



Customer City of Richmond Dept. Public Utilities

 Owner City of Richmond Dept. Public Utilities

Site Location	Circuit Designation/Substation	Equipment ID	PAGE NO.
<b>Asset</b>			
PLANT			
15056RIC - MAIN CKT. BKR. SEC. INJ. TE			
PLANT			
15056RIC - MAIN CKT. BKR. SEC. INJ. TE			
PLANT			
15056RIC - MAIN CKT. BKR. SEC. INJ. TE			
PLANT			
15056RIC - ██████████ MAIN CKT.			
PLANT			
15056RIC - MAIN CKT. BKR. SEC. INJ. TE			
PLANT			
15056RIC - ██████████ CKT. BKR. SEC. I			
PLANT			
15056RIC - SPARE CKT. BKR. SEC. INJ. T			
PLANT			
15056RIC - TIE CKT. BKR. SEC. INJ. TEST			
PLANT			
15056RIC - TRANSFORMER ██████ CKT. BK			
PLANT			
15056RIC - MAIN CKT. BKR. SEC. INJ. TE			
PLANT			
15056RIC - ██████████ CKT. BKR. SEC. IN			
PLANT			
15056RIC - TIE CKT. BKR. SEC. INJ. TEST			
WWTP			
15000RIC - ██████████ MAIN █ SEC			
WWTP			
15000RIC - ██████████ SECONDARY INJ			
WWTP			
15000RIC - MAIN SECONDARY INJECTIO			
WWTP			
15000RIC - ██████████ SECON			
WWTP			
15000RIC - ██████████ SE			
WWTP			
15000RIC - PLNT █ MAIN SERVICE ██████			
WWTP			
15000RIC - TIE SECONDARY INJECTION			
WWTP			
15000RIC - TRANSFORMER ██████ SECONDA			
WWTP			
16100RIC - BUS TIE VACUUM CIRCUIT BR			
WWTP			
16100RIC - ██████████ PS ██████ V			
WWTP			
16100RIC - ██████████ VACU			
WWTP			
16100RIC - XFMR-██████████			
WWTP			
16100RIC - XFMR-██████████ VA			
WWTP			
16100RIC - ██████████ VACUUM			

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Site Location	Circuit Designation/Substation	Equipment ID	PAGE NO.
<b>Asset</b>			
WWTP			
16100RIC - [REDACTED] SERVICE FD- [REDACTED] VACUUM			
WWTP			
16100RIC - [REDACTED] XFMR MAIN VACUUM			
WWTP			
16100RIC - XFMR [REDACTED]			
WWTP			
External Document Placeholder			
WWTP			
94500RIC - TRANSFORMER [REDACTED]			
WWTP			
94500RIC - TRANSFORMER [REDACTED]			
WWTP			
16100RIC - BUS TIE VACUUM CIRCUIT BR			
WWTP			
16100RIC - [REDACTED] SWGR [REDACTED]			
WWTP			
16100RIC - [REDACTED] SERVICE FEED			
WWTP			
16100RIC - [REDACTED] SWGR. [REDACTED]-F			
WWTP			
16000 - MAIN MEDIUM VOLTAGE AIR CKT			
WWTP			
94500RIC - TRANSFORMER TEST(ALL XF			
WWTP			
16100RIC - [REDACTED] V			
WWTP			
16100RIC - GENERATOR- [REDACTED] VACUUM CIR			
WWTP			
16100RIC - [REDACTED] SWGR [REDACTED]			
WWTP			
16100RIC - [REDACTED] SERVICE FEED			
WWTP			
16100RIC - [REDACTED] FEEDER [REDACTED] VA			
WWTP			
16100RIC - SPARE VACUUM CIRCUIT BR			
WWTP			
16100RIC - SPARE VACUUM CIRCUIT BR			
WWTP			
SIDE 2 RELAYS			
WWTP			
94500RIC - TRANSFORMER [REDACTED]			
WWTP			
94500RIC - TRANSFORMER [REDACTED]			



# Comment Summary Job #RVA22131-140



PAGE \_\_\_\_\_

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Site Location: [REDACTED]  
Circuit Designation/Substation: [REDACTED]  
Equipment ID: [REDACTED]  
Equipment: 15056RIC - MSBH-HDP2 CKT. BKR. SEC. INJ. TEST

Page: \_\_\_\_\_  
Date: 1/13/2023

COMMENTS: REPLACED WITH NEW TRIP UNIT

Site Location: [REDACTED]  
Circuit Designation/Substation: [REDACTED]  
Equipment ID: [REDACTED]  
Equipment: 16000 - MAIN MEDIUM VOLTAGE AIR CKT. BKR

Page: \_\_\_\_\_  
Date: 6/3/2022

COMMENTS: PASSED ALL NETA MTS SPECIFICATIONS

Site Location: [REDACTED]  
Circuit Designation/Substation: [REDACTED]  
Equipment ID: [REDACTED]  
Equipment: 94500RIC - TRANSFORMER TEST(ALL XFMRs)

Page: \_\_\_\_\_  
Date: 6/3/2022

COMMENTS: High side of transformer tested only, Low side X0 bushing was leaking so we didnt mess with it because we didnt want to make it leak even more.

Site Location: [REDACTED]  
Circuit Designation/Substation: [REDACTED]  
Equipment ID: [REDACTED]  
Equipment: 94500RIC - TRANSFORMER [REDACTED]

Page: \_\_\_\_\_  
Date: 11/2/2022

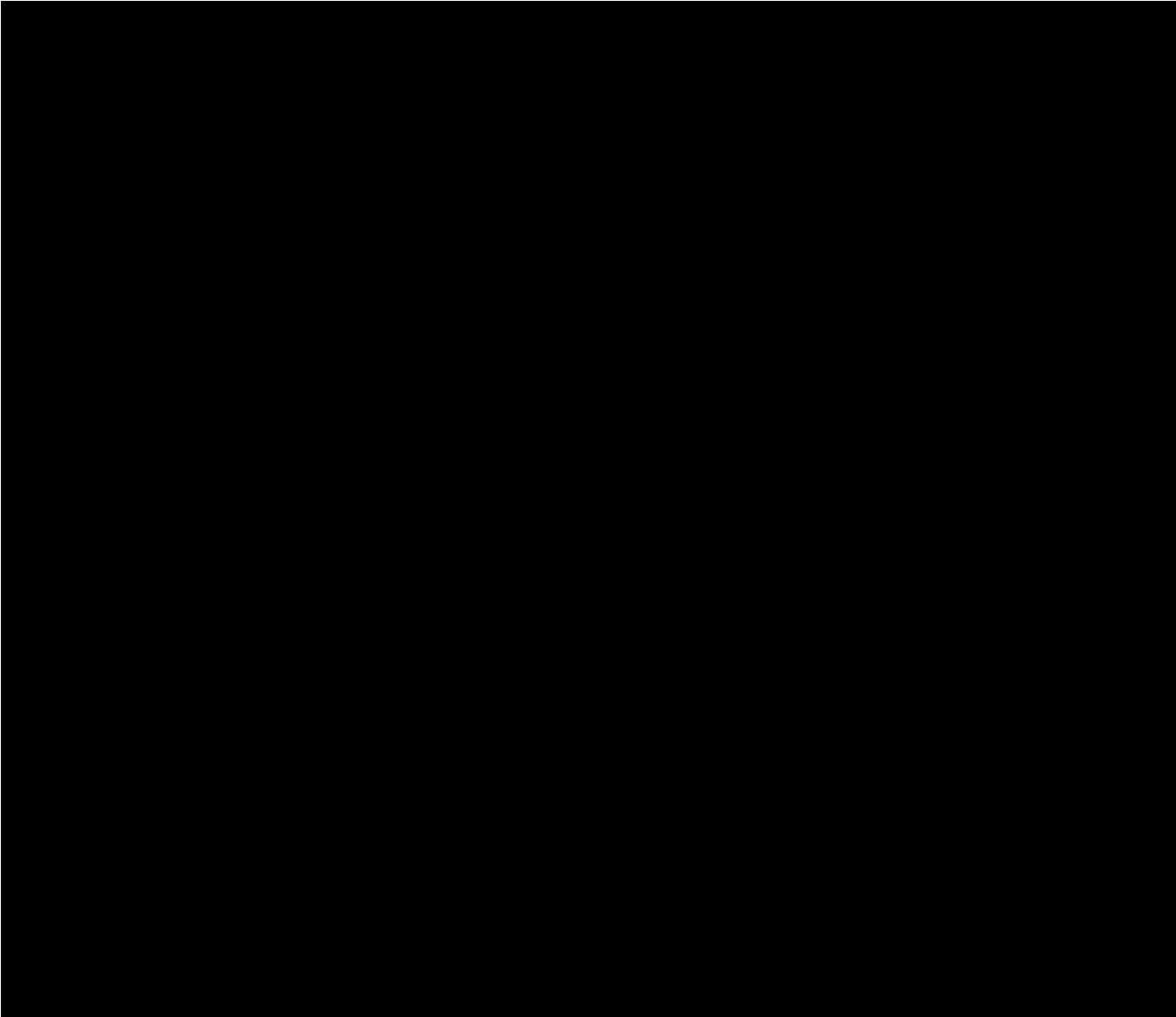
COMMENTS: FUSES FOR FAN WERE BLOWN. XFMR RATED AT LOWEST VALUE UNTIL FANS ARE REPAIRED.



# LOW VOLTAGE CIRCUIT BKR SEC INJ TEST



CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
 OWNER City of Richmond Dept. Public Utilities  
 REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
 DATE 11/8/2022 AMBIENT TEMPERATURE 72 °F HUMIDITY 37 % EQPT. LOCATION DOUGLASDALE  
 SUBSTATION SWITCHGEAR POSITION MAIN



ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

COMMENTS: \_\_\_\_\_  
 DEFICIENCIES: \_\_\_\_\_

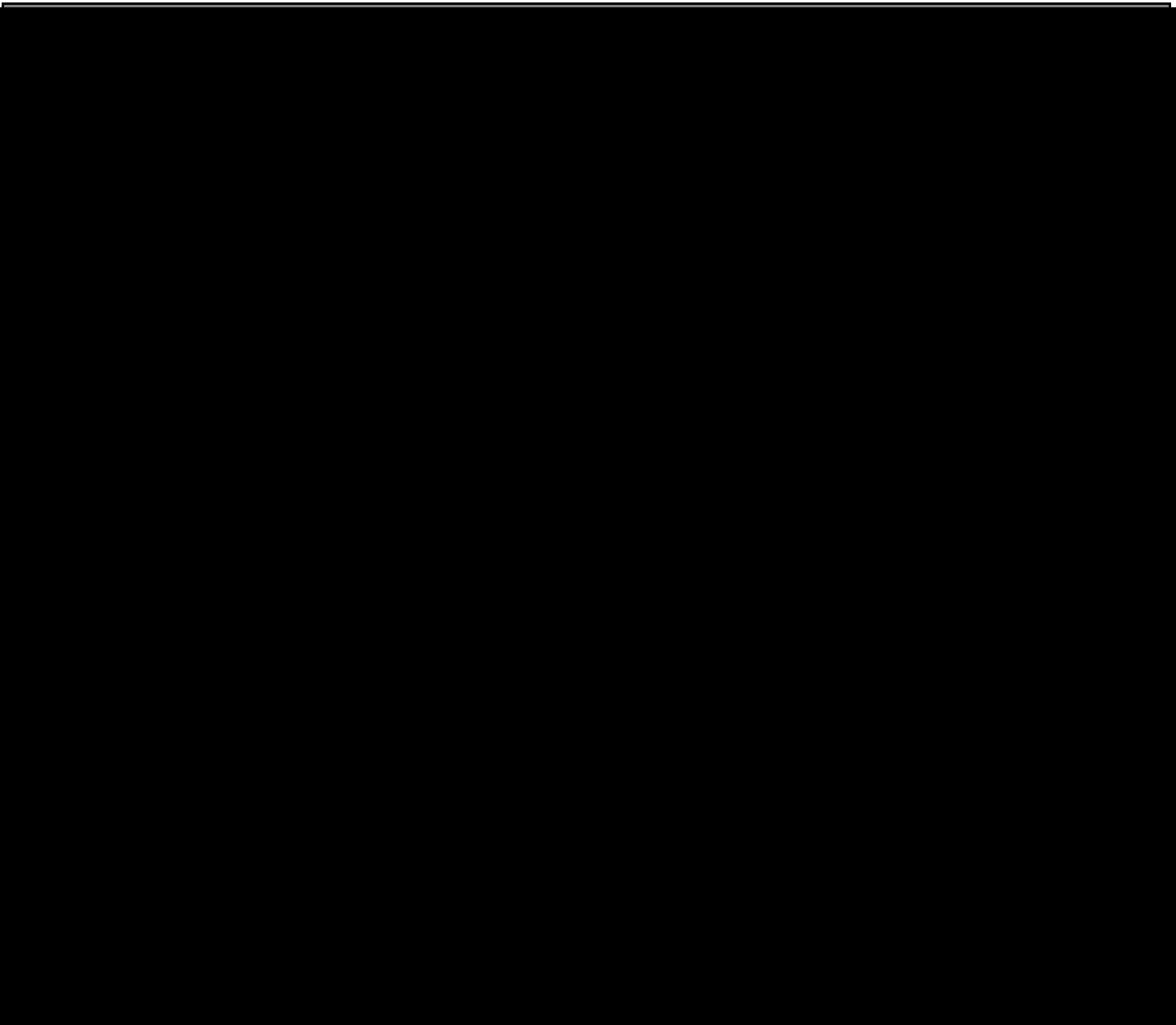
TEST EQUIPMENT USED: MVT SECONDARY TEST SET TESTED BY: Rick Evans



# LOW VOLTAGE CIRCUIT BKR SEC INJ TEST



CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
 OWNER City of Richmond Dept. Public Utilities  
 REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
 DATE 11/8/2022 AMBIENT TEMPERATURE 72 °F HUMIDITY 35 % EQPT. LOCATION DOUGLASDALE  
 SUBSTATION SWITCHGEAR POSITION MAIN



ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

COMMENTS: \_\_\_\_\_  
 DEFICIENCIES: \_\_\_\_\_

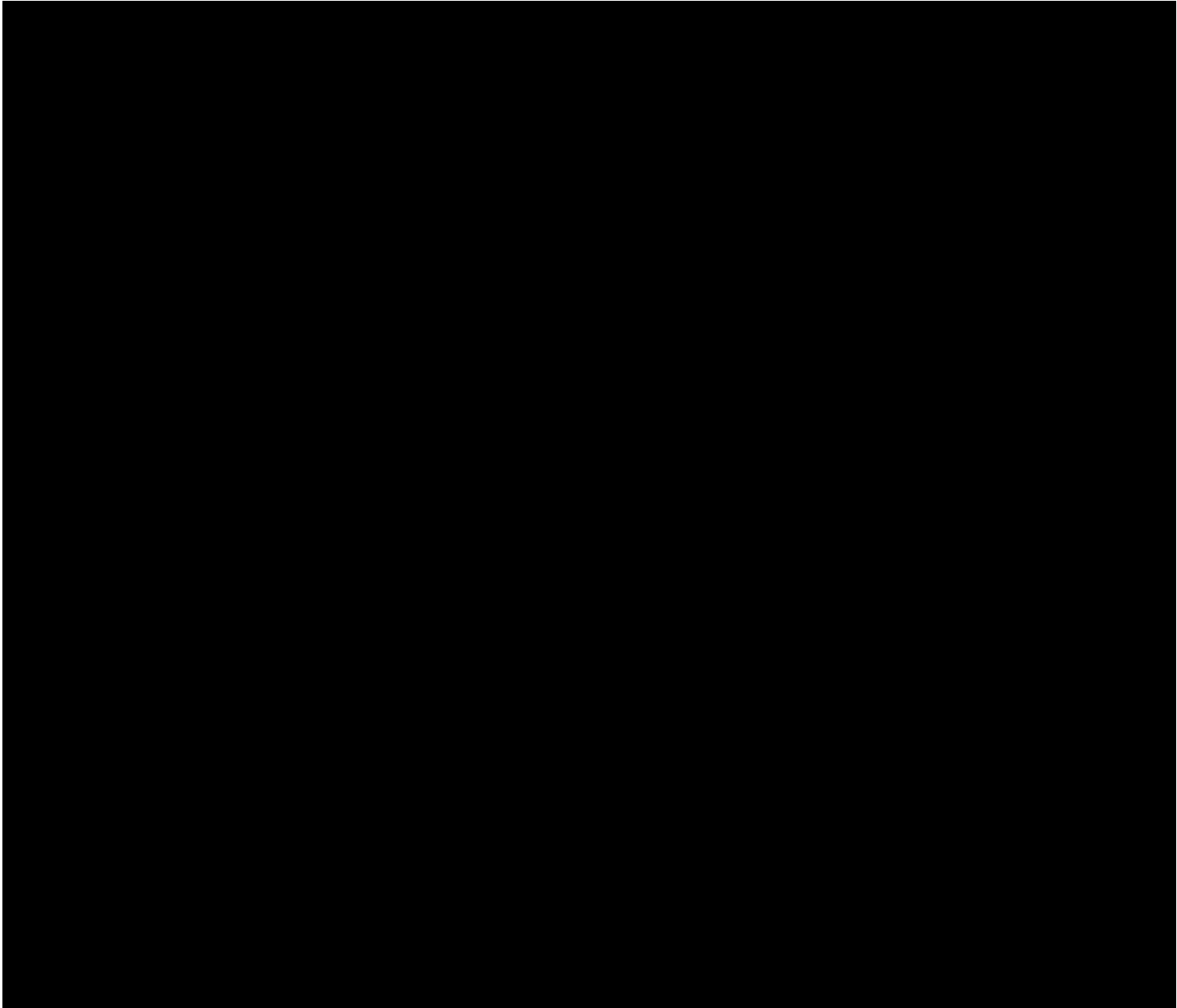
TEST EQUIPMENT USED: MVT SECONDARY TEST SET TESTED BY: Rick Evans



# LOW VOLTAGE CIRCUIT BKR SEC INJ TEST



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ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
OWNER City of Richmond Dept. Public Utilities  
REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
DATE 11/8/2022 AMBIENT TEMPERATURE 73 °F HUMIDITY 36 % EQPT. LOCATION DOUGLASDALE  
SUBSTATION MAIN INCOMING POSITION MAIN SERVICE



ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

COMMENTS: \_\_\_\_\_  
DEFICIENCIES: \_\_\_\_\_

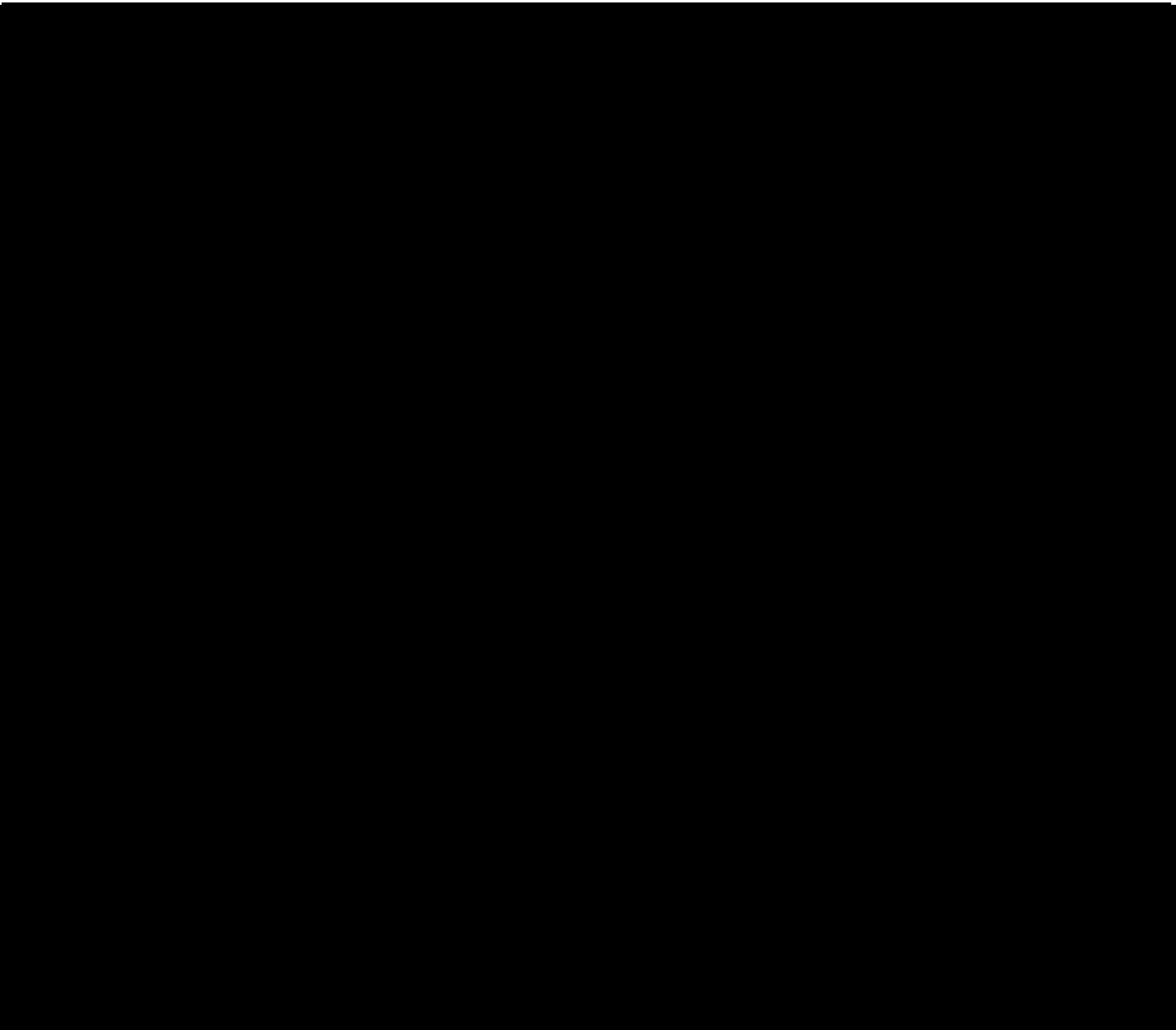
TEST EQUIPMENT USED: SECONDARY TEST SET/ DLRO / 1KVMEGGER TESTED BY: Rick Evans



# LOW VOLTAGE CIRCUIT BKR SEC INJ TEST



CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
 OWNER City of Richmond Dept. Public Utilities  
 REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
 DATE 11/8/2022 AMBIENT TEMPERATURE 72 °F HUMIDITY 37 % EQPT. LOCATION DOUGLASDALE  
 SUBSTATION MSBH POSITION -MAIN



ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

COMMENTS: \_\_\_\_\_  
 DEFICIENCIES: \_\_\_\_\_

TEST EQUIPMENT USED: SECONDARY TEST SET/ DLRO / 1KVMEGGER TESTED BY: Rick Evans

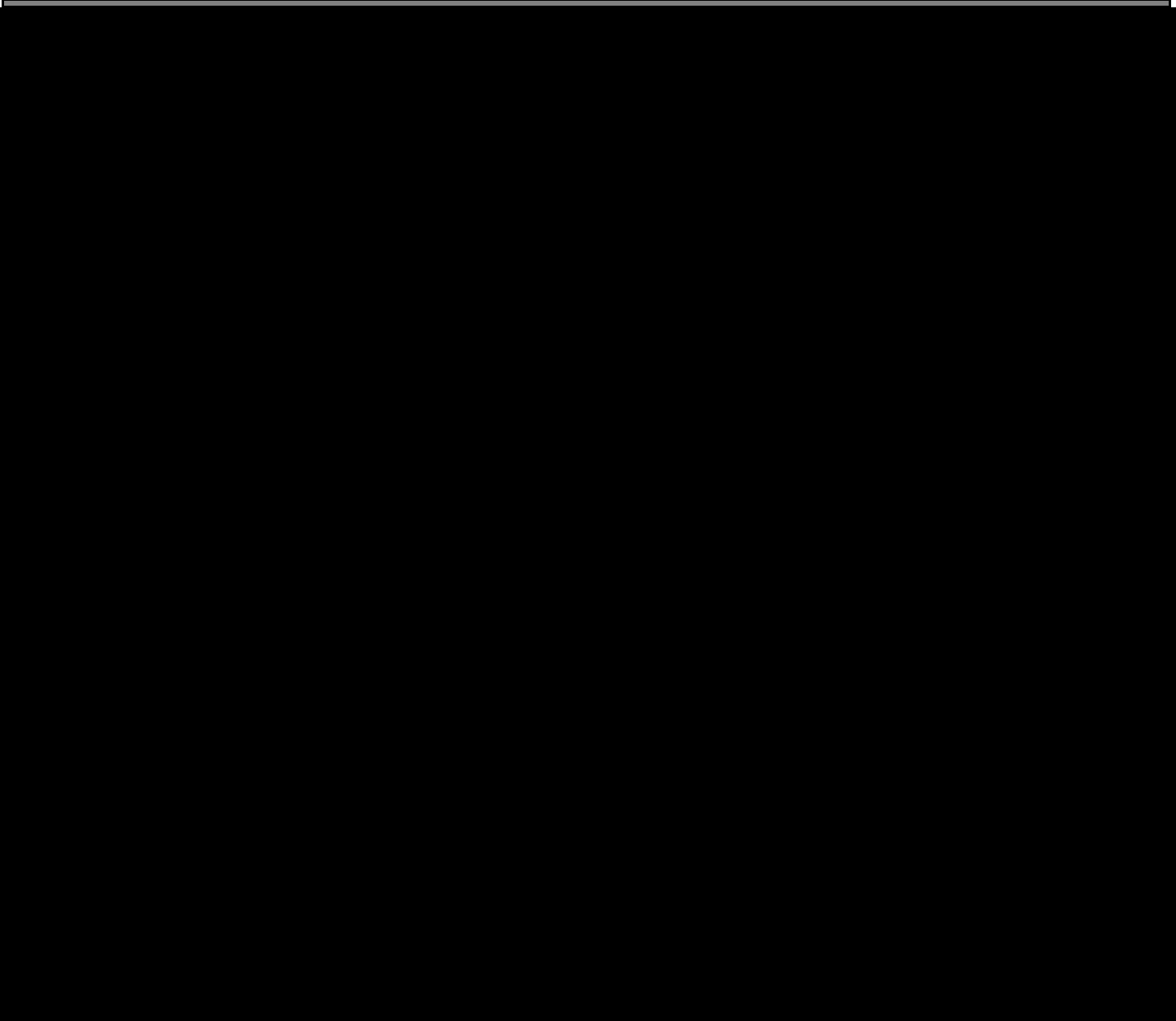




# LOW VOLTAGE CIRCUIT BKR SEC INJ TEST



CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
 OWNER City of Richmond Dept. Public Utilities  
 REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
 DATE 11/8/2022 AMBIENT TEMPERATURE 71 °F HUMIDITY 37 % EQPT. LOCATION DOUGLASDALE  
 SUBSTATION MSBH POSITION MAIN



ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

COMMENTS: \_\_\_\_\_  
 DEFICIENCIES: \_\_\_\_\_

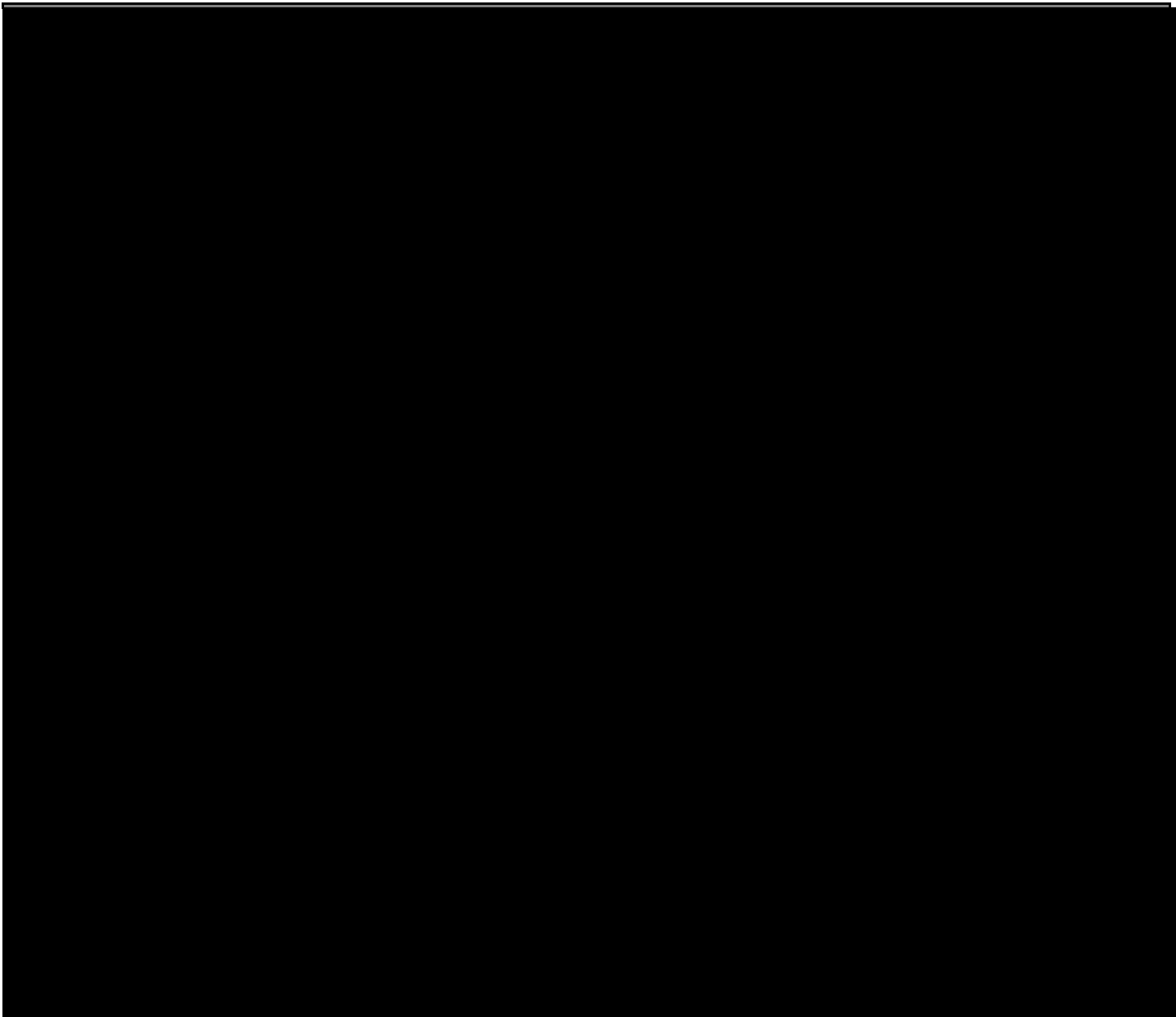
TEST EQUIPMENT USED: SECONDARY TEST SET/ DLRO / 1KVMEGGER TESTED BY: Rick Evans



# LOW VOLTAGE CIRCUIT BKR SEC INJ TEST



CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
 OWNER City of Richmond Dept. Public Utilities  
 REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
 DATE 1/13/2023 AMBIENT TEMPERATURE 72 °F HUMIDITY 37 % EQPT. LOCATION DOUGLASDALE  
 SUBSTATION \_\_\_\_\_ MSBH-     POSITION MSBH -     



ASSESSMENT OF BREAKER: **PASSED ALL NETA ATS SPECIFICATIONS**

COMMENTS: REPLACED WITH NEW TRIP UNIT  
 DEFICIENCIES: \_\_\_\_\_

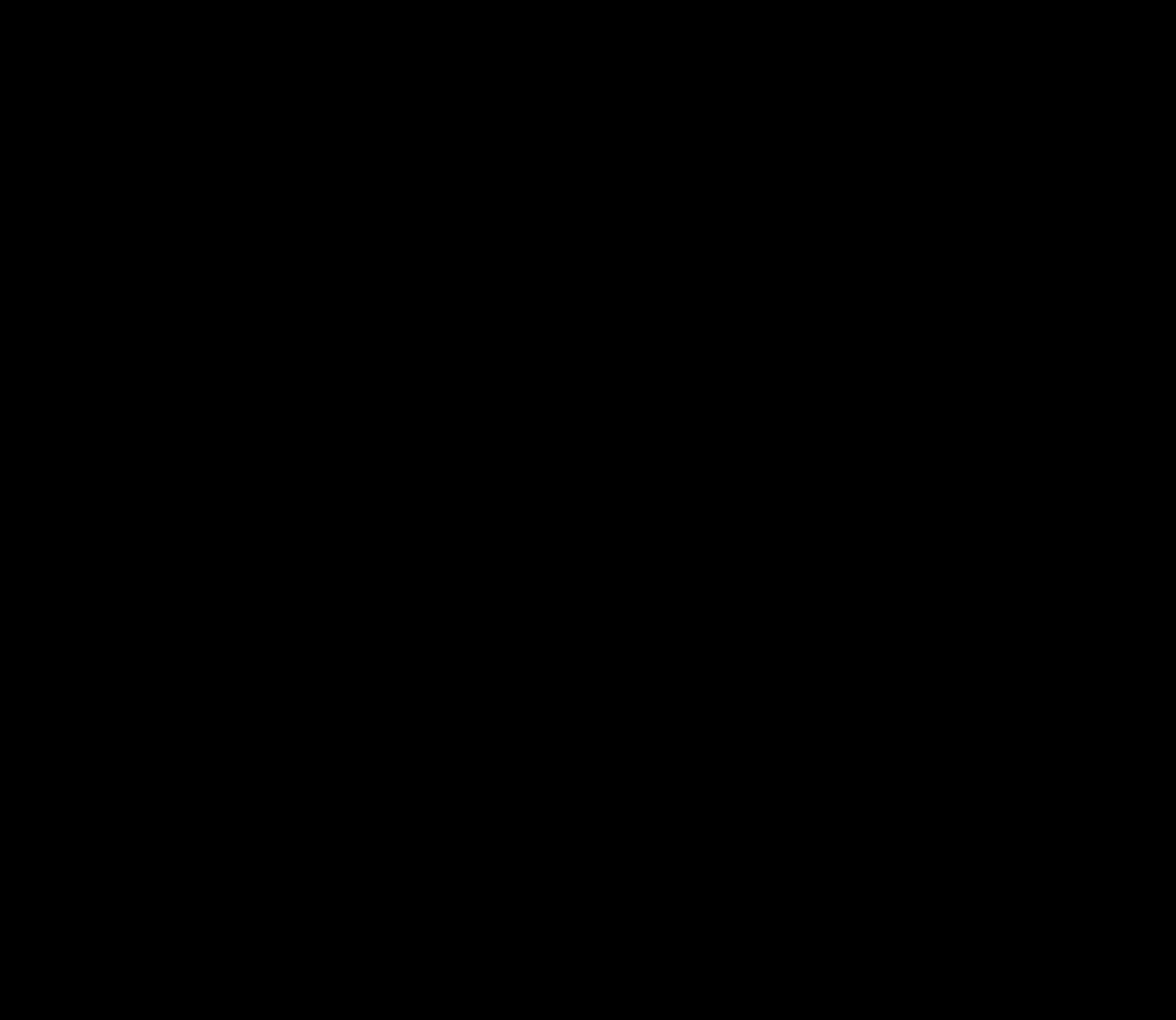
TEST EQUIPMENT USED:      SECONDARY TEST SET/ DLRO / 1KVMEGGER TESTED BY: Rick Evans



# LOW VOLTAGE CIRCUIT BKR SEC INJ TEST



CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
 OWNER City of Richmond Dept. Public Utilities  
 REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
 DATE 11/8/2022 AMBIENT TEMPERATURE 72 °F HUMIDITY 37 % EQPT. LOCATION DOUGLASDALE  
 SUBSTATION MSBH POSITION SPARE



ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

COMMENTS: \_\_\_\_\_  
 DEFICIENCIES: \_\_\_\_\_

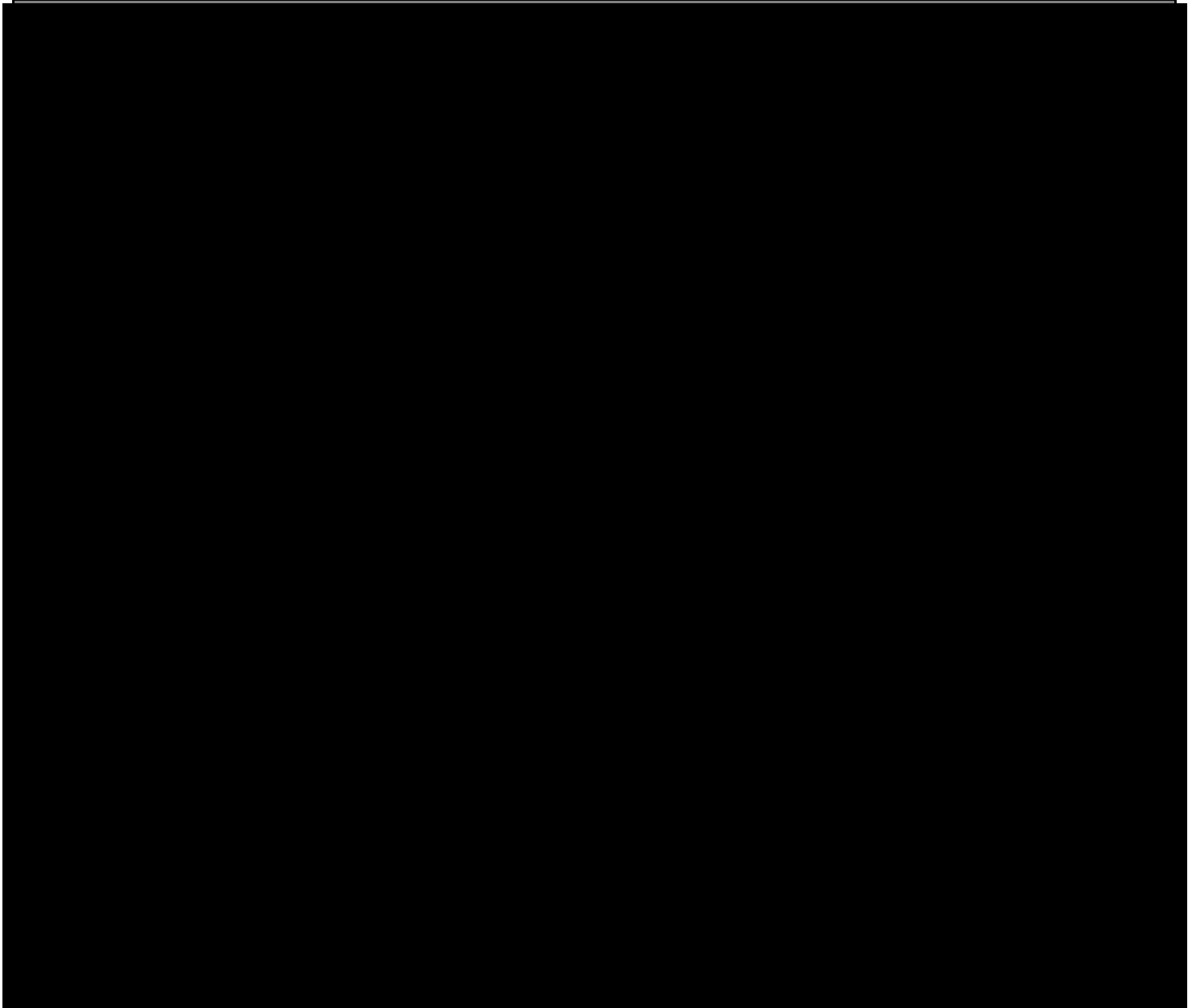
TEST EQUIPMENT USED: SECONDARY TEST SET/ DLRO / 1KVMEGGER TESTED BY: Rick Evans



# LOW VOLTAGE CIRCUIT BKR SEC INJ TEST



CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
 OWNER City of Richmond Dept. Public Utilities  
 REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
 DATE 11/8/2022 AMBIENT TEMPERATURE 72 °F HUMIDITY 37 % EQPT. LOCATION DOUGLASDALE  
 SUBSTATION MSBH POSITION TIE



ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

COMMENTS: \_\_\_\_\_  
 DEFICIENCIES: \_\_\_\_\_

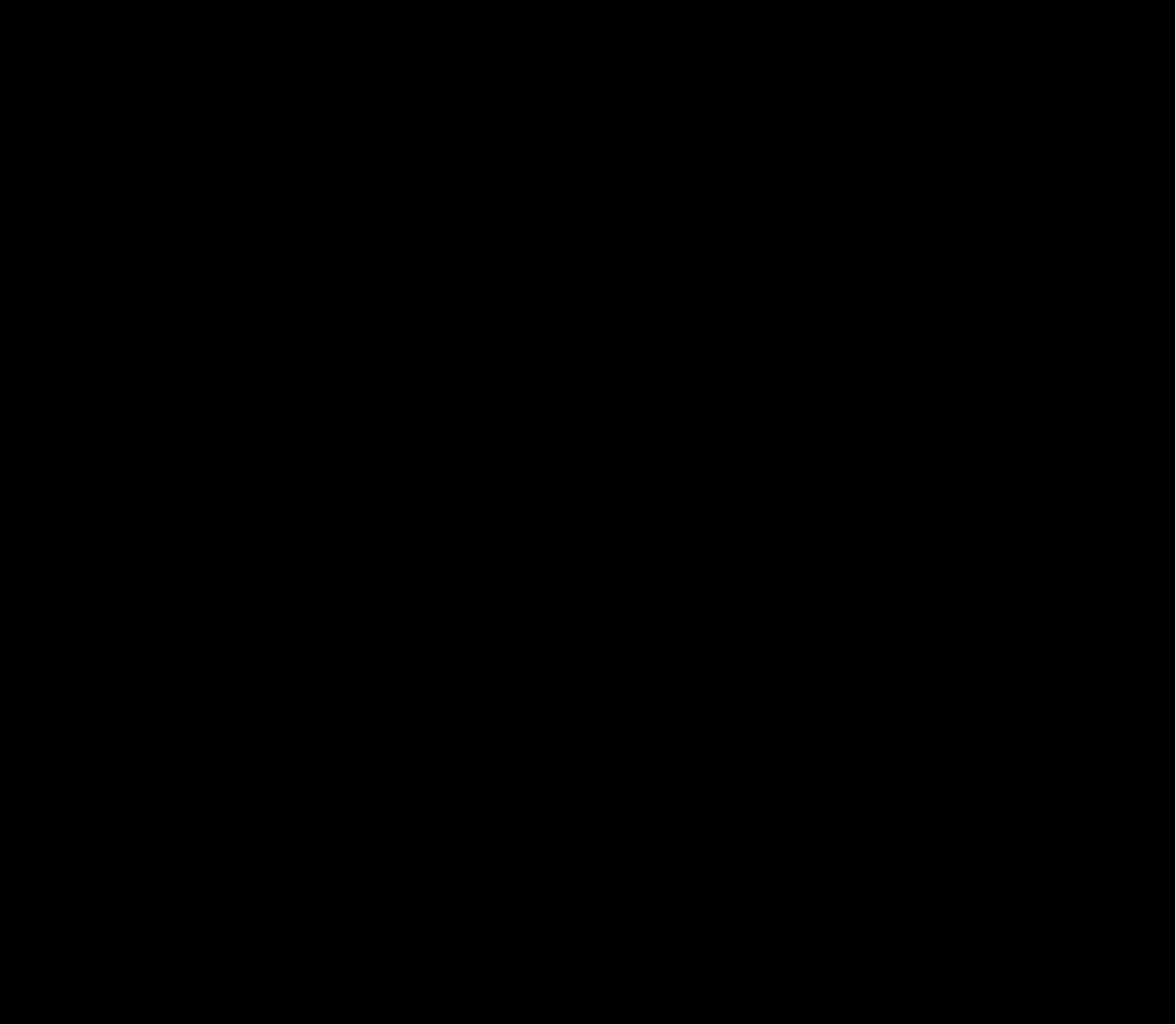
TEST EQUIPMENT USED: SECONDARY TEST SET/ DLRO / 1KVMEGGER TESTED BY: Rick Evans



# LOW VOLTAGE CIRCUIT BKR SEC INJ TEST



CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
OWNER City of Richmond Dept. Public Utilities  
REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
DATE 11/8/2022 AMBIENT TEMPERATURE 72 °F HUMIDITY 37 % EQPT. LOCATION DOUGLASDALE  
SUBSTATION MSBH POSITION TRANSFORMER



ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

COMMENTS: \_\_\_\_\_  
DEFICIENCIES: \_\_\_\_\_

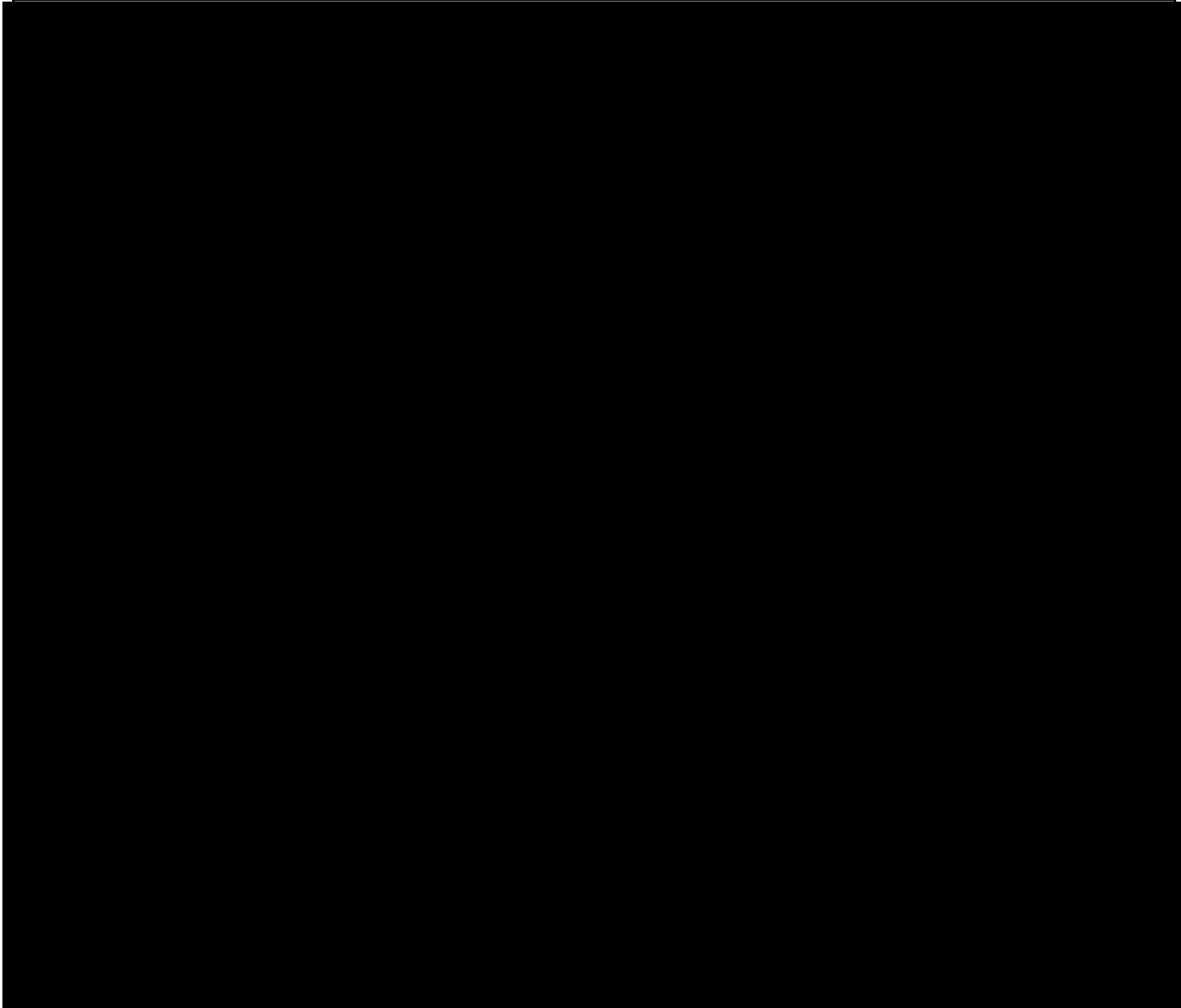
TEST EQUIPMENT USED: SECONDARY TEST SET/ DLRO / 1KVMEGGER TESTED BY: Rick Evans



# LOW VOLTAGE CIRCUIT BKR SEC INJ TEST



CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
 OWNER City of Richmond Dept. Public Utilities  
 REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
 DATE 11/8/2022 AMBIENT TEMPERATURE 68 °F HUMIDITY 36 % EQPT. LOCATION DOUGLASDALE  
 SUBSTATION \_\_\_\_\_ MSBL-█ POSITION MAIN



ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

COMMENTS: \_\_\_\_\_  
 DEFICIENCIES: \_\_\_\_\_

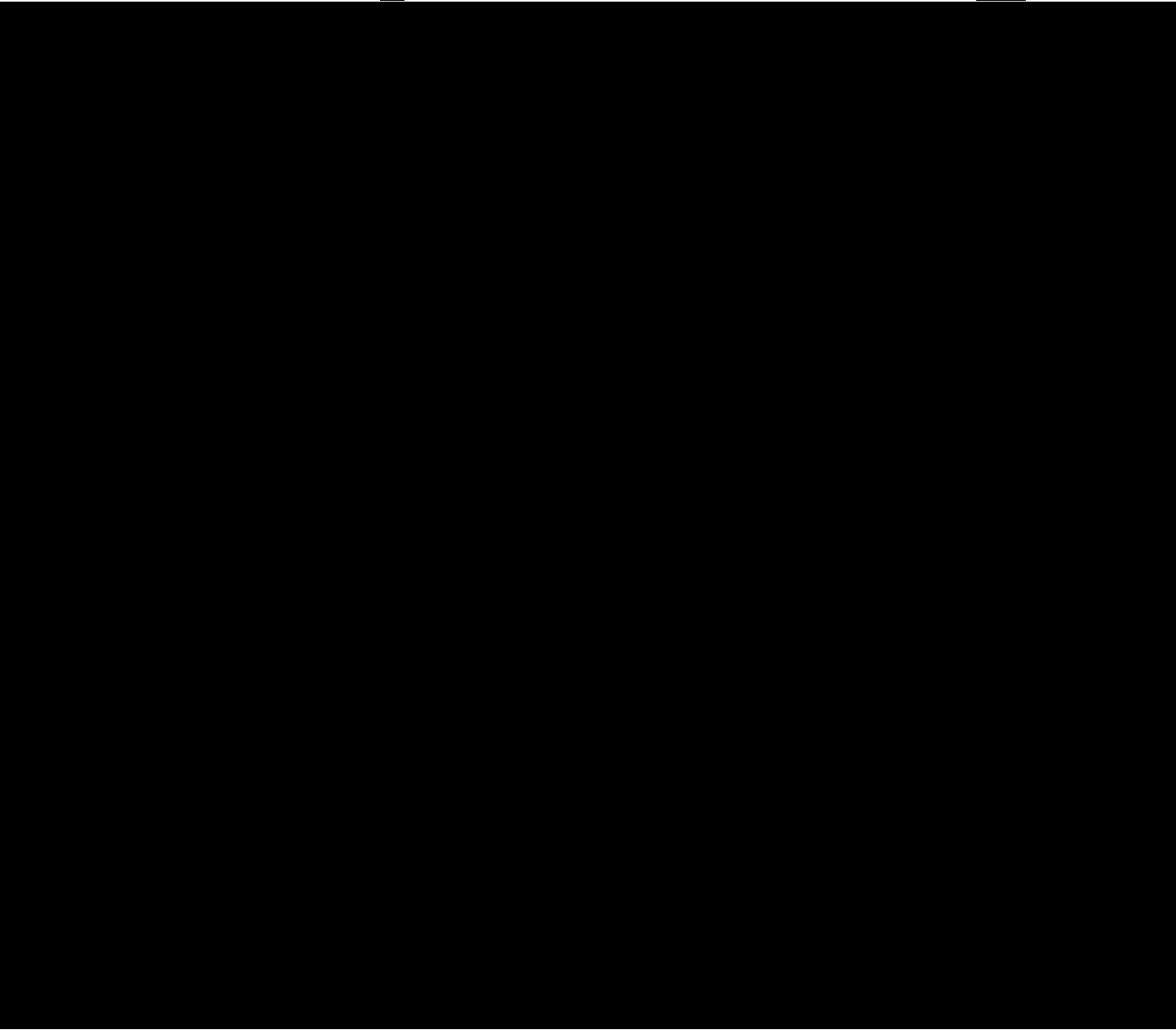
TEST EQUIPMENT USED: DFLRORCH0080/ MEGGRCH105 / SQUARE D FULL FUI TESTED BY: Rick Evans



# LOW VOLTAGE CIRCUIT BKR SEC INJ TEST



CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
 OWNER City of Richmond Dept. Public Utilities  
 REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
 DATE 11/8/2022 AMBIENT TEMPERATURE 71 °F HUMIDITY 35 % EQPT. LOCATION DOUGLASDALE  
 SUBSTATION \_\_\_\_\_ MSBL-     POSITION MSB -     



ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

COMMENTS: \_\_\_\_\_  
 DEFICIENCIES: \_\_\_\_\_

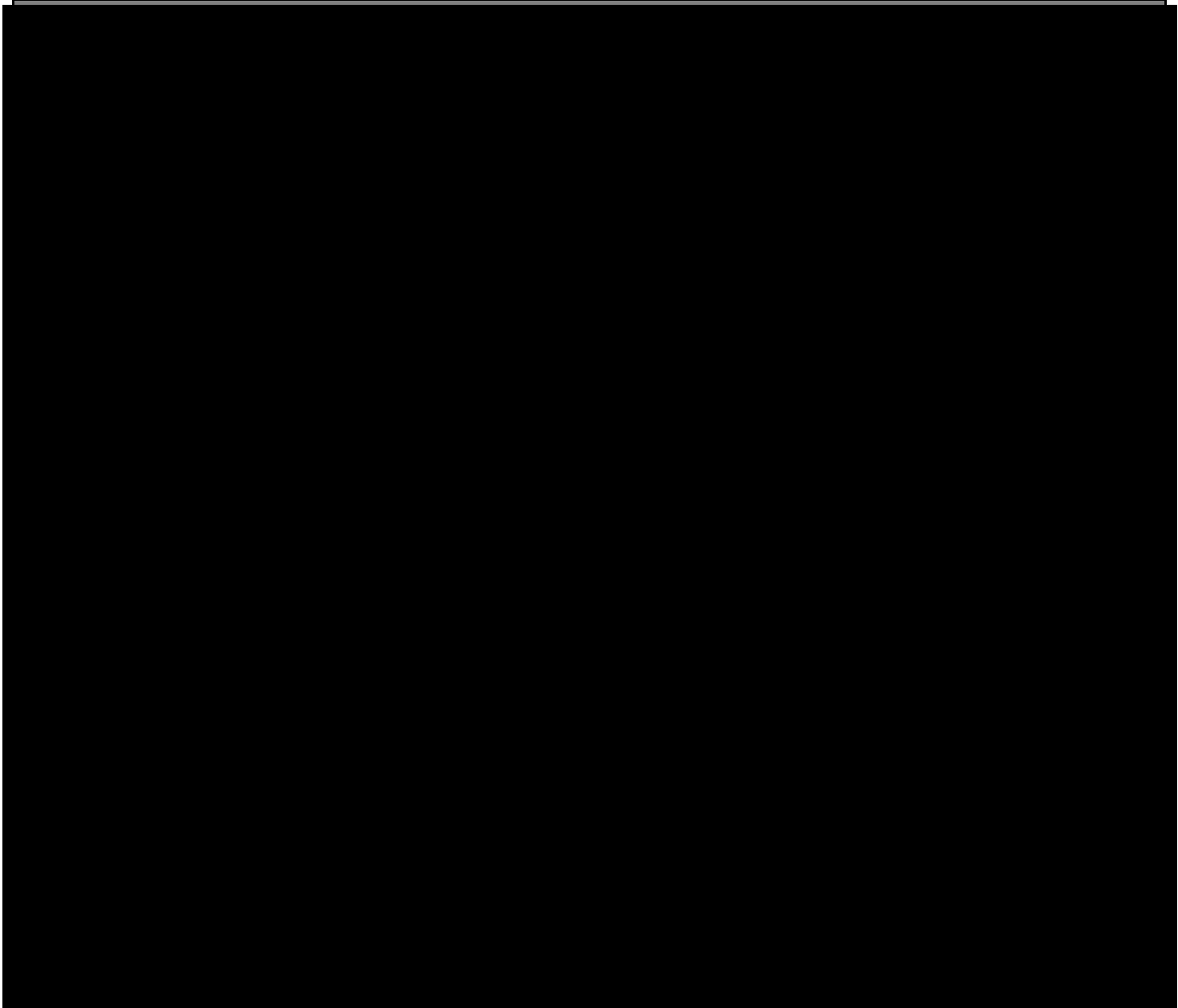
TEST EQUIPMENT USED:      SECONDARY TEST SET/ DLRO / 1KVMEGGER TESTED BY: Rick Evans



# LOW VOLTAGE CIRCUIT BKR SEC INJ TEST



CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
 OWNER City of Richmond Dept. Public Utilities  
 REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
 DATE 11/8/2022 AMBIENT TEMPERATURE 64 °F HUMIDITY 35 % EQPT. LOCATION DOUGLASDALE  
 SUBSTATION \_\_\_\_\_ MSBL-           POSITION TIE



ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

COMMENTS: \_\_\_\_\_  
 DEFICIENCIES: \_\_\_\_\_

TEST EQUIPMENT USED:            SECONDARY TEST SET/ DLRO / 1KVMEGGER TESTED BY: Rick Evans

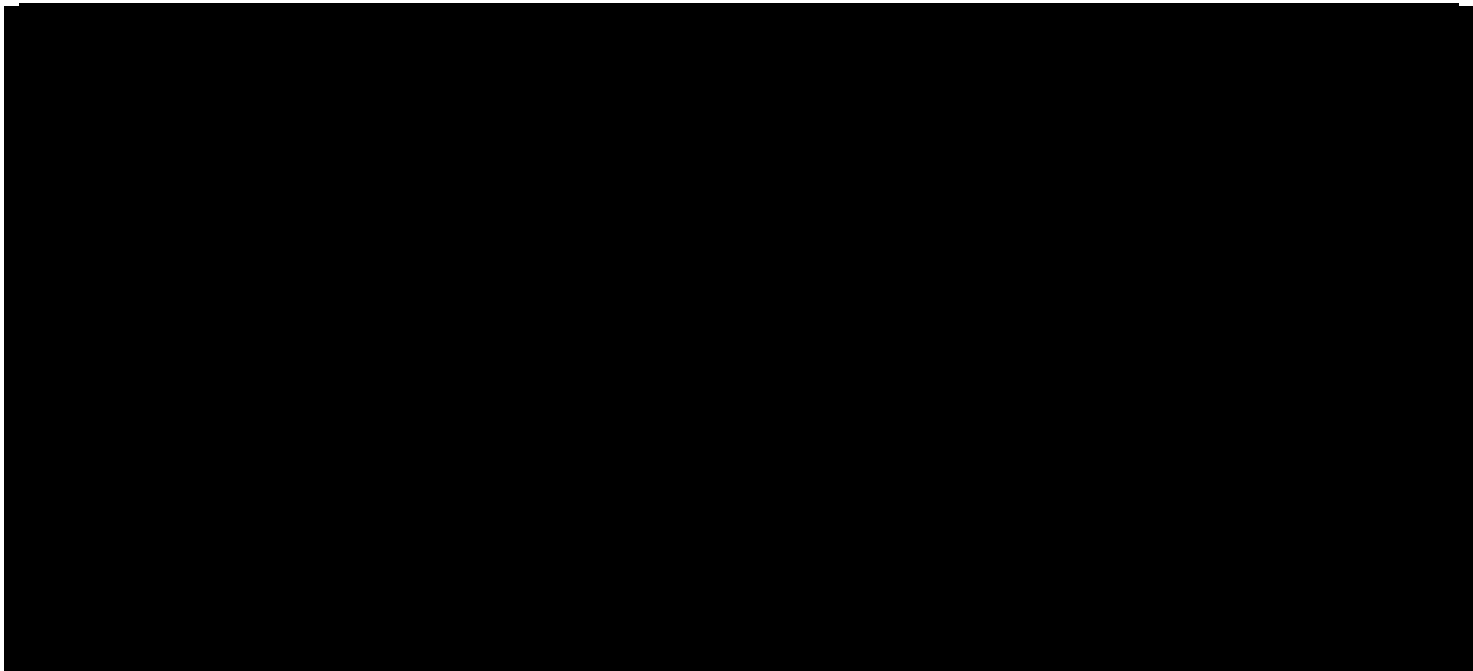




# LOW VOLTAGE POWER CIRCUIT BREAKER SEC INJ TEST



CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
 OWNER City of Richmond Dept. Public Utilities  
 REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
 DATE 6/13/2022 AMBIENT TEMPERATURE 72 °F HUMIDITY 34 % EQPT. LOCATION DOUGLASDALE  
 SUBSTATION \_\_\_\_\_ ELECTRICAL RM POSITION \_\_\_\_\_ MAIN \_\_\_\_\_



ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

COMMENTS: \_\_\_\_\_  
 DEFICIENCIES: \_\_\_\_\_

TEST EQUIPMENT USED: \_\_\_\_\_ RMS310 SECONDARY TEST SET

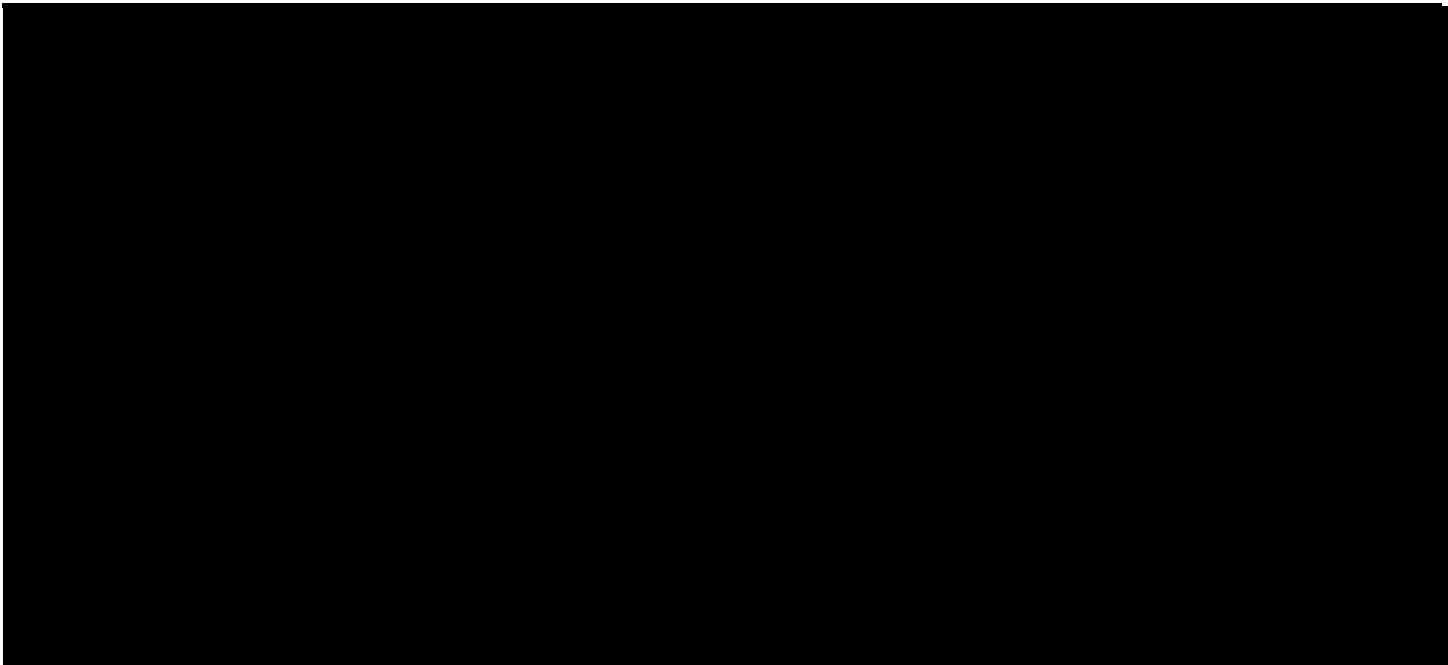
TESTED BY: RE/JC



# LOW VOLTAGE POWER CIRCUIT BREAKER SEC INJ TEST



CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
 OWNER City of Richmond Dept. Public Utilities  
 REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
 DATE 6/13/2022 AMBIENT TEMPERATURE 71 °F HUMIDITY 34 % EQPT. LOCATION DOUGLASDALE  
 SUBSTATION ██████████ ELECTRICAL RM POSITION MSBH-██████████



ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

COMMENTS: \_\_\_\_\_  
 DEFICIENCIES: \_\_\_\_\_

TEST EQUIPMENT USED: ██████████ RMS310 SECONDARY TEST SET

TESTED BY: RE/JC



# LOW VOLTAGE POWER CIRCUIT BREAKER SEC INJ TEST



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 ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
 OWNER City of Richmond Dept. Public Utilities  
 REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
 DATE 6/13/2022 AMBIENT TEMPERATURE 73 °F HUMIDITY 34 % EQPT. LOCATION DOUGLASDALE  
 SUBSTATION ██████████ ELECTRICAL RM POSITION ██████████ MAIN



ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

COMMENTS: \_\_\_\_\_  
 DEFICIENCIES: \_\_\_\_\_

TEST EQUIPMENT USED: ██████████ RMS310 SECONDARY TEST SET

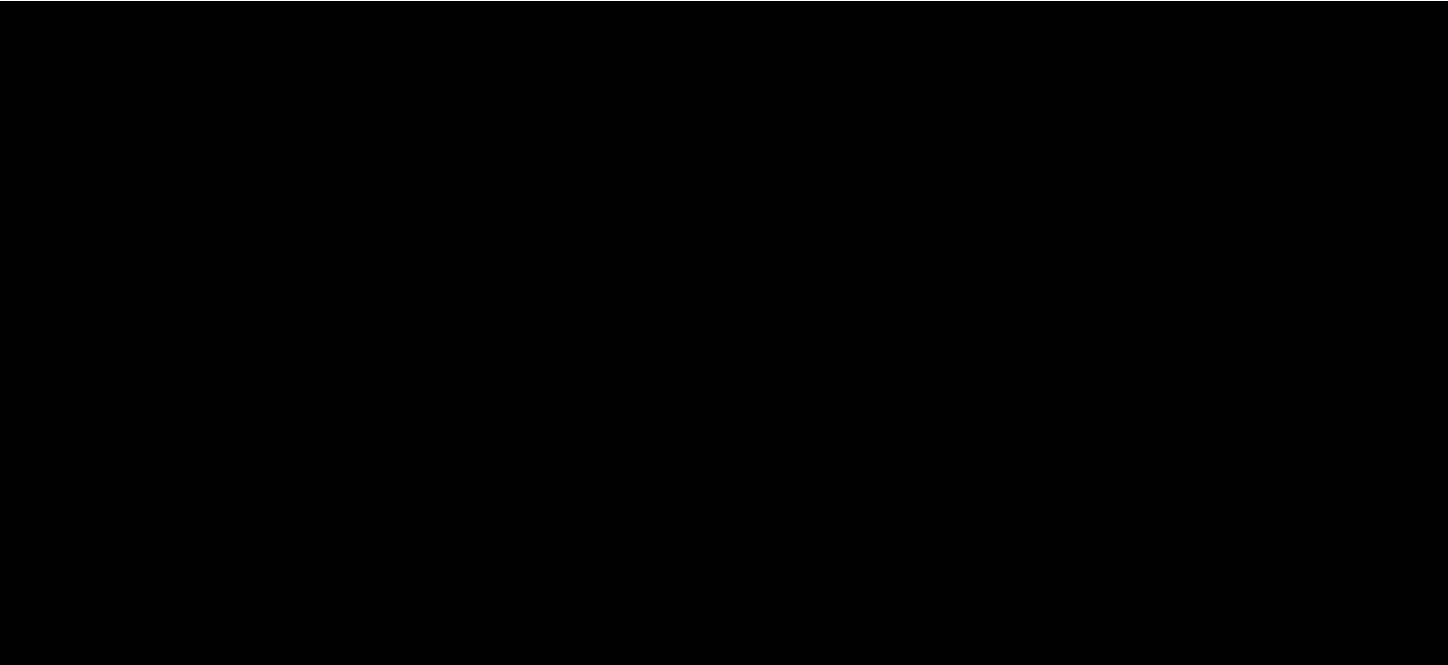
TESTED BY: RE/JC



# LOW VOLTAGE POWER CIRCUIT BREAKER SEC INJ TEST



CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
 OWNER City of Richmond Dept. Public Utilities  
 REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
 DATE 6/13/2022 AMBIENT TEMPERATURE 72 °F HUMIDITY 32 % EQPT. LOCATION DOUGLASDALE  
 SUBSTATION \_\_\_\_\_ ELECTRICAL RM POSITION MSBL-1B- PANEL



ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

COMMENTS: \_\_\_\_\_  
 DEFICIENCIES: \_\_\_\_\_

TEST EQUIPMENT USED: \_\_\_\_\_ RMS310 SECONDARY TEST SET

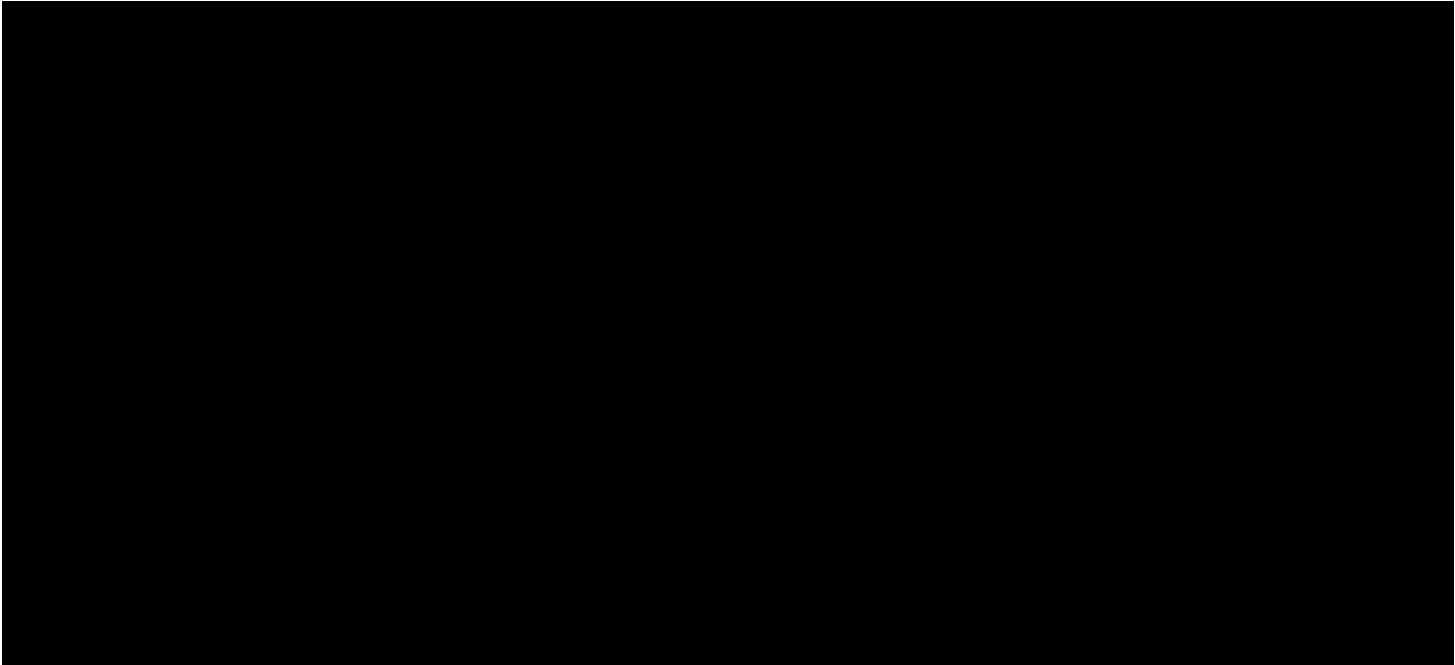
TESTED BY: RE/JC



# LOW VOLTAGE POWER CIRCUIT BREAKER SEC INJ TEST



CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
 OWNER City of Richmond Dept. Public Utilities  
 REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
 DATE 6/13/2022 AMBIENT TEMPERATURE 73 °F HUMIDITY 34 % EQPT. LOCATION DOUGLASDALE  
 SUBSTATION ██████████ ELECTRICAL RM POSITION MSBL-1B- TIE ██████████



ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

COMMENTS: 

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 DEFICIENCIES: 

--

TEST EQUIPMENT USED: ██████████ RMS310 SECONDARY TEST SET

TESTED BY: RE/JC



# LOW VOLTAGE POWER CIRCUIT BREAKER SEC INJ TEST



CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
OWNER City of Richmond Dept. Public Utilities  
REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
DATE 6/13/2022 AMBIENT TEMPERATURE 73 °F HUMIDITY 34 % EQPT. LOCATION DOUGLASDALE  
SUBSTATION ██████████ ELECTRICAL RM POSITION ██████████ MAIN SERVICE XFMR ██████████



COMMENTS: \_\_\_\_\_  
DEFICIENCIES: \_\_\_\_\_

TEST EQUIPMENT USED: ██████████ RMS310 SECONDARY TEST SET

TESTED BY: RE/JC



# LOW VOLTAGE POWER CIRCUIT BREAKER SEC INJ TEST



CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
OWNER City of Richmond Dept. Public Utilities  
REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
DATE 6/13/2022 AMBIENT TEMPERATURE 72 °F HUMIDITY 32 % EQPT. LOCATION DOUGLASDALE  
SUBSTATION ██████████ ELECTRICAL RM POSITION TIE



ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

COMMENTS: \_\_\_\_\_  
DEFICIENCIES: \_\_\_\_\_

TEST EQUIPMENT USED: ██████████ RMS310 SECONDARY TEST SET

TESTED BY: RE/JC



# LOW VOLTAGE POWER CIRCUIT BREAKER SEC INJ TEST



CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
 OWNER City of Richmond Dept. Public Utilities  
 REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
 DATE 6/13/2022 AMBIENT TEMPERATURE 75 °F HUMIDITY 34 % EQPT. LOCATION DOUGLASDALE  
 SUBSTATION ██████████ ELECTRICAL RM POSITION TRANSFORMER ██████



ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

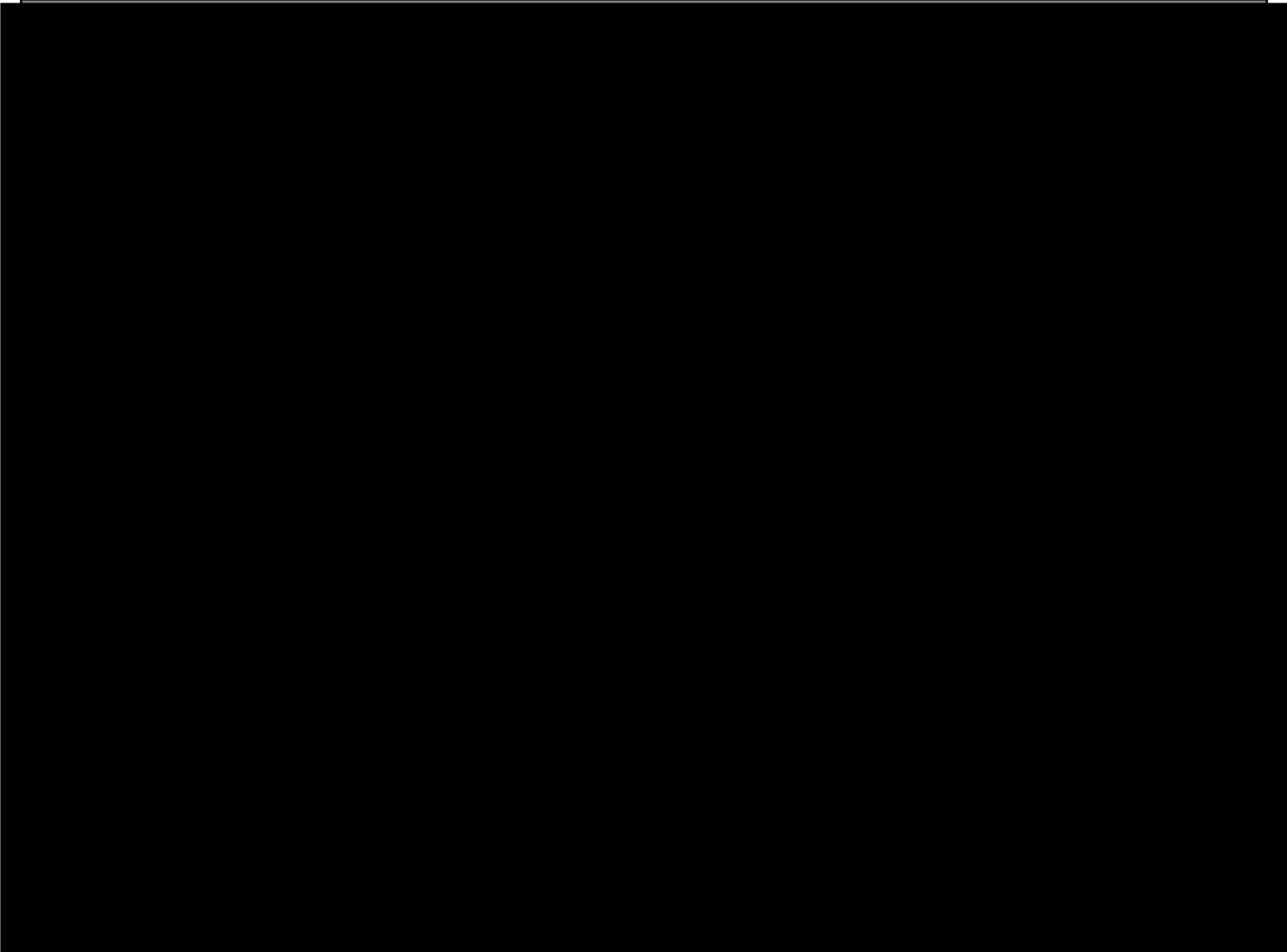
COMMENTS: \_\_\_\_\_  
 DEFICIENCIES: \_\_\_\_\_

TEST EQUIPMENT USED: ██████████ RMS310 SECONDARY TEST SET

TESTED BY: RE/JC



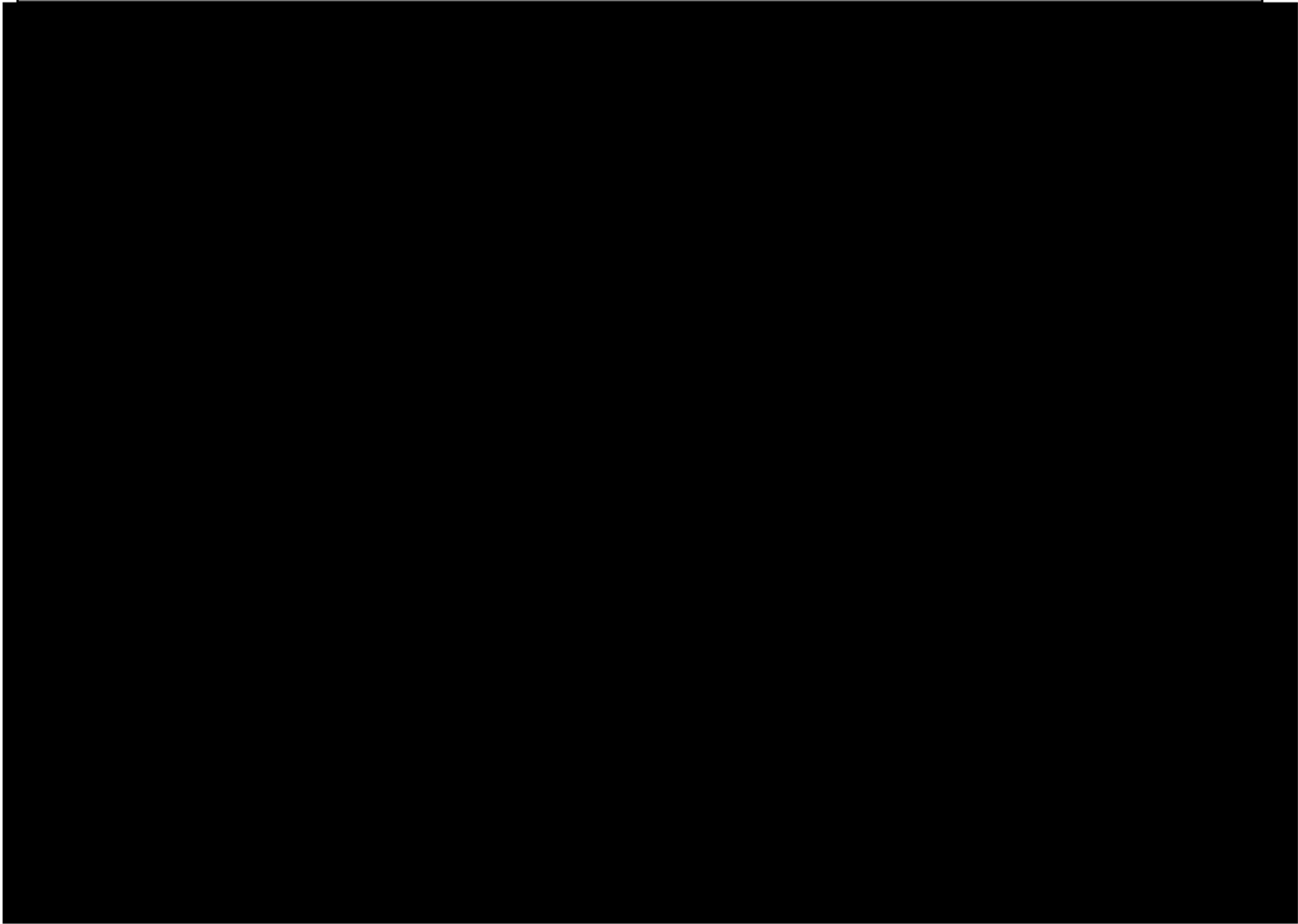
CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
OWNER City of Richmond Dept. Public Utilities  
REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
DATE 6/9/2022 AMBIENT TEMPERATURE 76 °F HUMIDITY 43 % EQPT. LOCATION DOUGLASDALE  
SUBSTATION SG- [REDACTED] POSITION BUS TIE



ASSESSMENT OF BREAKER: PASSED ALL NETA MTS SPECIFICATIONS

COMMENTS: \_\_\_\_\_  
DEFICIENCIES: \_\_\_\_\_

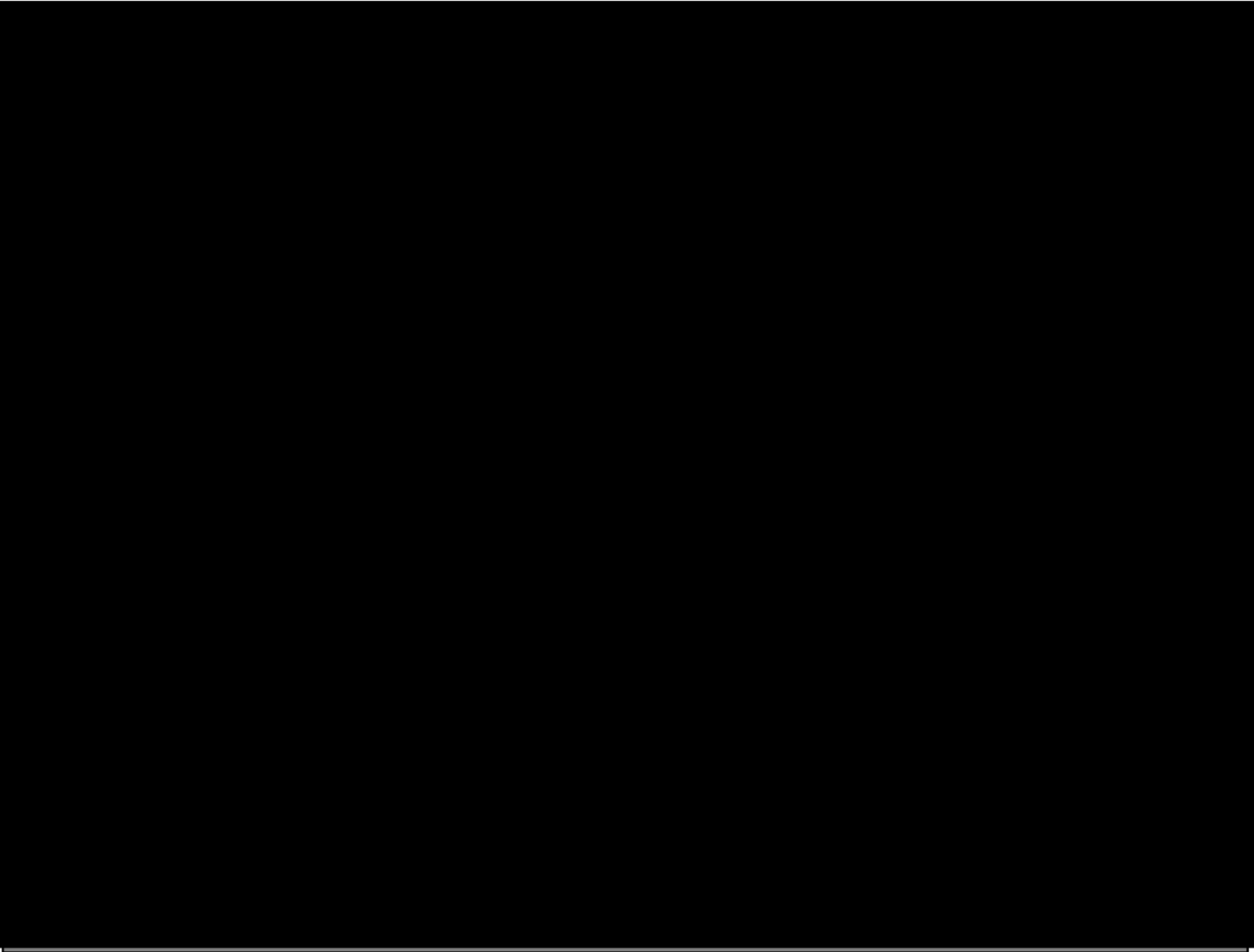
CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
OWNER City of Richmond Dept. Public Utilities  
REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
DATE 6/9/2022 AMBIENT TEMPERATURE 76 °F HUMIDITY 43 % EQPT. LOCATION DOUGLASDALE  
SUBSTATION \_\_\_\_\_ SG-                      POSITION \_\_\_\_\_ PS                     



ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

COMMENTS: \_\_\_\_\_  
DEFICIENCIES: \_\_\_\_\_

CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
OWNER City of Richmond Dept. Public Utilities  
REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
DATE 6/9/2022 AMBIENT TEMPERATURE 76 °F HUMIDITY 43 % EQPT. LOCATION DOUGLASDALE  
SUBSTATION SG- [REDACTED] POSITION MAIN [REDACTED] SERVICE FDR- [REDACTED]

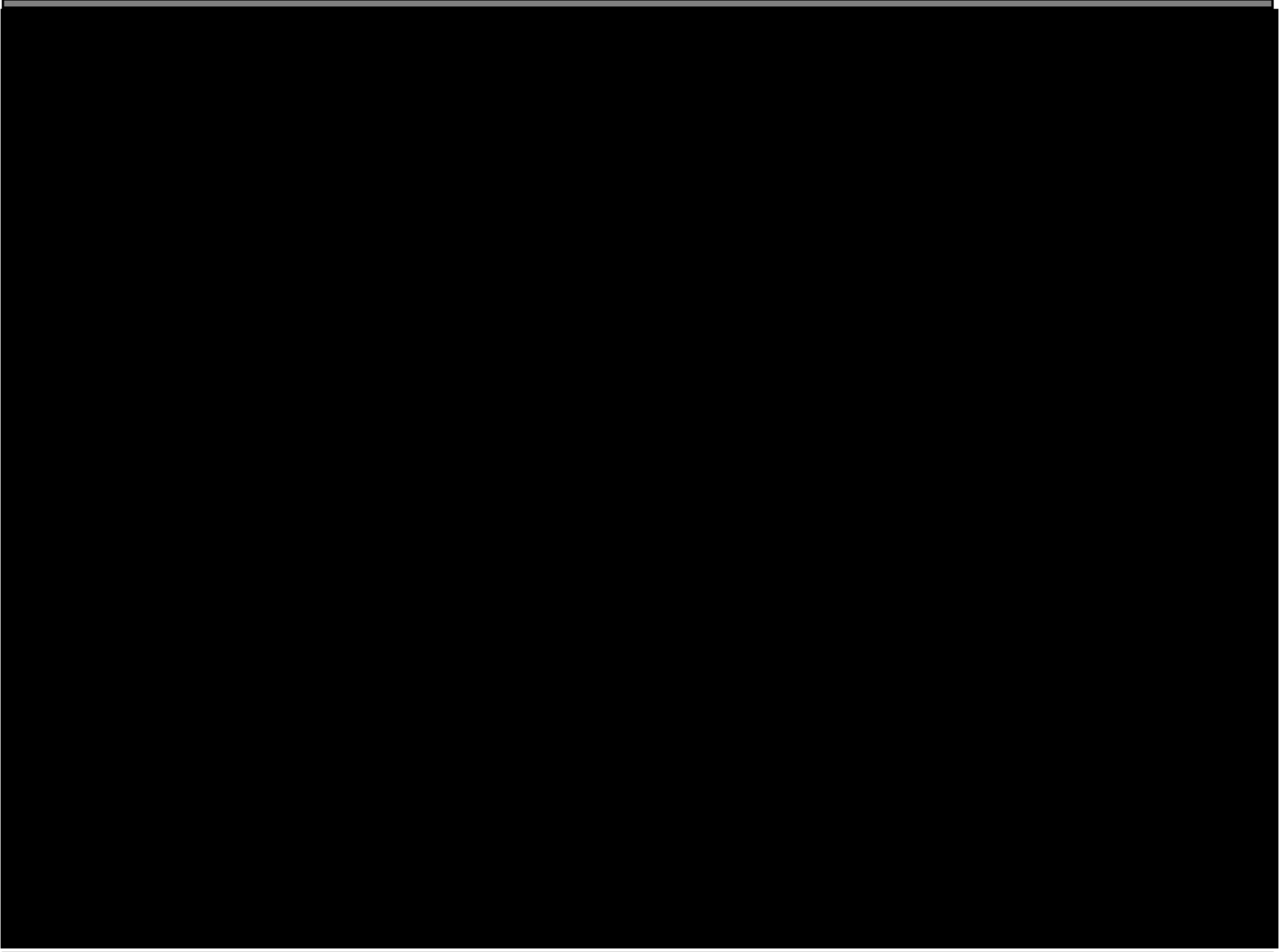


ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

COMMENTS: \_\_\_\_\_  
DEFICIENCIES: \_\_\_\_\_

TEST EQUIPMENT USED: HI-POT 214242 / MEGGER RCH0068 / DLRO 6240 TESTED BY: RE/JC

CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
OWNER City of Richmond Dept. Public Utilities  
REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
DATE 6/9/2022 AMBIENT TEMPERATURE 78 °F HUMIDITY 43 % EQPT. LOCATION DOUGLASDALE 78  
SUBSTATION SG- [REDACTED] POSITION XFMR- [REDACTED]

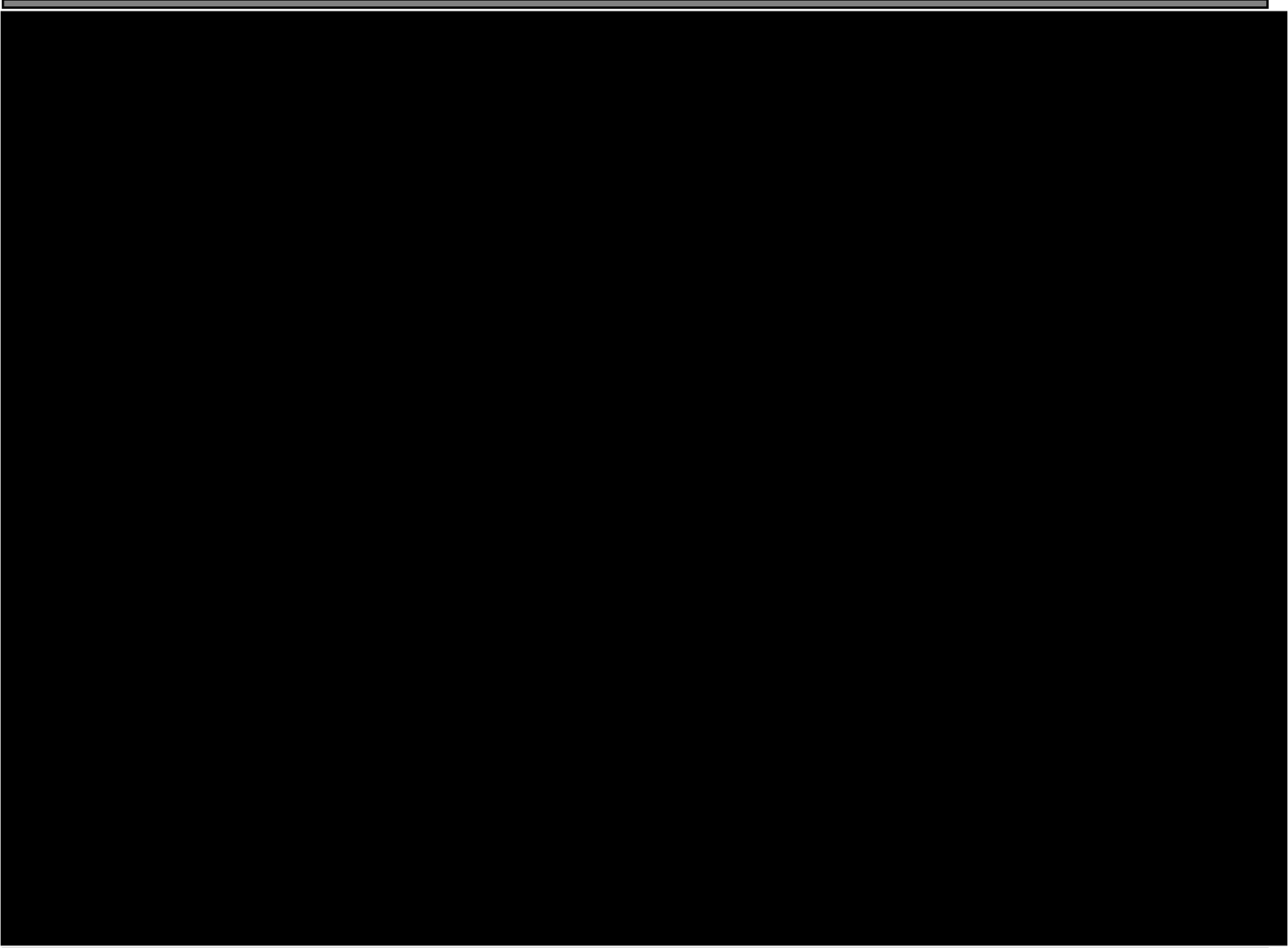


ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

COMMENTS: \_\_\_\_\_  
DEFICIENCIES: \_\_\_\_\_

TEST EQUIPMENT USED: HI-POT 214242 / MEGGER RCH0068 / DLRO 6240 TESTED BY: RE/JC

CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
OWNER City of Richmond Dept. Public Utilities  
REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
DATE 6/9/2022 AMBIENT TEMPERATURE 76 °F HUMIDITY 43 % EQPT. LOCATION DOUGLASDALE  
SUBSTATION SG- [REDACTED] POSITION XFMR- [REDACTED]



ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

COMMENTS: \_\_\_\_\_  
DEFICIENCIES: \_\_\_\_\_

TEST EQUIPMENT USED: HI-POT 214242 / MEGGER RCH0068 / DLRO 6240 TESTED BY: RE/JC

CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
OWNER City of Richmond Dept. Public Utilities  
REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
DATE 6/13/2022 AMBIENT TEMPERATURE 78 °F HUMIDITY 43 % EQPT. LOCATION DOUGLASDALE  
SUBSTATION SG- [REDACTED] POSITION [REDACTED]



ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

COMMENTS: \_\_\_\_\_  
DEFICIENCIES: \_\_\_\_\_

TEST EQUIPMENT USED: HI-POT 214242 / MEGGER RCH0068 / DLRO 6240 TESTED BY: RE/JC

CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
OWNER City of Richmond Dept. Public Utilities  
REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
DATE 6/13/2022 AMBIENT TEMPERATURE 78 °F HUMIDITY 43 % EQPT. LOCATION DOUGLASDALE  
SUBSTATION \_\_\_\_\_ SG-                     POSITION MAIN ■ SERVICE FD ■



ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

COMMENTS: \_\_\_\_\_  
DEFICIENCIES: \_\_\_\_\_

CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
OWNER City of Richmond Dept. Public Utilities  
REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
DATE 6/13/2022 AMBIENT TEMPERATURE 78 °F HUMIDITY 45 % EQPT. LOCATION DOUGLASDALE  
SUBSTATION SG- [REDACTED] POSITION [REDACTED] XFMR MAIN



ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

COMMENTS: \_\_\_\_\_  
DEFICIENCIES: \_\_\_\_\_

TEST EQUIPMENT USED: HI-POT 214242 / MEGGER RCH0068 / DLRO 6240 TESTED BY: RE/JC



CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
OWNER City of Richmond Dept. Public Utilities  
REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
DATE 6/13/2022 AMBIENT TEMPERATURE 81 °F HUMIDITY 43 % EQPT. LOCATION DOUGLASDALE  
SUBSTATION \_\_\_\_\_ SG-                     POSITION XFMR                     



ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

COMMENTS: \_\_\_\_\_  
DEFICIENCIES: \_\_\_\_\_



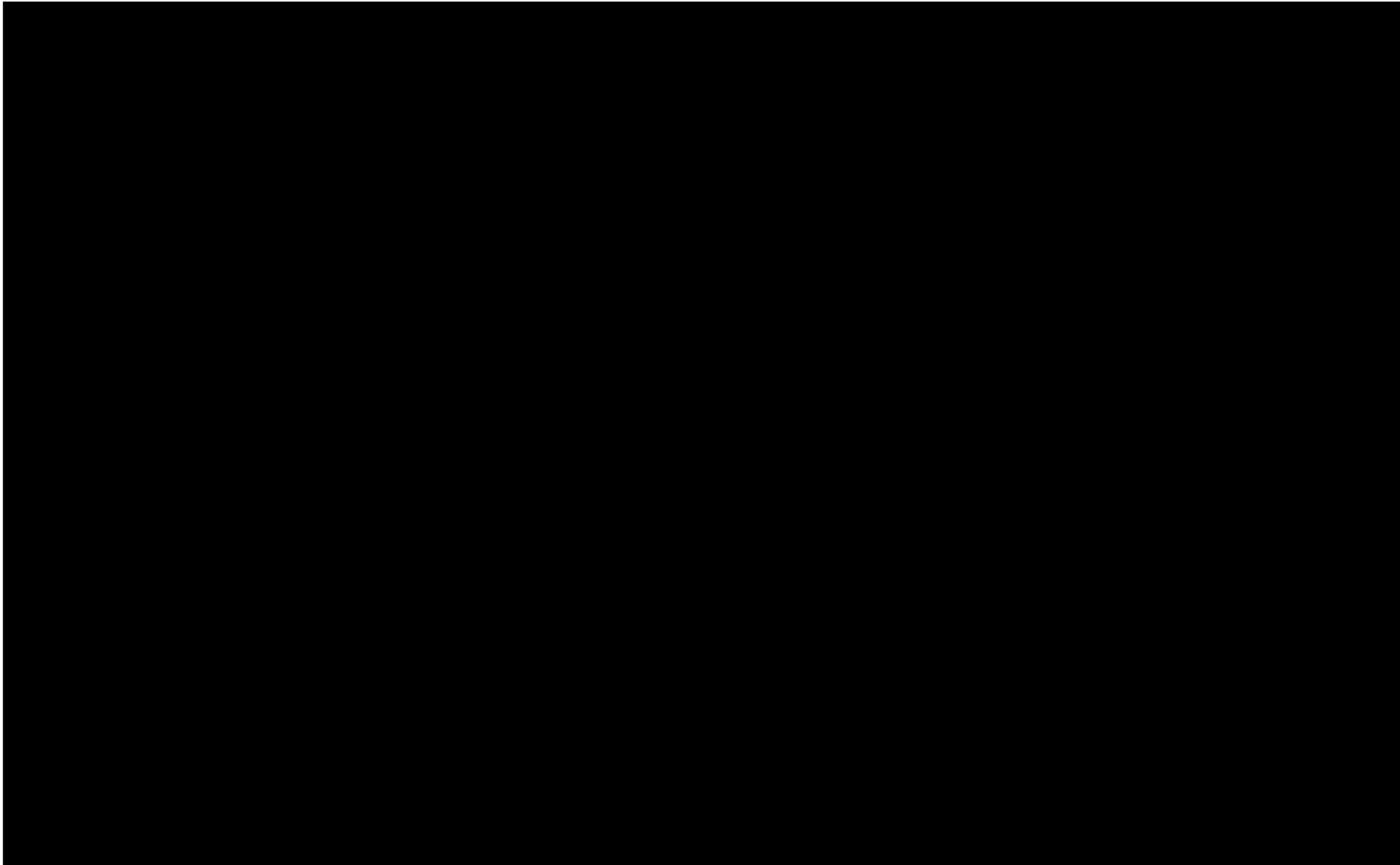
# Electric Power Systems

Device		COR WWTP	Status	No status
Description	50/51			
Station Name	█			
Apparatus		Serial Number		
Manufacturer	█	Special ID		
Model		Location	Richmond VA	
Function		Company		
Circuit		Division	Richmond	
Firmware Version / Date		Asset Tag		
Tested by	j.maitland	Reg. Category	Calibration	
Last tested	2022-Jun-08 15:35	Next test due		
Prior test				

Plan	XFMR	PHASE	Status	No status
Last modified	2022-Jun-01 13:29	Comment		
Last tested	2022-Jun-01 11:26	Tested by	j.maitland	

Test	Relay INFO	Status	Pass
Description	Document Step		
Last modified	2022-Jun-01 11:16	Comment	
Last tested	2022-Jun-01 11:15	Tested by	j.maitland
Instrument SN	█	Device Firmware Version	
Calibrated on	2021-Nov-01		

Label / Value	Tested	Expected	+	-	Actual	% Error	Result
*	2022-Jun-01 11:15						Pass



**Test PICKUP Status Pass**

Description Inductive Pickup, Current (IA)  
 Last modified 2022-Jun-01 11:20 Comment  
 Last tested 2022-Jun-01 11:20 Tested by j.maitland  
 Instrument SN [REDACTED]  
 Calibrated on 2021-Nov-01 Device Firmware Version

Label / Value	Tested	Expected	+	-	Actual	% Error	Result
Average	2022-Jun-01 11:20	6.000 A	10.00 %	10.00 %	6.100 A	1.67 %	Pass
Dropout		Op			6.000 A		Pass
Pickup		Op			6.200 A		Pass

**Test TIME Status Pass**

Description Time Overcurrent Characteristic Plot (IA)  
 Last modified 2022-Jun-01 11:23 Comment  
 Last tested 2022-Jun-01 11:24 Tested by j.maitland  
 Instrument SN [REDACTED]  
 Calibrated on 2021-Nov-01 Device Firmware Version

Label / Value	Tested	Expected	+	-	Actual	% Error	Result
2.000 * Tap	2022-Jun-01 11:24	1.2800 s	10.00 %	10.00 %	1.2418 s	-2.98 %	Pass
3.000 * Tap		0.5270 s	10.00 %	10.00 %	0.5304 s	0.65 %	Pass
4.000 * Tap		0.3700 s	10.00 %	10.00 %	0.3331 s	-9.97 %	Pass

**Test INST. Status Pass**

Description Manual Current Ramp (T1)  
 Last modified 2022-Jun-01 11:25 Comment  
 Last tested 2022-Jun-01 11:26 Tested by j.maitland  
 Instrument SN [REDACTED]  
 Calibrated on 2021-Nov-01 Device Firmware Version

Label / Value	Tested	Expected	+	-	Actual	% Error	Result
Ramp	2022-Jun-01 11:26	45.000 A	10.00 %	10.00 %	46.000 A	2.22 %	Pass

**Test Seal in Status Pass**

Description Document Step  
 Last modified 2022-Jun-01 13:29 Comment  
 Last tested 2022-Jun-01 11:26 Tested by j.maitland  
 Instrument SN [REDACTED]  
 Calibrated on 2021-Nov-01 Device Firmware Version

Label / Value	Tested	Expected	+	-	Actual	% Error	Result
*	2022-Jun-01 11:26						Pass

**Originator Notes**

Inject 2.0 AMPS DC (HOLD DISK CLOSED)

Drop out PASS

**Plan XFMR [REDACTED] PHASE Status No status**

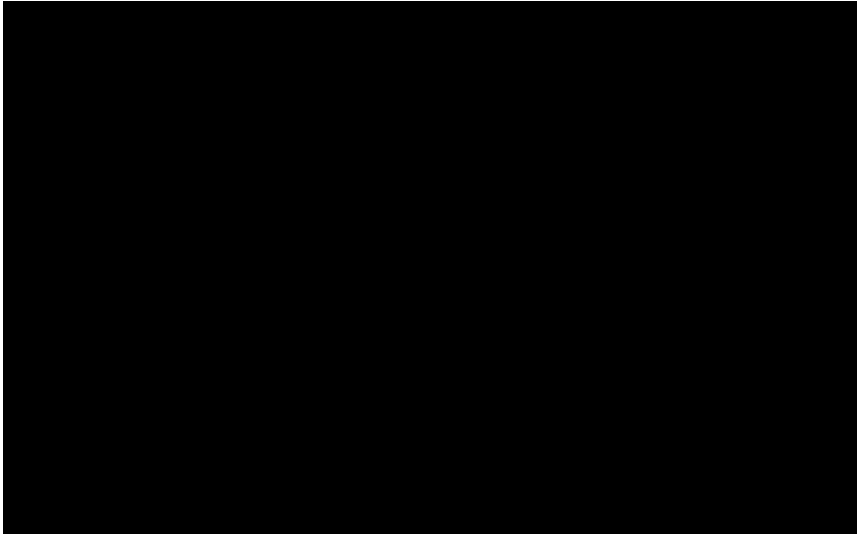
Last modified 2022-Jun-01 11:42 Comment



# LIQUID FILLED TRANSFORMER TESTS



CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
 OWNER City of Richmond Dept. Public Utilities  
 REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
 DATE 6/3/2022 AMBIENT TEMPERATURE 90 °F HUMIDITY 72 % EQPT. LOCATION \_\_\_\_\_  
 SUBSTATION \_\_\_\_\_ POSITION \_\_\_\_\_ XFMR



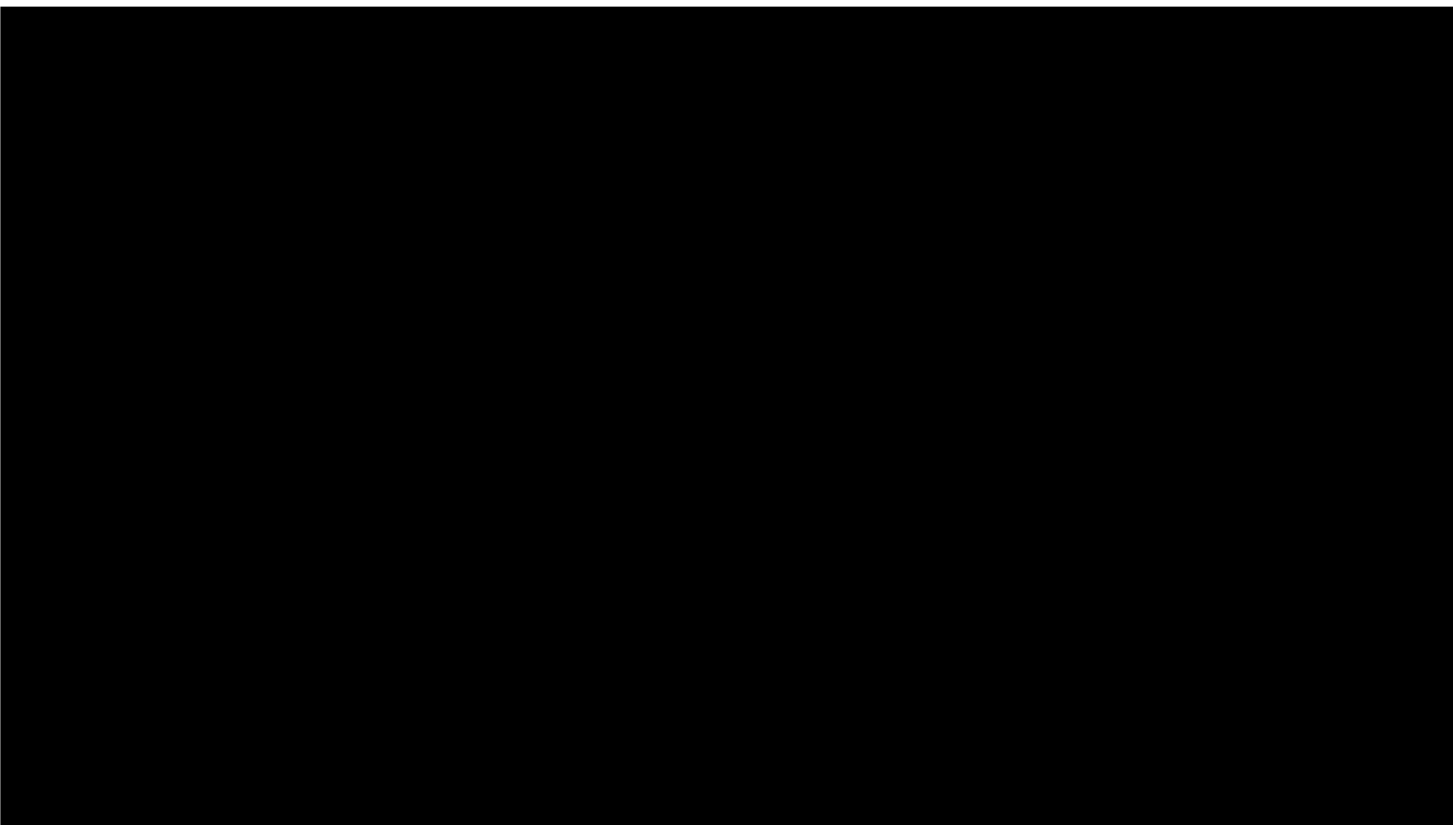
COMMENTS XO INSULATOR LEAKING OIL

VISUAL AND MECHANICAL INSPECTION:	
Inspect physical and mechanical condition.	PASS
Inspect anchorage, alignment, and grounding.	PASS
Verify the presence of PCB labeling.	PASS
Prior to cleaning the unit, perform as-found tests, if required.	PASS
Clean bushings and control cabinets.	SEE COMMENTS
Verify operation of alarm, control, and trip circuits from temperature and level indicators, pressure-relief device, gas accumulator, and fault-pressure relay.	PASS
Verify that cooling fans and/or pumps operate correctly.	PASS
Inspect bolted electrical connections for high resistance.	PASS
Verify correct liquid level in tanks and bushings.	N/A
Verify that positive pressure is maintained on gas-blanketed transformers.	PASS
Perform inspections and mechanical tests as recommended by the manufacturer.	PASS
Test load tap-changer in accordance with Section 7.12.	PASS
Verify the presence of transformer surge arresters.	PASS
Perform as-left tests.	PASS
Verify de-energized tap-changer position is left as specified.	PASS



TEST EQUIPMENT USED: RCH0079, RCH0090

TESTED BY: J. Crenshaw



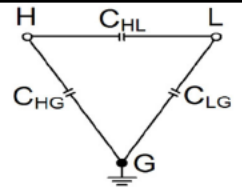
NOTE: SHORT EACH WINDING ON ITSELF

INSULATION RATING KEY

- G = GOOD
- D = DETERIORATED
- I = INVESTIGATE
- B = BAD

- H = HIGH VOLTAGE WINDING
- L = LOW VOLTAGE WINDING
- G = GROUND
- N = NEUTRAL BUSHING

EQUIVALENT CIRCUIT



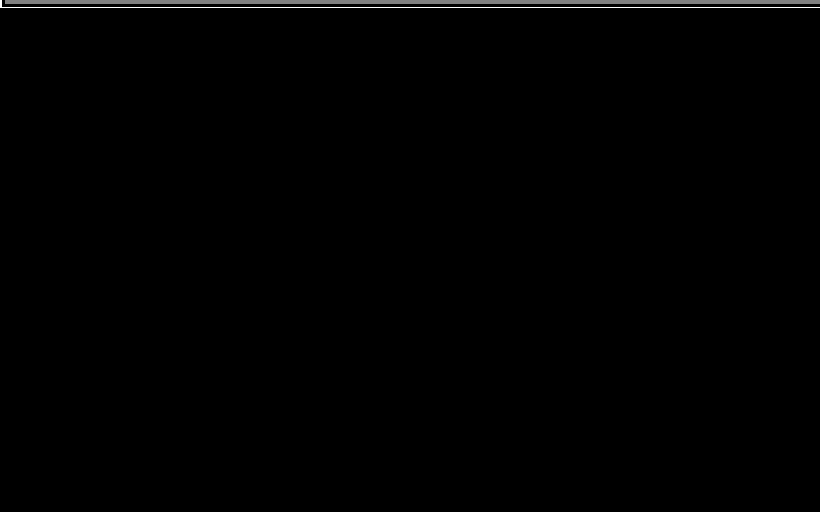
COMMENTS:  
DEFICIENCIES:



# LIQUID FILLED TRANSFORMER TESTS

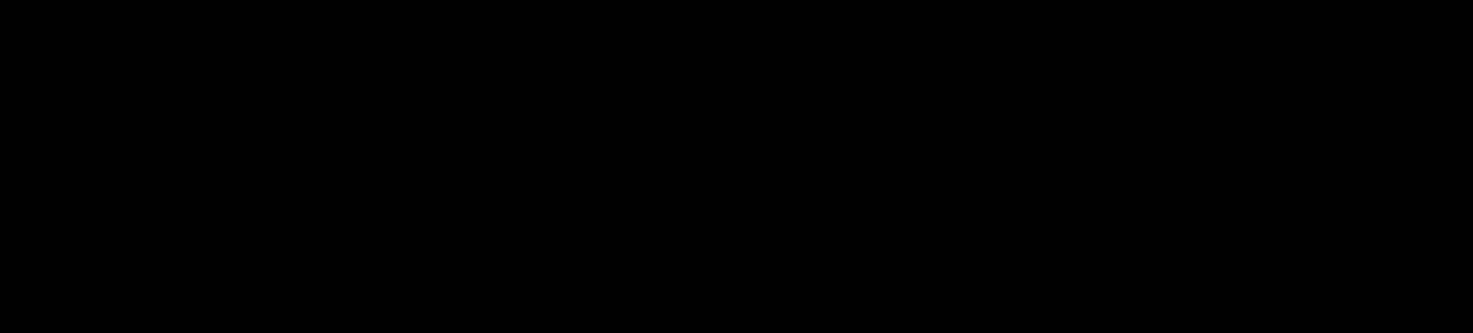


CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
 OWNER City of Richmond Dept. Public Utilities  
 REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
 DATE 5/23/2022 AMBIENT TEMPERATURE 79 °F HUMIDITY 30 % EQPT. LOCATION \_\_\_\_\_ SUB \_\_\_\_\_  
 SUBSTATION \_\_\_\_\_ POSITION \_\_\_\_\_



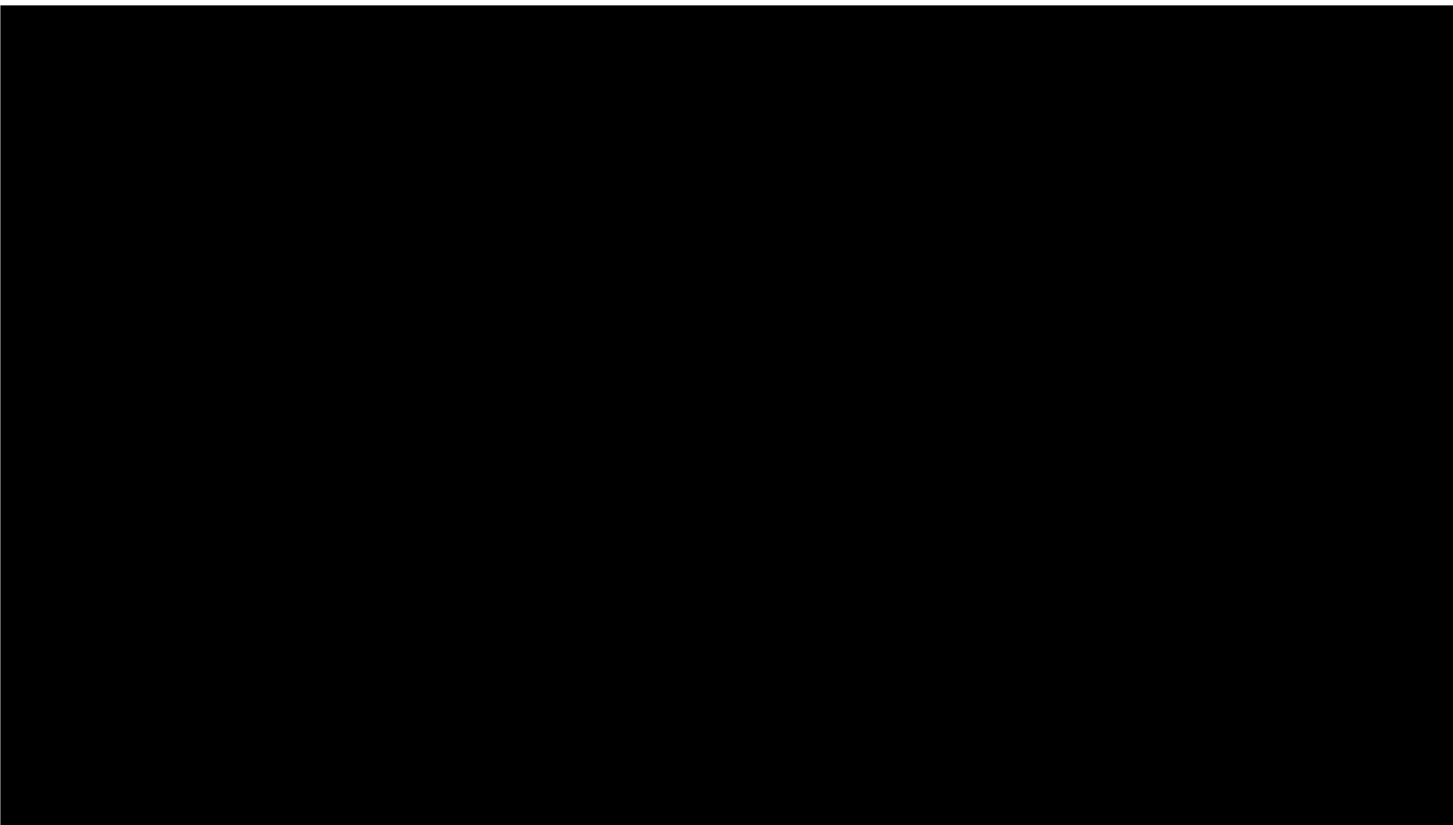
COMMENTS

VISUAL AND MECHANICAL INSPECTION:	
Inspect physical and mechanical condition.	PASS
Inspect anchorage, alignment, and grounding.	PASS
Verify the presence of PCB labeling.	PASS
Prior to cleaning the unit, perform as-found tests, if required.	PASS
Clean bushings and control cabinets.	N/A
Verify operation of alarm, control, and trip circuits from temperature and level indicators, pressure-relief device, gas accumulator, and fault-pressure relay.	PASS
Verify that cooling fans and/or pumps operate correctly.	PASS
Inspect bolted electrical connections for high resistance.	PASS
Verify correct liquid level in tanks and bushings.	N/A
Verify that positive pressure is maintained on gas-blanketed transformers.	PASS
Perform inspections and mechanical tests as recommended by the manufacturer.	PASS
Test load tap-changer in accordance with Section 7.12.	PASS
Verify the presence of transformer surge arresters.	PASS
Perform as-left tests.	PASS
Verify de-energized tap-changer position is left as specified.	PASS



TEST EQUIPMENT USED: AMEC 225304

TESTED BY: DD/JC



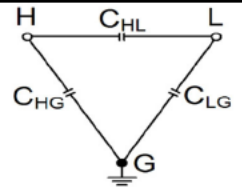
NOTE: SHORT EACH WINDING ON ITSELF

**INSULATION RATING KEY**

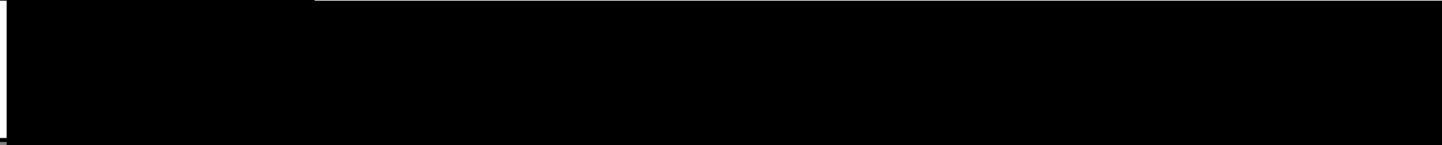
- G = GOOD
- D = DETERIORATED
- I = INVESTIGATE
- B = BAD

- H = HIGH VOLTAGE WINDING
- L = LOW VOLTAGE WINDING
- G = GROUND
- N = NEUTRAL BUSHING

EQUIVALENT CIRCUIT



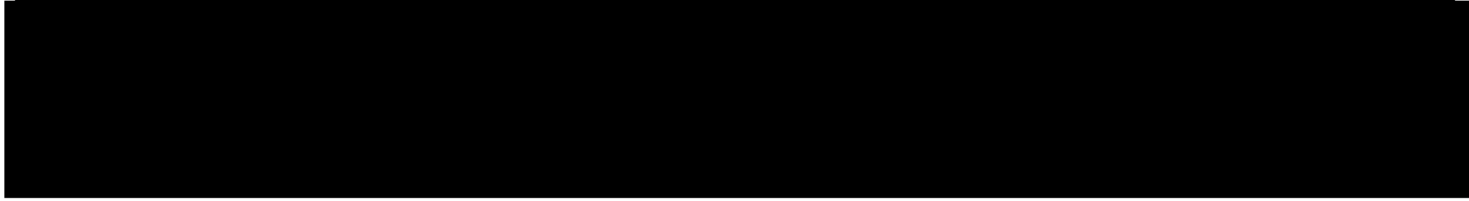
**EXCITING CURRENT TESTS**



ASSESSMENT OF TRANSFORMER: PASSED ALL NETA ATS SPECIFICATIONS

COMMENTS:  
DEFICIENCIES:

CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
 OWNER City of Richmond Dept. Public Utilities  
 REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
 DATE 6/2/2022 AMBIENT TEMPERATURE 84 °F HUMIDITY 57 % EQPT. LOCATION DOUGLASDALE  
 SUBSTATION \_\_\_\_\_ POSITION BUS TIE



Description	INSPECTED	CONDITION	CLEAN/LUBE
OVERALL CLEANLINESS	<input checked="" type="checkbox"/>	Good	
INSULATING MEMBERS	<input checked="" type="checkbox"/>	Good	
MECHANICAL CONNECTIONS	<input checked="" type="checkbox"/>	Good	
STRUCTURAL MEMBERS	<input checked="" type="checkbox"/>	Good	
CUBICLE	<input checked="" type="checkbox"/>	Good	
RACKING DEVICES	<input checked="" type="checkbox"/>	Good	
SHUTTER	<input checked="" type="checkbox"/>	Good	

Description	INSPECTED	CONDITION	CLEAN/LUBE
CONTACT FINGERS	<input checked="" type="checkbox"/>	Good	
VACUUM BOTTLE	<input checked="" type="checkbox"/>	Good	
CONTACT EROSION INDICATOR	<input checked="" type="checkbox"/>	Good	
OPERATING MECHANISM	<input checked="" type="checkbox"/>	Good	
CONTACT SEQUENCE	<input checked="" type="checkbox"/>	Good	
GROUND CONNECTION	<input checked="" type="checkbox"/>	Good	
AUXILIARY DEVICES	<input checked="" type="checkbox"/>	Good	

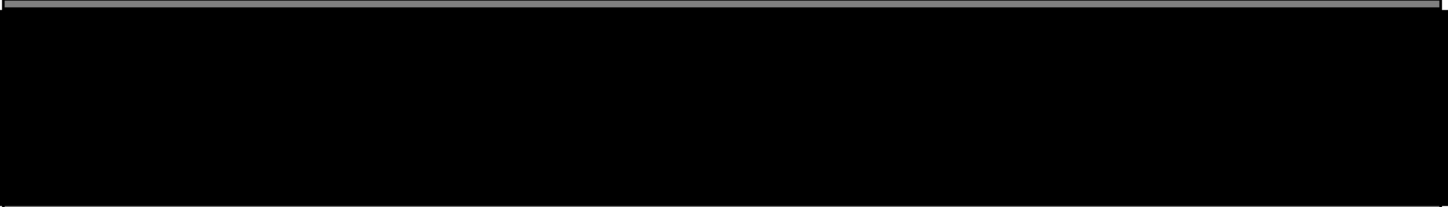


ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

COMMENTS: \_\_\_\_\_  
 DEFICIENCIES: \_\_\_\_\_

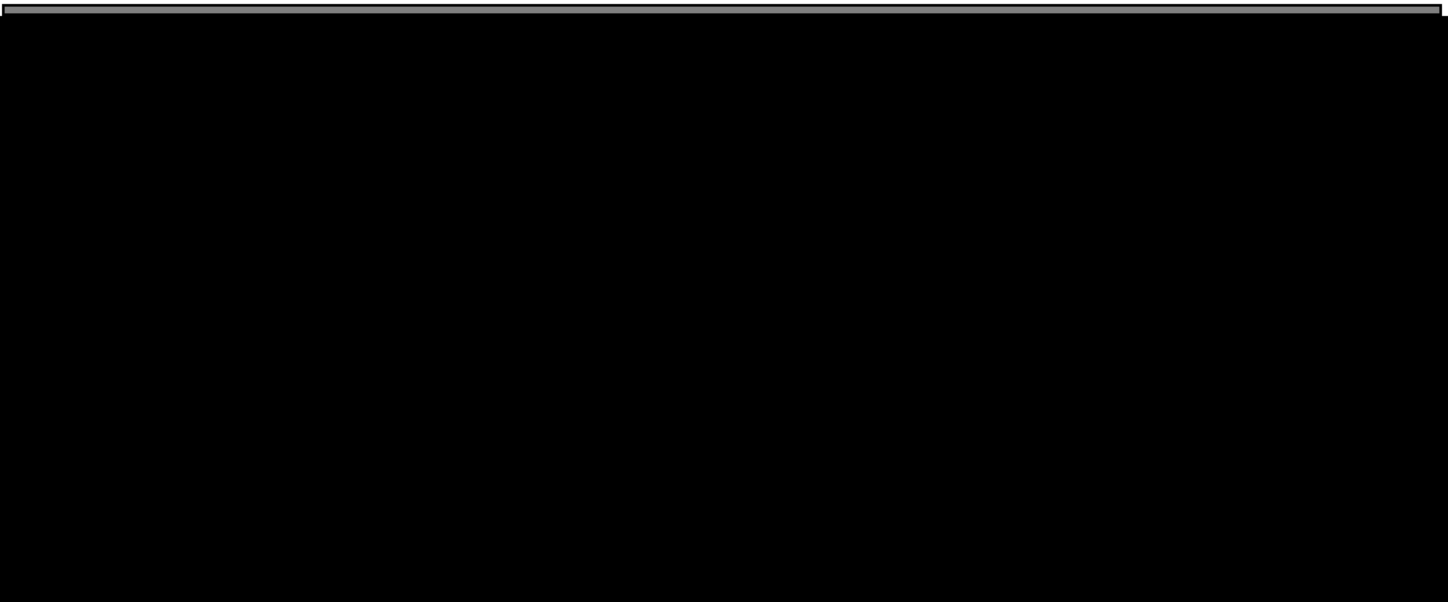


CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
 OWNER City of Richmond Dept. Public Utilities  
 REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
 DATE 6/2/2022 AMBIENT TEMPERATURE 84 °F HUMIDITY 57 % EQPT. LOCATION DOUGLASDALE  
 SUBSTATION \_\_\_\_\_ POSITION \_\_\_\_\_ SWGR \_\_\_\_\_



Description	INSPECTED	CONDITION	CLEAN/LUBE
OVERALL CLEANLINESS	<input checked="" type="checkbox"/>	Good	
INSULATING MEMBERS	<input checked="" type="checkbox"/>	Good	
MECHANICAL CONNECTIONS	<input checked="" type="checkbox"/>	Good	
STRUCTURAL MEMBERS	<input checked="" type="checkbox"/>	Good	
CUBICLE	<input checked="" type="checkbox"/>	Good	
RACKING DEVICES	<input checked="" type="checkbox"/>	Good	
SHUTTER	<input checked="" type="checkbox"/>	Good	

Description	INSPECTED	CONDITION	CLEAN/LUBE
CONTACT FINGERS	<input checked="" type="checkbox"/>	Good	
VACUUM BOTTLE	<input checked="" type="checkbox"/>	Good	
CONTACT EROSION INDICATOR	<input checked="" type="checkbox"/>	Good	
OPERATING MECHANISM	<input checked="" type="checkbox"/>	Good	
CONTACT SEQUENCE	<input checked="" type="checkbox"/>	Good	
GROUND CONNECTION	<input checked="" type="checkbox"/>	Good	
AUXILIARY DEVICES	<input checked="" type="checkbox"/>	Good	



ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

COMMENTS: \_\_\_\_\_  
 DEFICIENCIES: \_\_\_\_\_

CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
 OWNER City of Richmond Dept. Public Utilities  
 REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
 DATE 6/2/2022 AMBIENT TEMPERATURE 84 °F HUMIDITY 57 % EQPT. LOCATION DOUGLASDALE  
 SUBSTATION \_\_\_\_\_ POSITION SERVICE FEEDER



Description	INSPECTED	CONDITION	CLEAN/LUBE
OVERALL CLEANLINESS	<input checked="" type="checkbox"/>	Good	
INSULATING MEMBERS	<input checked="" type="checkbox"/>	Good	
MECHANICAL CONNECTIONS	<input checked="" type="checkbox"/>	Good	
STRUCTURAL MEMBERS	<input checked="" type="checkbox"/>	Good	
CUBICLE	<input checked="" type="checkbox"/>	Good	
RACKING DEVICES	<input checked="" type="checkbox"/>	Good	
SHUTTER	<input checked="" type="checkbox"/>	Good	

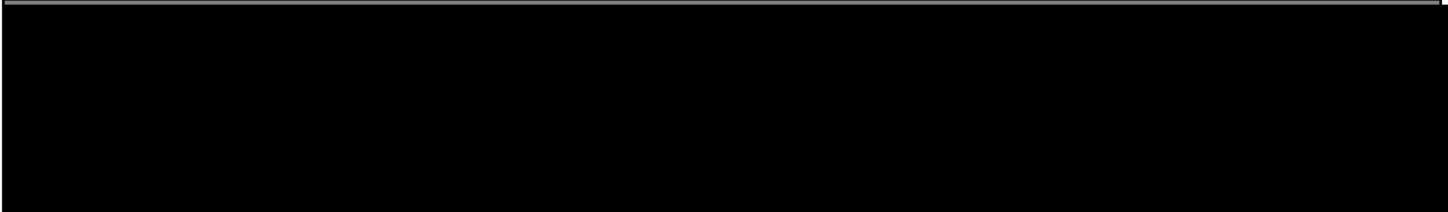
Description	INSPECTED	CONDITION	CLEAN/LUBE
CONTACT FINGERS	<input checked="" type="checkbox"/>	Good	
VACUUM BOTTLE	<input checked="" type="checkbox"/>	Good	
CONTACT EROSION INDICATOR	<input checked="" type="checkbox"/>	Good	
OPERATING MECHANISM	<input checked="" type="checkbox"/>	Good	
CONTACT SEQUENCE	<input checked="" type="checkbox"/>	Good	
GROUND CONNECTION	<input checked="" type="checkbox"/>	Good	
AUXILIARY DEVICES	<input checked="" type="checkbox"/>	Good	



ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

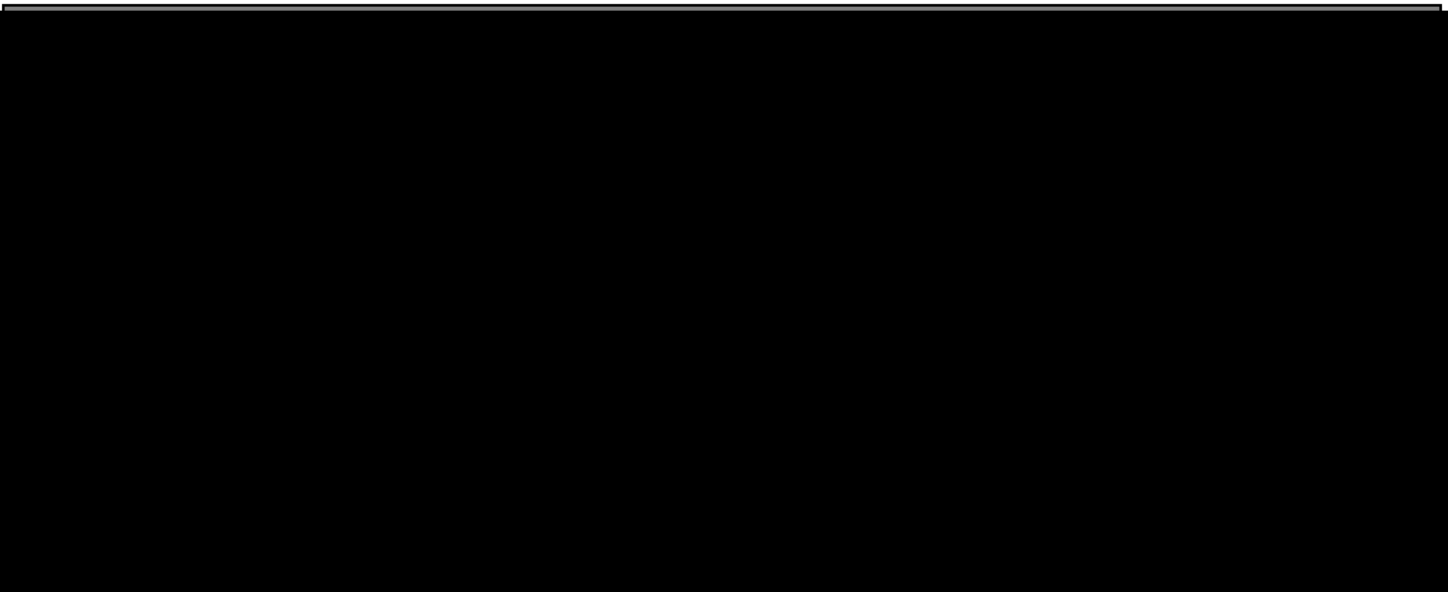
COMMENTS: \_\_\_\_\_  
 DEFICIENCIES: \_\_\_\_\_

CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
 OWNER City of Richmond Dept. Public Utilities  
 REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
 DATE 6/2/2022 AMBIENT TEMPERATURE 84 °F HUMIDITY 57 % EQPT. LOCATION DOUGLASDALE  
 SUBSTATION \_\_\_\_\_ POSITION SWGR.



Description	INSPECTED	CONDITION	CLEAN/LUBE
OVERALL CLEANLINESS	<input checked="" type="checkbox"/>	Good	
INSULATING MEMBERS	<input checked="" type="checkbox"/>	Good	
MECHANICAL CONNECTIONS	<input checked="" type="checkbox"/>	Good	
STRUCTURAL MEMBERS	<input checked="" type="checkbox"/>	Good	
CUBICLE	<input checked="" type="checkbox"/>	Good	
RACKING DEVICES	<input checked="" type="checkbox"/>	Good	
SHUTTER	<input checked="" type="checkbox"/>	Good	

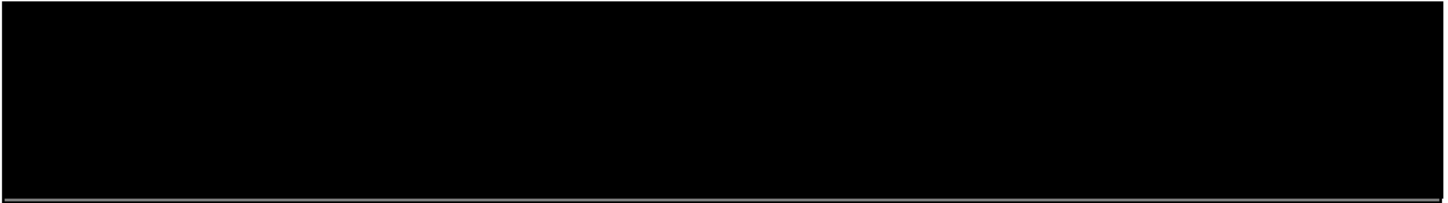
Description	INSPECTED	CONDITION	CLEAN/LUBE
CONTACT FINGERS	<input checked="" type="checkbox"/>	Good	
VACUUM BOTTLE	<input checked="" type="checkbox"/>	Good	
CONTACT EROSION INDICATOR	<input checked="" type="checkbox"/>	Good	
OPERATING MECHANISM	<input checked="" type="checkbox"/>	Good	
CONTACT SEQUENCE	<input checked="" type="checkbox"/>	Good	
GROUND CONNECTION	<input checked="" type="checkbox"/>	Good	
AUXILIARY DEVICES	<input checked="" type="checkbox"/>	Good	



ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

COMMENTS: \_\_\_\_\_  
 DEFICIENCIES: \_\_\_\_\_

CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
 OWNER City of Richmond Dept. Public Utilities  
 REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
 DATE 6/3/2022 AMBIENT TEMPERATURE 88 °F HUMIDITY 48 % EQPT. LOCATION DOUGLASDALE  
 SUBSTATION \_\_\_\_\_ POSITION MAIN INCOMING BREAKER



Description	INSPECTED	CONDITION	CLEAN/LUBE
OVERALL CLEANLINESS	<input checked="" type="checkbox"/>	Good	C
INSULATING MEMBERS	<input checked="" type="checkbox"/>	Good	C
MECHANICAL CONNECTIONS	<input checked="" type="checkbox"/>	Good	C/L
STRUCTURAL MEMBERS	<input checked="" type="checkbox"/>	Good	
CUBICLE	<input checked="" type="checkbox"/>	Good	C
RACKING DEVICES	<input checked="" type="checkbox"/>	Good	L
SHUTTER	<input checked="" type="checkbox"/>	Good	
CONTACT FINGERS	<input checked="" type="checkbox"/>	Good	

Description	INSPECTED	CONDITION	CLEAN/LUBE
MAIN CONTACTS	<input checked="" type="checkbox"/>	Good	C
ARCING CONTACTS	<input checked="" type="checkbox"/>	Good	
ARC CHUTES	<input checked="" type="checkbox"/>	Good	
PUFFER OPERATION	<input checked="" type="checkbox"/>	Good	
OPERATING MECHANISM	<input checked="" type="checkbox"/>	Good	L
CONTACT SEQUENCE	<input checked="" type="checkbox"/>	Good	
GROUND CONNECTION	<input checked="" type="checkbox"/>	Good	
AUXILIARY DEVICES	<input checked="" type="checkbox"/>	Good	



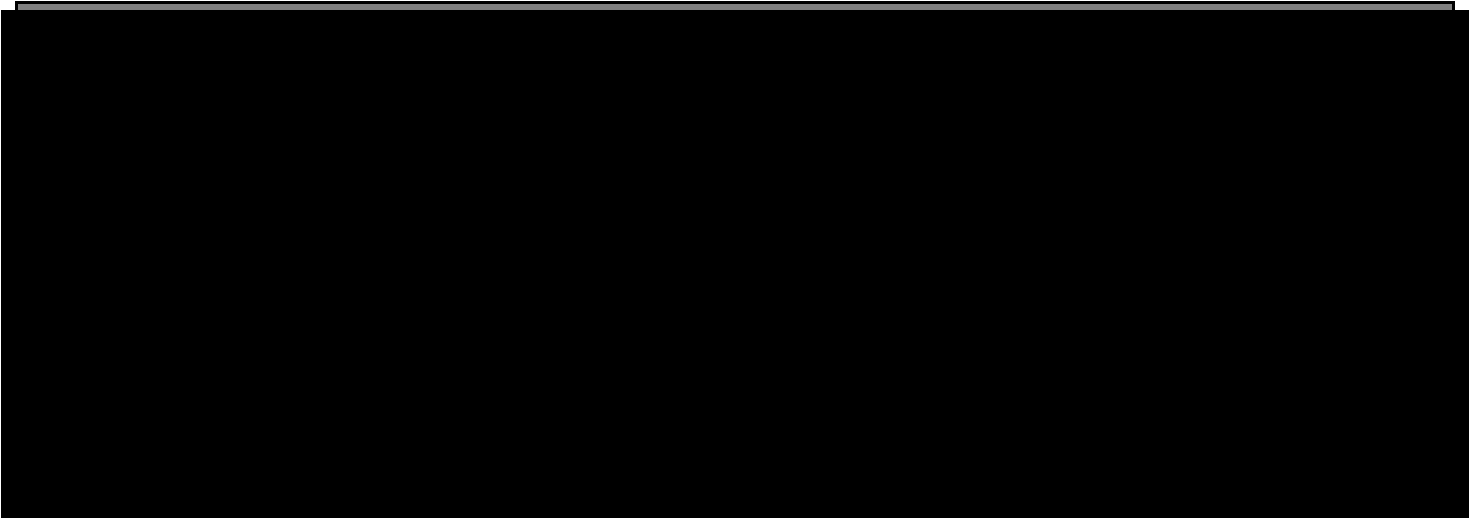
COMMENTS: PASSED ALL NETA MTS SPECIFICATIONS  
 DEFICIENCIES: \_\_\_\_\_



# LIQUID FILLED TRANSFORMER TESTS

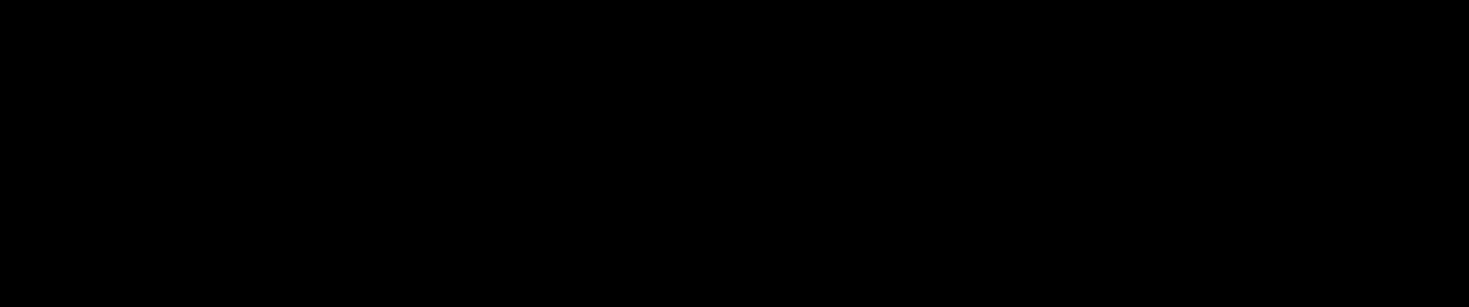


CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
 OWNER City of Richmond Dept. Public Utilities  
 REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
 DATE 6/3/2022 AMBIENT TEMPERATURE 90 °F HUMIDITY 72 % EQPT. LOCATION \_\_\_\_\_ SUB 1  
 SUBSTATION \_\_\_\_\_ POSITION \_\_\_\_\_ MAIN



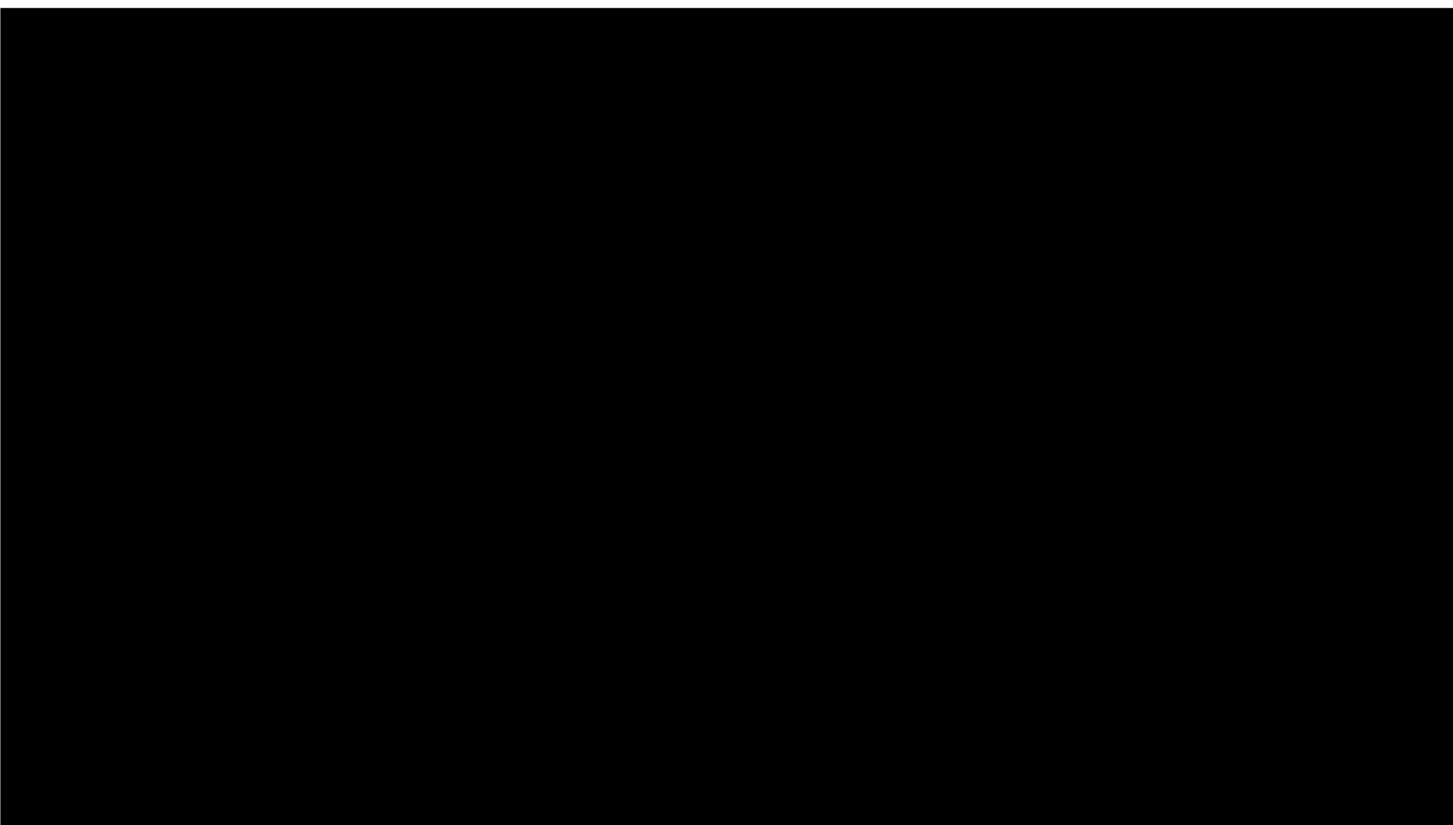
COMMENTS XO BUSHING LEAKING OIL

VISUAL AND MECHANICAL INSPECTION:	
Inspect physical and mechanical condition.	PASS
Inspect anchorage, alignment, and grounding.	PASS
Verify the presence of PCB labeling.	PASS
Prior to cleaning the unit, perform as-found tests, if required.	PASS
Clean bushings and control cabinets.	PASS
Verify operation of alarm, control, and trip circuits from temperature and level indicators, pressure-relief device, gas accumulator, and fault-pressure relay.	PASS
Verify that cooling fans and/or pumps operate correctly.	PASS
Inspect bolted electrical connections for high resistance.	PASS
Verify correct liquid level in tanks and bushings.	N/A
Verify that positive pressure is maintained on gas-blanketed transformers.	PASS
Perform inspections and mechanical tests as recommended by the manufacturer.	PASS
Test load tap-changer in accordance with Section 7.12.	PASS
Verify the presence of transformer surge arresters.	PASS
Perform as-left tests.	PASS
Verify de-energized tap-changer position is left as specified.	PASS



TEST EQUIPMENT USED: 51732379

TESTED BY: J. Crenshaw



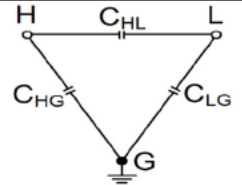
NOTE: SHORT EACH WINDING ON ITSELF

INSULATION RATING KEY

- G = GOOD
- D = DETERIORATED
- I = INVESTIGATE
- B = BAD

- H = HIGH VOLTAGE WINDING
- L = LOW VOLTAGE WINDING
- G = GROUND
- N = NEUTRAL BUSHING

EQUIVALENT CIRCUIT



ASSESSMENT OF TRANSFORMER: **PASSED ALL NETA ATS SPECIFICATIONS**

COMMENTS:  
DEFICIENCIES:

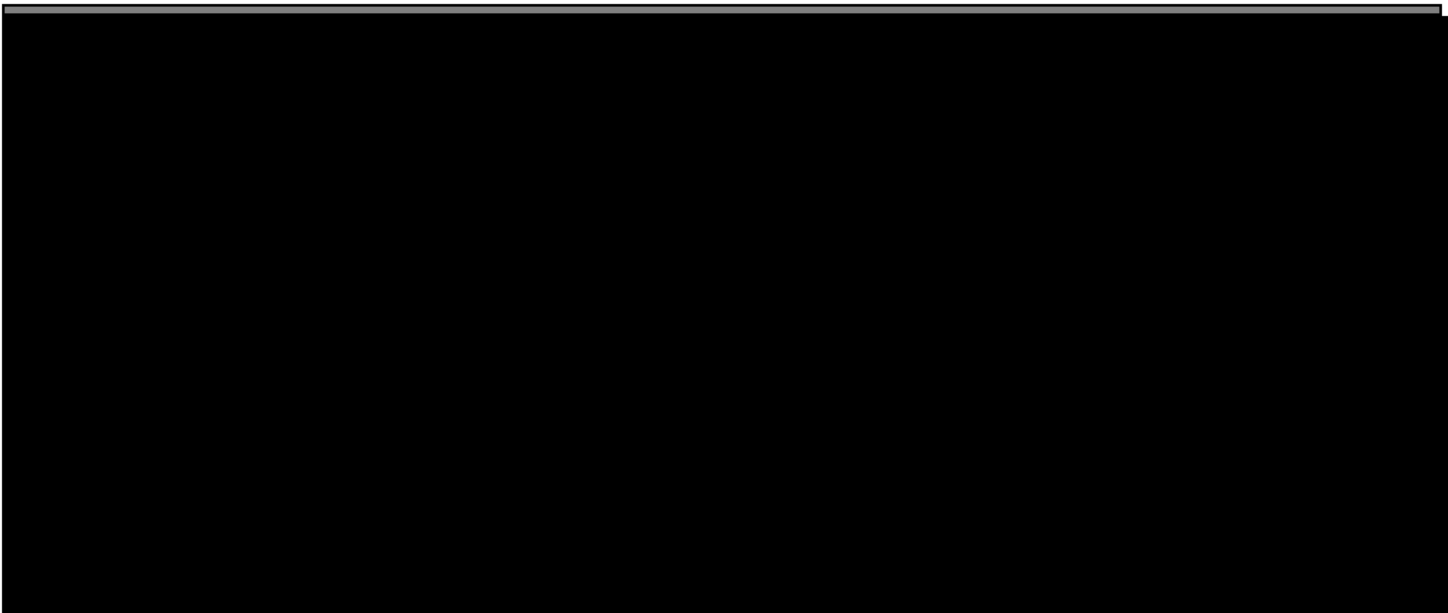
High side of transformer tested only, Low side X0 bushing was leaking so we didnt mess with it because we didnt want to make it leak even more.

CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
 OWNER City of Richmond Dept. Public Utilities  
 REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
 DATE 5/24/2022 AMBIENT TEMPERATURE 67 °F HUMIDITY 43 % EQPT. LOCATION DOUGLASDALE  
 SUBSTATION \_\_\_\_\_ POSITION SG-FDR



Description	INSPECTED	CONDITION	CLEAN/LUBE
OVERALL CLEANLINESS	<input checked="" type="checkbox"/>	Good	
INSULATING MEMBERS	<input checked="" type="checkbox"/>	Good	
MECHANICAL CONNECTIONS	<input checked="" type="checkbox"/>	Good	
STRUCTURAL MEMBERS	<input checked="" type="checkbox"/>	Good	
CUBICLE	<input checked="" type="checkbox"/>	Good	
RACKING DEVICES	<input checked="" type="checkbox"/>	Good	
SHUTTER	<input checked="" type="checkbox"/>	Good	

Description	INSPECTED	CONDITION	CLEAN/LUBE
CONTACT FINGERS	<input checked="" type="checkbox"/>	Good	
VACUUM BOTTLE	<input checked="" type="checkbox"/>	Good	
CONTACT EROSION INDICATOR	<input checked="" type="checkbox"/>	Good	
OPERATING MECHANISM	<input checked="" type="checkbox"/>	Good	
CONTACT SEQUENCE	<input checked="" type="checkbox"/>	Good	
GROUND CONNECTION	<input checked="" type="checkbox"/>	Good	
AUXILIARY DEVICES	<input checked="" type="checkbox"/>	Good	



ASSESSMENT OF BREAKER: PASSED ALL NETA MTS SPECIFICATIONS

COMMENTS: \_\_\_\_\_  
 DEFICIENCIES: \_\_\_\_\_

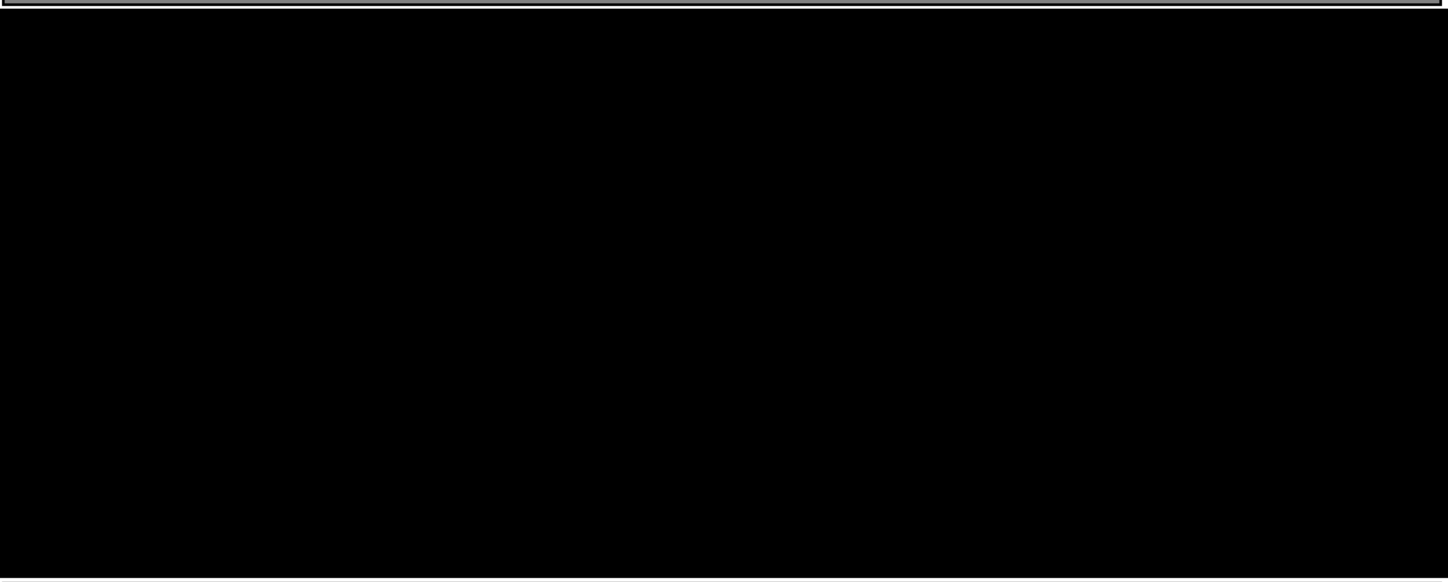
TEST EQUIPMENT USED: HI-POT 214242 / MEGGER RCH0068 / DLRO 6240 TESTED BY: RE/JC

CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
 OWNER City of Richmond Dept. Public Utilities  
 REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
 DATE 5/24/2022 AMBIENT TEMPERATURE 71 °F HUMIDITY 54 % EQPT. LOCATION DOUGLASDALE  
 SUBSTATION \_\_\_\_\_ POSITION GENERATOR -



Description	INSPECTED	CONDITION	CLEAN/LUBE
OVERALL CLEANLINESS	<input checked="" type="checkbox"/>	Good	
INSULATING MEMBERS	<input checked="" type="checkbox"/>	Good	
MECHANICAL CONNECTIONS	<input checked="" type="checkbox"/>	Good	
STRUCTURAL MEMBERS	<input checked="" type="checkbox"/>	Good	
CUBICLE	<input checked="" type="checkbox"/>	Good	
RACKING DEVICES	<input checked="" type="checkbox"/>	Good	
SHUTTER	<input checked="" type="checkbox"/>	Good	

Description	INSPECTED	CONDITION	CLEAN/LUBE
CONTACT FINGERS	<input checked="" type="checkbox"/>	Good	
VACUUM BOTTLE	<input checked="" type="checkbox"/>	Good	
CONTACT EROSION INDICATOR	<input checked="" type="checkbox"/>	Good	
OPERATING MECHANISM	<input checked="" type="checkbox"/>	Good	
CONTACT SEQUENCE	<input checked="" type="checkbox"/>	Good	
GROUND CONNECTION	<input type="checkbox"/>	Good	
AUXILIARY DEVICES	<input checked="" type="checkbox"/>	Good	



ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

COMMENTS: \_\_\_\_\_  
 DEFICIENCIES: \_\_\_\_\_

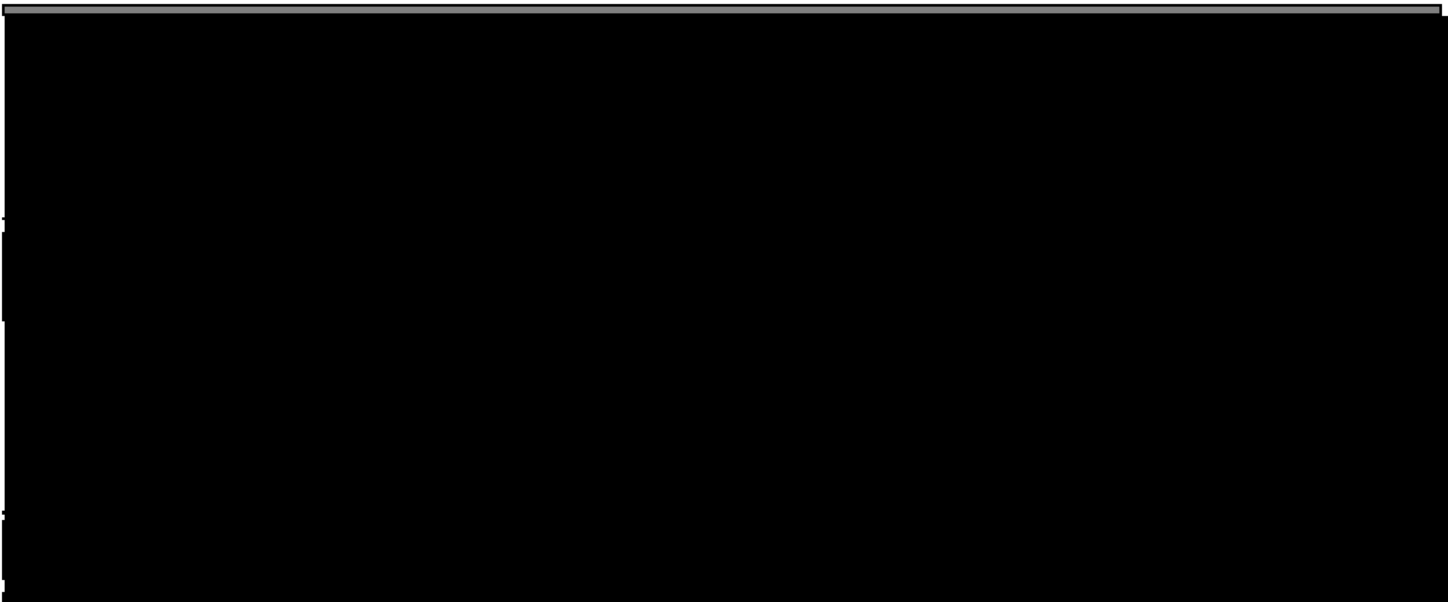


CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
 OWNER City of Richmond Dept. Public Utilities  
 REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
 DATE 5/24/2022 AMBIENT TEMPERATURE 72 °F HUMIDITY 43 % EQPT. LOCATION DOUGLASDALE  
 SUBSTATION \_\_\_\_\_ POSITION SWGR FDR



Description	INSPECTED	CONDITION	CLEAN/LUBE
OVERALL CLEANLINESS	<input checked="" type="checkbox"/>	Good	
INSULATING MEMBERS	<input checked="" type="checkbox"/>	Good	
MECHANICAL CONNECTIONS	<input checked="" type="checkbox"/>	Good	
STRUCTURAL MEMBERS	<input checked="" type="checkbox"/>	Good	
CUBICLE	<input checked="" type="checkbox"/>	Good	
RACKING DEVICES	<input checked="" type="checkbox"/>	Good	
SHUTTER	<input checked="" type="checkbox"/>	Good	

Description	INSPECTED	CONDITION	CLEAN/LUBE
CONTACT FINGERS	<input checked="" type="checkbox"/>	Good	
VACUUM BOTTLE	<input checked="" type="checkbox"/>	Good	
CONTACT EROSION INDICATOR	<input checked="" type="checkbox"/>	Good	
OPERATING MECHANISM	<input checked="" type="checkbox"/>	Good	
CONTACT SEQUENCE	<input checked="" type="checkbox"/>	Good	
GROUND CONNECTION	<input checked="" type="checkbox"/>	Good	
AUXILIARY DEVICES	<input checked="" type="checkbox"/>	Good	



ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

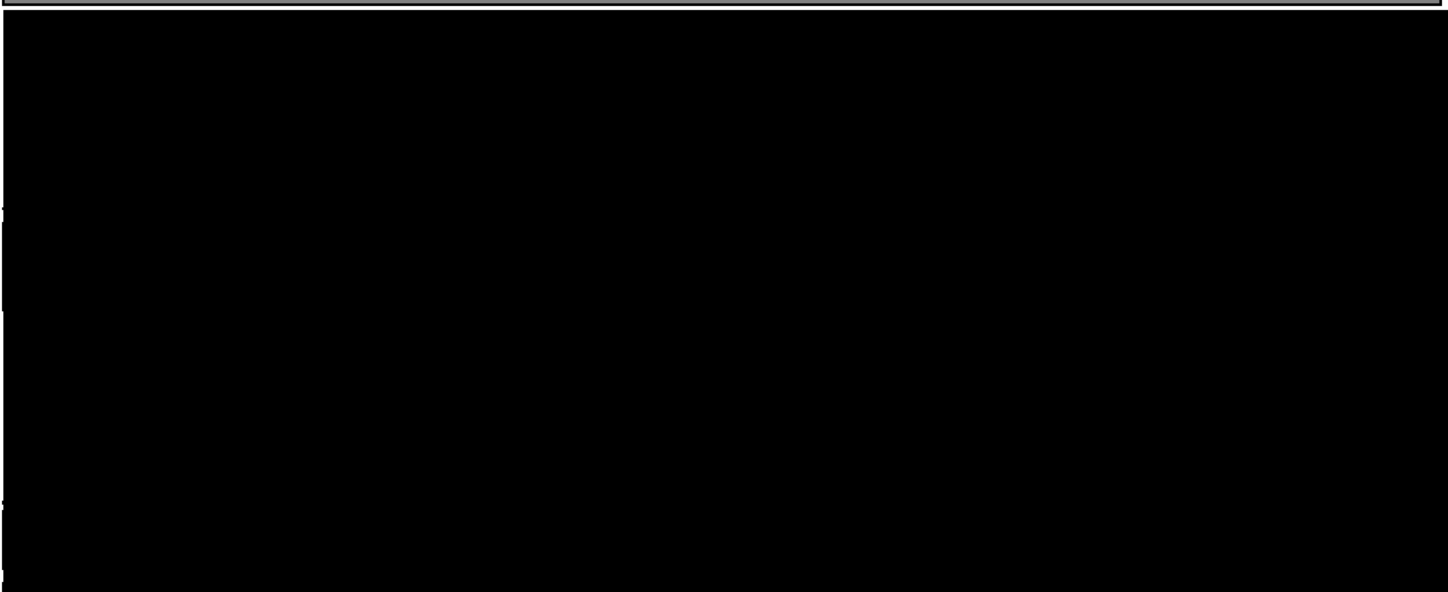
COMMENTS: \_\_\_\_\_  
 DEFICIENCIES: \_\_\_\_\_

CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
 OWNER City of Richmond Dept. Public Utilities  
 REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
 DATE 5/24/2022 AMBIENT TEMPERATURE 65 °F HUMIDITY 43 % EQPT. LOCATION DOUGLASDALE  
 SUBSTATION \_\_\_\_\_ POSITION \_\_\_\_\_ SERVICE FEEDER \_\_\_\_\_



Description	INSPECTED	CONDITION	CLEAN/LUBE
OVERALL CLEANLINESS	<input checked="" type="checkbox"/>	Good	
INSULATING MEMBERS	<input checked="" type="checkbox"/>	Good	
MECHANICAL CONNECTIONS	<input checked="" type="checkbox"/>	Good	
STRUCTURAL MEMBERS	<input checked="" type="checkbox"/>	Good	
CUBICLE	<input checked="" type="checkbox"/>	Good	
RACKING DEVICES	<input checked="" type="checkbox"/>	Good	
SHUTTER	<input checked="" type="checkbox"/>	Good	

Description	INSPECTED	CONDITION	CLEAN/LUBE
CONTACT FINGERS	<input checked="" type="checkbox"/>	Good	
VACUUM BOTTLE	<input checked="" type="checkbox"/>	Good	
CONTACT EROSION INDICATOR	<input checked="" type="checkbox"/>	Good	
OPERATING MECHANISM	<input checked="" type="checkbox"/>	Good	
CONTACT SEQUENCE	<input checked="" type="checkbox"/>	Good	
GROUND CONNECTION	<input checked="" type="checkbox"/>	Good	
AUXILIARY DEVICES	<input checked="" type="checkbox"/>	Good	



ASSESSMENT OF BREAKER: PASSED ALL NETA MTS SPECIFICATIONS

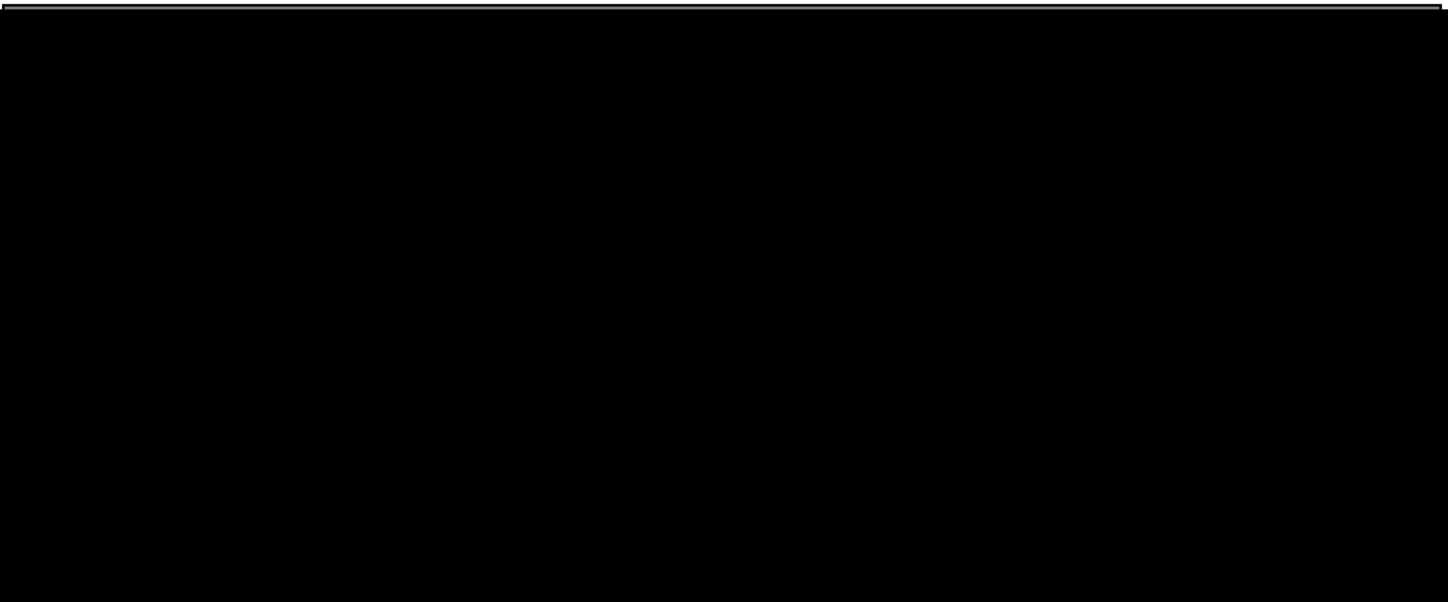
COMMENTS: \_\_\_\_\_  
 DEFICIENCIES: \_\_\_\_\_

CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
 OWNER City of Richmond Dept. Public Utilities  
 REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
 DATE 5/24/2022 AMBIENT TEMPERATURE 72 °F HUMIDITY 43 % EQPT. LOCATION DOUGLASDALE  
 SUBSTATION \_\_\_\_\_ POSITION MAIN BASS FEEDER



Description	INSPECTED	CONDITION	CLEAN/LUBE
OVERALL CLEANLINESS	<input checked="" type="checkbox"/>	Good	
INSULATING MEMBERS	<input checked="" type="checkbox"/>	Good	
MECHANICAL CONNECTIONS	<input checked="" type="checkbox"/>	Good	
STRUCTURAL MEMBERS	<input checked="" type="checkbox"/>	Good	
CUBICLE	<input checked="" type="checkbox"/>	Good	
RACKING DEVICES	<input checked="" type="checkbox"/>	Good	
SHUTTER	<input checked="" type="checkbox"/>	Good	

Description	INSPECTED	CONDITION	CLEAN/LUBE
CONTACT FINGERS	<input checked="" type="checkbox"/>	Good	
VACUUM BOTTLE	<input checked="" type="checkbox"/>	Good	
CONTACT EROSION INDICATOR	<input checked="" type="checkbox"/>	Good	
OPERATING MECHANISM	<input checked="" type="checkbox"/>	Good	
CONTACT SEQUENCE	<input checked="" type="checkbox"/>	Good	
GROUND CONNECTION	<input checked="" type="checkbox"/>	Good	
AUXILIARY DEVICES	<input checked="" type="checkbox"/>	Good	



ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

COMMENTS: \_\_\_\_\_  
 DEFICIENCIES: \_\_\_\_\_

TEST EQUIPMENT USED: HI-POT 214242 / MEGGER RCH0068 / DLRO 6240 TESTED BY: RE/JC

CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
 OWNER City of Richmond Dept. Public Utilities  
 REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
 DATE 5/24/2022 AMBIENT TEMPERATURE 68 °F HUMIDITY 43 % EQPT. LOCATION DOUGLASDALE  
 SUBSTATION \_\_\_\_\_ POSITION SPARE



Description	INSPECTED	CONDITION	CLEAN/LUBE
OVERALL CLEANLINESS	<input checked="" type="checkbox"/>	Good	
INSULATING MEMBERS	<input checked="" type="checkbox"/>	Good	
MECHANICAL CONNECTIONS	<input checked="" type="checkbox"/>	Good	
STRUCTURAL MEMBERS	<input checked="" type="checkbox"/>	Good	
CUBICLE	<input checked="" type="checkbox"/>	Good	
RACKING DEVICES	<input checked="" type="checkbox"/>	Good	
SHUTTER	<input checked="" type="checkbox"/>	Good	

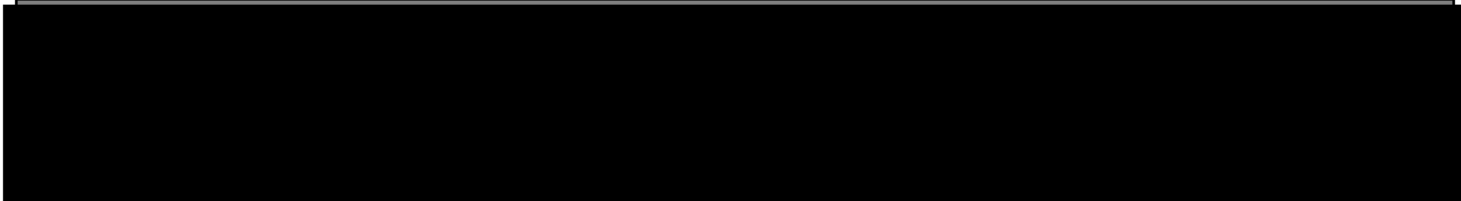
Description	INSPECTED	CONDITION	CLEAN/LUBE
CONTACT FINGERS	<input checked="" type="checkbox"/>	Good	
VACUUM BOTTLE	<input checked="" type="checkbox"/>	Good	
CONTACT EROSION INDICATOR	<input checked="" type="checkbox"/>	Good	
OPERATING MECHANISM	<input checked="" type="checkbox"/>	Good	
CONTACT SEQUENCE	<input checked="" type="checkbox"/>	Good	
GROUND CONNECTION	<input checked="" type="checkbox"/>	Good	
AUXILIARY DEVICES	<input checked="" type="checkbox"/>	Good	



ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

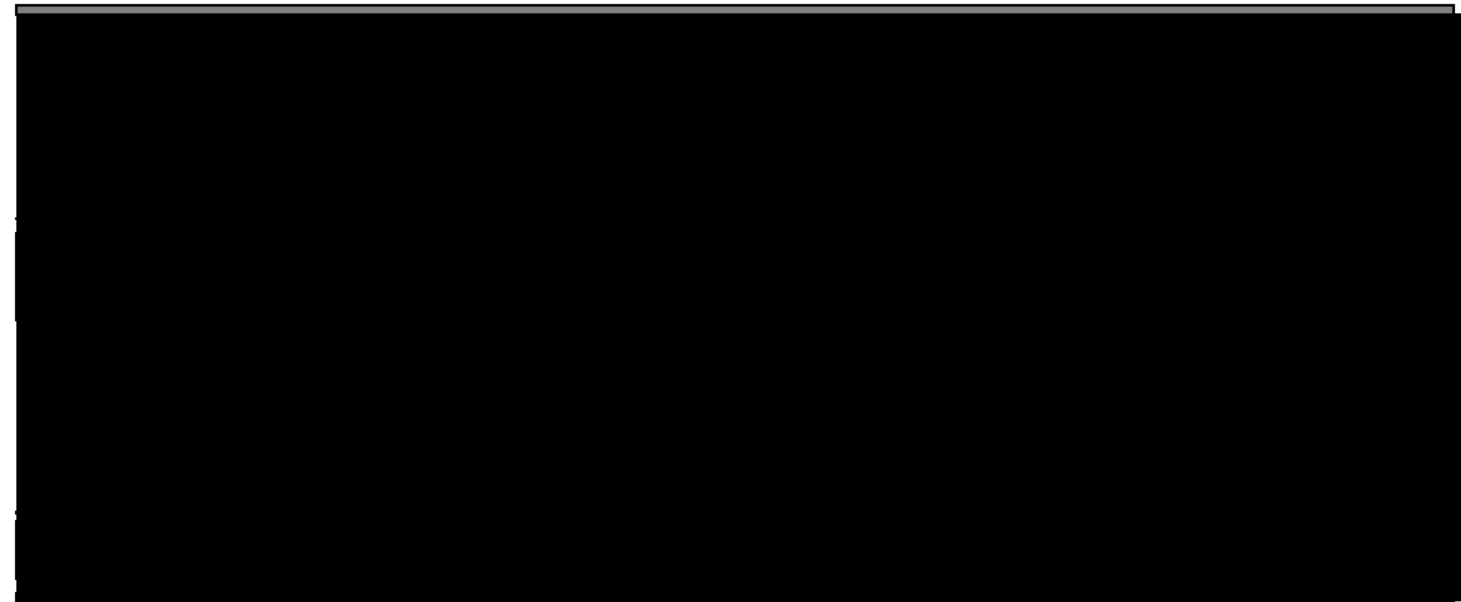
COMMENTS: \_\_\_\_\_  
 DEFICIENCIES: \_\_\_\_\_

CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
 OWNER City of Richmond Dept. Public Utilities  
 REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
 DATE 5/24/2022 AMBIENT TEMPERATURE 73 °F HUMIDITY 43 % EQPT. LOCATION DOUGLASDALE  
 SUBSTATION \_\_\_\_\_ POSITION SPARE -



Description	INSPECTED	CONDITION	CLEAN/LUBE
OVERALL CLEANLINESS	<input checked="" type="checkbox"/>	Good	
INSULATING MEMBERS	<input checked="" type="checkbox"/>	Good	
MECHANICAL CONNECTIONS	<input checked="" type="checkbox"/>	Good	
STRUCTURAL MEMBERS	<input checked="" type="checkbox"/>	Good	
CUBICLE	<input checked="" type="checkbox"/>	Good	
RACKING DEVICES	<input checked="" type="checkbox"/>	Good	
SHUTTER	<input checked="" type="checkbox"/>	Good	

Description	INSPECTED	CONDITION	CLEAN/LUBE
CONTACT FINGERS	<input checked="" type="checkbox"/>	Good	
VACUUM BOTTLE	<input checked="" type="checkbox"/>	Good	
CONTACT EROSION INDICATOR	<input checked="" type="checkbox"/>	Good	
OPERATING MECHANISM	<input checked="" type="checkbox"/>	Good	
CONTACT SEQUENCE	<input checked="" type="checkbox"/>	Good	
GROUND CONNECTION	<input checked="" type="checkbox"/>	Good	
AUXILIARY DEVICES	<input checked="" type="checkbox"/>	Good	



ASSESSMENT OF BREAKER: **PASSED ALL NETA MTS SPECIFICATIONS**

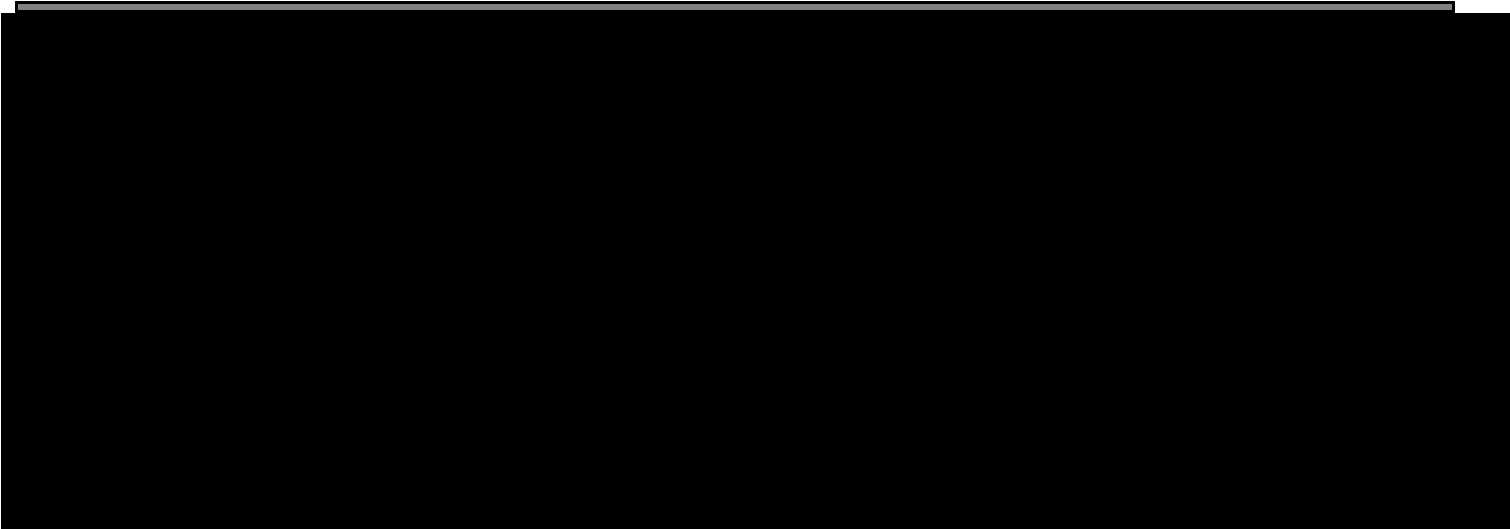
COMMENTS: \_\_\_\_\_  
 DEFICIENCIES: \_\_\_\_\_



# LIQUID FILLED TRANSFORMER TESTS



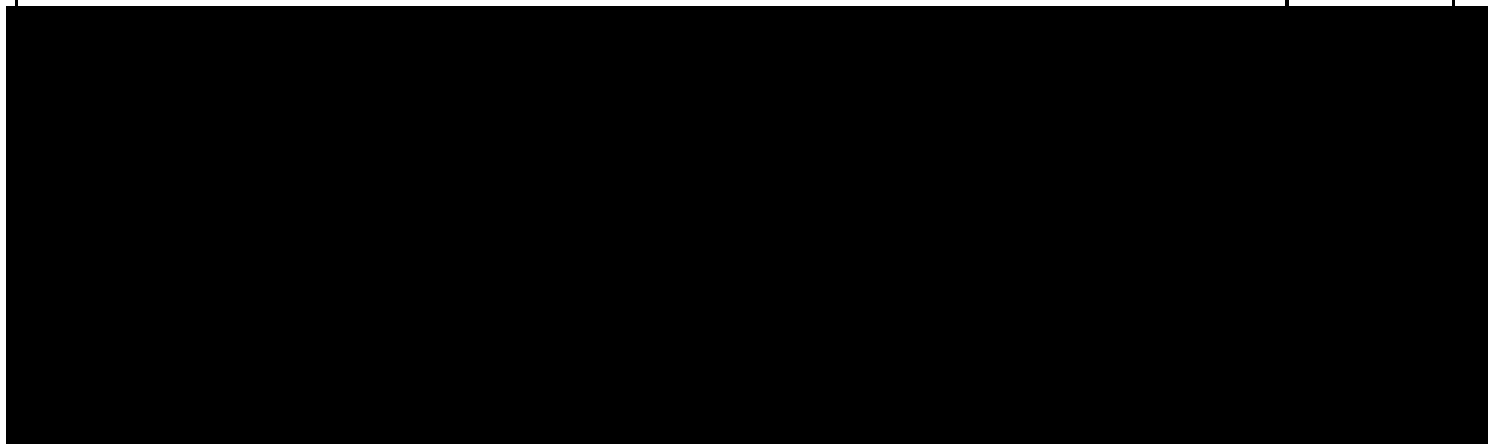
CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ JOB # RVA22131-140  
 OWNER City of Richmond Dept. Public Utilities  
 REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_  
 DATE 6/7/2022 AMBIENT TEMPERATURE 70 °F HUMIDITY 45 % EQPT. LOCATION \_\_\_\_\_  
 SUBSTATION \_\_\_\_\_ TRANSFORMER \_\_\_\_\_ POSITION \_\_\_\_\_



COMMENTS \_\_\_\_\_

**VISUAL AND MECHANICAL INSPECTION:**

Inspect physical and mechanical condition.	PASS
Inspect anchorage, alignment, and grounding.	PASS
Verify the presence of PCB labeling.	N/A
Prior to cleaning the unit, perform as-found tests, if required.	N/A
Clean bushings and control cabinets.	PASS
Verify operation of alarm, control, and trip circuits from temperature and level indicators, pressure-relief device, gas accumulator, and fault-pressure relay.	N/A
Verify that cooling fans and/or pumps operate correctly.	PASS
Inspect bolted electrical connections for high resistance.	N/A
Verify correct liquid level in tanks and bushings.	PASS
Verify that positive pressure is maintained on gas-blanketed transformers.	PASS
Perform inspections and mechanical tests as recommended by the manufacturer.	PASS
Test load tap-changer in accordance with Section 7.12.	N/A
Verify the presence of transformer surge arresters.	PASS
Perform as-left tests.	N/A



TEST EQUIPMENT USED: RCH0056/RCH0098

TESTED BY: J. Maitland

COMMENTS:  
DEFICIENCIES:




# LIQUID FILLED TRANSFORMER TESTS



CUSTOMER City of Richmond Dept. Public Utilities PAGE \_\_\_\_\_

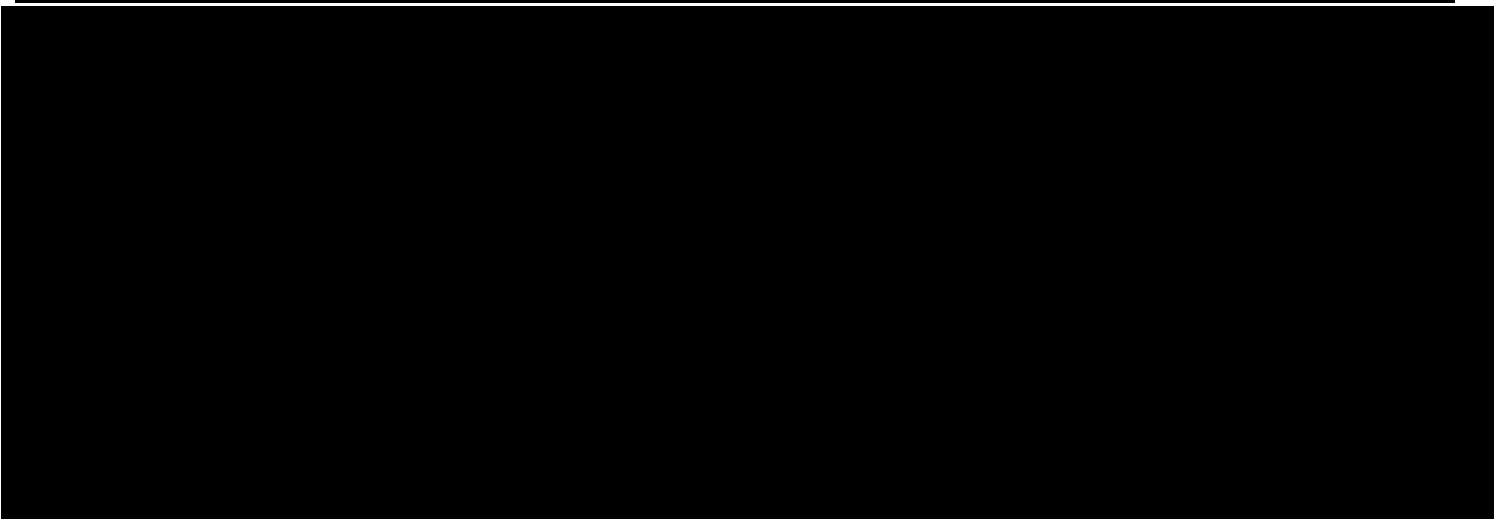
ADDRESS \_\_\_\_\_ JOB # RVA22131-140

OWNER City of Richmond Dept. Public Utilities

REPRESENTATIVE \_\_\_\_\_ TELEPHONE \_\_\_\_\_

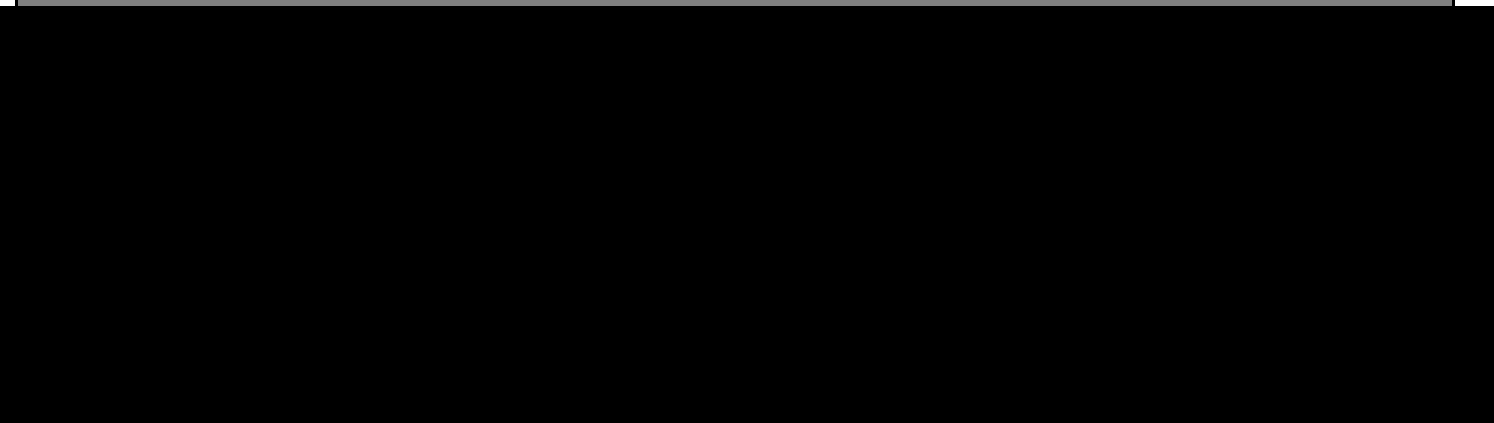
DATE 11/2/2022 AMBIENT TEMPERATURE 70 °F HUMIDITY 50 % EQPT. LOCATION \_\_\_\_\_ PLANT ELEC ROOM

SUBSTATION TRANSFORMER POSITION \_\_\_\_\_



COMMENTS

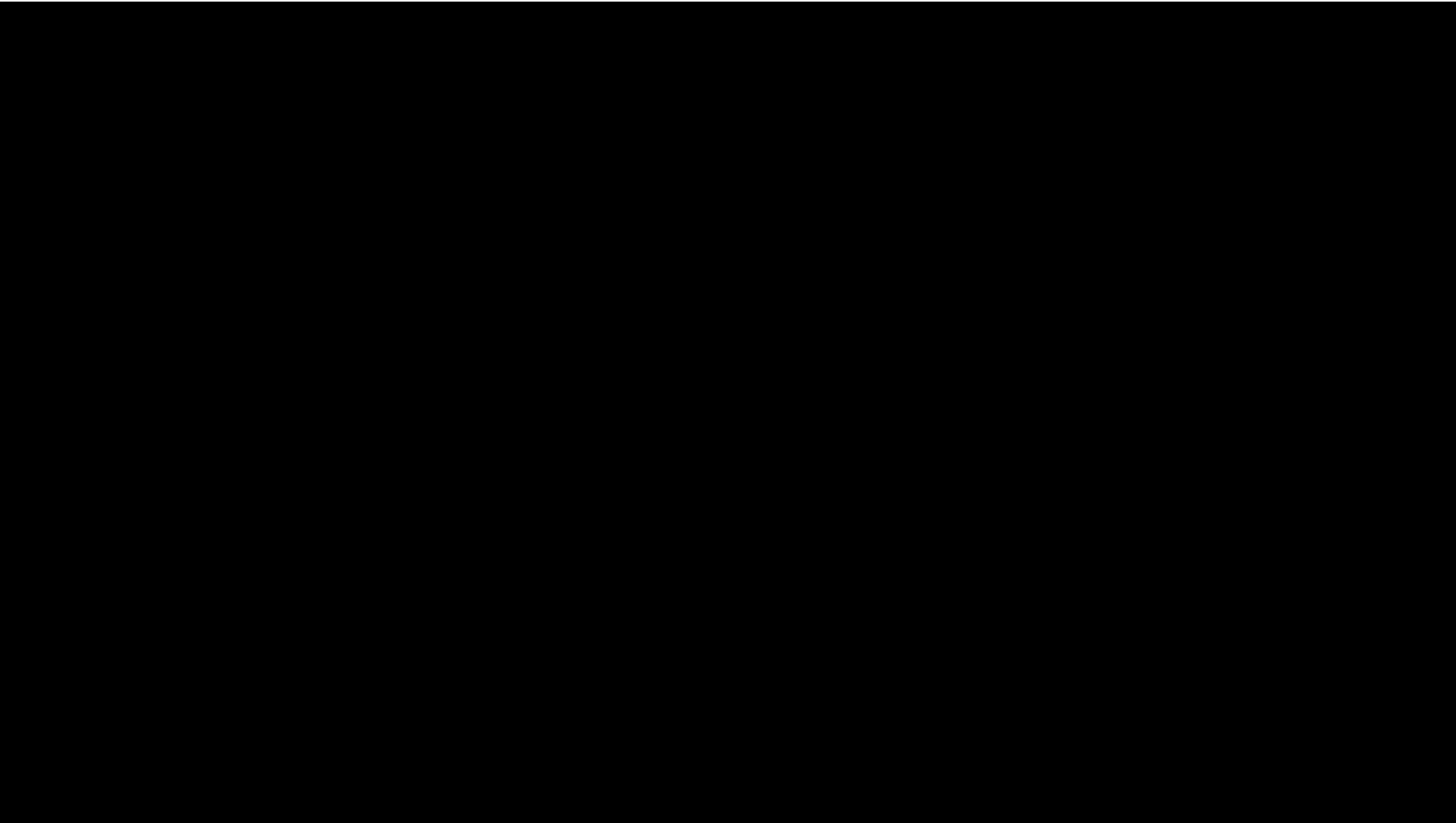
VISUAL AND MECHANICAL INSPECTION:	
Inspect physical and mechanical condition.	PASS
Inspect anchorage, alignment, and grounding.	PASS
Verify the presence of PCB labeling.	N/A
Prior to cleaning the unit, perform as-found tests, if required.	N/A
Clean bushings and control cabinets.	PASS
Verify operation of alarm, control, and trip circuits from temperature and level indicators, pressure-relief device, gas accumulator, and fault-pressure relay.	N/A
Verify that cooling fans and/or pumps operate correctly.	SEE COMMENTS
Inspect bolted electrical connections for high resistance.	N/A
Verify correct liquid level in tanks and bushings.	PASS
Verify that positive pressure is maintained on gas-blanketed transformers.	PASS
Perform inspections and mechanical tests as recommended by the manufacturer.	PASS
Test load tap-changer in accordance with Section 7.12.	N/A
Verify the presence of transformer surge arresters.	PASS
Perform as-left tests.	N/A
Verify de-energized tap-changer position is left as specified.	PASS



TEST EQUIPMENT USED: RCH0079, RCH0090

TESTED BY: HUNTER HAYES, BEN CONDON





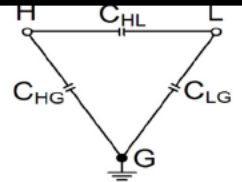
NOTE: SHORT EACH WINDING ON ITSELF

INSULATION RATING KEY

- G = GOOD
- D = DETERIORATED
- I = INVESTIGATE
- B = BAD

- H = HIGH VOLTAGE WINDING
- L = LOW VOLTAGE WINDING
- G = GROUND
- N = NEUTRAL BUSHING

EQUIVALENT  
CIRCUIT



ASSESSMENT OF TRANSFORMER: **PASS**

COMMENTS:  
DEFICIENCIES:

FUSES FOR FAN WERE BLOWN. XFMR RATED AT LOWEST VALUE UNTIL FANS ARE REPAIRED.

# Work Order Complete Report

Work Order Number	Status	Asset Number	Slot Number	Fault Code	Work Type	Action Code	Work Area
C266361	CLO	0006743			PM		WP

**Originator** BRIZENDINE, MATTHEW E  
**Phone No** 804-646-1792  
**OriginalPriority**  
**Priority** 4  
**Supervisor ID** BRIZENDINEM  
**Planner** BRIZENDINEM

<b>ChargeCost Center</b> ELECTRICAL 052 <b>CreditCost Center</b> <b>Labor Account</b> WPP - 1101 <b>Material Account</b> WPP - 2258 <b>ContractorAccount</b> <b>Support Requirement</b>	<b>OriginationDate</b> 06/10/2021 14:38 <b>Due Date</b> 07/10/2021 14:38 <b>Closed Date:</b> 10/27/2021 10:01 <b>Exception Date</b> 00/00/0000 <b>Schedule Date</b> 06/10/2021 <b>StatusChg Date</b> 10/27/2021 10:01
--	--

**Project ID:**  
**Task IDCounter**  
**PM ID**  
**Route ID**  
**GroupCode**  
**WorkRequest No**  
**Approved** Y

**Safety** N  
**Maint Work Group:** ELECTRICAL WTP  
**WorkClass** MAIN  
**WorkLocation**

**Entry Date** 06/10/2021  
**CriticalRatio** .00000  
**Funding Source**  
**Finance Close** N

<b>Labor Cost</b>	\$0.00
<b>Mtl Cost</b>	\$0.00
<b>Contract Cost</b>	\$3,130.00
<b>OtherCost</b>	\$0.00

**Work Requested** I am creating this to have the company Concentric come in and perform a major PM on this unit.

**CorrectiveAction** 8-24-21 (MEB)- The UPS's were checked and PM'd.

# Work Order Complete Report

Work Order Number	Status	Asset Number	Slot Number	Fault Code	Work Type	Action Code	Work Area
C272509	CLO	0016623			COREC		WP

**Originator** BIES, MARK A  
**Phone No** 804-646-1810  
**OriginalPriority**  
**Priority** 2  
**Supervisor ID** BIESMA  
**Planner** BIESMA

**ChargeCost Center** 052  
**CreditCost Center**  
**Labor Account**  
**Material Account**  
**ContractorAccount**  
**Support Requirement**

**OriginationDate** 08/18/2023 09:41  
**Due Date** 08/23/2023 09:41  
**Closed Date:** 09/12/2023 08:49  
**Exception Date** 00/00/0000  
**Schedule Date** 00/00/0000  
**StatusChg Date** 09/12/2023 08:49

**Project ID:**  
**Task IDCounter**  
**PM ID**  
**Route ID**  
**GroupCode**  
**WorkRequest No**  
**Approved** N

**Safety** N  
**Maint Work Group:** I&C WATER PLANT  
**WorkClass** MAIN  
**WorkLocation**

**Entry Date** 08/18/2023  
**CriticalRatio** .00000  
**Funding Source**  
**Finance Close** N

**Labor Cost** \$0.00  
**Mtl Cost** \$9,543.00  
**Contract Cost** \$0.00  
**OtherCost** \$0.00

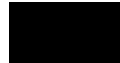
**Work Requested** Replace UPS for Plant ■ Main

**CorrectiveAction** 18Aug23/MAB: Ordering UPS  
 12Sep23/MAB: UPS replaced.

# Asset History Report

Asset Number	Asset Type	Asset Location	Cost Center	Asset Cost	Month-To-Date Total Cost	Year-To-Date Total Cost	Life-To-Date Total Cost
0016624	E	PLANT ■ BUILDING	052	\$0.00	\$0.00	\$0.00	\$0.00
UPS, ■ - PLANT ■ PLC							


Work Order Number	Closed Date:	Work Requested	PM Group	Work Type	Fault Code	Action Code	Labor Cost	Mtl Cost	Contract Cost	Total Cost
-------------------	--------------	----------------	----------	-----------	------------	-------------	------------	----------	---------------	------------



# Carter Machinery EPG PM1

PM

● 1 ● 3 ● 64 ● 30

Inspection Number	19525413	Customer No	2974846161
Seria Number	██████████	Customer Name	CITY OF RICHMOND-DPU WATER TREATMENT-VALERIE K MOORE
Make	██████████	Customer Phone	8046461792
Mode	██	Customer Email	matthew.brizendine@richmondgov.com
Equipment Family	ELECTRIC POWER GENERATION - DIESEL	Work Order	R182080
Asset ID	Dougas 1	Completed On	10/16/2024 2:21:03 PM
SMU	██████████	Inspector	Tyler Harding
Location	3920 Douglas Road	PDF Generated On	10/16/2024
Coordinates	0, 0, 0	Package KW	██
Engine Mode	██	Engine Serial Number	██████████
Generator Mode / Serial	██████████		
Technician			

## General Info & Comments

● **General info/Comments** NORMAL

## Engine Lubrication System

● **1.1 Oil Level (prior to service)** FULL

● **1.2 Oil level (after service)** FULL

● **1.3 Oil Capacity (Comment Capacity)** SELECT THEN ADD COMMENT

Comments: █ Ga ons

● **1.4 Oil PSI @ Operating temperature** SELECT THEN ADD COMMENT

Comments: █

● **1.5 Hours on Oil** SELECT THEN ADD COMMENT

Comments: [REDACTED] Hours

● 1.6 Oil Changed (comment oil grade) NOT REQUIRED

● 1.7 Oil Filter(s) Changed (comment QTY and part#) NOT REQUIRED

Co ent [REDACTED]

● 1.8 Condition of Crankcase Breather / Filter (comment filter#) OK

● 1.9 Crankcase Piping Condition / Routing OK

● 1.10 Engine Noise and Vibration OK

● 1.11 Oil Sample Taken (attach photo of sample/label) COMPLETED



● 1.12 Oil Leaks NO

Comments: Engine is wet stacking

### Cooling System

● 2.1 Radiator and Tanks OK

● 2.2 Coolant temperature (prior to running) SELECT THEN ADD COMMENT

Comments: [REDACTED]

● 2.3 Radiator Cap / Seal SELECT THEN ADD COMMENT

Comments: [REDACTED]

<input checked="" type="radio"/>	2.4 Coolant System Pressure Test	YES
<input checked="" type="radio"/>	2.5 Coolant System Leaks	NO
<input checked="" type="radio"/>	2.6 Coolant Age / Condition (comment coolant age/condition)	OK
	Comments: New 2/23	
<input type="radio"/>	2.7 Coolant Type (comment type)	SELECT THEN ADD COMMENT
	Comments: [REDACTED]	
<input checked="" type="radio"/>	2.8 Coolant Level	FULL
<input type="radio"/>	2.9 Conditioner PPM	SELECT THEN ADD COMMENT
	Comments: Within spec	
<input type="radio"/>	2.10 Coolant Freeze Point	SELECT THEN ADD COMMENT
	Comments: Within spec	
<input type="radio"/>	2.11 Coolant Sample Taken (Provide Photo Of Label)	NOT REQUIRED
<input checked="" type="radio"/>	2.12 Hoses / Clamps	OK
<input checked="" type="radio"/>	2.13 Belts (comment part# and qty)	OK
	Comments: [REDACTED]	
<input checked="" type="radio"/>	2.14 Fan Belt & Tensioner Adjustment	OK
<input checked="" type="radio"/>	2.15 Fan	OK
<input checked="" type="radio"/>	2.16 Fan Drive (Grease bearing)	OK
	Comments: Recommended during PM2	
<input checked="" type="radio"/>	2.17 Water Pump	OK

● 2.18 Coolant Recovery Tank N/A

● 2.19 Operating Temperature SELECT THEN ADD COMMENT

Comments: [REDACTED]

● 2.20 Engine Block Heaters / Hoses MONITOR - OPEN ACTION

Comments: Hoses due for replacement

● 2.21 Block Heater Part Number SELECT THEN ADD COMMENT

Comments: [REDACTED]

● 2.22 Isolation Valve OK

● 2.23 Louver System OK

### Fuel System

● 3.1 Main Fuel Tank / Cap OK

● 3.2 Main Fuel Tank Capacity (comment tank capacity) KNOWN

Comments: [REDACTED] Gallons

● 3.3 Main Fuel Tank Level (comment tank level in percentage) SELECT TO ADD COMMENT

Comments: 75%

● 3.4 Day Tank Fuel Level SELECT TO ADD COMMENT

Comments: [REDACTED]

● 3.5 Fuel Pump OK

● 3.6 Fuel Priming Pump OK

● 3.7 Fuel Lines OK



●	3.8 Fuel PSI (Comment PSI)	SELECT THEN ADD COMMENT
Comments: [REDACTED]		
●	3.9 Change Primary Fuel Filter(s) - comment part # and qty	NOT REQUIRED
Comments: [REDACTED]		
●	3.10 Change Secondary Fuel Filter(s) - comment part # and qty	NOT REQUIRED
Comments: [REDACTED]		
●	3.11 Governor Operation / Control	OK
●	3.12 Fuel Leaks	NO
●	3.13 Fuel Sample	NOT REQUIRED
<b>Air Induction &amp; Exhaust System</b>		
●	4.1 Air Cleaner Element / Housing	MONITOR - OPEN ACTION
Comments: Fi ters due for rep acement [REDACTED]		
●	4.2 Pre Cleaner Element	N/A
●	4.3 Air Cleaner Element(s) Replaced	NOT REQUIRED
Comments: Fi ters new 2017, recommend rep acement		
●	4.4 Air Intake Lines / Seals / Gaskets	OK
●	4.5 Restriction Gauge	OK
●	4.6 Exhaust Manifold / Piping	OK
●	4.7 Turbocharger(s)	OK
●	4.8 Exhaust Silencer	OK

● 4.9 Rain Cap(s) N/A

**Generator Set**

● 5.1 Enclosure (Comment mfg) OK

Comments: [REDACTED]

● 5.2 Mounting Bolts / Vibration Isolators OK

● 5.3 Sound Attenuation material (visual) OK

● 5.4 Control Panel (comment Control Panel Model Number) OK

Comments: [REDACTED]

● 5.5 Is QR Code installed? If not, install QR code per SWI Guide ID 2266 NO



● 5.6 Auto / Remote - Start / Stop Functional OK

● 5.7 Control Wiring OK

● 5.8 Generator Voltmeter Single Phase (comment voltage) N/A

● 5.9 Generator Voltmeter Three Phase (comment voltage) OK

Comments: [REDACTED]

● 5.10 Generator Ammeter / AMPS Average (comment Amperage) OK

Comments: No load transferred

● 5.11 Frequency Meter (Comment Hz) OK  
Comments: [REDACTED]

● 5.12 Voltage Adjust Potentiometer or Switch N/A

● 5.13 Frequency / Speed Adjustment OK

● 5.14 Generator Rear Bearing Lubrication Date (comment date) KNOWN  
Comments: Done 2/23

● 5.15 Generator Exciter / Rectifier OK

● 5.16 Generator Strip Heater Operation MONITOR - OPEN ACTION  
Comments: Not working

● 5.17 Generator Wiring OK

● 5.18 Automatic Voltage Regulator OK

● 5.19 Generator Circuit Breaker Lugs & Cables OK  
Comments: [REDACTED]

● 5.20 Circuit Breaker Test Date (Comment Date) UNKNOWN

**Electrical System**

● 6.1 Battery Terminals / Cables / Posts (Inspect For Damage) OK

● 6.2 Number of Batteries SELECT THEN ADD COMMENT  
Comments: [REDACTED]

● 6.3 Battery Part # SELECT THEN ADD COMMENT  
Comments: 1 [REDACTED]

6.4 Battery Age

SELECT THEN ADD COMMENT

Comments: New 2/23

6.5 Battery Voltage W/ Charger

OK

Comments: [REDACTED]

6.6 Battery Voltage w/o Charger (comment voltage)

OK

6.7 Confirm charger operations (comment output voltage)

OK

6.8 Cranking voltage drop test

OK

Comments: [REDACTED]

6.9 Starting Motor Performance

OK

6.10 Engine Alternator and belt (comment voltage and belt part#)

OK

Comments: [REDACTED]

6.11 Tachometer RPM (comment RPM)

OK

Comments: [REDACTED] RPM

6.12 DC Ammeter (Comment Amperage)

OK

6.13 Engine Wiring

OK

6.14 Pre Alarms Operational

OK

6.15 Shutdown Alarm Operational

OK

6.16 Safety Shut Off / E-Stop Operational

OK

Batteries (If Applicable)

7.1 Battery Specific Gravity (Tap to Add Details) (Use '+' to add additional batteries)

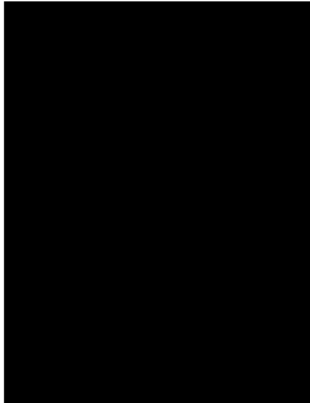
SELECT THEN ADD COMMENT

Electrolyte Level : 0


Load Test Results : 0  
Spec f c Grav ty 1 : 0  
Spec f c G v ty 0  
Spec f c Grav ty 3 : 0  
Spec f c Grav ty 4 : 0  
Spec f c Grav ty 5 : 0  
Spec f c Grav ty 6 : 0

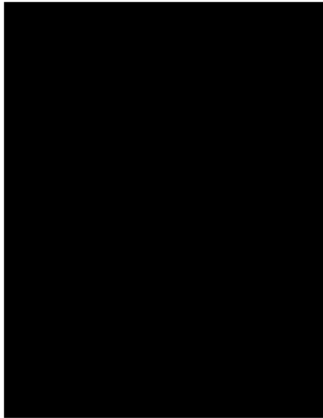
## Analysis and Recommendations

- **8.1 Control Switch in Auto** YES



- **8.2 Circuit Breaker Closed** NO

Comments: 




- **8.3 Analysis and Recommendations** *SELECT THEN ADD COMMENT*

Comments: See anything noted as minor, no major issues found

# Carter Machinery EPG PM1

PM

● 1 ● 1 ● 68 ● 28

Inspection Number	19526693	Customer No	2974846161
Seria Number	██████████	Customer Name	CITY OF RICHMOND- DPU WATER TREATMENT-VALERIE K MOORE
Make	██████████	Customer Phone	8046461792
Mode	██	Customer Email	matthew.brizendine@ric hmondgov.com
Equipment Family	ELECTRIC POWER GENERATION - DIESEL	Work Order	R182070
Asset ID	Dou gas 2	Completed On	10/16/2024 2:21:15 PM
SMU	██████████	Inspector	Tyer Harding
Location	3920 Douglas Rd	PDF Generated On	10/16/2024
Coordinates	0, 0, 0	Package KW	██
Engine Mode	██	Engine Serial Number	██████████
Generator Mode / Serial	██████████		
Technician			

## General Info & Comments

● **General info/Comments** NORMAL

## Engine Lubrication System

● **1.1 Oil Level (prior to service)** FULL

● **1.2 Oil level (after service)** FULL

● **1.3 Oil Capacity (Comment Capacity)** SELECT THEN ADD COMMENT

Comments: 110 Gallons

● **1.4 Oil PSI @ Operating temperature** SELECT THEN ADD COMMENT

Comments: ██████████

● **1.5 Hours on Oil** SELECT THEN ADD COMMENT

Comments: [REDACTED] Hours

- 1.6 Oil Changed (comment oil grade) NOT REQUIRED

Comments: [REDACTED]

- 1.7 Oil Filter(s) Changed (comment QTY and part#) NOT REQUIRED

Comments: [REDACTED]

- 1.8 Condition of Crankcase Breather / Filter (comment filter#) OK

- 1.9 Crankcase Piping Condition / Routing OK

- 1.10 Engine Noise and Vibration OK

- 1.11 Oil Sample Taken (attach photo of sample/label) COMPLETED



- 1.12 Oil Leaks NO

Comments: Engine is wetstacking

### Cooling System

- 2.1 Radiator and Tanks OK

- 2.2 Coolant temperature (prior to running) SELECT THEN ADD COMMENT

Comment: [REDACTED]

- 2.3 Radiator Cap / Seal SELECT THEN ADD COMMENT

Comments: [REDACTED]

<input checked="" type="radio"/>	2.4 Coolant System Pressure Test	YES
<input checked="" type="radio"/>	2.5 Coolant System Leaks	NO
<input checked="" type="radio"/>	2.6 Coolant Age / Condition (comment coolant age/condition)	OK
	Comments: New 2/23	
<input type="radio"/>	2.7 Coolant Type (comment type)	SELECT THEN ADD COMMENT
	Comments: [REDACTED]	
<input checked="" type="radio"/>	2.8 Coolant Level	FULL
<input type="radio"/>	2.9 Conditioner PPM	SELECT THEN ADD COMMENT
	Comments: Within spec	
<input type="radio"/>	2.10 Coolant Freeze Point	SELECT THEN ADD COMMENT
	Comments: Within spec	
<input type="radio"/>	2.11 Coolant Sample Taken (Provide Photo Of Label)	NOT REQUIRED
<input checked="" type="radio"/>	2.12 Hoses / Clamps	OK
<input checked="" type="radio"/>	2.13 Belts (comment part# and qty)	OK
	Comments: [REDACTED]	
<input checked="" type="radio"/>	2.14 Fan Belt & Tensioner Adjustment	OK
<input checked="" type="radio"/>	2.15 Fan	OK
<input checked="" type="radio"/>	2.16 Fan Drive (Grease bearing)	OK
<input checked="" type="radio"/>	2.17 Water Pump	OK



● 2.18 Coolant Recovery Tank OK

● 2.19 Operating Temperature *SELECT THEN ADD COMMENT*

Comments: [REDACTED]

● 2.20 Engine Block Heaters / Hoses OK

● 2.21 Block Heater Part Number *SELECT THEN ADD COMMENT*

Comments: [REDACTED]

● 2.22 Isolation Valve OK

● 2.23 Louver System OK

### Fuel System

● 3.1 Main Fuel Tank / Cap OK

● 3.2 Main Fuel Tank Capacity (comment tank capacity) *KNOWN*

Comments: [REDACTED] Ga ons

● 3.3 Main Fuel Tank Level (comment tank level in percentage) *SELECT TO ADD COMMENT*

Comments: 75%

● 3.4 Day Tank Fuel Level *SELECT TO ADD COMMENT*

Comments: [REDACTED]

● 3.5 Fuel Pump OK

● 3.6 Fuel Priming Pump OK

● 3.7 Fuel Lines OK

● 3.8 Fuel PSI (Comment PSI) *SELECT THEN ADD COMMENT*

Comments: Within spec

● 3.9 Change Primary Fuel Filter(s) - comment part # and qty NOT REQUIRED

Comments: [REDACTED]

● 3.10 Change Secondary Fuel Filter(s) - comment part # and qty NOT REQUIRED

Comments: [REDACTED]

● 3.11 Governor Operation / Control OK

● 3.12 Fuel Leaks NO

● 3.13 Fuel Sample NOT REQUIRED

### Air Induction & Exhaust System

● 4.1 Air Cleaner Element / Housing MONITOR - OPEN ACTION

Comments: Due to rep ace due to age, new 2017

● 4.2 Pre Cleaner Element OK

● 4.3 Air Cleaner Element(s) Replaced NOT REQUIRED

Co ent [REDACTED]

● 4.4 Air Intake Lines / Seals / Gaskets OK

● 4.5 Restriction Gauge OK

● 4.6 Exhaust Manifold / Piping OK

● 4.7 Turbocharger(s) OK

● 4.8 Exhaust Silencer OK

● 4.9 Rain Cap(s) N/A

## Generator Set

- 5.1 Enclosure (Comment mfg) OK  
Comments: [REDACTED]
- 
- 5.2 Mounting Bolts / Vibration Isolators OK
- 
- 5.3 Sound Attenuation material (visual) OK
- 
- 5.4 Control Panel (comment Control Panel Model Number) OK  
Comments: [REDACTED]
- 
- 5.5 Is QR Code installed? If not, install QR code per SWI Guide ID 2266 NO  

- 
- 5.6 Auto / Remote - Start / Stop Functional OK
- 
- 5.7 Control Wiring OK
- 
- 5.8 Generator Voltmeter Single Phase (comment voltage) N/A
- 
- 5.9 Generator Voltmeter Three Phase (comment voltage) OK  
Comments: [REDACTED]
- 
- 5.10 Generator Ammeter / AMPS Average (comment Amperage) OK  
Comments: [REDACTED]
- 
- 5.11 Frequency Meter (Comment Hz) OK  
Comments: [REDACTED]

●	5.12 Voltage Adjust Potentiometer or Switch	N/A
●	5.13 Frequency / Speed Adjustment	OK
●	5.14 Generator Rear Bearing Lubrication Date (comment date)	KNOWN
Comments: Done 2/23		
●	5.15 Generator Exciter / Rectifier	OK
●	5.16 Generator Strip Heater Operation	OK
●	5.17 Generator Wiring	OK
●	5.18 Automatic Voltage Regulator	OK
Comments: [REDACTED]		
●	5.19 Generator Circuit Breaker Lugs & Cables	OK
●	5.20 Circuit Breaker Test Date (Comment Date)	UNKNOWN

**Electrical System**

●	6.1 Battery Terminals / Cables / Posts (Inspect For Damage)	OK
●	6.2 Number of Batteries	SELECT THEN ADD COMMENT
Comments: [REDACTED]		
●	6.3 Battery Part #	SELECT THEN ADD COMMENT
Comments: [REDACTED]		
●	6.4 Battery Age	SELECT THEN ADD COMMENT
Comments: New 2/23		
●	6.5 Battery Voltage W/ Charger	OK
Comments: [REDACTED]		

- 6.6 Battery Voltage w/o Charger (comment voltage) OK
- 6.7 Confirm charger operations (comment output voltage) OK
- 6.8 Cranking voltage drop test OK  

Comments: [REDACTED]
- 6.9 Starting Motor Performance OK
- 6.10 Engine Alternator and belt (comment voltage and belt part#) OK  

Comments: [REDACTED]
- 6.11 Tachometer RPM (comment RPM) OK  

Comments: [REDACTED]
- 6.12 DC Ammeter (Comment Amperage) OK
- 6.13 Engine Wiring OK
- 6.14 Pre Alarms Operational OK
- 6.15 Shutdown Alarm Operational OK
- 6.16 Safety Shut Off / E-Stop Operational OK

**Batteries (If Applicable)**

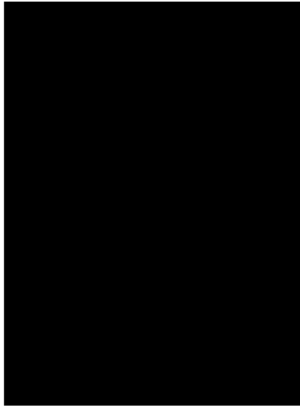
- 7.1 Battery Specific Gravity (Tap to Add Details) (Use '+' to add additional batteries) *SELECT THEN ADD COMMENT*  
  

Electrolyte Level : 0  
 Load Test Results : 0  
 Specific Gravity 1 : 0  
 Specific Gravity 2 : 0  
 Specific Gravity 3 : 0  
 Specific Gravity 4 : 0  
 Specific Gravity 5 : 0  
 Specific Gravity 6 : 0

Analysis and Recommendations

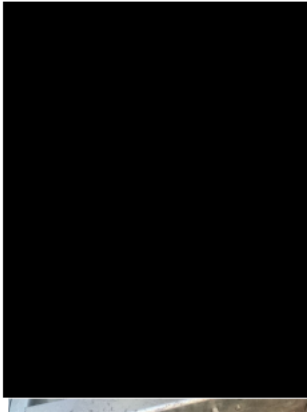
● 8 1 Control Switch in Auto

YES



● 8 2 Circuit Breaker Closed

NO



● 8 3 Analysis and Recommendations

*SELECT THEN ADD  
COMMENT*


Comments: See anything noted as minor, no major issues found

**ENGINE**

EQUIP NUM: DOUGLASDALE GEN

SERIAL NUMBER:

D100-54295-0387  
 SHOP JOB NUM : RI82080  
 SAMPLE SHIP TIME (days) : 5  
 CITY OF RICHMOND-DPU  
 WATER TREATMENT  
 RECEIVED DATE: 21-Oct-24

 **No Action Required**

NO PROBLEMS PRESENTLY ASSOCIATED WITH THIS SAMPLE. CONTINUE SAMPLING AT THE NORMAL INTERVAL.

Interp By: Robert W Hobson  
 Interpreted On: 21-Oct-24

**SAMPLE INFORMATION**

	16-Oct-24	17-Jun-24	06-Dec-23	01-May-23
Sampled Date	16-Oct-24	17-Jun-24	06-Dec-23	01-May-23
Sample Id	D100-54295-0387	D100-54172-0485	D100-53342-0144	D100-53124-0533
Lab Date	21-Oct-24	20-Jun-24	08-Dec-23	04-May-23
Meter [Hr]	196.2	196.0	193	188
Meter On Fluid	3.0	3.0	7	2
Fluid Brand				
Fluid Weight	15W-40	15W-40	15W-40	15W-40
Fluid Type				
Fluid Change	N	N	Y	N
Filter Change	N	N	U	U

**PREVIOUS SAMPLE**

NO PROBLEMS PRESENTLY ASSOCIATED WITH THIS SAMPLE. CONTINUE SAMPLING AT THE NORMAL INTERVAL.

**CONDITION / CONTAMINATION**

		16-Oct-24	17-Jun-24	06-Dec-23	01-May-23
<b>VISCOSITY (CENTISTOKES) ASTM D445</b>					
V100	Viscosity at 100 C	12.80	12.90	13.20	13.40

**INFRARED (UFM) ASTM E2412**

		16-Oct-24	17-Jun-24	06-Dec-23	01-May-23
ST	Soot	3	0	2	0
OXI	Oxidation	17	18	13	13
SUL	Sulfur Products	21	21	17	17
NIT	Nitration	0	0	4	4

**WEAR LEVELS / ADDITIVES**

		16-Oct-24	17-Jun-24	06-Dec-23	01-May-23
<b>ELEMENTAL ANALYSIS (PPM) ASTM D6185 [OIL] / ASTM D6130 [COOLANT]</b>					
Cu	Copper	0	0	1	1
Fe	Iron	3	1	1	1
Cr	Chromium	0	0	0	0
Al	Aluminum	1	0	0	0
Pb	Lead	0	0	0	1
Sn	Tin	0	1	0	0
Si	Silicon	6	6	2	4
Na	Sodium	4	3	2	4
K	Potassium	0	0	2	0
Mo	Molybdenum	43	41	60	66
Ni	Nickel	0	0	0	0
Ag	Silver	0	0	0	0
Ti	Titanium	0	0	0	0
V	Vanadium	1	1	1	1
Ca	Calcium	1643	1525	1158	1247
P	Phosphorus	938	896	1091	1186
Zn	Zinc	1121	1076	1239	1388
Mg	Magnesium	599	570	994	1135
B	Boron	94	131	5	6

**WATER**

		16-Oct-24	17-Jun-24	06-Dec-23	01-May-23
W	Water	N	N	N	N

**ANTIFREEZE**

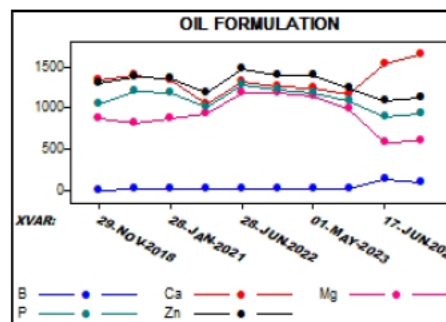
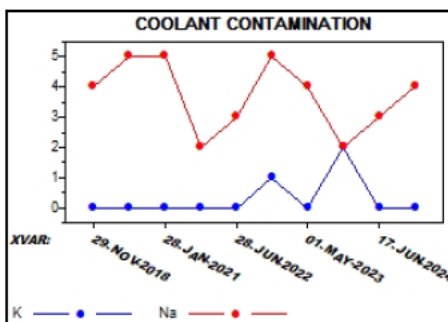
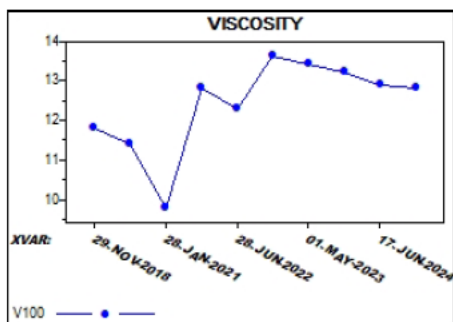
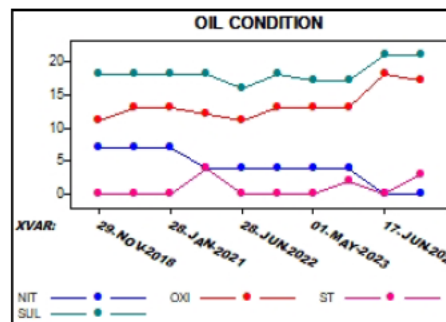
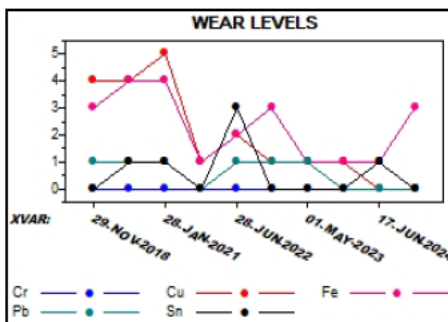
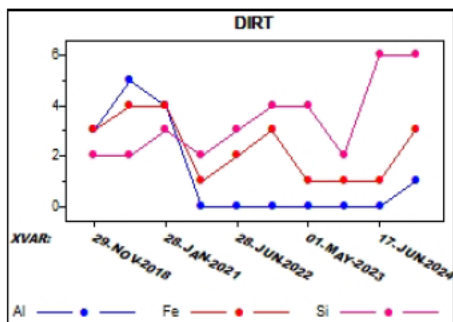
		16-Oct-24	17-Jun-24	06-Dec-23	01-May-23
A	Antifreeze	N	N	N	N

**FUEL**

		16-Oct-24	17-Jun-24	06-Dec-23	01-May-23
F	Fuel	N	N	N	N

**CLEANLINESS**

		16-Oct-24	17-Jun-24	06-Dec-23	01-May-23
<b>FERROUS DEBRIS</b>					
PQI	PQ Index				2



Report Comment

Our sample report has been updated! For more information on the new report, go to - <https://www.youtube.com/watch?v=4h8bREJVUrs>



**ENGINE**

EQUIP NUM: DOUGLASDALE GEN

SERIAL NUMBER:

D100-54295-0675  
 SHOP JOB NUM : RI82070  
 SAMPLE SHIP TIME (days) : 5  
 CITY OF RICHMOND-DPU  
 WATER TREATMENT  
 RECEIVED DATE: 21-Oct-24

No Action Required

NO PROBLEMS PRESENTLY ASSOCIATED WITH THIS SAMPLE. CONTINUE SAMPLING AT THE NORMAL INTERVAL.

Interp By: Robert W Hobson  
 Interpreted On: 21-Oct-24

**SAMPLE INFORMATION**

	16-Oct-24	17-Jun-24	07-Dec-23	01-May-23
Sampled Date	16-Oct-24	17-Jun-24	07-Dec-23	01-May-23
Sample Id	D100-54295-0675	D100-54172-0481	D100-53345-0405	D100-53124-0522
Lab Date	21-Oct-24	20-Jun-24	11-Dec-23	04-May-23
Meter [Hr]	184.5	184.1	181.2	178.9
Meter On Fluid	2.0	2.9	5.0	2.3
Fluid Brand				
Fluid Weight	15W-40	15W-40	15W-40	15W-40
Fluid Type				
Fluid Change	N	N	Y	N
Filter Change	N	N	Y	U

**PREVIOUS SAMPLE**

NO PROBLEMS PRESENTLY ASSOCIATED WITH THIS SAMPLE. CONTINUE SAMPLING AT THE NORMAL INTERVAL.

**CONDITION / CONTAMINATION**

		16-Oct-24	17-Jun-24	07-Dec-23	01-May-23
<b>VISCOSITY (CENTISTOKES) ASTM D445</b>					
V100	Viscosity at 100 C	13.10	13.5	13.90	14.30

**INFRARED (UFM) ASTM E2412**

		16-Oct-24	17-Jun-24	07-Dec-23	01-May-23
ST	Soot	3	0	2	0
OXI	Oxidation	17	18	13	14
SUL	Sulfur Products	21	21	18	19
NIT	Nitration	0	0	4	5

**WEAR LEVELS / ADDITIVES**

		16-Oct-24	17-Jun-24	07-Dec-23	01-May-23
<b>ELEMENTAL ANALYSIS (PPM) ASTM D6185 [OIL] / ASTM D6130 [COOLANT]</b>					
Cu	Copper	0	0	1	1
Fe	Iron	1	1	1	1
Cr	Chromium	0	0	0	0
Al	Aluminum	0	0	0	0
Pb	Lead	0	1	0	0
Sn	Tin	1	1	0	0
Si	Silicon	5	6	3	3
Na	Sodium	4	3	2	4
K	Potassium	0	0	1	0
Mo	Molybdenum	34	41	61	68
Ni	Nickel	0	0	0	0
Ag	Silver	0	0	0	0
Ti	Titanium	0	0	0	0
V	Vanadium	1	1	1	1
Ca	Calcium	1315	1462	1134	1238
P	Phosphorus	763	872	1069	1178
Zn	Zinc	924	1034	1242	1368
Mg	Magnesium	465	539	985	1122
B	Boron	77	125	7	8

**WATER**

		16-Oct-24	17-Jun-24	07-Dec-23	01-May-23
W	Water	N	N	N	N

**ANTIFREEZE**

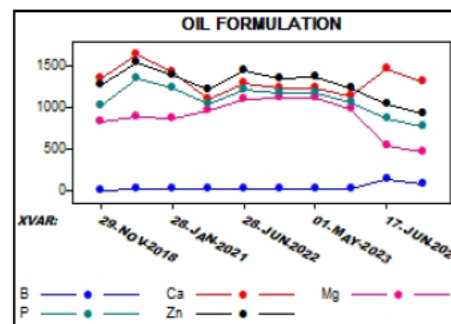
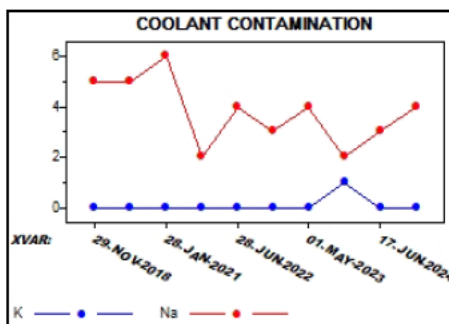
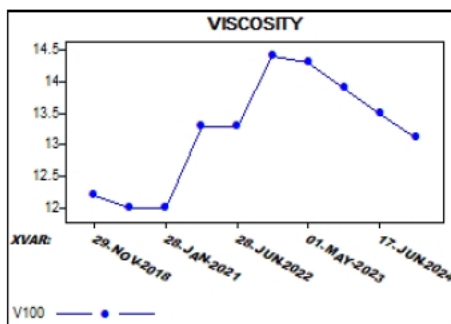
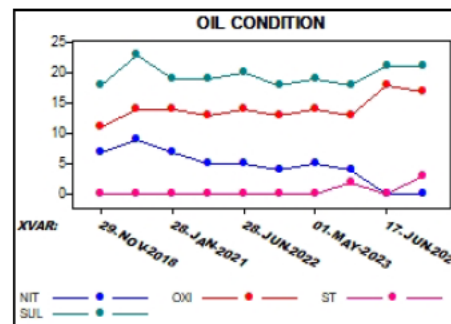
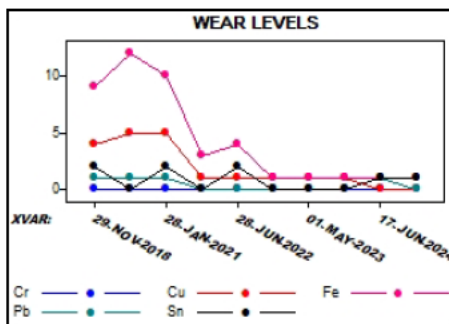
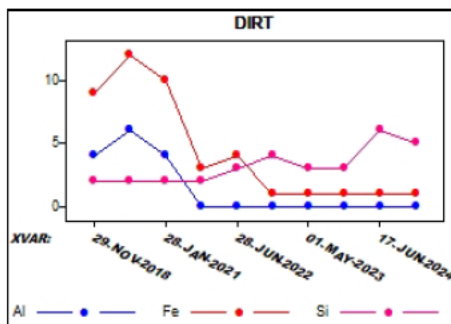
		16-Oct-24	17-Jun-24	07-Dec-23	01-May-23
A	Antifreeze	N	N	N	N

**FUEL**

		16-Oct-24	17-Jun-24	07-Dec-23	01-May-23
F	Fuel	N	N	N	N

**CLEANLINESS**

		16-Oct-24	17-Jun-24	07-Dec-23	01-May-23
<b>FERROUS DEBRIS</b>					
PQI	PQ Index				2



Report Comment

Our sample report has been updated! For more information on the new report, go to - <https://www.youtube.com/watch?v=4h8bREJVUrs>