         NONE            Precipitate         scalar         Visual*         NONE         NONE            Silt         scalar         Visual*         NONE         NONE            Debris         scalar         Visual*         NONE         NONE            Sand/Dirt         scalar         Visual*         NONE         NONE            Appearance	DGA - Acetylene	ppm			0		
DGA - Total Gas Content         %         ASTM D3612(e)*         92169             DGA - Total Combustible Gas         ppm         ASTM D3612(e)*         581             FLUID DEGRADATION         method         limit/base         current         history1         history2           Acid Number (AN)         mg KOH/g         ASTM D974*         0.03             VISUAL         method         limit/base         current         history1         history2           White Metal         scalar         Visual*         NONE         NONE             Yellow Metal         scalar         Visual*         NONE         NONE             Silt         scalar         Visual*         NONE         NONE             Debris <td>DGA - Ethylene</td> <td>ppm</td> <td>ASTM D3612(e)*</td> <td></td> <td><u> </u></td> <td></td> <td></td>	DGA - Ethylene	ppm	ASTM D3612(e)*		<u> </u>		
DGA - Total Combustible Gas         ppm         ASTM D3612(e)*         581             FLUID DEGRADATION method limit/base current history1         history2           Acid Number (AN)         mg KOH/g         ASTM D974*         0.03             VISUAL         method limit/base current history1         history2           White Metal         scalar Visual* NONE NONE         NONE            Yellow Metal         scalar Visual* NONE NONE             Precipitate         scalar Visual* NONE NONE             Silt         scalar Visual* NONE NONE             Debris         scalar Visual* NONE NONE             Sand/Dirt         scalar Visual* NONE NONE NONE             Appearance         scalar Visual* NORML NORML             Odor         scalar Visual* NORML NORML             FLUID PROPERTIES         method limit/base current history1 history2         history2           Specific Gravity         ASTM D4052(e)         0.865             Interfacial Tension         mN/m ASTM D971(e)* <td>DGA - Ethane</td> <td>ppm</td> <td>ASTM D3612(e)*</td> <td></td> <td>1</td> <td></td> <td></td>	DGA - Ethane	ppm	ASTM D3612(e)*		1		
FLUID DEGRADATION         method         limit/base         current         history1         history2           Acid Number (AN)         mg KOH/g         ASTM D974*         0.03             VISUAL         method         limit/base         current         history1         history2           White Metal         scalar         Visual*         NONE         NONE            Yellow Metal         scalar         Visual*         NONE         NONE            Precipitate         scalar         Visual*         NONE         NONE            Precipitate         scalar         Visual*         NONE         NONE            Silt         scalar         Visual*         NONE         NONE            Debris         scalar         Visual*         NONE         NONE            Sand/Dirt         scalar         Visual*         NONE         NONE            Appearance         scalar         Visual*         NORML         NORML            Odor         scalar         Visual*         NORML         NORML            FLUID PROPERTIES         method <t< td=""><td>DGA - Total Gas Content</td><td>%</td><td>ASTM D3612(e)*</td><td></td><td>92169</td><td></td><td></td></t<>	DGA - Total Gas Content	%	ASTM D3612(e)*		92169		
Acid Number (AN)   mg KOH/g   ASTM D974*   0.03	DGA - Total Combustible Gas	ppm	ASTM D3612(e)*		581		
VISUAL         method         limit/base         current         history1         history2           White Metal         scalar         Visual*         NONE         NONE             Yellow Metal         scalar         Visual*         NONE         NONE             Precipitate         scalar         Visual*         NONE         NONE             Silt         scalar         Visual*         NONE         NONE             Debris         scalar         Visual*         NONE         NONE             Sand/Dirt         scalar         Visual*         NONE         NONE             Appearance         scalar         Visual*         NORML         NORML             Odor         scalar         Visual*         NORML         NORML             FLUID PROPERTIES         method         limit/base         current         history1         history2           Specific Gravity         ASTM D4052(e)         55             Interfacial Tension         mN/m         ASTM D971(e)* <th>FLUID DEGRADA</th> <th>TION</th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th>	FLUID DEGRADA	TION	method	limit/base	current	history1	history2
White Metal         scalar         Visual*         NONE         NONE             Yellow Metal         scalar         Visual*         NONE         NONE             Precipitate         scalar         Visual*         NONE         NONE             Silt         scalar         Visual*         NONE         NONE             Debris         scalar         Visual*         NONE         NONE             Sand/Dirt         scalar         Visual*         NONE         NONE             Appearance         scalar         Visual*         NORML         NORML             Odor         scalar         Visual*         NORML         NORML             FLUID PROPERTIES         method         limit/base         current         history1         history2           Specific Gravity         ASTM D4052(e)         0.865             Dielectric Breakdown         kV         ASTM D971(e)*         34.82             Interfacial Tension         mN/m         ASTM D971(e)*	Acid Number (AN)	mg KOH/g	ASTM D974*		0.03		
Yellow Metal         scalar         Visual*         NONE         NONE             Precipitate         scalar         Visual*         NONE         NONE             Silt         scalar         Visual*         NONE         NONE             Debris         scalar         Visual*         NONE         NONE             Sand/Dirt         scalar         Visual*         NONE         NONE             Appearance         scalar         Visual*         NORML         NORML             Odor         scalar         Visual*         NORML         NORML             FLUID PROPERTIES         method         limit/base         current         history1         history2           Specific Gravity         ASTM D4052(e)         0.865             Dielectric Breakdown         kV         ASTM D971(e)*         34.82	VISUAL		method	limit/base	current	history1	history2
Precipitate         scalar         Visual*         NONE         NONE             Silt         scalar         Visual*         NONE         NONE             Debris         scalar         Visual*         NONE         NONE             Sand/Dirt         scalar         Visual*         NONE         NONE             Appearance         scalar         Visual*         NORML         NORML             Odor         scalar         Visual*         NORML         NORML             FLUID PROPERTIES         method         limit/base         current         history1         history2           Specific Gravity         ASTM D4052(e)         0.865             Dielectric Breakdown         kV         ASTM D971(e)*         34.82	White Metal	scalar	Visual*	NONE	NONE		
Silt         scalar         Visual*         NONE         NONE             Debris         scalar         Visual*         NONE         NONE             Sand/Dirt         scalar         Visual*         NONE         NONE             Appearance         scalar         Visual*         NORML         NORML             Odor         scalar         Visual*         NORML         NORML             FLUID PROPERTIES         method         limit/base         current         history1         history2           Specific Gravity         ASTM D4052(e)         0.865             Dielectric Breakdown         kV         ASTM D971(e)*         55             Interfacial Tension         mN/m         ASTM D971(e)*         34.82	Yellow Metal	scalar	Visual*	NONE	NONE		
Debris   Scalar   Visual*   NONE   NONE         Sand/Dirt   Scalar   Visual*   NONE   NONE         Appearance   Scalar   Visual*   NORML   NORML         Odor   Scalar   Visual*   NORML   NORML         FLUID PROPERTIES   method   limit/base   current   history1   history2     Specific Gravity   ASTM D4052(e)   0.865         Dielectric Breakdown   kV   ASTM D971(e)*   55         Interfacial Tension   mN/m   ASTM D971(e)*   34.82	Precipitate	scalar	Visual*	NONE	NONE		
Sand/Dirt         scalar         Visual*         NONE         NONE             Appearance         scalar         Visual*         NORML         NORML             Odor         scalar         Visual*         NORML         NORML             FLUID PROPERTIES         method         limit/base         current         history1         history2           Specific Gravity         ASTM D4052(e)         0.865             Dielectric Breakdown         kV         ASTM D3612(e)*         55            Interfacial Tension         mN/m         ASTM D971(e)*         34.82	Silt	scalar	Visual*	NONE	NONE		
Appearance         scalar         Visual*         NORML         NORML             Odor         scalar         Visual*         NORML         NORML             FLUID PROPERTIES         method         limit/base         current         history1         history2           Specific Gravity         ASTM D4052(e)         0.865             Dielectric Breakdown         kV         ASTM D3612(e)*         55             Interfacial Tension         mN/m         ASTM D971(e)*         34.82	Debris	scalar	Visual*	NONE	NONE		
Odor         scalar         Visual*         NORML              FLUID PROPERTIES         method         limit/base         current         history1         history2           Specific Gravity         ASTM D4052(e)         0.865             Dielectric Breakdown         kV         ASTM D3612(e)*         55             Interfacial Tension         mN/m         ASTM D971(e)*         34.82	Sand/Dirt	scalar	Visual*	NONE	NONE		
FLUID PROPERTIES         method         limit/base         current         history1         history2           Specific Gravity         ASTM D4052(e)         0.865             Dielectric Breakdown         kV         ASTM D3612(e)*         55             Interfacial Tension         mN/m         ASTM D971(e)*         34.82	Appearance	scalar	Visual*	NORML	NORML		
Specific Gravity         ASTM D4052(e)         0.865             Dielectric Breakdown         kV         ASTM D3612(e)*         55             Interfacial Tension         mN/m         ASTM D971(e)*         34.82	Odor	scalar	Visual*	NORML	NORML		
Dielectric Breakdown         kV         ASTM D3612(e)*         55             Interfacial Tension         mN/m         ASTM D971(e)*         34.82	FLUID PROPERT	IES	method	limit/base	current	history1	history2
Interfacial Tension mN/m ASTM D971(e)* 34.82	Specific Gravity		ASTM D4052(e)		0.865		
	Dielectric Breakdown	kV	ASTM D3612(e)*		55		
ASTM Color scalar ASTM D1500(e) 2.0	Interfacial Tension	mN/m	ASTM D971(e)*		34.82		
	ASTM Color	scalar	ASTM D1500(e)		2.0		



## **OIL ANALYSIS REPORT**







Sample No.

Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9 : WC0475694 Lab Number : 02377159

Unique Number : 5108612

100

Test Package : TRF 2

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.

Portage Power - Energy Ottawa

4 Booth Street Ottawa, ON CA K1R 6K8

Contact: Cheryl Gharib info@portagepower.com

T: F: x:

: 22 Sep 2020

: 23 Sep 2020

: 13 Oct 2020 - Bill Quesnel

Received

Diagnosed

**Tested**