Revision History

Date	Rev#	Comments
10/Aug/2013	1	Initial publication as a controlled procedure.
08/Nov/2013	2	Updated laboratory equipment information
11/Dec/2014	3	Annual review and update.
30/Dec/2015	4	Annual review and update.
15/Dec/2016	5	Annual review and update.
01/Dec/2017	6	Annual review and update.
21/Dec/2018	7	Annual review and update.
20/Dec/2019	8	Annual review and update.
01/Dec/2020	9	Annual review and update.
28/Dec/2021	10	Annual review and update.

Measurement and Recording Equipment Listing – Balmertown, Cochenour & McKenzie Island Drinking Water System		
Equipment Identifier	**Classification**	**Make & Model**
Flow Measuring Devices		
Flow Meter, Raw Water (CWTP)	Regulatory	Endress + Hauser Proline Promag 50 Electromagnetic Flowmeter
Flow Meter, Cochenour Distribution (CWTP)	Regulatory	Endress + Hauser Proline Promag 50 Electromagnetic Flowmeter
Flow Meter, Balmertown Transfer (CWTP)	Process	Endress + Hauser Proline Promag 50 Electromagnetic Flowmeter
Flow Meter, Incoming Transfer (BRPS)	Process	Endress + Hauser Proline Promag 50 Electromagnetic Flowmeter
Flow Meter, Balmertown Distribution (BRPS)	Regulatory	Endress + Hauser Proline Promag 50 Electromagnetic Flowmeter
Water Quality Analyzers		
Turbidimeter, Filter 1 (CWTP)	Regulatory	Hach 1720D Low Range Turbidimeter
Turbidimeter, Filter 2 (CWTP)	Regulatory	Hach 1720D Low Range Turbidimeter
Turbidimeter, Filter 3 (CWTP)	Regulatory	Hach 1720D Low Range Turbidimeter
Turbidimeter, Treated Water (CWTP)	Process	Hach 1720D Low Range Turbidimeter
pH/Free Chlorine Residual Analyzer, Treated Water (CWTP)	Regulatory	Wallace & Tiernan Depolox 3 Plus Residual Analyzer
Free Chlorine Residual Analyzer, Distribution Water (BRPS)	Regulatory	Wallace & Tiernan Depolox 3 Plus Residual Analyzer
Lab Instrumentation		
Hach 2100P Portable Turbidimeter (Cochenour WTP)	Regulatory*	Hach 2100P Portable Turbidimeter
Hach DR/2500 Laboratory Spectrophotometer (Cochenour WTP)	Regulatory*	Hach DR/2500 Laboratory Spectrophotometer
Real Tech UV254 Field Meter (Cochenour WTP)	Process	Real Tech UV254 Field Meter
Hach 2100P Portable Turbidimeter (Balmertown RPS)	Regulatory*	Hach 2100P Portable Turbidimeter
Hach DR300 Pocket Chlorine Colorimeter (Balmertown RPS)	Regulatory*	Hach DR300 Pocket Chlorine Colorimeter
Hach Pocket Colorimeter II - Chlorine (Field Unit)	Regulatory*	Hach Pocket Colorimeter II - Chlorine
*Laboratory instruments may be considered to be regulatory analyzers if they are used to conduct a test for the purposes of satisfying regulatory requirements.		

Calibration & Maintenance Record: **Turbidimeter, Filter 1 (Cochenour WTP)** Year: **2022**

Manual: Hach 1720D Low Range Process Turbidimeter

Comparative Checks

Comparative Checks: Comparative checks involve comparing the reading of the analyzer to a grab sample result. Such comparisons shall be completed on a routine basis as a component of routine operational checks, and shall be recorded within the daily operational spreadsheets. A calibration is necessary if the check reveals a discrepancy of ± 0.10 NTU between measured and actual values. Such calibrations would generally involve the User-prepared Calibration Procedure (section 3.2.2 of the User Manual), and these calibrations would be considered non-routine/unscheduled. Unscheduled calibrations shall be recorded within the section "Other Calibration and Maintenance Activities", while routine/scheduled calibrations shall be recorded within the section "Inspection, Cleaning, and Calibration".

Inspection, Cleaning and Calibration

Inspection, Cleaning, and Calibration (routinely every quarter, or if there is a discrepancy of ± 0.10 NTU): The photocell window shall be inspected and the turbidimeter body and bubble trap shall be cleaned on a quarterly basis (section 5.1.3 of the Manual). Following inspection and cleaning, the unit shall be calibrated in accordance with the User-prepared Calibration Procedure (section 3.2.2 of the Manual). Other calibration methods described within the Manual are also acceptable. Calibration shall adhere to the Calibration guidelines (section 3.1.2) contained within the Manual. Following calibration, the flow rate through the turbidimeter should be verified to be between 250 – 750 mL/min. The same procedures apply if there is a discrepancy of ± 0.10 NTU, in which case a non-routine/unscheduled calibration may be required. Non-routine calibrations shall be recorded within the section "Other Calibration and Maintenance Activities".

Quarter	Quarter 1 (Jan-Feb-Mar)	Quarter 2 (Apr-May-Jun)	Quarter 3 (Jul-Aug-Sep)	Quarter 4 (Oct-Nov-Dec)
Date (dd/mm)				
Time				
Turbidimeter Body Inspected/Cleaned? (Y/N)				
Photocell Window Inspected? (Y/N)				
User-prepared Calibration Conducted? (Y/N)				
Calibration Accepted? (Y/N)				
Sample Flow Verification? (Y/N, mL/min)				
Operator Initials				
Operations Manager Initials				

Other Calibration and Maintenance Activities

Other Calibration and Maintenance Activities (as required): Additional activities must be recorded below. Such activities may be associated with troubleshooting (section 6), lamp replacement, and non-routine calibrations. Indicate the dates of any other calibration and maintenance activities below so that they may be cross-referenced with logbook entries.

Date (dd/mm)	Time	Initials	Activity

Calibration & Maintenance Record: **Turbidimeter, Filter 2 (Cochenour WTP)** Year: **2022**

Manual: Hach 1720D Low Range Process Turbidimeter

Comparative Checks

Comparative Checks: Comparative checks involve comparing the reading of the analyzer to a grab sample result. Such comparisons shall be completed on a routine basis as a component of routine operational checks, and shall be recorded within the daily operational spreadsheets. A calibration is necessary if the check reveals a discrepancy of ± 0.10 NTU between measured and actual values. Such calibrations would generally involve the User-prepared Calibration Procedure (section 3.2.2 of the User Manual), and these calibrations would be considered non-routine/unscheduled. Unscheduled calibrations shall be recorded within the section "Other Calibration and Maintenance Activities", while routine/scheduled calibrations shall be recorded within the section "Inspection, Cleaning, and Calibration".

Inspection, Cleaning and Calibration

Inspection, Cleaning, and Calibration (routinely every quarter, or if there is a discrepancy of ± 0.10 NTU): The photocell window shall be inspected and the turbidimeter body and bubble trap shall be cleaned on a quarterly basis (section 5.1.3 of the Manual). Following inspection and cleaning, the unit shall be calibrated in accordance with the User-prepared Calibration Procedure (section 3.2.2 of the Manual). Other calibration methods described within the Manual are also acceptable. Calibration shall adhere to the Calibration guidelines (section 3.1.2) contained within the Manual. Following calibration, the flow rate through the turbidimeter should be verified to be between 250 – 750 mL/min. The same procedures apply if there is a discrepancy of ± 0.10 NTU, in which case a non-routine/unscheduled calibration may be required. Non-routine calibrations shall be recorded within the section "Other Calibration and Maintenance Activities".

Quarter	Quarter 1 (Jan-Feb-Mar)	Quarter 2 (Apr-May-Jun)	Quarter 3 (Jul-Aug-Sep)	Quarter 4 (Oct-Nov-Dec)
Date (dd/mm)				
Time				
Turbidimeter Body Inspected/Cleaned? (Y/N)				
Photocell Window Inspected? (Y/N)				
User-prepared Calibration Conducted? (Y/N)				
Calibration Accepted? (Y/N)				
Sample Flow Verification? (Y/N, mL/min)				
Operator Initials				
Operations Manager Initials				

Other Calibration and Maintenance Activities

Other Calibration and Maintenance Activities (as required): Additional activities must be recorded below. Such activities may be associated with troubleshooting (section 6), lamp replacement, and non-routine calibrations. Indicate the dates of any other calibration and maintenance activities below so that they may be cross-referenced with logbook entries.

Date (dd/mm)	Time	Initials	Activity

Calibration & Maintenance Record: **Turbidimeter, Filter 3 (Cochenour WTP)** Year: **2022**

Manual: Hach 1720D Low Range Process Turbidimeter

Comparative Checks

Comparative Checks: Comparative checks involve comparing the reading of the analyzer to a grab sample result. Such comparisons shall be completed on a routine basis as a component of routine operational checks, and shall be recorded within the daily operational spreadsheets. A calibration is necessary if the check reveals a discrepancy of ± 0.10 NTU between measured and actual values. Such calibrations would generally involve the User-prepared Calibration Procedure (section 3.2.2 of the User Manual), and these calibrations would be considered non-routine/unscheduled. Unscheduled calibrations shall be recorded within the section "Other Calibration and Maintenance Activities", while routine/scheduled calibrations shall be recorded within the section "Inspection, Cleaning, and Calibration".

Inspection, Cleaning and Calibration

Inspection, Cleaning, and Calibration (routinely every quarter, or if there is a discrepancy of ± 0.10 NTU): The photocell window shall be inspected and the turbidimeter body and bubble trap shall be cleaned on a quarterly basis (section 5.1.3 of the Manual). Following inspection and cleaning, the unit shall be calibrated in accordance with the User-prepared Calibration Procedure (section 3.2.2 of the Manual). Other calibration methods described within the Manual are also acceptable. Calibration shall adhere to the Calibration guidelines (section 3.1.2) contained within the Manual. Following calibration, the flow rate through the turbidimeter should be verified to be between 250 – 750 mL/min. The same procedures apply if there is a discrepancy of ± 0.10 NTU, in which case a non-routine/unscheduled calibration may be required. Non-routine calibrations shall be recorded within the section "Other Calibration and Maintenance Activities".

Quarter	Quarter 1 (Jan-Feb-Mar)	Quarter 2 (Apr-May-Jun)	Quarter 3 (Jul-Aug-Sep)	Quarter 4 (Oct-Nov-Dec)
Date (dd/mm)				
Time				
Turbidimeter Body Inspected/Cleaned? (Y/N)				
Photocell Window Inspected? (Y/N)				
User-prepared Calibration Conducted? (Y/N)				
Calibration Accepted? (Y/N)				
Sample Flow Verification? (Y/N, mL/min)				
Operator Initials				
Operations Manager Initials				

Other Calibration and Maintenance Activities

Other Calibration and Maintenance Activities (as required): Additional activities must be recorded below. Such activities may be associated with troubleshooting (section 6), lamp replacement, and non-routine calibrations. Indicate the dates of any other calibration and maintenance activities below so that they may be cross-referenced with logbook entries.

Date (dd/mm)	Time	Initials	Activity

Calibration & Maintenance Record: **Turbidimeter, Treated Water (Cochenour WTP)** Year: **2022**

Manual: Hach 1720D Low Range Process Turbidimeter

Comparative Checks

Comparative Checks: Comparative checks involve comparing the reading of the analyzer to a grab sample result. Such comparisons shall be completed on a routine basis as a component of routine operational checks, and shall be recorded within the daily operational spreadsheets. A calibration is necessary if the check reveals a discrepancy of ± 0.10 NTU between measured and actual values. Such calibrations would generally involve the User-prepared Calibration Procedure (section 3.2.2 of the User Manual), and these calibrations would be considered non-routine/unscheduled. Unscheduled calibrations shall be recorded within the section "Other Calibration and Maintenance Activities", while routine/scheduled calibrations shall be recorded within the section "Inspection, Cleaning, and Calibration".

Inspection, Cleaning and Calibration

Inspection, Cleaning, and Calibration (routinely every quarter, or if there is a discrepancy of ± 0.10 NTU): The photocell window shall be inspected and the turbidimeter body and bubble trap shall be cleaned on a quarterly basis (section 5.1.3 of the Manual). Following inspection and cleaning, the unit shall be calibrated in accordance with the User-prepared Calibration Procedure (section 3.2.2 of the Manual). Other calibration methods described within the Manual are also acceptable. Calibration shall adhere to the Calibration guidelines (section 3.1.2) contained within the Manual. Following calibration, the flow rate through the turbidimeter should be verified to be between 250 – 750 mL/min. The same procedures apply if there is a discrepancy of ± 0.10 NTU, in which case a non-routine/unscheduled calibration may be required. Non-routine calibrations shall be recorded within the section "Other Calibration and Maintenance Activities".

Quarter	Quarter 1 (Jan-Feb-Mar)	Quarter 2 (Apr-May-Jun)	Quarter 3 (Jul-Aug-Sep)	Quarter 4 (Oct-Nov-Dec)
Date (dd/mm)				
Time				
Turbidimeter Body Inspected/Cleaned? (Y/N)				
Photocell Window Inspected? (Y/N)				
User-prepared Calibration Conducted? (Y/N)				
Calibration Accepted? (Y/N)				
Sample Flow Verification? (Y/N, mL/min)				
Operator Initials				
Operations Manager Initials				

Other Calibration and Maintenance Activities

Other Calibration and Maintenance Activities (as required): Additional activities must be recorded below. Such activities may be associated with troubleshooting (section 6), lamp replacement, and non-routine calibrations. Indicate the dates of any other calibration and maintenance activities below so that they may be cross-referenced with logbook entries.

Date (dd/mm)	Time	Initials	Activity

Calibration & Maintenance Record: **pH/Free Chlorine Residual Analyzer, Treated Water (Cochenour WTP)** Year: **2022**

Manual: Depolox 3 Plus Residual Analyzer

Leak Detection, Grit Quantity and Comparative Checks

Leak Detection, Grit Quantity, and Comparative Checks (daily): Each day the unit shall be checked for leaks and a comparison between measured and displayed results shall be conducted. With the sample water turned on, the unit should be checked to ensure that there is sufficient grit in the measuring cell block to keep the electrode clean. These checks correspond with the daily and weekly checks contained within section 4.2.1 (Maintenance) of the User Manual.

Comparative checks involve comparing the reading of the analyzer to a grab sample result. Such comparisons shall be completed as a component of routine operational checks (as per the required frequency of water quality testing), and shall be recorded within the daily operational spreadsheets. The chlorine sensor shall be calibrated if there is a discrepancy of ± 0.05 mg/L between actual and measured values for residuals less than or equal to 1.00 mg/L, or ± 5% between the actual and measured values for residuals greater than 1.00 mg/L. Record all calibrations in the section "Chlorine Sensor Calibrations".

pH Probe Cleaning & Calibration

pH Probe Cleaning & Calibration (monthly): The pH probe shall be cleaned and calibrated according to section 4.3.2 (Maintaining pH Electrode) of the User Manual. Verify the accuracy of the displayed pH value and proceed to conduct the pH offset calibration as required. Conduct the zero and span calibrations only if there was a problem after conducting the offset. Perform pH electrode calibrations in accordance with section 3.2.3 (pH Calibration) of the User Manual. pH probe calibration should occur after any relevant checks, but prior to any calibration of the chlorine sensor. Unscheduled calibrations, such as those associated with the calibration of the chlorine sensor, shall be recorded elsewhere (see "Chlorine Sensor Calibrations").

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Day												
Time												
pH Probe Cleaned? (Y/N)												
pH Buffer Solutions Satisfactory? (Y/N)												
pH Value Verified? (Y/N)												
pH Offset Calibration Conducted? (Y/N)												
pH Zero and Span Calibration Conducted? (Y/N)												
Operator Initials												
Operations Manager Initials												

Chlorine Analyzer Checks & Electrolyte Replacement

Zero Point Check, Electrolyte Level Check, Grit Replacement, Membrane Inspection, & Flow Block Cleaning (bimonthly): Every two months the zero point shall be checked to ensure no drift has occurred. The potassium chloride electrolyte level must also be checked and topped up if necessary. Grit replacement must be conducted every two months, in addition to performing an inspection of the two porous membranes. Altogether, these checks correspond with the bimonthly checks indicated in section 4.2.1 (Maintenance) of the User Manual. Additionally, the flow block assembly shall be cleaned. Record any subsequent calibrations within the section entitled "Chlorine Sensor Calibrations".

Electrolyte Replacement (semi-annually): Every 6 months the reference electrolyte shall be replaced in accordance with the procedure indicated for semi-annual checks within section 4.2.1 (Maintenance) of the User Manual. **IMPORTANT NOTE:** Electrolyte replacement should be performed at the same time as a bimonthly check, such that electrolyte replacement would occur coincident with grit replacement and a check of the condition of the porous membranes.

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Day	24-FEB-2022											
Time	13:12											
Zero Point Value (i.e. – 0.01 mg/L)	0.00											
Electrolyte Level/Membranes Checked? (Y/N)	Y											
Electrolyte Added? (Y/N)	NR											
Membranes Require Replacement? (Y/N)	NR											
Grit Replacement Conducted? (Y/N)	Y											
Flow Block Assembly Cleaned? (Y/N)	Y											
Electrolyte Replacement Conducted? (Y/N)	**EVERY 6 MONTHS:**						**EVERY 6 MONTHS:**					
Operator Initials	BB											
Operations Manager Initials												

Chlorine Sensor Calibrations

Chlorine Sensor Calibrations (as required): The chlorine sensor shall be calibrated if there is a discrepancy of ± 0.05 mg/L between actual and measured values for residuals less than or equal to 1.00 mg/L, or ± 5% between the actual and measured values for residuals greater than 1.00 mg/L. Calibration of the chlorine sensor is also required after performing certain maintenance activities, such as electrolyte, grit, and membrane replacements. Calibrating the chlorine sensor may require performing zero and/or span calibrations, in accordance with section 3.2.1 (Free Chlorine Bare Electrode Calibration) of the User Manual. Contact Compliance if additional space is required to record chlorine sensor calibrations.

Date (dd/mm)	03/01	05/01	08/01	05/02	05/02	06/02	17/02	24/02	24/02	10/03		
Time	10:38	11:03	10:14	17:28	17:36	15:17	12:22	13:13	13:39	12:23		
pH Value Verified/Calibrated? (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
pH Offset Value Before Calibration	N	N	N	N	0.10	N	N	N	N	-0.20		
pH Offset Value After Calibration (if Cal. Completed)	N	N	N	N	-0.20	N	N	N	N	0.05		
Zero Calibration Conducted? (Y/N)	N	N	N	N	N	N	N	Y	N	N		
Confirm flow to analyzer is off if a zero calibration/check was conducted? (Y/N)	N	N	N	N	N	N	N	Y	N	N		
Span Calibration Conducted? (Y/N)	Y	Y	Y	Y	Y	Y	Y	N	Y	Y		
Displayed Result before Calibration (mg/L)	1.91	1.96	1.89	1.64	0.98	1.44	1.86	1.88	1.90	2.12		
Displayed Result after Calibration (mg/L)	2.00	1.77	1.96	1.26	1.26	1.60	1.98	1.90	1.80	1.85		
Calibration maintenance related? (Y/N)	N	N	N	N	N	N	N	Y	N	N		
Operator Initials	BB	BB	BB	BB	BB	BB	BB	BB	BB	BB		
Date (dd/mm)												
Time												
pH Value Verified/Calibrated? (Y/N)												
pH Offset Value Before Calibration												
pH Offset Value After Calibration (if Cal. Completed)												
Zero Calibration Conducted? (Y/N)												

Confirm flow to analyzer is off if a zero calibration/check was conducted? (Y/N)												
Span Calibration Conducted? (Y/N)												
Displayed Result before Calibration (mg/L)												
Displayed Result after Calibration (mg/L)												
Calibration maintenance related? (Y/N)												
Operator Initials												
Date (dd/mm)												
Time												
pH Value Verified/Calibrated? (Y/N)												
pH Offset Value Before Calibration												
pH Offset Value After Calibration (if Cal. Completed)												
Zero Calibration Conducted? (Y/N)												
Confirm flow to analyzer is off if a zero calibration/check was conducted? (Y/N)												
Span Calibration Conducted? (Y/N)												
Displayed Result before Calibration (mg/L)												
Displayed Result after Calibration (mg/L)												
Calibration maintenance related? (Y/N)												
Operator Initials												
Date (dd/mm)												
Time												
pH Value Verified/Calibrated? (Y/N)												
pH Offset Value Before Calibration												
pH Offset Value After Calibration (if Cal. Completed)												
Zero Calibration Conducted? (Y/N)												
Confirm flow to analyzer is off if a zero calibration/check was conducted? (Y/N)												
Span Calibration Conducted? (Y/N)												
Displayed Result before Calibration (mg/L)												
Displayed Result after Calibration (mg/L)												
Calibration maintenance related? (Y/N)												
Operator Initials												
Date (dd/mm)												
Time												
pH Value Verified/Calibrated? (Y/N)												
pH Offset Value Before Calibration												
pH Offset Value After Calibration (if Cal. Completed)												
Zero Calibration Conducted? (Y/N)												
Confirm flow to analyzer is off if a zero calibration/check was conducted? (Y/N)												
Span Calibration Conducted? (Y/N)												
Displayed Result before Calibration (mg/L)												
Displayed Result after Calibration (mg/L)												
Calibration maintenance related? (Y/N)												
Operator Initials												
Date (dd/mm)												
Time												
pH Value Verified/Calibrated? (Y/N)												
pH Offset Value Before Calibration												
pH Offset Value After Calibration (if Cal. Completed)												
Zero Calibration Conducted? (Y/N)												
Confirm flow to analyzer is off if a zero calibration/check was conducted? (Y/N)												
Span Calibration Conducted? (Y/N)												
Displayed Result before Calibration (mg/L)												
Displayed Result after Calibration (mg/L)												
Calibration maintenance related? (Y/N)												
Operator Initials												
Date (dd/mm)												
Time												
pH Value Verified/Calibrated? (Y/N)												
pH Offset Value Before Calibration												
pH Offset Value After Calibration (if Cal. Completed)												
Zero Calibration Conducted? (Y/N)												
Confirm flow to analyzer is off if a zero calibration/check was conducted? (Y/N)												
Span Calibration Conducted? (Y/N)												
Displayed Result before Calibration (mg/L)												
Displayed Result after Calibration (mg/L)												
Calibration maintenance related? (Y/N)												
Operator Initials												
Date (dd/mm)												
Time												

pH Value Verified/Calibrated? (Y/N)												
pH Offset Value Before Calibration												
pH Offset Value After Calibration (if Cal. Completed)												
Zero Calibration Conducted? (Y/N)												
Confirm flow to analyzer is off if a zero calibration/check was conducted? (Y/N)												
Span Calibration Conducted? (Y/N)												
Displayed Result before Calibration (mg/L)												
Displayed Result after Calibration (mg/L)												
Calibration maintenance related? (Y/N)												
Operator Initials												
Date (dd/mm)												
Time												
pH Value Verified/Calibrated? (Y/N)												
pH Offset Value Before Calibration												
pH Offset Value After Calibration (if Cal. Completed)												
Zero Calibration Conducted? (Y/N)												
Confirm flow to analyzer is off if a zero calibration/check was conducted? (Y/N)												
Span Calibration Conducted? (Y/N)												
Displayed Result before Calibration (mg/L)												
Displayed Result after Calibration (mg/L)												
Calibration maintenance related? (Y/N)												
Operator Initials												
Date (dd/mm)												
Time												
pH Value Verified/Calibrated? (Y/N)												
pH Offset Value Before Calibration												
pH Offset Value After Calibration (if Cal. Completed)												
Zero Calibration Conducted? (Y/N)												
Confirm flow to analyzer is off if a zero calibration/check was conducted? (Y/N)												
Span Calibration Conducted? (Y/N)												
Displayed Result before Calibration (mg/L)												
Displayed Result after Calibration (mg/L)												
Calibration maintenance related? (Y/N)												
Operator Initials												

Other Maintenance Activities

Other Maintenance Activities (as required): Additional activities shall be recorded below. Provide such details below so that they may be cross-referenced with logbook entries. Such activities may be associated with chlorine electrode replacement, replacement of the porous membranes, and troubleshooting. Refer to the User Manual for more information. **Note:** Membranes can have a life up to 3 years of continuous use, but should be replaced whenever they begin to discolour.

Date (dd/mm)	Time	Initials	Activity

Calibration & Maintenance Record: **Free Chlorine Residual Analyzer, Treated Water (Balmertown RPS)** Year: **2022**

Manual: Depolox 3 Plus Residual Analyzer

Leak Detection, Grit Quantity and Comparative Checks

Leak Detection, Grit Quantity, and Comparative Checks (daily): Each day the unit shall be checked for leaks and a comparison between measured and displayed results shall be conducted. With the sample water turned on, the unit should be checked to ensure that there is sufficient grit in the measuring cell block to keep the electrode clean. These checks correspond with the daily and weekly checks contained within section 4.2.1 (Maintenance) of the User Manual.

Comparative checks involve comparing the reading of the analyzer to a grab sample result. Such comparisons shall be completed as a component of routine operational checks (as per the required frequency of water quality testing), and shall be recorded within the daily operational spreadsheets. The chlorine sensor shall be calibrated if there is a discrepancy of ± 0.05 mg/L between actual and measured values for residuals less than or equal to 1.00 mg/L, or ± 5% between the actual and measured values for residuals greater than 1.00 mg/L. Record all calibrations in the section "Chlorine Sensor Calibrations".

Chlorine Analyzer Checks & Electrolyte Replacement

Zero Point Check, Electrolyte Level Check, Grit Replacement, Membrane Inspection, & Flow Block Cleaning (bimonthly): Every two months the zero point shall be checked to ensure no drift has occurred. The potassium chloride electrolyte level must also be checked and topped up if necessary. Grit replacement must be conducted every two months, in addition to performing an inspection of the two porous membranes. Altogether, these checks correspond with the bimonthly checks indicated in section 4.2.1 (Maintenance) of the User Manual. Additionally, the flow block assembly shall be cleaned. Record any subsequent calibrations within the section entitled "Chlorine Sensor Calibrations".

Electrolyte Replacement (semi-annually): Every 6 months the reference electrolyte shall be replaced in accordance with the procedure indicated for semi-annual checks within section 4.2.1 (Maintenance) of the User Manual. **IMPORTANT NOTE:** Electrolyte replacement should be performed at the same time as a bimonthly check, such that electrolyte replacement would occur coincident with grit replacement and a check of the condition of the porous membranes.

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Day												
Time												
Zero Point Value (i.e. – 0.01 mg/L)												
Electrolyte Level/Membranes Checked? (Y/N)												
Electrolyte Added? (Y/N)												
Membranes Require Replacement? (Y/N)												
Grit Replacement Conducted? (Y/N)												
Flow Block Assembly Cleaned? (Y/N)												
Electrolyte Replacement Conducted? (Y/N)	**EVERY 6 MONTHS:**						**EVERY 6 MONTHS:**					
Operator Initials												
Operations Manager Initials												

Chlorine Sensor Calibrations

Chlorine Sensor Calibrations (as required): The chlorine sensor shall be calibrated if there is a discrepancy of ± 0.05 mg/L between actual and measured values for residuals less than or equal to 1.00 mg/L, or ± 5% between the actual and measured values for residuals greater than 1.00 mg/L. Calibration of the chlorine sensor is also required after performing certain maintenance activities, such as electrolyte, grit, and membrane replacements. Calibrating the chlorine sensor may require performing zero and/or span calibrations, in accordance with section 3.2.1 (Free Chlorine Bare Electrode Calibration) of the User Manual. Contact Compliance if additional space is required to record chlorine sensor calibrations.

Date (dd/mm)												
Time												
Zero Calibration Conducted? (Y/N)												
Confirm flow to analyzer is off if a zero calibration/check was conducted? (Y/N)												
Span Calibration Conducted? (Y/N)												
Displayed Result before Calibration (mg/L)												
Displayed Result after Calibration (mg/L)												
Calibration maintenance related? (Y/N)												
Operator Initials												
Date (dd/mm)												
Time												
Zero Calibration Conducted? (Y/N)												
Confirm flow to analyzer is off if a zero calibration/check was conducted? (Y/N)												
Span Calibration Conducted? (Y/N)												
Displayed Result before Calibration (mg/L)												
Displayed Result after Calibration (mg/L)												
Calibration maintenance related? (Y/N)												
Operator Initials												
Date (dd/mm)												
Time												
Zero Calibration Conducted? (Y/N)												
Confirm flow to analyzer is off if a zero calibration/check was conducted? (Y/N)												
Span Calibration Conducted? (Y/N)												
Displayed Result before Calibration (mg/L)												
Displayed Result after Calibration (mg/L)												
Calibration maintenance related? (Y/N)												
Operator Initials												
Date (dd/mm)												
Time												
Zero Calibration Conducted? (Y/N)												
Confirm flow to analyzer is off if a zero calibration/check was conducted? (Y/N)												
Span Calibration Conducted? (Y/N)												
Displayed Result before Calibration (mg/L)												

Displayed Result after Calibration (mg/L)												
Calibration maintenance related? (Y/N)												
Operator Initials												
Date (dd/mm)												
Time												
Zero Calibration Conducted? (Y/N)												
Confirm flow to analyzer is off if a zero calibration/check was conducted? (Y/N)												
Span Calibration Conducted? (Y/N)												
Displayed Result before Calibration (mg/L)												
Displayed Result after Calibration (mg/L)												
Calibration maintenance related? (Y/N)												
Operator Initials												
Date (dd/mm)												
Time												
Zero Calibration Conducted? (Y/N)												
Confirm flow to analyzer is off if a zero calibration/check was conducted? (Y/N)												
Span Calibration Conducted? (Y/N)												
Displayed Result before Calibration (mg/L)												
Displayed Result after Calibration (mg/L)												
Calibration maintenance related? (Y/N)												
Operator Initials												
Date (dd/mm)												
Time												
Zero Calibration Conducted? (Y/N)												
Confirm flow to analyzer is off if a zero calibration/check was conducted? (Y/N)												
Span Calibration Conducted? (Y/N)												
Displayed Result before Calibration (mg/L)												
Displayed Result after Calibration (mg/L)												
Calibration maintenance related? (Y/N)												
Operator Initials												

Other Maintenance Activities

Other Maintenance Activities (as required): Additional activities shall be recorded below. Provide such details below so that they may be cross-referenced with logbook entries. Such activities may be associated with chlorine electrode replacement, replacement of the porous membranes, and troubleshooting. Refer to the User Manual for more information. **Note:** Membranes can have a life up to 3 years of continuous use, but should be replaced whenever they begin to discolour.

Date (dd/mm)	Time	Initials	Activity

Calibration & Maintenance Record: **Hach 2100P Portable Turbidimeter (Cochenour WTP)** Year: **2022**

Manual: Hach 2100P Portable Turbidimeter

Initial Assigned Gelex Values

Initial Assigned Values (Gelex): At the beginning of the year, record the values of the Gelex standards as determined after the most recent calibration from the year before. If the Gelex standards are new, determine the values and record them below.

Standard Information:	Gelex 0 – 10 NTU (Value Assigned Jan. 1):	Gelex 10 – 100 NTU (Value Assigned Jan. 1):	Gelex 100 – 1000 NTU (Value Assigned Jan. 1):
Values:			

Unit Inspection, Cleaning and Calibration Checks

Inspection, Cleaning, and Calibration Checks with Gelex Secondary Standards (monthly): The instrument shall be inspected and cleaned monthly, in accordance with section 4.1 (Cleaning) of the Manual. Gelex secondary standards shall be used for periodic calibration checks in accordance with section 3.6.4.2 (Routine calibration check with Gelex Standards). If the reading is not within 5% of the previously established value, then the instrument must be calibrated with a formazin primary standard in accordance with section 3.6 (Calibration).

Important Note: Gelex standards must be assigned values after a formal calibration and before use as secondary standards, in accordance with section 3.6.4.1 (Assigning values to Gelex standards). When conducting calibration checks, operators are therefore comparing readings to those values that were assigned to the Gelex standards after the most recent calibration. When conducting calibration checks, operators are therefore comparing readings to those values that were assigned to the Gelex standards after the most recent calibration.

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Day												
Time												
Unit Inspected and Exterior Cleaned? (Y/N)												
Gelex 0 – 10 NTU Result												
Gelex 10 – 100 NTU Result												
Gelex 100 – 1000 NTU Result												
Calibration Check Passed? (Y/N) **(readings within 5% of previously measured values – measured directly after the most recent calibration)**												
Operator Initials												
Operations Manager Initials												

Calibration

Calibration with StablCal Standards (quarterly, or when there is a discrepancy of 5% respecting secondary standards): A formazin calibration shall be performed every three months in accordance with section 3.6.3 (Calibrating the turbidimeter). StablCal standards typically include <0.1, 20, 100, and 800 NTU primary standards. The Manual contains information about how to store, handle, and prepare these standards. It is not necessary to conduct a routine quarterly calibration if a calibration has already been conducted within the quarter. Assign new values to the Gelex standards following calibration. For months in which a calibration is conducted, attempt to stagger the calibration and the monthly calibration check (i.e. calibrate the instrument on the first of the month, and perform the calibration check in the middle of the month).

Quarter	Quarter 1 (Jan-Feb-Mar)	Quarter 2 (Apr-May-Jun)	Quarter 3 (Jul-Aug-Sep)	Quarter 4 (Oct-Nov-Dec)
Date (dd/mm)				
Time				
StablCal Calibration Conducted? (Y/N) (using <0.1, 20, 100 and 800 NTU primary standards)				
New Gelex 0 – 10 Assigned Value				
New Gelex 10 – 100 Assigned Value				
New Gelex 100 – 1000 Assigned Value				
Operator Initials				
Operations Manager Initials				

Other Calibration and Maintenance Activities

Other Calibration and Maintenance Activities (as required): Additional activities shall be recorded below. Such maintenance may be associated with lamp replacement or troubleshooting. Indicate the dates of any other calibration/maintenance activities below so that they may be cross-referenced with logbook entries.

Date (dd/mm)	Time	Initials	Activity

Calibration & Maintenance Record: **Real Tech UV254 Field Meter (Cochenour WTP)**	Year: **2022**
Manual:	**Real Tech UV254 Field Meter (refer to instructions printed on unit)**

Calibration

Calibration (as required): The field meter shall be calibrated as required as per the instructions printed on the unit (and repeated below). For best results the unit should be recalibrated frequently. Printed on the unit are several important operational guidelines that should be followed during the calibration and operation of the unit.

Calibration instructions:

1. Press POWER to turn on. After a short warm-up time the display will read ***Ready.***
2. Always rinse cuvettes at least twice before calibration.
3. Ensure cuvette is not in the test chamber, then press CALIBRATE. The display will read ***Insert Cuvette with DI Water.***
4. Insert the cuvette containing DI water. Display will read ***100.0*** when in UVT mode or ***0.000*** when in UVA mode.
5. Remove the cuvette containing the DI water from the test chamber. The meter is now calibrated.

Date (dd/mm)						
Time						
DI UVT Reading before Calibration						
DI Calibration Conducted? (Y/N)						
DI UVT Reading after Calibration (must be between 99.5 - 100.5)						
Operator Initials						
Date (dd/mm)						
Time						
DI UVT Reading before Calibration						
DI Calibration Conducted? (Y/N)						
DI UVT Reading after Calibration (must be between 99.5 - 100.5)						
Operator Initials						
Date (dd/mm)						
Time						
DI UVT Reading before Calibration						
DI Calibration Conducted? (Y/N)						
DI UVT Reading after Calibration (must be between 99.5 - 100.5)						
Operator Initials						
Date (dd/mm)						
Time						
DI UVT Reading before Calibration						
DI Calibration Conducted? (Y/N)						
DI UVT Reading after Calibration (must be between 99.5 - 100.5)						
Operator Initials						

Other Maintenance Activities

Other Maintenance Activities (as required): Additional activities shall be recorded below. Such activities may be associated with troubleshooting or non-routine maintenance. Indicate the dates of any other maintenance activities below so that they may be cross-referenced with logbook entries.

Date (dd/mm)	Time	Initials	Activity

Calibration & Maintenance Record: **Hach DR/2500 Laboratory Spectrophotometer (Cochenour WTP)** Year: **2022**

Manual: Hach DR/2500 Laboratory Spectrophotometer

Control Values and Tolerance Ranges

Control Values and Tolerance Ranges: Record standard values and tolerance ranges in the fields below. Standards pertain to the DR/Check Absorbance Secondary Standards and the DPD Chlorine-LR Secondary Standards. Enough fields have been provided to record up to two (2) different sets of standards in a calendar year (i.e. to be used after a set of secondary standards expires).

Standard Information	Set 1			Set 2		
	Standard 1 (Low)	Standard 2 (Middle)	Standard 3 (High)	Standard 1 (Low)	Standard 2 (Middle)	Standard 3 (High)
Date ABS Standards Placed Into Service:						
420 nm (ABS) Value:						
520 nm (ABS) Value:						
560 nm (ABS) Value:						
610 nm (ABS) Value:						
Date DPD Chlorine-LR Standards Placed Into Service:						
DPD Chlorine-LR:						

Unit Inspection, Cleaning and Quality Assurance

Inspection & Cleaning (quarterly): The unit shall be inspected and cleaned quarterly. Refer to section 12.2 (Cleaning the instrument) of the User Manual.

Quality Assurance with Absorbance & DPD-Chlorine LR Secondary Standards (quarterly): Instrument performance shall be verified quarterly using the DR/Check Absorbance Secondary Standards Kit. Refer to section 1.8 (Using DR/Check Absorbance Standards) of the User Manual for more information. This kit includes standards for low-, mid-, and high range absorbance values from 0 to 2 ABS. The values of the standards must be determined at different wavelengths, whereby consistent instrument performance is indicated if the values are within documented tolerance ranges. Instrument performance shall also be verified quarterly by using SpecCheck DPD-Chlorine LR standards.

Quarter	Quarter 1 (Jan-Feb-Mar)	Quarter 2 (Apr-May-Jun)	Quarter 3 (Jul-Aug-Sep)	Quarter 4 (Oct-Nov-Dec)
Date (dd/mm)				
Time				
Unit Inspected & Cleaned? (Y/N)				
420 nm ABS Readings (STD 1/STD 2/STD 3)				
520 nm ABS Readings (STD 1/STD 2/STD 3)				
560 nm ABS Readings (STD 1/STD 2/STD 3)				
610 nm ABS Readings (STD 1/STD 2/STD 3)				
Absorbance Readings Within Range? (Y/N)				
DPD-Chlorine LR Readings (STD 1/STD 2/STD 3)				
DPD-Chlorine LR Readings Acceptable? (Y/N)				
Operator Initials				
Operations Manager Initials				

Other Calibration and Maintenance Activities

Other Calibration and Maintenance Activities (as required): Additional activities must be recorded below. Such activities may include replacing of the illuminator module (section 12.3), troubleshooting (section 14), or replacing the relevant secondary standards. Refer to the User Manual for more information. Indicate the dates of any other calibration and maintenance activities below so that they may be cross-referenced with logbook entries.

Date (dd/mm)	Time	Initials	Activity

Calibration & Maintenance Record: **Hach 2100P Portable Turbidimeter (Balmertown RPS)** Year: **2022**

Manual: Hach 2100P Portable Turbidimeter

Initial Assigned Gelex Values

Initial Assigned Values (Gelex): At the beginning of the year, record the values of the Gelex standards as determined after the most recent calibration from the year before. If the Gelex standards are new, determine the values and record them below.

Standard Information:	Gelex 0 – 10 NTU (Value Assigned Jan. 1):	Gelex 10 – 100 NTU (Value Assigned Jan. 1):	Gelex 100 – 1000 NTU (Value Assigned Jan. 1):
Values:			

Unit Inspection, Cleaning and Calibration Checks

Inspection, Cleaning, and Calibration Checks with Gelex Secondary Standards (monthly): The instrument shall be inspected and cleaned monthly, in accordance with section 4.1 (Cleaning) of the Manual. Gelex secondary standards shall be used for periodic calibration checks in accordance with section 3.6.4.2 (Routine calibration check with Gelex Standards). If the reading is not within 5% of the previously established value, then the instrument must be calibrated with a formazin primary standard in accordance with section 3.6 (Calibration).

Important Note: Gelex standards must be assigned values after a formal calibration and before use as secondary standards, in accordance with section 3.6.4.1 (Assigning values to Gelex standards). When conducting calibration checks, operators are therefore comparing readings to those values that were assigned to the Gelex standards after the most recent calibration. When conducting calibration checks, operators are therefore comparing readings to those values that were assigned to the Gelex standards after the most recent calibration.

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Day												
Time												
Unit Inspected and Exterior Cleaned? (Y/N)												
Gelex 0 – 10 NTU Result												
Gelex 10 – 100 NTU Result												
Gelex 100 – 1000 NTU Result												
Calibration Check Passed? (Y/N) **(readings within 5% of previously measured values – measured directly after the most recent calibration)**												
Operator Initials												
Operations Manager Initials												

Calibration

Calibration with StablCal Standards (quarterly, or when there is a discrepancy of 5% respecting secondary standards): A formazin calibration shall be performed every three months in accordance with section 3.6.3 (Calibrating the turbidimeter). StablCal standards typically include <0.1, 20, 100, and 800 NTU primary standards. The Manual contains information about how to store, handle, and prepare these standards. It is not necessary to conduct a routine quarterly calibration if a calibration has already been conducted within the quarter. Assign new values to the Gelex standards following calibration. For months in which a calibration is conducted, attempt to stagger the calibration and the monthly calibration check (i.e. calibrate the instrument on the first of the month, and perform the calibration check in the middle of the month).

Quarter	Quarter 1 (Jan-Feb-Mar)	Quarter 2 (Apr-May-Jun)	Quarter 3 (Jul-Aug-Sep)	Quarter 4 (Oct-Nov-Dec)
Date (dd/mm)				
Time				
StablCal Calibration Conducted? (Y/N) (using <0.1, 20, 100 and 800 NTU primary standards)				
New Gelex 0 – 10 Assigned Value				
New Gelex 10 – 100 Assigned Value				
New Gelex 100 – 1000 Assigned Value				
Operator Initials				
Operations Manager Initials				

Other Calibration and Maintenance Activities

Other Calibration and Maintenance Activities (as required): Additional activities shall be recorded below. Such maintenance may be associated with lamp replacement or troubleshooting. Indicate the dates of any other calibration/maintenance activities below so that they may be cross-referenced with logbook entries.

Date (dd/mm)	Time	Initials	Activity

Calibration & Maintenance Record: **Hach DR300 Pocket Chlorine Colorimeter (Balmertown RPS)** Year: **2022**

Manual: Hach DR300 Pocket Colorimeter, Chlorine

Control Values and Tolerance Ranges

Control Values and Tolerance Ranges: Record standard values and tolerance ranges in the fields below. Standards pertain to SpecCheck DPD-Chlorine LR Secondary Standards. Enough fields have been provided to record up to three (3) different sets of standards in a calendar year (i.e. to be used after a set of secondary standards expires).

Standard Information	Set 1	Set 2	Set 3
Date Standards Placed Into Service:			
Values for Standard 1:			
Values for Standard 2:			
Values for Standard 3:			

Unit Inspection, Cleaning and Quality Assurance

Inspection & Cleaning (monthly): The unit shall be inspected and cleaned monthly.

Quality Assurance with Low Range DPD-Chlorine SpecCheck Secondary Standards (monthly): Instrument performance shall be verified monthly by using SpecCheck DPD-Chlorine LR standards. Standards exist each for a low, middle, and high value. The values of the standards must be determined, whereby consistent instrument performance is indicated if the values are within documented tolerance ranges. Never use secondary standards to calibrate the instrument.

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Day												
Time												
Unit Inspected & Cleaned? (Y/N)												
STD 1 DPD-Chlorine LR Reading												
STD 2 DPD-Chlorine LR Reading												
STD 3 DPD-Chlorine LR Reading												
Readings Within Range? (Y/N)												
Operator Initials												
Operations Manager Initials												

Calibration and Other Maintenance Activities

Calibration (only as required): Calibration is indicated if quality assurance reveals inconsistent instrument operation. Refer to the Instrument Manual for more information.

Other Maintenance Activities (as required): Additional activities must be recorded below. Provide such details below so that they may be cross-referenced with logbook entries. Such activities may include replacing batteries or other components, or replacing the SpecCheck Secondary Standards. Refer to the Instruction Manual for more information.

Date (dd/mm)	Time	Initials	Activity

Calibration & Maintenance Record: **Hach Pocket Colorimeter II - Chlorine (Field Unit)** Year: **2022**

Manual: Hach Pocket Colorimeter II - Chlorine

Control Values and Tolerance Ranges

Control Values and Tolerance Ranges: Record standard values and tolerance ranges in the fields below. Standards pertain to SpecCheck DPD-Chlorine LR Secondary Standards. Enough fields have been provided to record up to three (3) different sets of standards in a calendar year (i.e. to be used after a set of secondary standards expires).

Standard Information	Set 1	Set 2	Set 3
Date Standards Placed Into Service:			
Values for Standard 1:			
Values for Standard 2:			
Values for Standard 3:			

Unit Inspection, Cleaning and Quality Assurance

Inspection & Cleaning (monthly): The unit shall be inspected and cleaned monthly.

Quality Assurance with Low Range DPD-Chlorine SpecCheck Secondary Standards (monthly): Instrument performance shall be verified monthly by using SpecCheck DPD-Chlorine LR standards. Standards exist each for a low, middle, and high value. The values of the standards must be determined, whereby consistent instrument performance is indicated if the values are within documented tolerance ranges. Never use secondary standards to calibrate the instrument.

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Day												
Time												
Unit Inspected & Cleaned? (Y/N)												
STD 1 DPD-Chlorine LR Reading												
STD 2 DPD-Chlorine LR Reading												
STD 3 DPD-Chlorine LR Reading												
Readings Within Range? (Y/N)												
Operator Initials												
Operations Manager Initials												

Calibration and Other Maintenance Activities

Calibration (only as required): Calibration is indicated if quality assurance reveals inconsistent instrument operation. Refer to the Instrument Manual for more information.

Other Maintenance Activities (as required): Additional activities must be recorded below. Provide such details below so that they may be cross-referenced with logbook entries. Such activities may include replacing batteries or other components, or replacing the SpecCheck Secondary Standards. Refer to the Instruction Manual for more information.

Date (dd/mm)	Time	Initials	Activity

Revision History

Date	Rev#	Comments
20/Jan/2015	1	Initial publication as a controlled procedure.
10/Dec/2015	2	Annual review and update.
17/Dec/2016	3	Annual review and update.
01/Dec/2017	4	Annual review and update.
21/Dec/2018	5	Annual review and update.
20/Dec/2019	6	Annual review and update.
01/Dec/2020	7	Annual review and update.
28/Dec/2021	8	Annual review and update.

Maintenance Record: **Maintenance Assignments - BCMI Drinking Water System & Cochenour Sewage Lagoon** Year: **2022**

Instructions: Use this record to track the progress completed toward maintenance assignments. The Operations Manager or Senior Operator may assign tasks associated with infrastructure maintenance, rehabilitation or renewal; tasks may be associated with various capital and noncapital projects.

Task:	Date Assigned:	Date Due:	Assigned To:	Status:

Maintenance Record: **Comments** Year: **2022**

Instructions: As per section 3.8 (Using the *Comments* Record) of the procedure: In addition to being used to provide explanations about incomplete maintenance activities as per section 3.5 and to record deficiencies as per section 3.7, the Comments record shall be used to record 1) observations about a specific piece of equipment or maintenance task, 2) suggested or implemented modifications to an existing planned maintenance activity, and 3) suggested new planned maintenance activities. All information recorded in the Comments record will be considered during the annual program review described in section 3.11.

Date	Operator Initials	Comment	ORO/Operations Manager/Senior Operator Initials
27-01-2022	BB	For the month of January Flushing and chemical pump maintance not completed (Also not required) as it's a two person job and operator on COVID-19 proticall.	

Maintenance Record: **Administrative Tasks & Major Maintenance**													Year: **2022**
MAINTENANCE ACTIVITY	**FREQUENCY**	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**
ADMINISTRATIVE TASKS													
Verify that there are no alarm transmission delays on the regulatory alarms pertaining to filtrate turbidity and the treated water free chlorine residual - includes Cochenour WTP and Balmertown RPS Regulatory alarms must be transmitted immediately with no delay (10 second delay not acceptable)	**MONTHLY**	27/BB	28/BB										
Complete and submit previous month's S1/S2 form for Cochenour Lagoon		NK?	NK?	NK?									
Verify collection of decant TSS sample (Cochenour WTP)		18/CL	15/BB	16/BB									
Verify collection of monthly wastewater sample (Cochenour Lagoon)		12/BB	09/BB	09/BB									
Verify completion of calibration and maintenance records (Cochenour WTP)		27/BB	24/BB										
Verify completion of calibration and maintenance records (Balmertown RPS)		27/BB	28/BB										
Prepare and submit previous month's operations report		04/BB	NK?	NK?									
Mix new pH buffer solutions		04/BB	28/BB	22/BB									
Ensure availability of PPE, cleaning supplies, reagents, etc., and order as required		04/BB	09/BB	04/BB									
Check expiry dates and integrity of all **primary/secondary standards** and **reagents** used for calibration and quality assurance - replace as required **Note: Implement methods to ensure that standards are disposed of on the exact day they expire**	**QUARTERLY**	23-02-2022-BW											
Verify collection of quarterly (nitrate/nitrite/THM/HAA) samples		Feb-16-2022-BB											
Submit water taking data for previous year to WTRS	**ANNUAL**												
THIRD-PARTY & MAJOR MAINTENANCE TASKS													
To ensure the facility can produce water under a sustained high-flow emergency situation, temporarily operate the facility at a production rate that approaches the rated capacity (i.e. produce water at a rate of 65 - 70 L/s for 2 - 3 hours). Record the results of the test in the logbook and correct any deficiencies identified during the test. **Note: Be careful not to exceed the L/min limit provided within the Permit to Take Water.**	**ANNUAL** ***REQUIRED***												
Distribution system flushing and hydrant inspection and maintenance (indicate start and end dates)													
Third-party flow meter calibration verification													
Inspect and clean process wastewater tanks (indicate tank and dates)													
Indicate any and all dates associated with additional planned and unplanned system maintenance tasks, including fire extinguisher servicing, hoist inspections, generator inspection and servicing, thermal imaging inspections, backflow prevention device testing, etc. Add more rows as required.	**AS REQUIRED**	**ACTIVITY:**								**DATE:**			
		ACTIVITY:								**DATE:**			
		ACTIVITY:								**DATE:**			
		ACTIVITY:								**DATE:**			
ORO/Operations Manager/Senior Operator Initials													

Maintenance Record: **Overall Facility Maintenance, Cochenour Sewage Lagoon & Lift Station**														Year: **2022**
MAINTENANCE ACTIVITY		**FREQUENCY**	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**
OVERALL FACILITY MAINTENANCE (COCHENOUR WTP)														
Flush/inspect all emergency eyewash/shower stations	1st Half of Month	**TWICE-MONTHLY**												
	2nd Half of Month													
Inspect all fire extinguishers (check in accordance with printed instructions)		**MONTHLY**												
Inspect SCBA equipment, check air tanks and confirm availability of full spare SCBA tank														
Check/clean/replace overhead/outdoor lights														
Test all emergency lights														
Check operation of building exhaust fans														
Check operation of electric heaters (seasonal)														
Inspect first aid kits and restock as required **(to be completed by certified first aid personnel)**		**QUARTERLY**												
Conduct air swap in SCBA tanks														
Check building floor drains and remove/clean obstructions		**ANNUAL**												
COCHENOUR SEWAGE LAGOON & LIFT STATION														
Perform lagoon inspection during monthly sample collection. Check site security, access, vegetation, rodents, foliage and lagoon discharge pipe, etc.		**MONTHLY**												
Check/clean/replace all indoor/outdoor lights														
Inspect fire extinguisher (check in accordance with printed instructions)														
Perform facility alarm test														
Check operation of electric heaters (seasonal)														
Check valve chamber and dewater as required														
Inspect first aid kits and restock as required **(to be completed by certified first aid personnel)**		**QUARTERLY**												
Indicate date(s) of inspection and cleaning		**AS REQUIRED**												
Indicate date(s) of pump servicing														
ORO/Operations Manager/Senior Operator Initials														

Maintenance Record: **Low Lift Pump House**														Year: **2022**
MAINTENANCE ACTIVITY		**FREQUENCY**	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**
LOW LIFT PUMPS														
LLP-1	Check vibration, noise, heat of motor	**MONTHLY**												
	Check/adjust dripping at packing gland													
	Grease pump packing (1 location, follow tag)													
	Grease motor (2 locations, follow tag)	**SEMI-ANNUAL**												
LLP-2	Check vibration, noise, heat of motor	**MONTHLY**												
	Check/adjust dripping at packing gland													
	Grease pump packing (1 location, follow tag)													
	Grease motor (2 locations, follow tag)	**SEMI-ANNUAL**												
LLP-3	Check vibration, noise, heat of motor	**MONTHLY**												
	Check/adjust dripping at packing gland													
	Grease pump packing (1 location, follow tag)													
	Grease motor (2 locations, follow tag)	**SEMI-ANNUAL**												
OVERALL FACILITY (LLPH)														
Inspect fire extinguishers (check in accordance with printed instructions)		**MONTHLY**												
Verify operation of H/O/A switches														
Check/replace indoor/outdoor lights														
Perform facility alarm test														
Inspect first aid kits and restock as required **(to be completed by certified first aid personnel)**		**QUARTERLY**												
Turn off/on heat trace (off in May; on in October) (2 controllers)		**SEMI-ANNUAL**												
Inspect and clean intake screens		**ANNUAL**												
ORO/Operations Manager/Senior Operator Initials														

Maintenance Record: **Transfer & Backwash Pumps (CWTP)**														Year: **2022**
MAINTENANCE ACTIVITY		**FREQUENCY**	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**
TRANSFER PUMPS														
Verify transfer PRV operation (PRV regulates pressure; will be audible when pumps are offline)		**MONTHLY**												
TRP-501	Check vibration, noise, heat of motor													
	Check/adjust dripping at packing gland													
	Grease pump packing (1 location, follow tag)													
	Grease motor (2 locations, grease according to tag when pump is running)	**SEMI-ANNUAL**												
TRP-502	Check vibration, noise, heat of motor	**MONTHLY**												
	Check/adjust dripping at packing gland													
	Grease pump packing (1 location, follow tag)													
	Grease motor (2 locations, grease according to tag when pump is running)	**SEMI-ANNUAL**												
BACKWASH PUMPS														
BWP-406	Check vibration, noise, heat of motor	**MONTHLY**												
	Check/adjust dripping at packing gland													
	Grease pump packing (1 location, follow tag)													
	Check motor oil level (top bearing)													
	Grease motor (lower bearing, according to tag)	**SEMI-ANNUAL**												
	Indicate motor oil change date(s) and update tag	**AS REQUIRED**												
BWP-407	Check vibration, noise, heat of motor	**MONTHLY**												
	Check/adjust dripping at packing gland													
	Grease pump packing (1 location, follow tag)													
	Check motor oil level (top bearing)													
	Grease motor (lower bearing, according to tag)	**SEMI-ANNUAL**												
	Indicate motor oil change date(s) and update tag	**AS REQUIRED**												
ORO/Operations Manager/Senior Operator Initials														

Maintenance Record: **Chemical Systems (CWTP)** Year: **2022**

MAINTENANCE ACTIVITY				FREQUENCY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
GAS CHLORINATION																
Check rotameter, lines, fittings, regulator and injector for gas leaks using fresh ammonia				MONTHLY												
Check regulator vent for leaks (outside)																
Check cleanliness of rotameter and operation of rotameter ball (i.e. bouncing, stuck, steady, etc.)																
Verify accuracy of actuator with respect to filter flow (calibrate actuator as required)																
Check condition of all cylinders and ensure they are properly tagged/secured																
Check and operate ventilation equipment																
Thoroughly clean chlorine room																
Test chlorine gas alarm, ensure phone call-out, and verify operation of alarm light and audible alarm																
Check operation of room heaters (seasonal)																
Check ammonia and replace if required (indicate if replaced)				QUARTERLY												
Verify cylinder repair kit A availability and completeness				ANNUAL												
Operate chlorine booster pump (2) for 5 minutes (both pumps may be operated at the same time)																
CHEMICAL ROOM (UPSTAIRS)																
Check alum bulk tank levels (minimum tank level is 1/3 of 1 tank) and inspect tank condition				MONTHLY												
Check chemical lines and fittings for leaks																
Clean polymer day mixing tank (as required, typically on a quarterly basis)				QUARTERLY												
Clean polymer sludge mixing tank (as required, typically on a quarterly basis)																
Clean soda ash hopper air filter				ANNUAL												
Clean soda ash (pre) mixing tank (as required, typically on an annual basis)																
CHEMICAL ROOM (DOWNSTAIRS)																
All systems - check all pumps, lines & fittings for leaks and encrustations (detailed inspection)				MONTHLY												
All systems – check pump operation throughout the month and ensure drawdowns match SCADA formulae (mismatches indicate a need for calibration)																
Alum - Test chemical pump flow monitors and plant shutdown																
Soda ash (pre) - Test chemical pump flow monitors and plant shutdown																
CHEMICAL METERING PUMP DUTIES	ALUM	Change chemical metering pump duties	Initial/Date:													
			Drawdown Value before Duty Switch:													
			Indicate New Duty Pump:													
			Drawdown Value after Duty Switch:													
	PRE-SODA	Change chemical metering pump duties	Initial/Date:													
			Drawdown Value before Duty Switch:													
			Indicate New Duty Pump:													
			Drawdown Value after Duty Switch:													
	POST-SODA	Change chemical metering pump duties	Initial/Date:													
			Drawdown Value before Duty Switch:													
			Indicate New Duty Pump:													
			Drawdown Value after Duty Switch:													
FLUSHING	Polymer day – flush system as required (typically quarterly)			AS REQUIRED												
	Polymer sludge – flush system as require (typically quarterly)															
	Alum – flush system as required (typically quarterly)															
	Soda ash (pre) – flush system as required (typically quarterly)															

	Soda ash (post) – flush system as required (typically quarterly)						
TANK CLEANING	Polymer day - clean day tank as required (typically quarterly)						
	Polymer sludge - clean day tank as required (typically quarterly)						
	Alum - clean day tank	QUARTERLY					
	Soda ash (pre) - clean day tank as required (typically annually)	AS REQUIRED					
	Soda ash (post) - clean day tank as required (typically annually)						
	ORO/Operations Manager/Senior Operator Initials						

Maintenance Record: **MCC Room & High Lift Pumps (CWTP)**														Year: **2022**
MAINTENANCE ACTIVITY		**FREQUENCY**	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**
MCC ROOM														
Check operation of climate control unit		**MONTHLY**												
Confirm operation of H/O/A lights throughout the month (do not manually change settings) – MCC Room														
Confirm operation of H/O/A lights throughout the month (do not manually change settings) – Filter PLC														
Check phase indicator module on surge protector (check for three green lights)														
HIGH LIFT PUMPS														
Check operation of HLP air relief valves (accomplished during HLP duty change)		**MONTHLY**												
Test dry contact backup pressure system		**QUARTERLY**												
HLP-1	Check vibration, noise, heat of motor	**MONTHLY**												
	Check/adjust dripping at packing gland													
	Grease pump packing (1 location, follow tag)													
	Grease motor (2 locations, grease according to tag when pump is running)	**SEMI-ANNUAL**												
HLP-2	Indicate if checks were not completed because the pump is assigned as the dedicated backup	**MONTHLY**												
	Check vibration, noise, heat of motor													
	Check/adjust dripping at packing gland													
	Grease pump packing (1 location, follow tag)													
	Grease motor (2 locations, grease according to tag when pump is running)	**SEMI-ANNUAL**												
HLP-3	Check vibration, noise, heat of motor	**MONTHLY**												
	Check/adjust dripping at packing gland													
	Grease pump packing (1 location, follow tag)													
	Grease motor (2 locations, grease according to tag when pump is running)	**SEMI-ANNUAL**												
HLP-4	Indicate if checks were not completed because the pump is assigned as the dedicated backup	**MONTHLY**												
	Check vibration, noise, heat of motor													
	Check/adjust dripping at packing gland													
	Grease pump packing (1 location, follow tag)													
	Grease motor (2 locations, grease according to tag when pump is running)	**SEMI-ANNUAL**												
ORO/Operations Manager/Senior Operator Initials														

Maintenance Record: **Treatment Units, Air Scour and Mechanical Room (CWTP)**														Year: **2022**
MAINTENANCE ACTIVITY		**FREQUENCY**	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**
TREATMENT UNITS														
Inspect splitter box and check for cracks, leaks, etc.		**MONTHLY**												
Check for proper valve operation (do not manually over-torque electric valves)														
Check oil level and condition in all floc drives (involves shutting down floc drives)														
Check floc drive lovejoy connectors for proper adjustment and alignment														
Drain, clean and inspect all flocculation tanks and clarifiers (Indicate the treatment unit and completion date as required)		**AS REQUIRED**												
AIR SCOUR SYSTEM														
ASB-201	Offline - check oil level	**MONTHLY**												
	Offline - check belt conditions and tensions													
	Check for oil/air leaks													
	Check vibration, noise, heat of blower motor													
	Grease blower (2 locations)													
	Indicate oil change date(s) and update tag	**AS REQUIRED**												
ASB-202	Offline - check oil level	**MONTHLY**												
	Offline - check belt conditions and tensions													
	Check for oil/air leaks													
	Check vibration, noise, heat of blower motor													
	Grease blower (2 locations)													
	Indicate oil change date(s) and update tag	**AS REQUIRED**												
BUILDING MECHANICAL ROOM														
Check hot water tank and boiler for leaks, corrosion		**MONTHLY**												
Check duty recirculation pump for vibration, noise, heat (motor), leaks														
Change recirculation pump duties		**QUARTERLY**												
Grease recirculation pump 1 motor (1 location)		**SEMI-ANNUAL**												
Grease recirculation pump 2 motor (1 location)														
Indicate boiler system service date(s)		**AS REQUIRED**												
ORO/Operations Manager/Senior Operator Initials														

Maintenance Record: **Balmertown Reservoir Pumping Station**														Year: **2022**
MAINTENANCE ACTIVITY		**FREQUENCY**	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**
OVERALL FACILITY MAINTENANCE (BALMERTOWN RPS)														
Inspect all fire extinguishers (check in accordance with printed instructions)		**MONTHLY**												
Inspect surge protector (green or red)														
Check/clean/replace overhead/outdoor lights														
Test all emergency lights														
Check operation of building exhaust fans														
Perform facility alarm test														
Check operation of electric heaters (seasonal)														
Check heater, lights, float, and sump pump operation within the incoming valve chamber **(as required - requires confined space entry)**		**AS REQUIRED**												
Inspect first aid kit and restock as required **(to be performed by first aid certified personnel)**		**QUARTERLY**												
FURNACE ROOM														
Check furnace filters and replace as required		**MONTHLY**												
Inspect supply fan belt for wear and alignment														
Inspect circulation fan belt for wear and alignment and grease pillow blocks														
Inspect air conditioner unit outside and clean screen (monthly from May to October)														
Inspect hot water heater for leaks and corrosion														
Indicate boiler system service date(s)		**AS REQUIRED**												
HIGH LIFT PUMPS														
Check pump pressure gauge and compare to digital distribution pressure reading		**MONTHLY**												
Test dry contact backup pressure system		**QUARTERLY**												
HLP-401	Check vibration, noise, heat of motor	**MONTHLY**												
	Check/adjust dripping at packing gland													
	Grease pump packing (1 location, follow tag)													
	Check motor oil level (top bearing)													
	Grease motor (lower bearing, according to tag)	**SEMI-ANNUAL**												
	Indicate motor oil change date(s) and update tag	**AS REQUIRED**												
HLP-402	Indicate if checks were not completed because the pump is assigned as the dedicated backup	**MONTHLY**												
	Check vibration, noise, heat of motor													
	Check/adjust dripping at packing gland													
	Grease pump packing (1 location, follow tag)													
	Check motor oil level (top bearing)													
	Grease motor (lower bearing, according to tag)	**SEMI-ANNUAL**												
	Indicate motor oil change date(s) and update tag	**AS REQUIRED**												
HLP-403	Check vibration, noise, heat of motor	**MONTHLY**												
	Check/adjust dripping at packing gland													
	Grease pump packing (1 location, follow tag)													
	Check motor oil level (top bearing)													
	Grease motor (lower bearing, according to tag)	**SEMI-ANNUAL**												
	Indicate motor oil change date(s) and update tag	**AS REQUIRED**												
HLP-4	Indicate if checks were not completed because the pump is assigned as the dedicated backup	**MONTHLY**												
	Check vibration, noise, heat of motor													

HLP-404	Check/adjust dripping at packing gland	MONTHLY												
	Grease pump packing (1 location, follow tag)													
	Check motor oil level (top bearing)													
	Grease motor (lower bearing, according to tag)	SEMI-ANNUAL												
	Indicate motor oil change date(s) and update tag	AS REQUIRED												
	ORO/Operations Manager/Senior Operator Initials													

Maintenance Record: **Generator - Cochenour Lift Station** Year: **2022**

GENERATOR INSPECTION & OPERATION

Instructions: Complete the following record during monthly generator operation. Note that not all parameters may apply to a given generator; indicate these non-applicable parameters with a dash or with "n/a". Prior to generator operation (1) check coolant level, (2) check oil level and condition, (3) check for fuel and oil leaks, (4) check battery condition and battery charger, (5) check any block heaters, (6) check condition of belts, (7) check fuel level, (8) check for faulty fuel lines and connections, (9) check air filters, etc. Generator operation is not required if the generator has already operated during a power outage within the calendar month. In such cases, some or all operational data may not be recorded.

Month	Day	Operator Initials	Generator ran during power outage (Y/N)?	Start-Up Checks Complete (Y/N)?	Meter Reading Start	Meter Reading Stop	Oil Press.	Oil Temp.	Water Temp.	Check All Voltages (L12/L23/L31/ L1N/L2N/L3N) (Y/N)			Check All Amps (L1/L2/L3) (Y/N)			Freq.	Engine RPM	Batt. Reading	Exhaust Temp.	Load Test Emergency Generator Battery (Quarterly)	Fuel Tank Level	**ORO/Operations Manager/Senior Operator Initials**
JAN																						
FEB																						
MAR																						
APR																						
MAY																						
JUN																						
JUL																						
AUG																						
SEP																						
OCT																						
NOV																						
DEC																						

GENERATOR MAINTENANCE

Instructions: Indicate any additional planned or unplanned maintenance performed, complete with dates (i.e. servicing by subcontractors, oil changes, battery replacement, equipment greasing, etc.)

Date	Operator Initials	Details

Maintenance Record: **Generator - Cochenour Water Treatment Plant** Year: **2022**

GENERATOR INSPECTION & OPERATION

Instructions: Complete the following record during monthly generator operation. Note that not all parameters may apply to a given generator; indicate these non-applicable parameters with a dash or with "n/a". Prior to generator operation (1) check coolant level, (2) check oil level and condition, (3) check for fuel and oil leaks, (4) check battery condition and battery charger, (5) check any block heaters, (6) check condition of belts, (7) check fuel level, (8) check for faulty fuel lines and connections, (9) check air filters, etc. Generator operation is not required if the generator has already operated during a power outage within the calendar month. In such cases, some or all operational data may not be recorded.

Month	Day	Operator Initials	Generator ran during power outage (Y/N)?	Start-Up Checks Complete (Y/N)?	Meter Reading Start	Meter Reading Stop	Oil Press.	Oil Temp.	Water Temp.	Check All Voltages (L12/L23/L31/ L1N/L2N/L3N) (Y/N)			Check All Amps (L1/L2/L3) (Y/N)			Freq.	Engine RPM	Batt. Reading	Load Test Emergency Generator Battery (Quarterly)	Fuel Tank Level	**ORO/Operations Manager/Senior Operator Initials**
JAN																					
FEB																					
MAR																					
APR																					
MAY																					
JUN																					
JUL																					
AUG																					
SEP																					
OCT																					
NOV																					
DEC																					

GENERATOR MAINTENANCE

Instructions: Indicate any additional planned or unplanned maintenance performed, complete with dates (i.e. servicing by subcontractors, oil changes, battery replacement, equipment greasing, etc.)

Date	Operator Initials	Details

Maintenance Record: **Generator - Cochenour Low Lift Pump House** Year: **2022**

GENERATOR INSPECTION & OPERATION

Instructions: Complete the following record during monthly generator operation. Note that not all parameters may apply to a given generator; indicate these non-applicable parameters with a dash or with "n/a". Prior to generator operation (1) check coolant level, (2) check oil level and condition, (3) check for fuel and oil leaks, (4) check battery condition and battery charger, (5) check any block heaters, (6) check condition of belts, (7) check fuel level, (8) check for faulty fuel lines and connections, (9) check air filters, etc. Generator operation is not required if the generator has already operated during a power outage within the calendar month. In such cases, some or all operational data may not be recorded.

Month	Day	Operator Initials	Generator ran during power outage (Y/N)?	Start-Up Checks Complete (Y/N)?	Meter Reading Start	Meter Reading Stop	Oil Press.	Water Temp.	Check All Voltages (L12/L23/L31/ L1N/L2N/L3N) (Y/N)			Check All Amps (L1/L2/L3) (Y/N)			Freq.	Batt. Reading	Exhaust Temp.	Load Test Emergency Generator Battery (Quarterly)	Fuel Tank Level	**ORO/Operations Manager/Senior Operator Initials**
JAN																				
FEB																				
MAR																				
APR																				
MAY																				
JUN																				
JUL																				
AUG																				
SEP																				
OCT																				
NOV																				
DEC																				

GENERATOR MAINTENANCE

Instructions: Indicate any additional planned or unplanned maintenance performed, complete with dates (i.e. servicing by subcontractors, oil changes, battery replacement, equipment greasing, etc.)

Date	Operator Initials	Details

Maintenance Record: **Generator - Balmertown Reservoir Pumping Station** Year: **2022**

GENERATOR INSPECTION & OPERATION

Instructions: Complete the following record during monthly generator operation. Note that not all parameters may apply to a given generator; indicate these non-applicable parameters with a dash or with "n/a". Prior to generator operation (1) check coolant level, (2) check oil level and condition, (3) check for fuel and oil leaks, (4) check battery condition and battery charger, (5) check any block heaters, (6) check condition of belts, (7) check fuel level, (8) check for faulty fuel lines and connections, (9) check air filters, etc. Generator operation is not required if the generator has already operated during a power outage within the calendar month. In such cases, some or all operational data may not be recorded.

Month	Day	Operator Initials	Generator ran during power outage (Y/N)?	Start-Up Checks Complete (Y/N)?	Meter Reading Start	Meter Reading Stop	Oil Press.	Oil Temp.	Water Temp.	Check All Voltages (L12/L23/L31/ L1N/L2N/L3N) (Y/N)			Check All Amps (L1/L2/L3) (Y/N)			Freq.	Engine RPM	Batt. Reading	Load Test Emergency Generator Battery (Quarterly)	Fuel Tank Level	**ORO/Operations Manager/Senior Operator Initials**
JAN																					
FEB																					
MAR																					
APR																					
MAY																					
JUN																					
JUL																					
AUG																					
SEP																					
OCT																					
NOV																					
DEC																					

GENERATOR MAINTENANCE

Instructions: Indicate any additional planned or unplanned maintenance performed, complete with dates (i.e. servicing by subcontractors, oil changes, battery replacement, equipment greasing, etc.)

Date	Operator Initials	Details