



# COMMONWEALTH of VIRGINIA

Karen Shelton, MD.  
State Health Commissioner

R. Christopher Lindsay  
Chief Operating Officer

DEPARTMENT OF HEALTH  
**OFFICE OF DRINKING  
WATER**  
**Richmond Field Office**

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## System Sanitary Survey Report

April 29, 2024

To: Bently Chan  
Henrico County Water System  
4301 E. Parham Rd. 2Nd Floor Annex  
Henrico, VA, 23273-0775

SUBJECT: Henrico County  
Waterworks: Henrico County Water System  
PWSID: VA4087125

Survey Date: February 26, 2024

Next Survey Due By: (scheduled date)

Present at Survey:

Name	Organization
Toby Bryant	Virginia Department Of Health
Henrico County Dept Of Public Utilities	
Bently Chan	Henrico County D.P.U.
Alvin Christian	Henrico County Dpu

Reviewer: Nyibe Smith

As a result of the sanitary survey noted above, the Office of Drinking Water offers the following comments. Should you have questions or desire to discuss our findings, please contact us at 804-365-4342 or toby.bryant@vdh.virginia.gov.

### ACCOLADES:

We would like to offer the following accolades to recognize exceptional performance at your waterworks:

Raw intake and pump house appear in good condition. WTP is fenced and gated with a call box. Inside WTP plant was clean and uncluttered. Safety signs were posted where necessary. Equipment not in service was locked out.

all within in acceptable range (question 28)

within acceptable range (question 25)

Hach 2100N: last calibration 01/16/2024 (question 38)

Per system representative, pH meter is calibrated as needed based on bench results (question 27)

System representative stated Henrico SWTP is actively replacing filter media. (question 103)

Filter NTU <0.10 goal placed into service after backwash only 27% of total backwashes for the year. Required NTU <0.3 was met 81.62% of total in service (136) (question 109)

Contact #2 - CT 4.07 day of inspection Contact #5 - CT 3.79 day of inspection (question 209)

97.22% (question 64)

4.0:1 ratio (question 181)

### SIGNIFICANT DEFICIENCIES:

There were no significant deficiencies at the time of this inspection.

### MINOR DEFICIENCIES:

The Virginia Waterworks Regulations require your waterworks to complete the following actions. Failure to complete these actions by the specified dates may result in a Notice of Alleged Violation.

Section	Recommendations
Henrico Water Treatment Plant	Floc was fair, majority pin floc. Recommend running jar tests to check coagulant dose. Color of water on top of filter had a blue tint indicating possible over dosage of polymer. – Photo Number: None
Henrico Water Treatment Plant	Recommend running jar tests to improve coagulant dosage as well as polymer dosages. See note from Flocculation question (No. 64) – Photo Number: None

### RECOMMENDATIONS:

The following recommendations do not rise to the level of a violation of the Virginia Waterworks Regulations but are items identified during the sanitary survey.

Section	Recommendations
Henrico Water Treatment Plant	27.46% of 863 total backwashes – Backwash VOP goal met for past 12 months (question 113)
Henrico Water Treatment Plant	50.74% of 136 – Filter effluent VOP goals met for past 12 months (question 112)

Please review the attached summary of required sampling and visit our web site at <http://www.vdh.virginia.gov/ODW/>. There you will find helpful information on water sampling and testing, operator licensing and training, consumer education, project funding and **many other topics, as well as links to other key websites and Virginia's *Waterworks Regulations*.**

Survey By,



Toby M. Bryant, Assistant District Engineer  
Richmond Field Office

Attachment: Sanitary Survey Checklist

cc: Christopher Adkins, Henrico County DPU  
Alvin Christian, Henrico County DPU  
Henrico County Health Department  
Henrico County Administration

## Public Water System Site Visit

**PWS ID:** VA4087125    **PWS Name:** HENRICO COUNTY WATER SYSTEM  
**Source Type:** SW    **System Type:** C    **Population:** 292000    **Local Name:** Henrico Dpu - Central Water  
**County:** HENRICO COUNTY    **City:**    **Last Sanitary Survey Date:** 6/15/2022

Service Area Characteristic Code	Name
R	MUNICIPALITY
O	WHOLESALE (SELLS WATER)

Service Connections	Name	Count
Commercial	Unknown	4700
Commercial	Unknown	600
Commercial	Unknown	90516

### Points of Contact

Name (Job Title)	POC Type	Address	Phone	Email
ADKINS, CHRISTOPHER	DO			adk21@henrico.us
PORTER, STEPHEN CHIEF OF OPERATIONS	OP	10401 Woodman Rd	804-727-8759	Por@Henrico.US
HENRICO COUNTY DEPT OF PUBLIC UTILITIES	OW	P. O. BOX 90775		
STUBBS, KIMBERLEE	SA		804-501-7633	stu005@henrico.us
CHAN, BENTLY DIRECTOR	EC   AC	4301 E. Parham Rd. 2nd Floor Annex P.O. Box 90775	804-501-4274	Cha70@Henrico.US
CHRISTIAN, ALVIN	EC		804-501-4500	chr26@henrico.us

### Active Water System Facilities

Active WS Facilities Type Name	WS Facility ID	Active Sample Point Name
CON. CONNECTION, RICHMOND	CC002	
DISTRIBUTION- HENRICO ZONE	DS001	DB013,TCR01,DB015,DB017,LCR007,LCR010,LCR008,LCR009,LCR006,LCR048,LCR049,LCR046,LCR017,LCR016,LCR019,LCR018,LCR020,LCR012,LCR030,LCR028,LCR026,LCR045,LCR022,LCR027,LCR021,LCR036,LCR024,LCR015,LCR038,LCR047,LCR023,LCR040,LCR039,LCR037,LCR029,LCR050,LCR011,LCR005,LCR013,LCR014,LCR002,LCR001,LCR004,LCR003,LCR042,LCR033,LCR044,LCR034,LCR031,LCR032,LCR056,LCR051,LCR052,LCR053,LCR054,LCR055,LCR057,LCR058,LCR059,LCR060,LCR061,LCR062,LCR063,LCR064,LCR065,LCR066,LCR067,LCR068,LCR069,LCR073,LCR070,LCR071,LCR072,LCR076,LCR077,LCR043,LCR041,LCR035,LCR025,LCR084,LCR074,LCR075,LCR078,LCR080,LCR081,LCR082,LCR083,LCR085,LCR086,LCR087,LCR088,LCR089,LCR090,LCR091,LCR079
DISTRIBUTION- RICHMOND ZONE	DS002	DB027,DB026,DB028
HENRICO WTP ENTRY POINT	EP001	EP001
CONSECUTIVE - ENTRY POINT #2	EP002	
HENRICO RAW WATER INTAKE	IN001	RW001
LEN AVE. PUMP STATION	PF010	
GLEN ALLEN PUMP STATION	PF011	
MOUNTAIN RD. PUMP STATION	PF012	
LAWRENCE RD. PUMP STATION	PF014	
SHADY GROVE PUMP STATION (THREE)	PF015	
THREE CHOPT RD. PUMP STATION	PF016	
RIDGE RD. PUMP STATION	PF017	
ELKO (EAST END) PUMP STATION	PF021	
ROBIN AVE. PS (2)	PF22	
LEN AVE. (2X2.5 MG TANKS)	ST010	
GLEN ALLEN (1.1 MG STANDPIPE)	ST011	
MOUNTAIN RD. (3MG TANK)	ST012	
COX RD. ( 2MG ELEVATED TANK)	ST013	
LAWRENCE RD. (1.2 & 2.4 MG TANKS)	ST014	ST014
SHADY GROVE (2X1.25 MG TANKS)	ST015	
THREE CHOPT RD (2X1.2 MG TANKS)	ST016	
RIDGE RD. (1.2 & 2.4 MG TANKS)	ST017	
EUBANK ELEVATED TANK(1.0 MG)	ST020	
ELKO (2X3MG TANKS)	ST021	
ROBIN AVENUE 3 MG STORAGE TANK	ST022	
HENRICO WATER TREATMENT PLANT	TP001	LAB01,FILIN,UP001,LAB02

### Compliance Schedules



Activity Achieve Date	Activity Comment	Activity Due Date	Activity Name	Activity Projected Date	Activity Reported Date
1/1/0001 12:00:00 AM		7/1/2024 12:00:00 AM	CCR COPY RECEIVED	1/1/0001 12:00:00 AM	1/1/0001 12:00:00 AM
Activity Achieve Date	Activity Comment	Activity Due Date	Activity Name	Activity Projected Date	Activity Reported Date
4/30/2007 12:00:00 AM		4/30/2007 12:00:00 AM	Z-NOUSE ST1 MONITORING PLAN APPROVED	1/1/0001 12:00:00 AM	1/1/0001 12:00:00 AM
Activity Achieve Date	Activity Comment	Activity Due Date	Activity Name	Activity Projected Date	Activity Reported Date
4/5/2005 12:00:00 AM		4/5/2005 12:00:00 AM	VAPLAN EMERGENCY MANAGEMENT PLAN	1/1/0001 12:00:00 AM	1/1/0001 12:00:00 AM
Activity Achieve Date	Activity Comment	Activity Due Date	Activity Name	Activity Projected Date	Activity Reported Date
1/1/0001 12:00:00 AM		12/29/2024 12:00:00 AM	LCN SUBMIT CERTIFICATION	1/1/0001 12:00:00 AM	1/1/0001 12:00:00 AM
Activity Achieve Date	Activity Comment	Activity Due Date	Activity Name	Activity Projected Date	Activity Reported Date
1/1/0001 12:00:00 AM		7/1/2024 12:00:00 AM	CCR DISTRIBUTION	1/1/0001 12:00:00 AM	1/1/0001 12:00:00 AM
Activity Achieve Date	Activity Comment	Activity Due Date	Activity Name	Activity Projected Date	Activity Reported Date
1/1/0001 12:00:00 AM		10/1/2024 12:00:00 AM	CCR RECEIVE CERTIFICATION	1/1/0001 12:00:00 AM	1/1/0001 12:00:00 AM
Activity Achieve Date	Activity Comment	Activity Due Date	Activity Name	Activity Projected Date	Activity Reported Date
6/17/1992 12:00:00 AM		6/17/1992 12:00:00 AM	VAPLAN LCR SAMPLE SITE REPORT	1/1/0001 12:00:00 AM	1/1/0001 12:00:00 AM
Activity Achieve Date	Activity Comment	Activity Due Date	Activity Name	Activity Projected Date	Activity Reported Date
4/6/1988 12:00:00 AM		4/6/1988 12:00:00 AM	Z-NOUSE LEAD NOTICE DATE	1/1/0001 12:00:00 AM	1/1/0001 12:00:00 AM
Activity Achieve Date	Activity Comment	Activity Due Date	Activity Name	Activity Projected Date	Activity Reported Date
9/26/2006 12:00:00 AM		9/26/2006 12:00:00 AM	VAPLAN LT2 ROUND 1 MONITOR PLAN APP	1/1/0001 12:00:00 AM	1/1/0001 12:00:00 AM
Activity Achieve Date	Activity Comment	Activity Due Date	Activity Name	Activity Projected Date	Activity Reported Date
11/23/2011 12:00:00 AM		11/23/2011 12:00:00 AM	VAPLAN CHLORINE/CHLORAMINES SSP APPROVED	1/1/0001 12:00:00 AM	1/1/0001 12:00:00 AM
Activity Achieve Date	Activity Comment	Activity Due Date	Activity Name	Activity Projected Date	Activity Reported Date
11/23/2011 12:00:00 AM		11/23/2011 12:00:00 AM	VAPLAN TOC/ALKALINITY SSP APPROVED	1/1/0001 12:00:00 AM	1/1/0001 12:00:00 AM
Activity Achieve Date	Activity Comment	Activity Due Date	Activity Name	Activity Projected Date	Activity Reported Date
3/20/2009 12:00:00 AM		3/20/2009 12:00:00 AM	Z-NOUSE IDSE REPORT	1/1/0001 12:00:00 AM	1/1/0001 12:00:00 AM
Activity Achieve Date	Activity Comment	Activity Due Date	Activity Name	Activity Projected Date	Activity Reported Date
1/29/2014 12:00:00 AM		1/29/2014 12:00:00 AM	VAPLAN LT2 ROUND 2 MONITOR PLAN APP	1/1/0001 12:00:00 AM	1/1/0001 12:00:00 AM

Activity Achieve Date	Activity Comment	Activity Due Date	Activity Name	Activity Projected Date	Activity Reported Date
3/15/2024 12:00:00 AM	BSSP added 30 sampling stations to raise number to 180 sites- JR 03/15/24	3/15/2024 12:00:00 AM	VAPLAN RTCR BSSP	1/1/0001 12:00:00 AM	1/1/0001 12:00:00 AM
11/23/2011 12:00:00 AM		11/23/2011 12:00:00 AM	VAPLAN BROMATE SSP APPROVED	1/1/0001 12:00:00 AM	1/1/0001 12:00:00 AM
4/30/2007 12:00:00 AM		4/30/2007 12:00:00 AM	VAPLAN BROMIDE SSP APPROVED	1/1/0001 12:00:00 AM	1/1/0001 12:00:00 AM

### Treatment Processes

Active Treatment Plant Name	Objective Name	Process Name	Process Number
HENRICO WATER TREATMENT PLANT	AMMONIATION	CHLORAMINES	200
HENRICO WATER TREATMENT PLANT	CHLORINATION	HYPOCHLORINATION, POST	421
HENRICO WATER TREATMENT PLANT	OZONATION	OZONATION, PRE	543
HENRICO WATER TREATMENT PLANT	FLASH MIXERS	COAGULATION	240
HENRICO WATER TREATMENT PLANT	FILTER # 6	FILTRATION, RAPID SAND	345
HENRICO WATER TREATMENT PLANT	FILTER # 5	FILTRATION, RAPID SAND	345
HENRICO WATER TREATMENT PLANT	FILTER # 1	FILTRATION, RAPID SAND	345
HENRICO WATER TREATMENT PLANT	FILTER # 3	FILTRATION, RAPID SAND	345
HENRICO WATER TREATMENT PLANT	FILTER # 2	FILTRATION, RAPID SAND	345
HENRICO WATER TREATMENT PLANT	FILTER # 11	FILTRATION, RAPID SAND	345
HENRICO WATER TREATMENT PLANT	FILTER # 12	FILTRATION, RAPID SAND	345
HENRICO WATER TREATMENT PLANT	FILTER COMBINED	FILTRATION, RAPID SAND	345
HENRICO WATER TREATMENT PLANT	FILTER # 7	FILTRATION, RAPID SAND	345
HENRICO WATER TREATMENT PLANT	FILTER # 8	FILTRATION, RAPID SAND	345
HENRICO WATER TREATMENT PLANT	FILTER # 9	FILTRATION, RAPID SAND	345
HENRICO WATER TREATMENT PLANT	FILTER # 10	FILTRATION, RAPID SAND	345
HENRICO WATER TREATMENT PLANT	FILTER # 4	FILTRATION, RAPID SAND	345
HENRICO WATER TREATMENT PLANT	FLOCCULATORS	FLOCCULATION	360
HENRICO WATER TREATMENT PLANT	FLUORIDATION	FLUORIDATION	380
HENRICO WATER TREATMENT PLANT	FILTER COMBINED	FILTRATION, RAPID SAND	345
HENRICO WATER TREATMENT PLANT	FILTER # 12	FILTRATION, RAPID SAND	345
HENRICO WATER TREATMENT PLANT	FILTER # 11	FILTRATION, RAPID SAND	345



HENRICO WATER TREATMENT PLANT	FILTER # 10	FILTRATION, RAPID SAND	345
HENRICO WATER TREATMENT PLANT	FILTER # 9	FILTRATION, RAPID SAND	345
HENRICO WATER TREATMENT PLANT	FILTER # 8	FILTRATION, RAPID SAND	345
HENRICO WATER TREATMENT PLANT	FILTER # 7	FILTRATION, RAPID SAND	345
HENRICO WATER TREATMENT PLANT	FILTER # 6	FILTRATION, RAPID SAND	345
HENRICO WATER TREATMENT PLANT	FILTER # 5	FILTRATION, RAPID SAND	345
HENRICO WATER TREATMENT PLANT	FILTER # 4	FILTRATION, RAPID SAND	345
HENRICO WATER TREATMENT PLANT	FILTER # 2	FILTRATION, RAPID SAND	345
HENRICO WATER TREATMENT PLANT	FILTER # 1	FILTRATION, RAPID SAND	345
HENRICO WATER TREATMENT PLANT	FILTER # 3	FILTRATION, RAPID SAND	345
HENRICO WATER TREATMENT PLANT	SED TRAIN # 1	SEDIMENTATION	660
HENRICO WATER TREATMENT PLANT	SED TRAIN # 2	SEDIMENTATION	660
HENRICO WATER TREATMENT PLANT	SED TRAIN # 3	SEDIMENTATION	660

#### TCR And Non-TCR Monitoring Schedules

Routine Schedule Analyte or Group	WSF Name	Frequency	Begin Date
COLIFORM (TCR)	Distribution System	150 RT per MN	1/1/1991
CARBON, TOTAL	HENRICO WATER TREATMENT PLANT	3 RT per MN	3/1/2024
CHLR ACID HERB(SOC)A	HENRICO WTP ENTRY POINT	1 RT per 3Y	1/1/2023
CARBAMATES (SOC)-A	HENRICO WTP ENTRY POINT	1 RT per 3Y	1/1/2023
VOC	HENRICO WTP ENTRY POINT	1 RT per YR	1/1/2017
PBCU	DISTRIBUTION- HENRICO ZONE	50 RT per 3Y	1/1/2016
TOC_ALK	HENRICO RAW WATER INTAKE	1 RT per MN	1/1/2015
FLUORIDE SPLIT	HENRICO WTP ENTRY POINT	1 OT per MN	1/1/2015
CYANIDE	HENRICO WTP ENTRY POINT	1 RT per 9Y	1/1/2011
INO_METALS COMBO	HENRICO WTP ENTRY POINT	1 RT per YR	1/1/2017
TTHM/HAA5	DISTRIBUTION- HENRICO ZONE	3 RT per QT	1/1/2015
TTHM/HAA5	DISTRIBUTION- RICHMOND ZONE	3 RT per QT	1/1/2015
RAD ALPHA	HENRICO WTP ENTRY POINT	1 RT per 6Y	1/1/2014
SOC-DIQUAT	HENRICO WTP ENTRY POINT	1 RT per 3Y	1/1/2023
VOLFUM(SOC)-A	HENRICO WTP ENTRY POINT	1 RT per 3Y	1/1/2023
SEMIVOL(SOC)-A	HENRICO WTP ENTRY POINT	1 RT per 3Y	1/1/2023
NITRATE + NITRITE	HENRICO WTP ENTRY POINT	1 RT per YR	1/1/2017
BROMATE	HENRICO WTP ENTRY POINT	1 RT per MN	1/1/2015

#### Water Facility Monthly Testing

Monthly Analyte	WSF Name	Count Per Day	Level Type	Level	Unit Of Measure	Begin Date
CARBON, TOTAL	HENRICO WATER TREATMENT PLANT	0	MIN	1.00	RATIO	1/1/2019
CHLORAMINE	DISTRIBUTION-RICHMOND ZONE	0	MAX	4.00	MG/L	1/1/2019
CHLORAMINE	DISTRIBUTION-HENRICO ZONE	0	MAX	4.00	MG/L	1/1/2019
ORTHOPHOSPHATE	DISTRIBUTION-RICHMOND ZONE	0	MIN	.80	MG/L	1/1/2019
ORTHOPHOSPHATE	DISTRIBUTION-HENRICO ZONE	0	MIN	.80	MG/L	1/1/2019
ORTHOPHOSPHATE	HENRICO WATER TREATMENT PLANT	0	MIN	.80	MG/L	1/1/2019
PH	DISTRIBUTION-HENRICO ZONE	0	MIN	7.00	SU	1/1/2019
PH	DISTRIBUTION-RICHMOND ZONE	0	MIN	7.00	SU	1/1/2019
PH	HENRICO WATER TREATMENT PLANT	0	MIN	7.00	SU	1/1/2019

### TCR Positives in Last 24 Months

Sample ID	Date Collected	Sample Type	Sample Point Name	Analyte
24-04107	4/1/2024 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
24-03490	3/18/2024 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
24-03123	3/11/2024 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
24-00765	1/17/2024 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
23-14187	11/2/2023 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
23-12705	10/2/2023 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
23-11613	9/11/2023 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
23-10557	8/16/2023 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
23-08404	7/5/2023 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
23-07508	6/13/2023 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
23-06029	5/9/2023 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
22-13253	10/19/2022 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
22-08458	7/11/2022 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)

### Violations in Last Five Years

There is no Violations in Last Five Years data.

### Unresolved Deficiencies

There is no Unresolved Deficiencies data.

# Sanitary Survey Report

## Treatment

### HENRICO WATER TREATMENT PLANT

- |    |   |   |
|----|---|---|
| 1  | Treatment - Are suitable sampling taps available? (upstream and downstream of each treatment process)   | ✓ |
| 2  | Treatment - Is an adequate entry point tap available?   | ✓ |
| 3  | Treatment - Is appropriate and operable testing equipment available?  | ✓ |
| 4  | Treatment - Does the waterworks have an operations and maintenance manual/SOP manual?   | ✓ |
| 5  | Treatment - Is waterworks providing adequate treatment for it's Bin classification, or on path to providing required treatment? (If no, describe in comments)           | ✓ |
| 6  | Treatment - Approved backflow device to isolate process water at treatment plant from distribution system, with current testing documentation                           | ✓ |
| 7  | Chemicals - Does the waterworks have documentation to demonstrate that all treatment chemicals used are ANSI certified or NSF approved?                                 | ✓ |
| 8  | Chemicals - No potential for explosions in chemical storage and handling areas? (i.e. KMnO4 with organic materials, or improperly stored PAC)                           | ✓ |
| 9  | Chemicals - Are incompatible chemicals stored separately? (i.e. acids/bases)  | ✓ |
| 10 | Chemicals - Is adequate personal protective equipment provided for the chemicals handled at this site (i.e. rubber gloves, breathing apparatus, goggles, aprons, etc.)? | ✓ |
| 11 | Chemicals - Are Safety Data Sheets (SDS) available?   | ✓ |
| 12 | Chemicals - Are all chemical containers labeled?  | ✓ |
| 13 | Chemicals - Is adequate on-site chemical storage area provided?   | ✓ |
| 14 | Chemicals - Are there approved backflow prevention devices installed to isolate process water from finished water?  | ✓ |

- |    |   |   |
|----|---|---|
| 15 | Chemicals - Is the manufacturers equipment literature available for all treatment equipment?  | ✓ |
| 16 | Chemicals - Is the treatment equipment in good operating condition? (cleaned and maintained as recommended by manufacturer)               | ✓ |
| 17 | Chemicals - Is the treatment equipment adequately operated?   | ✓ |
| 18 | Chemicals - Is a spare feeder/metering pump available? (req'd for req'd treatment, recommend spare pump or parts for voluntary treatment) | ✓ |
| 19 | Chemicals - Is there adequate chemical mixing downstream of chemical addition?  | ✓ |
| 20 | Chemicals - Is adequate mixing of chemical slurries/solutions provided?   | ✓ |
| 21 | Chemicals - Is adequate chemical storage provided? (30 days minimum)  | ✓ |
| 27 | Fluoride - Do fluoride split samples generally agree to within 0.2 mg/L?  | ✓ |
| 28 | Fluoride - Is the PHS recommended fluoride concentration of 0.7 mg/L generally maintained?  | ✓ |
| 30 | Fluoride - Is a functioning scale and loss of weight recorder provided for the fluoride feed system?                                      | ✓ |
| 31 | Fluoride - Is an operable anti-siphon device installed on the fluoride feeder?  | ✓ |
| 32 | Fluoride - Is an operable anti-siphon vacuum breaker or an air gap on make-up water line?   | ✓ |
| 49 | Hypochlorite - Is the feeder in good working condition?   | ✓ |
| 50 | Hypochlorite - Are safety features/procedures adequate to protect operators and the public? (ventilation/eye wash)                        | ✓ |
| 51 | Hypochlorite - Are operational procedures / controls adequate? (residuals maintained in an acceptable range)                              | ✓ |
| 52 | Chlorine - Is the chlorine contact tank in service?   | ✓ |

53	Chlorine - Is the chlorine contact tank in good condition?	✓
54	Hypochlorite - Is the injection line in good condition? (no scale build-up, leaks, etc.)	✓
55	Hypochlorite - Is the chlorine solution tank covered and in good condition?	✓
56	Hypochlorite - Does the waterworks have a depth/volume gauge, scale, or other means of determining the amount of chemical fed/remaining?	✓
57	Cl Field Test - Field test is generally equal to MOR residuals and in compliance with minimum residual requirements and the MRDL?	✓
61	Rapid/Static Mixer - General performance (proper mixing obtained, no evidence of vortexing, variable speed control operational if applicable)	✓
62	Rapid/Static Mixer - Equipment in good physical condition	✓
63	Flocculation - All mixers operational and meeting mixing requirements (tapered flocculation recommended)	✓
64	Flocculation - Good floc formation Floc was fair, majority pin floc. Recommend running jar tests to check coagulant dose. Color of water on top of filter had a blue tint indicating possible over dosage of polymer.	MIN Deficiency
65	Flocculation - adequate baffling/compartimentalization (No evidence of vortexing or basin short-circuiting), and plant can operate with basin out of service	✓
66	Flocculation - Equipment in good physical condition	✓
67	Flocculation - Coagulation process control procedures adequate Recommend running jar tests to improve coagulant dosage as well as polymer dosages. See note from Flocculation question (No. 64)	MIN Deficiency
68	Clarification - Clarification VOP goals been met for the past 12 months 97.22%	✓
103	Gravity Filtration - Media depth and condition monitored and adequately maintained System representative stated Henrico SWTP is actively replacing filter media.	✓
104	Gravity Filtration - Filtration rate routinely drop tested or rate-of-flow meter calibrated, and filtration rate maintained within permitted limit	✓

106	Gravity Filtration - Do MORs indicate that filter backwash frequency based on plant established maximum values (headloss, time, turbidity, particle counts, etc.)?	✓
107	Gravity Filtration - No indications of filter backwash performance issues (no boils or media loss during backwash, well distributed media after)	✓
108	Gravity Filtration - Filter to waste after any shutdowns	✓
109	Gravity Filtration - Filter to waste satisfactory (at design filtration rate, turbidity/particle counts monitored, placed into service <3 NTU required, <10 NTU goal) Filter NTU <0.10 goal placed into service after backwash only 27% of total backwashes for the year. Required NTU <0.3 was met 81.62% of total in service (136)	✓
110	Gravity Filtration - Good general performance	✓
111	Gravity Filtration - Equipment in good physical condition (rate of flow controls, rate-of-flow/loss-of-head/backwash indicators/recorders, surface wash/air scour, backwash pumps)	✓
112	Gravity Filtration - Filter effluent VOP goals met for the past 12 months 50.74% of 136	REC Deficiency
113	Gravity Filtration - Backwash VOP goals met for the past 12 months 27.46% of 863 total backwashes	REC Deficiency
163	Clearwell - Access protected from contamination	✓
164	Clearwell - Overflow not subject to flooding, and downturned and protected with a screen, or otherwise adequately protected	✓
165	Clearwell - Adequate drain	✓
166	Clearwell - Vents and other openings downturned and protected with non-corrodible insect screen	✓
167	Clearwell - Watertight roof/cover if outdoors or subject to flooding	✓
168	Clearwell - Hatch(s) secure	✓
169	Clearwell - Viewing port with light	✓

170	Clearwell - Cleaning adequate, no sediment present	✓
171	Clearwell - Good physical condition	✓
172	Finished water/intermediate pumps - all operable and in good physical condition	✓
173	Finished water/intermediate pumps - Pressure gauges, check valve, shut off valve provided/operable	✓
174	Finished water pumps - Flow meter operable	✓
175	NH4 - Ammonia storage/feed rooms adequately ventilated	✓
176	NH4 - Ammonia room doors equipped with panic hardware	✓
177	NH4 - Ammonia room door to outside of building	✓
179	NH4 - No brass, bronze, or other copper alloy fittings in ammonia feed system	✓
180	NH4 - Ammonia metering pump operable	✓
181	NH4 - Adequate chlorine to ammonia ratio 4.0:1 ratio	✓
182	NH4 - Operable discharge gauges on metering pump discharge piping	✓
183	NH4 - Ammonia storage tank in good condition with operable level gauge and pressure gauge	✓
184	NH4 - Recirculation connection to displace the ammonia vapors back into the delivery truck when filling the tank provided	✓
185	NH4 - Ammonia storage tank spill containment structure condition	✓
207	O2 - Diffuser inspected per the manufacturer's recommended frequency, and found to be in good condition	✓

208	O2 - Ozone monitoring adequate (probe/portable monitor calibration frequency and methods adequate, probe calibration checks adequate and performed weekly, use approved test method)	✓
209	O2 - Disinfection performance adequate (meeting CT requirements at time of inspection) Contractor #2 - CT 4.07 day of inspection Contractor #5 - CT 3.79 day of inspection	✓
210	O2 - CT requirements have been consistently met with Ozone since last inspection (MOR provides adequate verification that CT requirements have been met since the last inspection?)	✓
211	O2 - Observed ozone residuals within expected range for current conditions	✓
212	O2 - Ozone destruct units operational (air borne)	✓
213	O2 - Ozone quench operational (aqueous)	✓
214	O2 - Ambient ozone detectors operational	✓
215	O2 - Adequate power supply for the ozone generators	✓
216	O2 - Adequate alarm or shutdown settings to address a low ozone event	✓
217	O2 - Adequate number of units in service for reliable operation (LOX tanks, vaporizer, generators, contact chambers, etc.)	✓
218	Waste - Acceptable waste handling (waste disposal not limiting plant operation, recycle flows through all treatment processes-if applicable, chemical room drains separated from process waste flow streams)	✓
219	Emergency Power - Adequate emergency power available to operate water plant during a power outage, maintained, and routinely tested (Update SDWIS and WDS if emergency power is added.)	✓
221	Treatment - Overall general operation adequate	✓
105	Gravity Filtration - Surface wash backflow preventer provided with up-to-date test records, if surface wash is provided	Not Applicable
178	NH4 - Ammonia cylinder repair kit available	Not Applicable



## Distribution

### DISTRIBUTION- HENRICO ZONE

- |    |  |   |
|----|--|---|
| 1  | Is the CCCP maintained by an individual designated in responsible charge of the CCCP by the owner?   | ✓ |
| 3  | Does the waterworks have adequate and up to date records of all cross connections , all required annual testing of installed backflow prevention devices, and records of assessments of all connections? | ✓ |
| 4  | Are CCCP records retained for 10 years?  | ✓ |
| 5  | Is the vault drain/sump pump functioning? (is there evidence of standing water?)   | ✓ |
| 6  | If the meter is a consecutive connection, Is there an operable sample tap?   | ✓ |
| 7  | Are operators able to safely enter the vault for inspection, maintenance and repairs? (adequate ladder, confined space equipment and training if applicable)   | ✓ |
| 8  | Is access to the vault / chamber locked or otherwise secured?  | ✓ |
| 9  | Is there bypass piping and isolation valves available for meter maintenance?   | ✓ |
| 10 | Are there operable pressure gauges present? (for PRV or altitude valve)  | ✓ |
| 11 | Are air and vacuum relief valves routinely checked to ensure that ports are properly installed to prevent against cross connections? (not subject to flooding, downward facing, and screened)            | ✓ |
| 12 | Is the meter in the vault operational? (recommend recording meter reading in comments)   | ✓ |
| 13 | Are individual service meters provided for all connections?  | ✓ |
| 14 | Is a service meter calibration and replacement program in effect?  | ✓ |
| 15 | Is a flushing program in place? (unidirectional preferred)   | ✓ |

- |    |   |   |
|----|---|---|
| 16 | Is an isolation valve exercising program in place?  | ✓ |
| 17 | No evidence of less than 20 psi at service connections or other pressure problems?  | ✓ |
| 18 | Does the waterworks follow ODW guidelines for disinfection, sampling, and Boil Water Advisories following a main repair (see ODW Field Manual)?             | ✓ |
| 19 | Are water audits (water loss/leakage calculation) routinely performed?  | ✓ |
| 20 | Was the average leakage (real losses) over the past 12 months less than or equal to 30%?  | ✓ |
| 21 | Are fire flow tests routinely performed and communicated to the waterworks?   | ✓ |
| 23 | Are plans, sketches, or maps with valve & master meter locations available?   | ✓ |
| 24 | Inspected records of repairs, flushing, hydrant testing, and water audits, and confirmed that they are adequate and maintained (kept) for at least 5 years? | ✓ |

**DISTRIBUTION- RICHMOND ZONE**

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- |   |  |   |
|---|--|---|
| 1 | Is the CCCP maintained by an individual designated in responsible charge of the CCCP by the owner?   | ✓ |
| 3 | Does the waterworks have adequate and up to date records of all cross connections , all required annual testing of installed backflow prevention devices, and records of assessments of all connections? | ✓ |
| 4 | Are CCCP records retained for 10 years?  | ✓ |
| 5 | Is the vault drain/sump pump functioning? (is there evidence of standing water?)   | ✓ |
| 6 | If the meter is a consecutive connection, Is there an operable sample tap?   | ✓ |
| 7 | Are operators able to safely enter the vault for inspection, maintenance and repairs? (adequate ladder, confined space equipment and training if applicable)   | ✓ |
| 8 | Is access to the vault / chamber locked or otherwise secured?  | ✓ |

- |    |   |   |
|----|---|---|
| 9  | Is there bypass piping and isolation valves available for meter maintenance?  | ✓ |
| 10 | Are there operable pressure gauges present? (for PRV or altitude valve)   | ✓ |
| 11 | Are air and vacuum relief valves routinely checked to ensure that ports are properly installed to prevent against cross connections? (not subject to flooding, downward facing, and screened) | ✓ |
| 12 | Is the meter in the vault operational? (recommend recording meter reading in comments)  | ✓ |
| 13 | Are individual service meters provided for all connections?   | ✓ |
| 14 | Is a service meter calibration and replacement program in effect?   | ✓ |
| 15 | Is a flushing program in place? (unidirectional preferred)  | ✓ |
| 16 | Is an isolation valve exercising program in place?  | ✓ |
| 17 | No evidence of less than 20 psi at service connections or other pressure problems?  | ✓ |
| 18 | Does the waterworks follow ODW guidelines for disinfection, sampling, and Boil Water Advisories following a main repair (see ODW Field Manual)?   | ✓ |
| 19 | Are water audits (water loss/leakage calculation) routinely performed?  | ✓ |
| 20 | Was the average leakage (real losses) over the past 12 months less than or equal to 30%?  | ✓ |
| 21 | Are fire flow tests routinely performed and communicated to the waterworks?   | ✓ |
| 23 | Are plans, sketches, or maps with valve & master meter locations available?   | ✓ |
| 24 | Inspected records of repairs, flushing, hydrant testing, and water audits, and confirmed that they are adequate and maintained (kept) for at least 5 years?                                   | ✓ |

### THREE CHOPT RD (2X1.2 MG TANKS)

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- |    |   |   |
|----|---|---|
| 1  | Is the access ladder locked from unauthorized access?   | ✓ |
| 2  | Has the waterworks provided documentation to verify the vent is properly shielded and screened with #24 mesh?   | ✓ |
| 3  | Has the waterworks provided documentation that the entrance hatch is locked and a shoebox style or otherwise protected from the entrance of water?                  | ✓ |
| 5  | Does the tank have a functioning drain with a protected outlet?   | ✓ |
| 6  | Does the tank have an overflow affixed with a screen adequate to prevent entry of pests or a duckbill, and an air gap with a splash pad/sanitary drain?             | ✓ |
| 7  | Is the sidewall access and all other access locked/bolted?  | ✓ |
| 8  | Is access to the storage tank facility fenced and locked, or located within a greater secure area? (fence and lock in good condition)                               | ✓ |
| 9  | Are all other tank openings curbed, sleeved, watertight and freeze protected?   | ✓ |
| 10 | Does the waterworks have an effective routine tank inspection and preventative maintenance program in place?  | ✓ |
| 11 | Does the waterworks have an adequate strategy to monitor and maintain tank water quality? (preventing issues due to stratification, water age, nitrification, etc.) | ✓ |
| 13 | Is tank level control adequate? (pressure maintained, high/low alarms if needed, level recorded)  | ✓ |
| 14 | Are operators familiar with tank levels necessary to maintain 20 psi, 1/2 day storage, and provide target fire flow for target duration?                            | ✓ |
| 15 | Is adequate corrosion control in place? (exterior coating in good condition, cathodic protection operable, ringwall seal intact)                                    | ✓ |
| 16 | Is operator safety adequately provided? (ladder safety system in good condition, operators trained and adequately equipped, no other hazards)                       | ✓ |
| 17 | Is access to the storage tank maintained? (lot mowed/kept up, road maintained)  | ✓ |

18	Is surface water diverted from the tank?	✓
28	No other issues with tank or associated appurtenances	✓
4	Are pictures of the tank interior provided? Are there indications of problems? (Floating debris, deteriorated lining, corrosion evident, excess sediment, etc.)	Not Applicable
12	Is the tank mixer/aerator functioning adequately?	Not Applicable

**RIDGE RD. (1.2 & 2.4 MG TANKS)**

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1	Is the access ladder locked from unauthorized access?	✓
2	Has the waterworks provided documentation to verify the vent is properly shielded and screened with #24 mesh?	✓
3	Has the waterworks provided documentation that the entrance hatch is locked and a shoebox style or otherwise protected from the entrance of water?	✓
5	Does the tank have a functioning drain with a protected outlet?	✓
6	Does the tank have an overflow affixed with a screen adequate to prevent entry of pests or a duckbill, and an air gap with a splash pad/sanitary drain?	✓
7	Is the sidewall access and all other access locked/bolted?	✓
8	Is access to the storage tank facility fenced and locked, or located within a greater secure area? (fence and lock in good condition)	✓
9	Are all other tank openings curbed, sleeved, watertight and freeze protected?	✓
10	Does the waterworks have an effective routine tank inspection and preventative maintenance program in place?	✓
11	Does the waterworks have an adequate strategy to monitor and maintain tank water quality? (preventing issues due to stratification, water age, nitrification, etc.)	✓
12	Is the tank mixer/aerator functioning adequately?	✓

13	Is tank level control adequate? (pressure maintained, high/low alarms if needed, level recorded)	✓
14	Are operators familiar with tank levels necessary to maintain 20 psi, 1/2 day storage, and provide target fire flow for target duration?	✓
15	Is adequate corrosion control in place? (exterior coating in good condition, cathodic protection operable, ringwall seal intact)	✓
16	Is operator safety adequately provided? (ladder safety system in good condition, operators trained and adequately equipped, no other hazards)	✓
17	Is access to the storage tank maintained? (lot mowed/kept up, road maintained)	✓
18	Is surface water diverted from the tank?	✓
28	No other issues with tank or associated appurtenances	✓
4	Are pictures of the tank interior provided? Are there indications of problems? (Floating debris, deteriorated lining, corrosion evident, excess sediment, etc.)	Not Applicable

**LAWRENCE RD. (1.2 & 2.4 MG TANKS)**

1	Is the access ladder locked from unauthorized access?	✓
2	Has the waterworks provided documentation to verify the vent is properly shielded and screened with #24 mesh?	✓
3	Has the waterworks provided documentation that the entrance hatch is locked and a shoebox style or otherwise protected from the entrance of water?	✓
5	Does the tank have a functioning drain with a protected outlet?	✓
6	Does the tank have an overflow affixed with a screen adequate to prevent entry of pests or a duckbill, and an air gap with a splash pad/sanitary drain?	✓
7	Is the sidewall access and all other access locked/bolted?	✓
8	Is access to the storage tank facility fenced and locked, or located within a greater secure area? (fence and lock in good condition)	✓

- |    |  |                   |
|----|--|-------------------|
| 9  | <b>Are all other tank openings curbed, sleeved, watertight and freeze protected?</b>   | ✓                 |
| 10 | <b>Does the waterworks have an effective routine tank inspection and preventative maintenance program in place?</b>  | ✓                 |
| 11 | <b>Does the waterworks have an adequate strategy to monitor and maintain tank water quality? (preventing issues due to stratification, water age, nitrification, etc.)</b> | ✓                 |
| 12 | <b>Is the tank mixer/aerator functioning adequately?</b>   | ✓                 |
| 13 | <b>Is tank level control adequate? (pressure maintained, high/low alarms if needed, level recorded)</b>  | ✓                 |
| 14 | <b>Are operators familiar with tank levels necessary to maintain 20 psi, 1/2 day storage, and provide target fire flow for target duration?</b>                            | ✓                 |
| 15 | <b>Is adequate corrosion control in place? (exterior coating in good condition, cathodic protection operable, ringwall seal intact)</b>                                    | ✓                 |
| 16 | <b>Is operator safety adequately provided? (ladder safety system in good condition, operators trained and adequately equipped, no other hazards)</b>                       | ✓                 |
| 17 | <b>Is access to the storage tank maintained? (lot mowed/kept up, road maintained)</b>  | ✓                 |
| 18 | <b>Is surface water diverted from the tank?</b>  | ✓                 |
| 28 | <b>No other issues with tank or associated appurtenances</b>   | ✓                 |
| 4  | <b>Are pictures of the tank interior provided? Are there indications of problems? (Floating debris, deteriorated lining, corrosion evident, excess sediment, etc.)</b>     | Not<br>Applicable |

**ELKO (2X3MG TANKS)**

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- |   |   |   |
|---|---|---|
| 1 | <b>Is the access ladder locked from unauthorized access?</b>  | ✓ |
| 2 | <b>Has the waterworks provided documentation to verify the vent is properly shielded and screened with #24 mesh?</b>                                      | ✓ |
| 3 | <b>Has the waterworks provided documentation that the entrance hatch is locked and a shoebox style or otherwise protected from the entrance of water?</b> | ✓ |

- |    |   |   |
|----|---|---|
| 4  | Are pictures of the tank interior provided? Are there indications of problems? (Floating debris, deteriorated lining, corrosion evident, excess sediment, etc.)     | ✓ |
| 5  | Does the tank have a functioning drain with a protected outlet?   | ✓ |
| 6  | Does the tank have an overflow affixed with a screen adequate to prevent entry of pests or a duckbill, and an air gap with a splash pad/sanitary drain?             | ✓ |
| 7  | Is the sidewall access and all other access locked/bolted?  | ✓ |
| 8  | Is access to the storage tank facility fenced and locked, or located within a greater secure area? (fence and lock in good condition)                               | ✓ |
| 9  | Are all other tank openings curbed, sleeved, watertight and freeze protected?   | ✓ |
| 10 | Does the waterworks have an effective routine tank inspection and preventative maintenance program in place?  | ✓ |
| 11 | Does the waterworks have an adequate strategy to monitor and maintain tank water quality? (preventing issues due to stratification, water age, nitrification, etc.) | ✓ |
| 12 | Is the tank mixer/aerator functioning adequately?   | ✓ |
| 13 | Is tank level control adequate? (pressure maintained, high/low alarms if needed, level recorded)  | ✓ |
| 14 | Are operators familiar with tank levels necessary to maintain 20 psi, 1/2 day storage, and provide target fire flow for target duration?                            | ✓ |
| 15 | Is adequate corrosion control in place? (exterior coating in good condition, cathodic protection operable, ringwall seal intact)                                    | ✓ |
| 16 | Is operator safety adequately provided? (ladder safety system in good condition, operators trained and adequately equipped, no other hazards)                       | ✓ |
| 17 | Is access to the storage tank maintained? (lot mowed/kept up, road maintained)  | ✓ |
| 18 | Is surface water diverted from the tank?  | ✓ |
| 28 | No other issues with tank or associated appurtenances   | ✓ |



**COX RD. ( 2MG ELEVATED TANK)**

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- 1 Is the access ladder locked from unauthorized access? ✓
  
- 2 Has the waterworks provided documentation to verify the vent is properly shielded and screened with #24 mesh? ✓
  
- 3 Has the waterworks provided documentation that the entrance hatch is locked and a shoebox style or otherwise protected from the entrance of water? ✓
  
- 5 Does the tank have a functioning drain with a protected outlet? ✓
  
- 6 Does the tank have an overflow affixed with a screen adequate to prevent entry of pests or a duckbill, and an air gap with a splash pad/sanitary drain? ✓
  
- 7 Is the sidewall access and all other access locked/bolted? ✓
  
- 8 Is access to the storage tank facility fenced and locked, or located within a greater secure area? (fence and lock in good condition) ✓
  
- 9 Are all other tank openings curbed, sleeved, watertight and freeze protected? ✓
  
- 10 Does the waterworks have an effective routine tank inspection and preventative maintenance program in place? ✓
  
- 11 Does the waterworks have an adequate strategy to monitor and maintain tank water quality? (preventing issues due to stratification, water age, nitrification, etc.) ✓
  
- 12 Is the tank mixer/aerator functioning adequately? ✓
  
- 13 Is tank level control adequate? (pressure maintained, high/low alarms if needed, level recorded) ✓
  
- 14 Are operators familiar with tank levels necessary to maintain 20 psi, 1/2 day storage, and provide target fire flow for target duration? ✓
  
- 15 Is adequate corrosion control in place? (exterior coating in good condition, cathodic protection operable, ringwall seal intact) ✓
  
- 16 Is operator safety adequately provided? (ladder safety system in good condition, operators trained and adequately equipped, no other hazards) ✓

17	Is access to the storage tank maintained? (lot mowed/kept up, road maintained)	✓
18	Is surface water diverted from the tank?	✓
28	No other issues with tank or associated appurtenances	✓
4	Are pictures of the tank interior provided? Are there indications of problems? (Floating debris, deteriorated lining, corrosion evident, excess sediment, etc.)	Not Applicable

### **GLEN ALLEN (1.1 MG STANDPIPE)**

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1	Is the access ladder locked from unauthorized access?	✓
2	Has the waterworks provided documentation to verify the vent is properly shielded and screened with #24 mesh?	✓
3	Has the waterworks provided documentation that the entrance hatch is locked and a shoebox style or otherwise protected from the entrance of water?	✓
5	Does the tank have a functioning drain with a protected outlet?	✓
6	Does the tank have an overflow affixed with a screen adequate to prevent entry of pests or a duckbill, and an air gap with a splash pad/sanitary drain?	✓
7	Is the sidewall access and all other access locked/bolted?	✓
8	Is access to the storage tank facility fenced and locked, or located within a greater secure area? (fence and lock in good condition)	✓
9	Are all other tank openings curbed, sleeved, watertight and freeze protected?	✓
10	Does the waterworks have an effective routine tank inspection and preventative maintenance program in place?	✓
11	Does the waterworks have an adequate strategy to monitor and maintain tank water quality? (preventing issues due to stratification, water age, nitrification, etc.)	✓
12	Is the tank mixer/aerator functioning adequately?	✓

13	Is tank level control adequate? (pressure maintained, high/low alarms if needed, level recorded)	✓
14	Are operators familiar with tank levels necessary to maintain 20 psi, 1/2 day storage, and provide target fire flow for target duration?	✓
15	Is adequate corrosion control in place? (exterior coating in good condition, cathodic protection operable, ringwall seal intact)	✓
16	Is operator safety adequately provided? (ladder safety system in good condition, operators trained and adequately equipped, no other hazards)	✓
17	Is access to the storage tank maintained? (lot mowed/kept up, road maintained)	✓
18	Is surface water diverted from the tank?	✓
28	No other issues with tank or associated appurtenances	✓
4	Are pictures of the tank interior provided? Are there indications of problems? (Floating debris, deteriorated lining, corrosion evident, excess sediment, etc.)	Not Applicable

#### **MOUNTAIN RD. (3MG TANK)**

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1	Is the access ladder locked from unauthorized access?	✓
2	Has the waterworks provided documentation to verify the vent is properly shielded and screened with #24 mesh?	✓
3	Has the waterworks provided documentation that the entrance hatch is locked and a shoebox style or otherwise protected from the entrance of water?	✓
5	Does the tank have a functioning drain with a protected outlet?	✓
6	Does the tank have an overflow affixed with a screen adequate to prevent entry of pests or a duckbill, and an air gap with a splash pad/sanitary drain?	✓
7	Is the sidewall access and all other access locked/bolted?	✓
8	Is access to the storage tank facility fenced and locked, or located within a greater secure area? (fence and lock in good condition)	✓

9	Are all other tank openings curbed, sleeved, watertight and freeze protected?	✓
10	Does the waterworks have an effective routine tank inspection and preventative maintenance program in place?	✓
11	Does the waterworks have an adequate strategy to monitor and maintain tank water quality? (preventing issues due to stratification, water age, nitrification, etc.)	✓
12	Is the tank mixer/aerator functioning adequately?	✓
13	Is tank level control adequate? (pressure maintained, high/low alarms if needed, level recorded)	✓
14	Are operators familiar with tank levels necessary to maintain 20 psi, 1/2 day storage, and provide target fire flow for target duration?	✓
15	Is adequate corrosion control in place? (exterior coating in good condition, cathodic protection operable, ringwall seal intact)	✓
16	Is operator safety adequately provided? (ladder safety system in good condition, operators trained and adequately equipped, no other hazards)	✓
17	Is access to the storage tank maintained? (lot mowed/kept up, road maintained)	✓
18	Is surface water diverted from the tank?	✓
28	No other issues with tank or associated appurtenances	✓
4	Are pictures of the tank interior provided? Are there indications of problems? (Floating debris, deteriorated lining, corrosion evident, excess sediment, etc.)	Not Applicable

### **ROBIN AVENUE 3 MG STORAGE TANK**

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1	Is the access ladder locked from unauthorized access?	✓
2	Has the waterworks provided documentation to verify the vent is properly shielded and screened with #24 mesh?	✓
3	Has the waterworks provided documentation that the entrance hatch is locked and a shoebox style or otherwise protected from the entrance of water?	✓

5	Does the tank have a functioning drain with a protected outlet?	✓
6	Does the tank have an overflow affixed with a screen adequate to prevent entry of pests or a duckbill, and an air gap with a splash pad/sanitary drain?	✓
7	Is the sidewall access and all other access locked/bolted?	✓
8	Is access to the storage tank facility fenced and locked, or located within a greater secure area? (fence and lock in good condition)	✓
9	Are all other tank openings curbed, sleeved, watertight and freeze protected?	✓
10	Does the waterworks have an effective routine tank inspection and preventative maintenance program in place?	✓
11	Does the waterworks have an adequate strategy to monitor and maintain tank water quality? (preventing issues due to stratification, water age, nitrification, etc.)	✓
12	Is the tank mixer/aerator functioning adequately?	✓
13	Is tank level control adequate? (pressure maintained, high/low alarms if needed, level recorded)	✓
14	Are operators familiar with tank levels necessary to maintain 20 psi, 1/2 day storage, and provide target fire flow for target duration?	✓
15	Is adequate corrosion control in place? (exterior coating in good condition, cathodic protection operable, ringwall seal intact)	✓
16	Is operator safety adequately provided? (ladder safety system in good condition, operators trained and adequately equipped, no other hazards)	✓
17	Is access to the storage tank maintained? (lot mowed/kept up, road maintained)	✓
18	Is surface water diverted from the tank?	✓
28	No other issues with tank or associated appurtenances	✓
4	Are pictures of the tank interior provided? Are there indications of problems? (Floating debris, deteriorated lining, corrosion evident, excess sediment, etc.)	Not Applicable

## **EUBANK ELEVATED TANK(1.0 MG)**

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- |    |   |   |
|----|---|---|
| 1  | Is the access ladder locked from unauthorized access?   | ✓ |
| 2  | Has the waterworks provided documentation to verify the vent is properly shielded and screened with #24 mesh?   | ✓ |
| 3  | Has the waterworks provided documentation that the entrance hatch is locked and a shoebox style or otherwise protected from the entrance of water?                  | ✓ |
| 5  | Does the tank have a functioning drain with a protected outlet?   | ✓ |
| 6  | Does the tank have an overflow affixed with a screen adequate to prevent entry of pests or a duckbill, and an air gap with a splash pad/sanitary drain?             | ✓ |
| 7  | Is the sidewall access and all other access locked/bolted?  | ✓ |
| 8  | Is access to the storage tank facility fenced and locked, or located within a greater secure area? (fence and lock in good condition)                               | ✓ |
| 9  | Are all other tank openings curbed, sleeved, watertight and freeze protected?   | ✓ |
| 10 | Does the waterworks have an effective routine tank inspection and preventative maintenance program in place?  | ✓ |
| 11 | Does the waterworks have an adequate strategy to monitor and maintain tank water quality? (preventing issues due to stratification, water age, nitrification, etc.) | ✓ |
| 12 | Is the tank mixer/aerator functioning adequately?   | ✓ |
| 13 | Is tank level control adequate? (pressure maintained, high/low alarms if needed, level recorded)  | ✓ |
| 14 | Are operators familiar with tank levels necessary to maintain 20 psi, 1/2 day storage, and provide target fire flow for target duration?                            | ✓ |
| 15 | Is adequate corrosion control in place? (exterior coating in good condition, cathodic protection operable, ringwall seal intact)                                    | ✓ |
| 16 | Is operator safety adequately provided? (ladder safety system in good condition, operators trained and adequately equipped, no other hazards)                       | ✓ |

17	Is access to the storage tank maintained? (lot mowed/kept up, road maintained)	✓
18	Is surface water diverted from the tank?	✓
28	No other issues with tank or associated appurtenances	✓
4	Are pictures of the tank interior provided? Are there indications of problems? (Floating debris, deteriorated lining, corrosion evident, excess sediment, etc.)	Not Applicable

### **SHADY GROVE (2X1.25 MG TANKS)**

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1	Is the access ladder locked from unauthorized access?	✓
2	Has the waterworks provided documentation to verify the vent is properly shielded and screened with #24 mesh?	✓
3	Has the waterworks provided documentation that the entrance hatch is locked and a shoebox style or otherwise protected from the entrance of water?	✓
5	Does the tank have a functioning drain with a protected outlet?	✓
6	Does the tank have an overflow affixed with a screen adequate to prevent entry of pests or a duckbill, and an air gap with a splash pad/sanitary drain?	✓
7	Is the sidewall access and all other access locked/bolted?	✓
8	Is access to the storage tank facility fenced and locked, or located within a greater secure area? (fence and lock in good condition)	✓
9	Are all other tank openings curbed, sleeved, watertight and freeze protected?	✓
10	Does the waterworks have an effective routine tank inspection and preventative maintenance program in place?	✓
11	Does the waterworks have an adequate strategy to monitor and maintain tank water quality? (preventing issues due to stratification, water age, nitrification, etc.)	✓
12	Is the tank mixer/aerator functioning adequately?	✓

13	Is tank level control adequate? (pressure maintained, high/low alarms if needed, level recorded)	✓
14	Are operators familiar with tank levels necessary to maintain 20 psi, 1/2 day storage, and provide target fire flow for target duration?	✓
15	Is adequate corrosion control in place? (exterior coating in good condition, cathodic protection operable, ringwall seal intact)	✓
16	Is operator safety adequately provided? (ladder safety system in good condition, operators trained and adequately equipped, no other hazards)	✓
17	Is access to the storage tank maintained? (lot mowed/kept up, road maintained)	✓
18	Is surface water diverted from the tank?	✓
28	No other issues with tank or associated appurtenances	✓
4	Are pictures of the tank interior provided? Are there indications of problems? (Floating debris, deteriorated lining, corrosion evident, excess sediment, etc.)	Not Applicable

**LEN AVE. (2X2.5 MG TANKS)**

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1	Is the access ladder locked from unauthorized access?	✓
2	Has the waterworks provided documentation to verify the vent is properly shielded and screened with #24 mesh?	✓
3	Has the waterworks provided documentation that the entrance hatch is locked and a shoebox style or otherwise protected from the entrance of water?	✓
5	Does the tank have a functioning drain with a protected outlet?	✓
6	Does the tank have an overflow affixed with a screen adequate to prevent entry of pests or a duckbill, and an air gap with a splash pad/sanitary drain?	✓
7	Is the sidewall access and all other access locked/bolted?	✓
8	Is access to the storage tank facility fenced and locked, or located within a greater secure area? (fence and lock in good condition)	✓



9	Are all other tank openings curbed, sleeved, watertight and freeze protected?	✓
10	Does the waterworks have an effective routine tank inspection and preventative maintenance program in place?	✓
11	Does the waterworks have an adequate strategy to monitor and maintain tank water quality? (preventing issues due to stratification, water age, nitrification, etc.)	✓
12	Is the tank mixer/aerator functioning adequately?	✓
13	Is tank level control adequate? (pressure maintained, high/low alarms if needed, level recorded)	✓
14	Are operators familiar with tank levels necessary to maintain 20 psi, 1/2 day storage, and provide target fire flow for target duration?	✓
15	Is adequate corrosion control in place? (exterior coating in good condition, cathodic protection operable, ringwall seal intact)	✓
16	Is operator safety adequately provided? (ladder safety system in good condition, operators trained and adequately equipped, no other hazards)	✓
17	Is access to the storage tank maintained? (lot mowed/kept up, road maintained)	✓
18	Is surface water diverted from the tank?	✓
28	No other issues with tank or associated appurtenances	✓
4	Are pictures of the tank interior provided? Are there indications of problems? (Floating debris, deteriorated lining, corrosion evident, excess sediment, etc.)	Not Applicable

## Pumps

### THREE CHOPT RD. PUMP STATION

1	Is the pump station lot in reasonable condition? (mowed, accessible, no inappropriate storage- i.e. chemicals, water diverted away)	✓
2	Is the pump station building in good condition? (lighting, ventilation, heating, structure, screened floor drain/concrete floor, pump gland piped to drain, locked)	✓
3	Is the pump station building free of contaminants that are not related to the treatment or distribution of drinking water?	✓

- |   |  |   |
|---|--|---|
| 4 | Are all pumps operating properly? (controls operating as designed, ie. alternating or lead lag)  | ✓ |
| 5 | Is the pump station affixed with all required operable appurtenances? (flow meter, low pressure cut off, alarms, isolation valves on inlet and outlet, compound gages, and outlet check valve) | ✓ |
| 6 | Are the pumps maintained properly? (Maintenance log, food grade oil/grease, sounds okay, and not leaking)  | ✓ |
| 7 | Are adequate replacement parts available?  | ✓ |
| 8 | Are all/any potential cross connections adequately protected?  | ✓ |
| 9 | Does the pump station have emergency power (permanent generator or connections for portable generator)? - Update SDWIS and WDS if emergency power is added.                                    | ✓ |

**RIDGE RD. PUMP STATION**

---

- |   |  |   |
|---|--|---|
| 1 | Is the pump station lot in reasonable condition? (mowed, accessible, no inappropriate storage- i.e. chemicals, water diverted away)  | ✓ |
| 2 | Is the pump station building in good condition? (lighting, ventilation, heating, structure, screened floor drain/concrete floor, pump gland piped to drain, locked)                            | ✓ |
| 3 | Is the pump station building free of contaminants that are not related to the treatment or distribution of drinking water?   | ✓ |
| 4 | Are all pumps operating properly? (controls operating as designed, ie. alternating or lead lag)  | ✓ |
| 5 | Is the pump station affixed with all required operable appurtenances? (flow meter, low pressure cut off, alarms, isolation valves on inlet and outlet, compound gages, and outlet check valve) | ✓ |
| 6 | Are the pumps maintained properly? (Maintenance log, food grade oil/grease, sounds okay, and not leaking)  | ✓ |
| 7 | Are adequate replacement parts available?  | ✓ |
| 8 | Are all/any potential cross connections adequately protected?  | ✓ |

- 9 Does the pump station have emergency power (permanent generator or connections for portable generator)? - Update SDWIS and WDS if emergency power is added. ✓

**LAWRENCE RD. PUMP STATION**

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- 1 Is the pump station lot in reasonable condition? (mowed, accessible, no inappropriate storage- i.e. chemicals, water diverted away) ✓
- 2 Is the pump station building in good condition? (lighting, ventilation, heating, structure, screened floor drain/concrete floor, pump gland piped to drain, locked) ✓
- 3 Is the pump station building free of contaminants that are not related to the treatment or distribution of drinking water? ✓
- 4 Are all pumps operating properly? (controls operating as designed, ie. alternating or lead lag) ✓
- 5 Is the pump station affixed with all required operable appurtenances? (flow meter, low pressure cut off, alarms, isolation valves on inlet and outlet, compound gages, and outlet check valve) ✓
- 6 Are the pumps maintained properly? (Maintenance log, food grade oil/grease, sounds okay, and not leaking) ✓
- 7 Are adequate replacement parts available? ✓
- 8 Are all/any potential cross connections adequately protected? ✓
- 9 Does the pump station have emergency power (permanent generator or connections for portable generator)? - Update SDWIS and WDS if emergency power is added. ✓

**GLEN ALLEN PUMP STATION**

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- 1 Is the pump station lot in reasonable condition? (mowed, accessible, no inappropriate storage- i.e. chemicals, water diverted away) ✓
- 2 Is the pump station building in good condition? (lighting, ventilation, heating, structure, screened floor drain/concrete floor, pump gland piped to drain, locked) ✓
- 3 Is the pump station building free of contaminants that are not related to the treatment or distribution of drinking water? ✓
- 4 Are all pumps operating properly? (controls operating as designed, ie. alternating or lead lag) ✓

- |   |  |   |
|---|--|---|
| 5 | Is the pump station affixed with all required operable appurtenances? (flow meter, low pressure cut off, alarms, isolation valves on inlet and outlet, compound gages, and outlet check valve) | ✓ |
| 6 | Are the pumps maintained properly? (Maintenance log, food grade oil/grease, sounds okay, and not leaking)  | ✓ |
| 7 | Are adequate replacement parts available?  | ✓ |
| 8 | Are all/any potential cross connections adequately protected?  | ✓ |
| 9 | Does the pump station have emergency power (permanent generator or connections for portable generator)? - Update SDWIS and WDS if emergency power is added.                                    | ✓ |

**ELKO (EAST END) PUMP STATION**

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- |   |  |   |
|---|--|---|
| 1 | Is the pump station lot in reasonable condition? (mowed, accessible, no inappropriate storage- i.e. chemicals, water diverted away)  | ✓ |
| 2 | Is the pump station building in good condition? (lighting, ventilation, heating, structure, screened floor drain/concrete floor, pump gland piped to drain, locked)                            | ✓ |
| 3 | Is the pump station building free of contaminants that are not related to the treatment or distribution of drinking water?   | ✓ |
| 4 | Are all pumps operating properly? (controls operating as designed, ie. alternating or lead lag)  | ✓ |
| 5 | Is the pump station affixed with all required operable appurtenances? (flow meter, low pressure cut off, alarms, isolation valves on inlet and outlet, compound gages, and outlet check valve) | ✓ |
| 6 | Are the pumps maintained properly? (Maintenance log, food grade oil/grease, sounds okay, and not leaking)  | ✓ |
| 7 | Are adequate replacement parts available?  | ✓ |
| 8 | Are all/any potential cross connections adequately protected?  | ✓ |
| 9 | Does the pump station have emergency power (permanent generator or connections for portable generator)? - Update SDWIS and WDS if emergency power is added.                                    | ✓ |

**MOUNTAIN RD. PUMP STATION**

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- |   |  |   |
|---|--|---|
| 1 | Is the pump station lot in reasonable condition? (mowed, accessible, no inappropriate storage- i.e. chemicals, water diverted away)  | ✓ |
| 2 | Is the pump station building in good condition? (lighting, ventilation, heating, structure, screened floor drain/concrete floor, pump gland piped to drain, locked)                            | ✓ |
| 3 | Is the pump station building free of contaminants that are not related to the treatment or distribution of drinking water?   | ✓ |
| 4 | Are all pumps operating properly? (controls operating as designed, ie. alternating or lead lag)  | ✓ |
| 5 | Is the pump station affixed with all required operable appurtenances? (flow meter, low pressure cut off, alarms, isolation valves on inlet and outlet, compound gages, and outlet check valve) | ✓ |
| 6 | Are the pumps maintained properly? (Maintenance log, food grade oil/grease, sounds okay, and not leaking)  | ✓ |
| 7 | Are adequate replacement parts available?  | ✓ |
| 8 | Are all/any potential cross connections adequately protected?  | ✓ |
| 9 | Does the pump station have emergency power (permanent generator or connections for portable generator)? - Update SDWIS and WDS if emergency power is added.                                    | ✓ |

**SHADY GROVE PUMP STATION(THREE)**

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- |   |  |   |
|---|--|---|
| 1 | Is the pump station lot in reasonable condition? (mowed, accessible, no inappropriate storage- i.e. chemicals, water diverted away)  | ✓ |
| 2 | Is the pump station building in good condition? (lighting, ventilation, heating, structure, screened floor drain/concrete floor, pump gland piped to drain, locked)                            | ✓ |
| 3 | Is the pump station building free of contaminants that are not related to the treatment or distribution of drinking water?   | ✓ |
| 4 | Are all pumps operating properly? (controls operating as designed, ie. alternating or lead lag)  | ✓ |
| 5 | Is the pump station affixed with all required operable appurtenances? (flow meter, low pressure cut off, alarms, isolation valves on inlet and outlet, compound gages, and outlet check valve) | ✓ |
| 6 | Are the pumps maintained properly? (Maintenance log, food grade oil/grease, sounds okay, and not leaking)  | ✓ |

- |   |   |   |
|---|---|---|
| 7 | Are adequate replacement parts available?   | ✓ |
| 8 | Are all/any potential cross connections adequately protected?   | ✓ |
| 9 | Does the pump station have emergency power (permanent generator or connections for portable generator)? - Update SDWIS and WDS if emergency power is added. | ✓ |

**ROBIN AVE. PS (2)**

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- |   |  |   |
|---|--|---|
| 1 | Is the pump station lot in reasonable condition? (mowed, accessible, no inappropriate storage- i.e. chemicals, water diverted away)  | ✓ |
| 2 | Is the pump station building in good condition? (lighting, ventilation, heating, structure, screened floor drain/concrete floor, pump gland piped to drain, locked)                            | ✓ |
| 3 | Is the pump station building free of contaminants that are not related to the treatment or distribution of drinking water?   | ✓ |
| 4 | Are all pumps operating properly? (controls operating as designed, ie. alternating or lead lag)  | ✓ |
| 5 | Is the pump station affixed with all required operable appurtenances? (flow meter, low pressure cut off, alarms, isolation valves on inlet and outlet, compound gages, and outlet check valve) | ✓ |
| 6 | Are the pumps maintained properly? (Maintenance log, food grade oil/grease, sounds okay, and not leaking)  | ✓ |
| 7 | Are adequate replacement parts available?  | ✓ |
| 8 | Are all/any potential cross connections adequately protected?  | ✓ |
| 9 | Does the pump station have emergency power (permanent generator or connections for portable generator)? - Update SDWIS and WDS if emergency power is added.                                    | ✓ |

**LEN AVE. PUMP STATION**

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- |   |   |   |
|---|---|---|
| 1 | Is the pump station lot in reasonable condition? (mowed, accessible, no inappropriate storage- i.e. chemicals, water diverted away)                                 | ✓ |
| 2 | Is the pump station building in good condition? (lighting, ventilation, heating, structure, screened floor drain/concrete floor, pump gland piped to drain, locked) | ✓ |

- |   |  |   |
|---|--|---|
| 3 | Is the pump station building free of contaminants that are not related to the treatment or distribution of drinking water?   | ✓ |
| 4 | Are all pumps operating properly? (controls operating as designed, ie. alternating or lead lag)  | ✓ |
| 5 | Is the pump station affixed with all required operable appurtenances? (flow meter, low pressure cut off, alarms, isolation valves on inlet and outlet, compound gages, and outlet check valve) | ✓ |
| 6 | Are the pumps maintained properly? (Maintenance log, food grade oil/grease, sounds okay, and not leaking)  | ✓ |
| 7 | Are adequate replacement parts available?  | ✓ |
| 8 | Are all/any potential cross connections adequately protected?  | ✓ |
| 9 | Does the pump station have emergency power (permanent generator or connections for portable generator)? - Update SDWIS and WDS if emergency power is added.                                    | ✓ |

### MR Data Verification

- |   |   |   |
|---|---|---|
| 1 | BSSP appropriate for the population served, sample sites used, and extent of the distribution system  | ✓ |
| 2 | Does the waterworks correctly rotate sites, use all approved sites, and not use unapproved sites? (verify collection addresses are from approved sites since the last inspection) | ✓ |
| 5 | Does the DDBP Monitoring Plan include the correct number of samples, frequency, and appropriate sample locations where maximum DBP formation is expected?                         | ✓ |
| 6 | Does the LCR Plan include the correct number of samples, frequency, and appropriate sample locations based on the Tiered criteria?  | ✓ |
| 7 | Does the MOR confirm continuous Optimized Corrosion Control Treatment (OCCT) in accordance with the Operation Permit Conditions?  | ✓ |
| 8 | Have all MORs been submitted in the last 12 months?   | ✓ |
| 9 | Are all required operational treatment parameter monitoring and other information reported?   | ✓ |

- |    |   |   |
|----|---|---|
| 10 | Continuous CI - Are grab samples collect at least weekly for routine verification checks for each on-line analyzer?   | ✓ |
| 11 | Continuous CI - Are results of grab sample verification checks within the larger of +/- 0.1 mg/L or +/- 15%?  | ✓ |
| 12 | Continuous CI - Are records of calibration recorded and maintained for 3 years?   | ✓ |
| 13 | Continuous CI - Is data recorded every 15 minutes?  | ✓ |
| 14 | Chlorine monitoring - Is an approved method used to analyze the chlorine grab samples? (methods using test strips or a color wheel are not approved)  | ✓ |
| 15 | Does the reading at the instrument agree with the reading at the SCADA system or chart recorder?  | ✓ |
| 16 | Is the continuous chlorine analyzer equipped with minimum and maximum alarms, and are the settings adequate to protect public health and ensure compliance with the regulations?                      | ✓ |
| 17 | Do all chemical reagents and standards for on-line analyzers and grab sample methods have an unexpired shelf life?  | ✓ |
| 18 | SWTR - Disinfection Profile submitted with Operation Reports or available for review, and acceptable?   | ✓ |
| 19 | Can the operator/sampler identify the correct sample locations and do they have access to approved monitoring plans (raw, entry point, process control, WQPs, DBPs, total coliform, lead and copper?) | ✓ |
| 20 | Request the operator/sampler to collect a typical test and observe the technique (chlorine residual, orthophosphate, iron, manganese, pH, etc.) Does the operator/sampler know how to use test kits?  | ✓ |
| 21 | Does the operator/sampler otherwise demonstrate sufficient knowledge of sampling requirements?  | ✓ |
| 22 | Are test kits appropriately maintained (correct reagents, unexpired reagents, calibration standards, calibration log book maintained, etc.)?  | ✓ |
| 23 | Review of SDWIS, MOR, field samples, and daily log water quality sampling results free of evidence of potential sampler error, potential data falsification, or other data problems?                  | ✓ |
| 24 | SCADA system calibrated to all online instrumentation (pH, turbidity, chlorine residual, etc. - Recommend recording all online instrument results for comparison to SCADA with comments or pictures)  | ✓ |



- 25 Do all SCADA/online instruments and bench pH monitoring results agree (Recommend recording all online instrument results for comparison to SCADA with comments or pictures) within acceptable range ✓
- 26 All pH measurements within acceptable range (compliant with regulations and operation permit conditions) ✓
- 27 Continuous pH monitoring equipment in good condition and calibrated in accordance with manufacturer recommendations (if applicable)  
Per system representative, pH meter is calibrated as needed based on bench results ✓
- 28 Do all SCADA/online instruments and bench turbidity monitoring results agree (Recommend recording all online instrument results for comparison to bench results with comments or pictures) all within in acceptable range ✓
- 29 All turbidity measurements below limit (compliant with regulations and operation permit conditions) ✓
- 30 All chlorine residual measurements within acceptable range (compliant with regulations and operation permit conditions) ✓
- 31 Daily log indicates adequate testing frequency for all required parameters and results within acceptable ranges (take photos of daily log for records) ✓
- 32 Raw water and finished water flow rates are within permitted values ✓
- 33 laboratory equipment in good condition (pH meter, turbidimeter, chlorine test equipment, jar tester, zeta meter, pilot filters, streaming current monitor, particle counter) ✓
- 34 Online turbidity monitors calibrated in accordance with manufacturers recommendations at least quarterly quarterly ✓
- 35 Each filter or membrane skid effluent has an individual continuous turbidity monitor ✓
- 36 Filter effluent turbidity monitoring system has adequate alarm set points ✓
- 37 Online turbidity monitoring results recorded at least every 4 hours (regs, 15 minutes recommended by VOP) and kept for at least 3 years ✓
- 38 Desktop turbidimeter maintained in accordance with manufactures recommendations (calibration methods and frequency, bulb changing, cuvette condition, unexpired standards)  
Hach 2100N: last calibration 01/16/2024 ✓
- 39 Chlorine residuals, pH, temperature, flowrate, and clearwell level monitored and controlled in range to meet inactivation requirements ✓

- |    |   |   |
|----|---|---|
| 40 | <b>Fluoride monitoring adequate (equipment in good condition, calibrated in accordance with manufacturer recommendations, online analyzer corresponds to bench if applicable)</b> | ✓ |
| 41 | <b>Adequate backflow protection at lab sinks (air gap or vacuum breaker), etc.</b>  | ✓ |
| 42 | <b>Laboratory in good general condition</b>   | ✓ |
| 43 | <b>Public Notices and Certification Forms submitted and are up to date in SDWIS</b>   | ✓ |

### Management and Operation

- |    |  |   |
|----|--|---|
| 1  | <b>Are the waterworks facilities and appurtenances in good operating condition? (source, treatment, and distribution facilities without defect) (triennial assessment)</b>       | ✓ |
| 2  | <b>Does the system meet Waterworks Regulations design and construction standards? (unpermitted construction or modification) (triennial assessment)</b>                          | ✓ |
| 3  | <b>Does the waterworks meet all established National Primary Drinking Water Standards, and has taken action to prevent recurrence of past violations? (triennial assessment)</b> | ✓ |
| 4  | <b>Did the owner issue Public Notice if required?</b>  | ✓ |
| 5  | <b>Has the waterworks either not received significant deficiencies, or completed timely correction of all significant deficiencies? (triennial assessment)</b>                   | ✓ |
| 6  | <b>Did the waterworks address recommendations from recent sanitary surveys? (triennial assessment)</b>   | ✓ |
| 7  | <b>Free of complaints since the last inspection? (explain or summarize any complaints reported to ODW or the waterworks in the comments)</b>                                     | ✓ |
| 8  | <b>Does the waterworks have a written policy for responding to customer complaints? (triennial assessment)</b>   | ✓ |
| 9  | <b>Does the waterworks have an emergency response plan that has been tested and is routinely updated?</b>  | ✓ |
| 10 | <b>Is the Emergency Management Plan for Extended Power Outage current?</b>   | ✓ |

- |    |  |   |
|----|--|---|
| 11 | Are all plans and reports up to date and implemented (eg. BSSP, LCR Plan, CCCP, CCR, Sampling, etc.)? (triennial assessment)                 | ✓ |
| 12 | Does the waterworks have sufficient licensed operator coverage for sick leave and vacation? (triennial assessment)                           | ✓ |
| 13 | No problems with personnel turnover  | ✓ |
| 14 | Are there records of an active ongoing staff training program?   | ✓ |
| 15 | Have all operators attended a technical training seminar or conference at least once per year, over the past 3 years? (triennial assessment) | ✓ |
| 16 | Did operators appear to be adequately trained for their roles?   | ✓ |
| 17 | Is there an active safety program?   | ✓ |
| 18 | Clear lines of communication established with managers, plant and system operators?  | ✓ |
| 19 | Is the system's management generally responsive to operator requests for training, equipment, or other needs?                                | ✓ |
| 20 | Does the waterworks have records demonstrating that preventative maintenance tasks are scheduled and performed?                              | ✓ |
| 21 | Does the waterworks have a written Asset Management Plan? (triennial assessment)   | ✓ |
| 22 | Does the waterworks have a written Capital Improvement Plan? (triennial assessment)  | ✓ |
| 23 | Is a reserve fund established to cover necessary replacements or Capital Improvements? (triennial assessment)                                | ✓ |
| 24 | Does the waterworks have at least 45 days cash on-hand to cover expenses? (triennial assessment)   | ✓ |
| 25 | Is the waterworks budget independent from subsidization by general funds, sewer funds or other funding sources? (triennial assessment)       | ✓ |
| 26 | Have the waterworks' rates been adjusted in the past three years? (triennial assessment)   | ✓ |

- |    |  |   |
|----|--|---|
| 27 | Does the waterworks have a WBOP that is up to date and implemented?  | ✓ |
| 28 | Are all service connections equipped with operational meters and is there a water accountability program in place? (triennial assessment)  | ✓ |
| 29 | Did the waterworks consistently operate within 80% of its permitted capacity? (not exceeded for 3 consecutive months) (triennial assessment)   | ✓ |
| 30 | Has the waterworks operated within their Operation Permit capacity since the last inspection? (if not, explain in comments)  | ✓ |
| 31 | Is treatment plant staffing in accordance with the Waterworks Regulations? (Is the number of adequately licensed operators adequate to run the plant as needed considering sick leave, vacation, etc.)   | ✓ |
| 32 | Adequate criteria and procedures established for plant shut down in case of unit process failure/significant overall quality degradation   | ✓ |
| 33 | Records retained in accordance with the Retention and Disposition Schedule of the Library of Virginia, General Schedule No. 7 for public utility records of county and municipal governments   | ✓ |
| 34 | Has the waterworks implemented Operational Technology (OT), such as SCADA, industrial controls systems (ICS), building management systems, fire control systems, and physical access control systems? (If yes, update SDWIS OT indicator to reflect) | ✓ |
| 35 | Does the waterworks routinely perform cybersecurity assessments and address gaps identified?   | ✓ |

### Operator Compliance

- |   |  |   |
|---|--|---|
| 1 | Does the designated operator have an unexpired Virginia DPOR waterworks operator license of at least the same class as the waterworks? | ✓ |
| 2 | Sufficient number of adequately licensed operators to cover all shifts   | ✓ |

### Other

- |   |   |   |
|---|---|---|
| 1 | Enter into comment field the number of hours spent (number only) on this survey, including preparation, travel, time on site, and report writing.<br>On/at treatment plant - currently at ~18 hours 03/01/2024 TB | ✓ |
| 2 | Is the waterworks Operation Permit up-to-date? (if no, describe changes needed in comments)   | ✓ |

- |   |   |   |
|---|---|---|
| 3 | <p><b>Is the Waterworks Description Sheet up-to-date?</b> (if no, describe changes needed in comments)<br/>         Updating pump station information</p>   | ✓ |
| 4 | <p><b>Is SDWIS inventory data current?</b> (update while in the field if possible, or note changes needed in comments to update upon returning to the office)<br/>         Staff needs to be updated due to retirement/turnover</p>   | ✓ |
| 5 | <p><b>SDWIS data review - No unaddressed exceedances</b> (PMCL, SMCL, AL, OEL, etc.) If an exceedance was not indicated by a SDWIS compliance report, log in the SDWIS issue log at Y:\13-Manuals\09-Data Management Manual\SDWIS</p>   | ✓ |
| 6 | <p><b>SDWIS Data Review - Sample schedule types, frequencies, and number of samples correct</b></p>   | ✓ |
| 7 | <p><b>SDWIS Violation &amp; Enforcement Action data current?</b></p>  | ✓ |
| 8 | <p><b>No other safety issues or concerns noted during the inspection</b><br/>         Raw intake and pump house appear in good condition. WTP is fenced and gated with a call box. Inside WTP plant was clean and uncluttered. Safety signs were posted where necessary. Equipment not in service was locked out.</p> | ✓ |

**Sources**

**HENRICO RAW WATER INTAKE**

- |    |  |   |
|----|--|---|
| 44 | <p><b>Observed source water quality does not present potential treatability issues</b></p>   | ✓ |
| 45 | <p><b>No activities or pollution sources in the immediate intake area represent a potential health risk</b></p>                            | ✓ |
| 46 | <p><b>Condition of screen, adequate cleaning</b></p>   | ✓ |
| 47 | <p><b>Condition of intake and associated structures</b></p>  | ✓ |
| 48 | <p><b>Intake components do not restrict the ability of the waterworks to meet present demand</b></p>                                       | ✓ |
| 49 | <p><b>All raw water pumps maintained and operable, protected from flooding and vandalism</b></p>   | ✓ |
| 50 | <p><b>Present water demand does not exceed the permitted source capacity</b></p>   | ✓ |
| 51 | <p><b>Source Water Assessment is up-to-date (no changes have occurred that result in a change to the susceptibility determination)</b></p> | ✓ |

- 52 **Waterworks has a written source water protection plan (Inform community waterworks serving <50,000 persons that ODW contractors can assist with development of a plan, info on ODW webpage)** ✓
  
- 53 **Waterworks is aware of or a member of VA WARN (if not, inform the waterworks that this network can aid waterworks in response to emergencies, see vawarn.org)** ✓
  
- 54 **No contamination events since last survey** ✓