COMMONWEALTH of VIRGINIA

B. Cameron Webb, MD, JD
State Health Commissioner

DEPARTMENT OF HEALTH

OFFICE OF DRINKING WATER

Richmond Field Office

Madison Building
109 Governor St., 7th floor
Richmond, VA 23219
Phone: 804-864-7409
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System Sanitary Survey Report

April 3, 2026

To: Dr. Scott A. Morris
Richmond, City Of
730 East Broad Street, 6Th Fl
Richmond, VA, 23219

SUBJECT: Richmond City
Waterworks: Richmond, City Of
PWSID: VA4760100

Survey Date: February 23, 2026

Next Survey Due By: February 23, 2029

Present at Survey:

Name	Organization
Toby Bryant	Office Of Drinking Water
James Reynolds	Office Of Drinking Water
Mesfin Hirte	Office Of Drinking Water
Tony S. Singh	City Of Richmond DPU
Donte R. Johnson	City Of Richmond DPU
Lyndsey Mccauley	Office Of Drinking Water
Randall Morrissette	Office Of Drinking Water
Tanni Sarker	Office Of Drinking Water
Sam Neth	Office Of Drinking Water

Reviewer: Tanni Sarker

As a result of the sanitary survey noted above, the Office of Drinking Water offers the following report. Should you have questions or desire to discuss our findings, please contact us at 757-406-1252 or James.Reynolds@vdh.virginia.gov.

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:

James D. Reynolds, PE
Field Director- Richmond Field Office

Attachment

ec:
Donte R. Johnson, City Of Richmond DPU
VDH-ODW-Central Office
Richmond City Health Department
Richmond City Administrator

Public Water System Site Visit

PWS ID: VA4760100 PWS Name: RICHMOND, CITY OF

Source Type: SW System Type: C Population: 229395 Local Name:

County: City: RICHMOND CITY Last Sanitary Survey Date: 6/5/2002

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

Service Connections	Name	Count
Commercial	Unknown	13385
Commercial	Unknown	118
Commercial	Unknown	69751

Points of Contact

Name (Job Title)	POC Type	Address	Phone	Email
CITY OF RICHMOND	OW	900 E. Broad Street, Suite 201	804-646-7970	
SINGH, TONY S. DEPUTY DIRECTOR SR	AC	3920 Douglasdale Road	804-646-1635	Tony.Singh@rva.gov
JOHNSON, DONTE R. PROG AND OPS MGR -WTP	SA | EC | DO | AC	3920 Douglasdale Road	804-646-1807	Donte.Johnson@rva.gov
MORRIS, SCOTT A. DPU DIRECTOR	AC	730 East Broad Street, 6th FL	804-646-5205	Scott.Morris@rva.gov

Active Water System Facilities

Active WS Facilities Type Name	WS Facility ID	Active Sample Point Name
DISTRIBUTION SYSTEM	DS001	DB002,OTHER,DB010,TCR01,DB007,DB006,LCR-49,LCR-4,LCR-43,LCR-39,LCR-35,LCR-31,LCR-26,LCR-22,LCR-40,LCR-36,LCR-37,LCR-38,LCR-41,LCR-42,LCR-44,LCR-45,LCR-46,LCR-79,LCR-80,LCR-81,LCR-82,LCR-83,LCR-84,LCR-85,LCR-86,LCR-87,LCR-91,LCR-130,LCR-131,LCR-132,LCR-133,LCR-134,LCR-135,LCR-136,LCR-137,LCR-138,LCR-139,LCR-140,LCR-141,LCR-142,LCR-143,LCR-147,LCR-144,LCR-145,LCR-146,LCR-148,LCR-149,LCR-150,LCR-1,LCR-2,LCR-3,LCR-5,LCR-6,LCR-7,LCR-8,LCR-9,LCR-10,LCR-11,LCR-13,LCR-15,LCR-16,LCR-17,LCR-18,LCR-19,LCR-20,LCR-21,LCR-23,LCR-24,LCR-29,LCR-75,LCR-25,LCR-27,LCR-28,LCR-30,LCR-32,LCR-33,LCR-34,LCR-61,LCR-51,LCR-52,LCR-53,LCR-54,LCR-55,LCR-56,LCR-57,LCR-58,LCR-59,LCR-60,LCR-62,LCR-63,LCR-64,LCR-65,LCR-66,LCR-67,LCR-69,LCR-72,LCR-73,LCR-74,LCR-76,LCR-77,LCR-78,LCR-88,LCR-89,LCR-90,LCR-92,LCR-93,LCR-94,LCR-95,LCR-96,LCR-97,LCR-98,LCR-99,LCR-100,LCR-101,LCR-102,LCR-103,LCR-104,LCR-105,LCR-106,LCR-107,LCR-108,LCR-109,LCR-110,LCR-111,LCR-112,LCR-113,LCR-114,LCR-117,LCR-47,LCR-48,LCR-50,LCR-115,LCR-116,LCR-118,LCR-119,LCR-120,LCR-121,LCR-122,LCR-123,LCR-124,LCR-125,LCR-126,LCR-127,LCR-128,LCR-129,LCR-68,LCR-70,LCR-71,LCR-12,LCR-14
KORAH PS - ENTRY POINT NO 1	EP001	EP001

RAW WATER INTAKE	IN001	RW001
WESTHAMPTON PUMP STATION	PS001	
FOREST HILL AVE PUMP STATION	PS010	
CHURCH HILL PUMP STATION	PS011	
COFER ROAD PUMP STATION	PS021	
JAHNKE RD PUMP STATION	PS022	
HUGUENOT ROAD PUMP STATION	PS023	
KORAH PUMP STATION NOS. 1, 2 & 3	PS10A	
BYRD PARK PUMP STATION & RESERVE P.S.	PS10B	
TRAFFORD PUMP STATION	PS10C	
COLUMBUS PUMP STATION	PS10D	
BYRD PARK 55 MG RESERVOIR	ST010	
CHURCH HILL (5 MG TANK)	ST011	
GINTER PARK (1MG ELEV TANK)	ST012	
COFER ROAD (2.0 MG TANK)	ST021	
JAHNKE ROAD (2.5 MG TANK)	ST022	
HUGENOT ROAD (0.75MG TANK)	ST023	
WARWICK ROAD (1MG ELEV TANK)	ST024	
WOODSIDE (1MG ELEV TANK)	ST025	
STRATFORD HILLS (0.25 MG ELEV TANK)	ST026	
FOREST HILL (0.2MG ELEV TANK)	ST027	
HIOAKS (2 MG ELEV TANK)	ST028	
COFER ROAD (2.1 MG TANK)	ST21A	
RICHMOND WTP	TP001	UP001

Compliance Schedules

Schedule Closed Date	Schedule Effective Date	Schedule Id	Schedule Status Code	Schedule Status Date	Schedule Type
1/1/0001 12:00:00 AM	4/14/1923 12:00:00 AM	2	F	3/20/2019 12:00:00 AM	PLAN
1/1/0001 12:00:00 AM	4/14/1923 12:00:00 AM	2	F	3/20/2019 12:00:00 AM	PLAN
1/1/0001 12:00:00 AM	6/28/2025 12:00:00 AM	32	F	1/1/0001 12:00:00 AM	AO
1/1/0001 12:00:00 AM	4/14/1923 12:00:00 AM	2	F	3/20/2019 12:00:00 AM	PLAN
1/1/0001 12:00:00 AM	6/28/2025 12:00:00 AM	32	F	1/1/0001 12:00:00 AM	AO
1/1/0001 12:00:00 AM	6/28/2025 12:00:00 AM	32	F	1/1/0001 12:00:00 AM	AO
1/1/0001 12:00:00 AM	6/28/2025 12:00:00 AM	32	F	1/1/0001 12:00:00 AM	AO
1/1/0001 12:00:00 AM	4/14/1923 12:00:00 AM	2	F	3/20/2019 12:00:00 AM	PLAN
1/1/0001 12:00:00 AM	4/14/1923 12:00:00 AM	2	F	3/20/2019 12:00:00 AM	PLAN
1/1/0001 12:00:00 AM	4/14/1923 12:00:00 AM	2	F	3/20/2019 12:00:00 AM	PLAN
1/1/0001 12:00:00 AM	4/14/1923 12:00:00 AM	2	F	3/20/2019 12:00:00 AM	PLAN
1/1/0001 12:00:00 AM	7/1/2025 12:00:00 AM	31	F	1/1/0001 12:00:00 AM	FOLL
1/1/0001 12:00:00 AM	4/14/1923 12:00:00 AM	2	F	3/20/2019 12:00:00 AM	PLAN
1/1/0001 12:00:00 AM	4/14/1923 12:00:00 AM	2	F	3/20/2019 12:00:00 AM	PLAN
1/1/0001 12:00:00 AM	6/28/2025 12:00:00 AM	32	F	1/1/0001 12:00:00 AM	AO
1/1/0001 12:00:00 AM	1/1/2026 12:00:00 AM	35	F	1/1/2026 12:00:00 AM	CCR
1/1/0001 12:00:00 AM	4/14/1923 12:00:00 AM	2	F	3/20/2019 12:00:00 AM	PLAN
1/1/0001 12:00:00 AM	6/28/2025 12:00:00 AM	32	F	1/1/0001 12:00:00 AM	AO
1/1/0001 12:00:00 AM	4/14/1923 12:00:00 AM	2	F	3/20/2019 12:00:00 AM	PLAN
1/1/0001 12:00:00 AM	6/28/2025 12:00:00 AM	32	F	1/1/0001 12:00:00 AM	AO
1/1/0001 12:00:00 AM	7/26/2025 12:00:00 AM	33	F	1/1/0001 12:00:00 AM	AO
1/1/0001 12:00:00 AM	4/14/1923 12:00:00 AM	2	F	3/20/2019 12:00:00 AM	PLAN
1/1/0001 12:00:00 AM	9/9/2024 12:00:00 AM	22	F	1/1/0001 12:00:00 AM	FOLL
1/1/0001 12:00:00 AM	1/1/2026 12:00:00 AM	35	F	1/1/2026 12:00:00 AM	CCR
1/1/0001 12:00:00 AM	4/14/1923 12:00:00 AM	2	F	3/20/2019 12:00:00 AM	PLAN
1/1/0001 12:00:00 AM	4/14/1923 12:00:00 AM	2	F	3/20/2019 12:00:00 AM	PLAN
1/1/0001 12:00:00 AM	1/1/2026 12:00:00 AM	35	F	1/1/2026 12:00:00 AM	CCR
1/1/0001 12:00:00 AM	4/14/1923 12:00:00 AM	2	F	3/20/2019 12:00:00 AM	PLAN
1/1/0001 12:00:00 AM	6/28/2025 12:00:00 AM	32	F	1/1/0001 12:00:00 AM	AO
1/1/0001 12:00:00 AM	7/26/2025 12:00:00 AM	33	F	1/1/0001 12:00:00 AM	AO

Compliance Schedule Activities					
Activity Achieve Date	Activity Comment	Activity Due Date	Activity Name	Activity Projected Date	Activity Reported Date
5/6/2025 12:00:00 AM	Updated to include at least 50% lead service lines and 50% copper with lead solder lines (Tier 1s)- JR 5/6/25	5/6/2025 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
6/14/2023 12:00:00 AM	150 Samples/month- JR 6/14/23	6/14/2023 12:00:00 AM	VAPLAN RTCR BSSP	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
9/8/2025 12:00:00 AM	d.Within 120 days of the effective date of this Order, collaborate with RFO and commit to completing a business operation plan with RFO by submitting to RFO the following items: a.Capital improvement plan (CIP) b.Updated organizational charts c.Water Asset Management Plan (AMP) or equivalent documents d.Approved budget e.Output from most recent rate model run f.List of active contracts for water related services	10/27/2025 12:00:00 AM	AO - ADMINISTRATIVE ORDER REQUIREMENT	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
1/9/2026 12:00:00 AM		1/9/2026 12:00:00 AM	VAPLAN CROSS-CONN. 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
1/9/2026 12:00:00 AM	provide RFO with quarterly progress reports regarding the status of the City's efforts to address each of the significant deficiencies identified in the Sanitary Survey Report, as set forth in the City's Significant Deficiencies Corrective Action Plan (CAP) and Schedule. The progress reports are due by the 10th day after the last day of the quarter being reported on. Upon completion of the Significant Deficiencies CAP, submit to RFO a final report verifying that the Significant Deficiencies CAP has been completed	1/10/2026 12:00:00 AM	AO - ADMINISTRATIVE ORDER REQUIREMENT	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
10/9/2025 12:00:00 AM	Within 120 days of the effective date of this Order, or as otherwise possible and appropriate, provide RFO with a comprehensive spreadsheet to RFO's satisfaction of all regulatory violations identified in this Order, and all deficiencies, areas of concern, and recommendations in: (1) the Sanitary Survey Report; (2) EPA's 2022 Safe Drinking Water Act Compliance Inspection Report and RFO's April 7, 2025, report regarding the	10/28/2025 12:00:00 AM	AO - ADMINISTRATIVE ORDER REQUIREMENT	1/1/0001 12:00:00 AM	1/1/0001 12:00:00 AM

	findings of RFO's follow-up site visit; (3) the HNTB report, and (4) the SEH report. For each regulatory violation, deficiency, area of concern, and recommendation, the City's comprehensive spreadsheet must include the City's CAP consisting of actions, already taken or planned, for addressing each item and a schedule (Schedule) for execution of the City's CAP for ODW's review and approval, in order to return the Richmond Waterworks to compliance with the PWSL and the Regulations. The City must include in the comprehensive spreadsheet responsive information for each regulatory violation, deficiency, area of concern, and recommendation, even if the City has resolved the identified item prior to the City creating the comprehensive spreadsheet. After submission of the comprehensive spreadsheet, the City must provide ODW with quarterly progress reports to resolve or respond to each identified item in the CAP. This comprehensive spreadsheet constitutes the					

	City's entire CAP and Schedule and must incorporate the Significant Deficiencies CAP and Schedule addressing the 12 significant deficiencies identified in the Sanitary Survey Report and required pursuant to 12VAC5- 590-350.D of the Regulations, discussed in paragraph a. above. The City may provide the RFO with quarterly progress reports in conjunction with the status update of the City's efforts to address each of the significant deficiencies identified in the Sanitary Survey Report, or at another less frequent period agreed to by both parties				
Activity Achieve Date	Activity Comment	Activity Due Date	Activity Name	Activity Projected Date	Activity Reported Date
7/1/2025 12:00:00 AM	per -:Enforcement_ProgressReportResponse_2025-11-14.pdf Within 120 days of the effective date of this Order, provide RFO with a list of current and updated SOPs, or a statement of the date(s) that the current SOPs were last updated since January 6, 2025, or that the SOPs do not require a further update at this time, especially with respect to power outage response. Continue to	10/26/2025 12:00:00 AM	AO - ADMINISTRATIVE ORDER REQUIREMENT	1/1/0001 12:00:00 AM	1/1/0001 12:00:00 AM

	ensure back-up power systems are routinely exercised and tested pursuant to SOP(s), including prior to storm events, to prevent flooding or other damage to the WTP or loss of water service. SOP(s) must include the frequency and procedures to test critical equipment and back-up power supplies on a periodic basis, as well as before storm events, and the frequency and procedures to practice transitioning the WTP from commercial power to emergency power and returning to commercial power; and maintenance, construction, and other project oversight. The SOP(s) must include roles and responsibilities of Richmond Waterworks staff in carrying out the action items within the SOP(s). In addition, the City must provide RFO with documentation that training was conducted on the SOP(s).				
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
1/1/1989 12:00:00 AM		1/1/1989 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
1/13/2009 12:00:00 AM		1/13/2009 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
2/26/2013 12:00:00 AM	Updated to last signed approved copy in files based on file search due to SNSV. JR 09/25/2020	2/26/2013 12:00:00 AM	VAPLAN ST2 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
2/9/2006 12:00:00 AM		2/9/2006 12:00:00 AM	Z-NOUSE BSSR	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
9/6/2006 12:00:00 AM		9/6/2006 12:00:00 AM	Z-NOUSE IDSE 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
10/10/2025 12:00:00 AM	Beginning with the calendar quarter that this Order becomes effective, provide RFO with quarterly progress reports regarding the status of the City's efforts to address each of the significant deficiencies identified in the Sanitary Survey Report, as set forth in the City's Significant Deficiencies Corrective Action Plan (CAP) and Schedule. The progress reports are due by the 10th day after the last day of the quarter being reported on. Upon completion of the Significant Deficiencies CAP, submit to RFO a final report verifying that the Significant Deficiencies CAP has been completed	10/10/2025 12:00:00 AM	AO - ADMINISTRATIVE ORDER REQUIREMENT	1/1/0001 12:00:00 AM	10/10/2025 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		7/1/2026 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
7/9/2014 12:00:00 AM		7/9/2014 12:00:00 AM	VAPLAN LT2 ROUND 2 NOTIFICATION LETTER	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
10/1/2025 12:00:00 AM	Within 120 days of the effective date of this Order, provide RFO the schedule for periodic testing of emergency backup systems at the Richmond Waterworks	10/25/2025 12:00:00 AM	AO - ADMINISTRATIVE ORDER REQUIREMENT	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
2/20/2015 12:00:00 AM		2/20/2015 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
1/1/0001 12:00:00 AM		4/10/2026 12:00:00 AM	AO - ADMINISTRATIVE ORDER REQUIREMENT	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
7/23/2025 12:00:00 AM	civil charge of $1482.60, within 30 days of effective date	8/26/2025 12:00:00 AM	AO - ADMINISTRATIVE ORDER REQUIREMENT	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
1/1/0001 12:00:00 AM	Follow up on construction	9/9/2028 12:00:00 AM	FOLLOW UP	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	Draft received 1/20/2026. TB 2/13/26	7/1/2026 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
3/18/2008 12:00:00 AM		3/18/2008 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
9/6/2006 12:00:00 AM		9/6/2006 12:00:00 AM	Z-NOUSE LT2 GRANDFATHER 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
1/1/0001 12:00:00 AM		10/1/2026 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
7/14/2005 12:00:00 AM		7/14/2005 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
7/23/2025 12:00:00 AM	Pay civil charge of $6817 within 30 days of the effective date of this order	7/28/2025 12:00:00 AM	AO - ADMINISTRATIVE ORDER REQUIREMENT	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
9/17/2025 12:00:00 AM	4760100_Enforcement_ConsentOrder_DocumentsReceived_2025-09-24 a.Within 120 days of the effective date of this Order, submit to RFO a report outlining which recommendation contained within the Filter Optimization Plan will be incorporated into the operations of the WTP. The report shall set forth actions that the City has taken or plans to take, and a schedule that the City plans to incorporate them.	11/23/2025 12:00:00 AM	AO - ADMINISTRATIVE ORDER REQUIREMENT	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
RICHMOND WTP	CHEMICALS	INHIBITOR, BIMETALLIC PHOSPHAT	441
RICHMOND WTP	CHEMICALS	PH ADJUSTMENT, POST	741
RICHMOND WTP	DISINFECTION	CHLORAMINES	200
RICHMOND WTP	DISINFECTION	HYPOCHLORINATION, PRE	423
RICHMOND WTP	FILTER # 19	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 20	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 17	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 16	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 15	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 14	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 13	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 12	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 11	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 9	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 8	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 7	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 6	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 5	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 4	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 3	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 2	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 1	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 18	FILTRATION, RAPID SAND	345

RICHMOND WTP	FILTER # 21	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 22	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 10	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER- PLT1	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER-PLT2	FILTRATION, RAPID SAND	345
RICHMOND WTP	FLUORIDATION	FLUORIDATION	380
RICHMOND WTP	FLASH MIX	COAGULATION	240
RICHMOND WTP	FILTER-PLT2	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER- PLT1	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 10	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 22	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 21	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 20	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 19	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 18	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 17	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 16	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 15	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 14	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 13	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 12	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 11	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 9	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 8	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 7	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 6	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 5	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 4	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 2	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 1	FILTRATION, RAPID SAND	345
RICHMOND WTP	FILTER # 3	FILTRATION, RAPID SAND	345
RICHMOND WTP	FLOCCULATION	FLOCCULATION	360
RICHMOND WTP	SED BASIN # 1	SEDIMENTATION	660
RICHMOND WTP	SED BASIN # 2	SEDIMENTATION	660
RICHMOND WTP	SED BASIN # 3	SEDIMENTATION	660
RICHMOND WTP	SED BASIN # 4	SEDIMENTATION	660
RICHMOND WTP	CHEMICALS	ACTIVATED CARBON, POWDERED	125

Routine Schedule Analyte or Group	WSF Name	Frequency	Begin Date
COLIFORM (TCR)	Distribution System	150 RT per MN	6/1/2024
CARBON, TOTAL	RICHMOND WTP	1 RT per MN	1/1/2013
CHLR ACID HERB(SOC)A	KORAH PS - ENTRY POINT NO 1	1 RT per 3Y	1/1/2026
SOC-DIQUAT	KORAH PS - ENTRY POINT NO 1	1 RT per 3Y	1/1/2026
VOC	KORAH PS - ENTRY POINT NO 1	1 RT per YR	1/1/2017
TTHM/HAA5	DISTRIBUTION SYSTEM	4 RT per QT	1/1/2025
RAD ALPHA	KORAH PS - ENTRY POINT NO 1	1 RT per 6Y	1/1/2014
TOC_ALK	RAW WATER INTAKE	1 RT per MN	1/1/2013
CARBAMATES (SOC)-A	KORAH PS - ENTRY POINT NO 1	1 RT per 3Y	1/1/2026
FLUORIDE SPLIT	KORAH PS - ENTRY POINT NO 1	1 OT per MN	1/1/2013
INO_METALS COMBO	KORAH PS - ENTRY POINT NO 1	1 RT per YR	1/1/2017
CYANIDE	KORAH PS - ENTRY POINT NO 1	1 RT per 9Y	1/1/2011
VOLFUM(SOC)-A	KORAH PS - ENTRY POINT NO 1	1 RT per 3Y	1/1/2026
NITRATE + NITRITE	KORAH PS - ENTRY POINT NO 1	1 RT per YR	1/1/2017
PBCU	DISTRIBUTION SYSTEM	50 RT per 3Y	1/1/2023
SEMIVOL(SOC)-A	KORAH PS - ENTRY POINT NO 1	1 RT per 3Y	1/1/2026

Water Facility Monthly Testing

Monthly Analyte	WSF Name	Count Per Day	Level Type	Level	Unit Of Measure	Begin Date
CARBON, TOTAL	RICHMOND WTP	0	MIN	1.00	RATIO	1/1/2019
CHLORAMINE	DISTRIBUTION SYSTEM	0	MAX	4.00	MG/L	1/1/2019
ORTHOPHOSPHATE	DISTRIBUTION SYSTEM	0	MIN	.80	MG/L	1/1/2019
ORTHOPHOSPHATE	RICHMOND WTP	0	MIN	1.00	MG/L	1/1/2019
PH	DISTRIBUTION SYSTEM	0	MIN	7.00	SU	1/1/2019
PH	RICHMOND WTP	0	MIN	7.30	SU	1/1/2019

TCR Positives in Last 24 Months

Sample ID	Date Collected	Sample Type	Sample Point Name	Analyte
AD21022	9/22/2025 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
AD20414	9/15/2025 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
AD17501	8/12/2025 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
AD14772	7/10/2025 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
AD14778	7/10/2025 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
AD14779	7/10/2025 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
AD14639	7/9/2025 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
AD11979	6/9/2025 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
AD11982	6/9/2025 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
AD10704	5/27/2025 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
AD10703	5/27/2025 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
AD06638	4/8/2025 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
AD06637	4/8/2025 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
AD06636	4/8/2025 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
AD06635	4/8/2025 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
AD00931	1/30/2025 12:00:00 AM	RP	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
AD00930	1/30/2025 12:00:00 AM	RP	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
AD00779	1/29/2025 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
AD00780	1/29/2025 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
AC92758	10/22/2024 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
AC86759	8/12/2024 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
AC86376	8/7/2024 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
AC86377	8/7/2024 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
AC86378	8/7/2024 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
AC86260	8/6/2024 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
AC84458	7/16/2024 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
AC84334	7/15/2024 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
AC84336	7/15/2024 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
AC84335	7/15/2024 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
AC79892	5/20/2024 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)
AC79891	5/20/2024 12:00:00 AM	RT	DISTRIBUTION SYSTEM POINT	COLIFORM (TCR)

Violations in Last Five Years

Facility	Violation Type	Analyte Name	Violation Begin Date	Violation End Date
	MONITORING, LAB CERT/METHOD ERROR (RTCR)	REVISED TOTAL COLIFORM RULE (RTCR)	9/1/2021	9/30/2021
	INADEQUATE DBP PRECURSOR REMOVAL	CARBON, TOTAL	7/1/2020	9/30/2020
	RELIABILITY PROBLEM		5/27/2025	7/26/2025
	RELIABILITY PROBLEM		4/23/2025	5/29/2025
	LESS THAN 20 PSI AT SERVICE CONNECTION		1/6/2025	1/11/2025
	RELIABILITY PROBLEM		1/6/2025	6/28/2025

Unresolved Deficiencies

CODE (NAME)	Visit Date	Identified Date	WSF	Category	Severity
TR169	2/23/2026 12:00:00 AM	2/20/2025 12:00:00 AM		TR	SIG
MO35	2/23/2026 12:00:00 AM	2/20/2025 12:00:00 AM		SM	SIG
FW05	2/23/2026 12:00:00 AM	2/20/2025 12:00:00 AM		FW	SIG
MO01	2/23/2026 12:00:00 AM	2/20/2025 12:00:00 AM		SM	SIG

Virginia Department of Health
Office of Drinking Water, Richmond Field Office
Sanitary Survey Report

Inspection Dates:	Monday, February 23, 2026 – Wednesday, February 25, 2026	
System Name:	City of Richmond	
PWSID:	VA4760100	
System Address:	3920 Douglasdale Road Richmond, Virginia 23221	
Site Point of Contact:	Scott Morris, Director Richmond Department of Public Utilities	
	Email: Scott.Morris@rva.gov	
ODW-RFO Inspectors:	Water Treatment Plant	James Reynolds (Primary) Email: james.reynolds@vdh.virginia.gov
		Toby Bryant Email: toby.bryant@vdh.virginia.gov
		Mesfin Hirte Email: mesfin.hirte@vdh.virginia.gov
	Distribution System	Randy Morrissette Email: randall.morrissette@vdh.virginia.gov
		Sam Neth Email: sam.neth@vdh.virginia.gov
		Tanni Sarker Email: tanni.sarker@vdh.virginia.gov
		Lyndsey McCauley Email: lyndsey.mccauley@vdh.virginia.gov
Report Prepared By:	James Reynolds Signature: Date: 04/03/26	
Report Reviewed By:	Tanni Sarker Signature: Tanni Sarker Date: 04/03/26	

Contents

Introduction

On Monday, February 23 through Wednesday, February 25, 2026, the Virginia Department of Health, Office of Drinking Water, Richmond Field Office ("ODW-RFO") conducted an announced Sanitary Survey of the City of Richmond Public Water System (PWSID VA4760100)("System") to evaluate the System's compliance with Virginia Waterworks Regulations.

A previous walkthrough conducted on December 16, 2025; an interview and on-site review of the Cross Connection Control Program ("CCCP") conducted on January 8, 2026; and a virtual interview and review of the implementation of cybersecurity conducted on January 26, 2026 will also be utilized to provide observations and updates related to the System. This walkthrough mostly covered the newly installed automatic transfer switch for the generators and the Uninterruptible Power Supply (UPS) systems for controlled shutdown of the water treatment plant ("WTP") in the event of power failure.

Prior to the on-site portion of the Sanitary Survey, ODW-RFO submitted a document request to the System and received requested documents by the requested submission date of January 15, 2026. Information and documentation requested included current information of customer population, water audits, water quality sampling programs, valve and hydrant testing, flushing programs, hydraulic modeling, and main break response procedures.

The inspection was led by James Reynolds, Field Director, ODW-RFO. Representatives from the System included Tony Singh, Deputy Department Director, Sr.; Donte Johnson, Programs and Operations Manager; Kenny Weeks, Programs and Operations Manager; Leroy Rice, Plant Operations Supervisor Sr.; Arnold Eberly, Program and Operations Supervisor; and Jeff McBride, Director of Water and Administration.

The agenda for the Sanitary Survey consisted of an opening meeting on February 23, 2026, followed by document review of remaining outstanding documents and inspection of the head of the WTP (pre-sedimentation basin, raw water pumps, chemical feeds, coagulation, flocculation, sedimentation). On-site document review included review of the Emergency Response Plan, training records, maintenance

records, backflow prevention device testing records, filter testing activities, and technical memos for upcoming projects.

Two teams split inspection of the distribution system tanks and pump stations on February 24, 2026.

The remaining portions of the WTP and on-site distribution system booster pumping systems were conducted on February 25, 2026. The end of each day concluded with a brief summary of the day's observations.

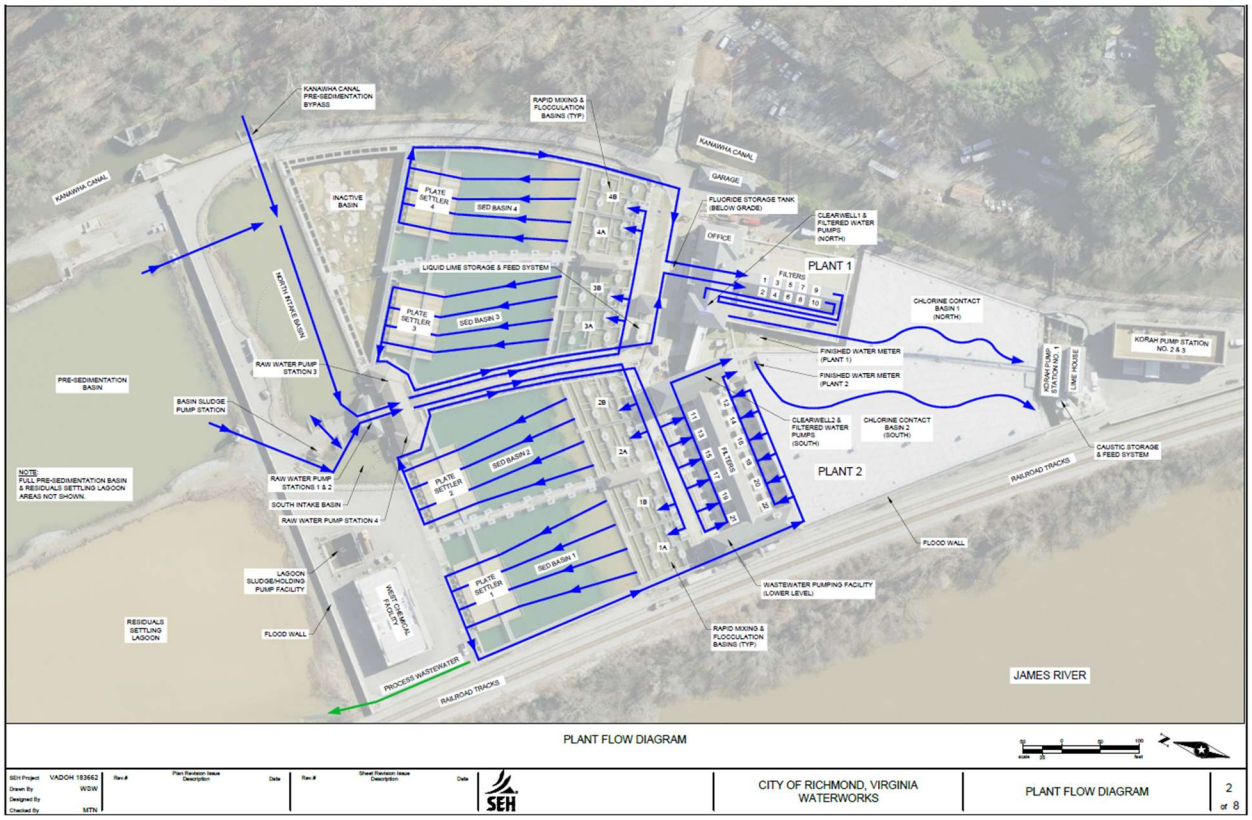
The Sanitary Survey concluded with a summary of major observations on the afternoon of February 25, 2026.

System Description

The City of Richmond WTP is a surface WTP facility that is currently permitted for a maximum capacity of 132 MGD. The WTP not only provides water to the City of Richmond service area, but wholesales water to serve portions of water demand for Henrico County, Chesterfield County, and Hanover County. In addition, Henrico County wholesales water to Goochland County and Chesterfield County wholesales water to Powhatan County. Hanover and Goochland Counties also wholesale water to smaller subdivision sized water systems.

The plant is located on the bank of the James River; it's primary water source. A flood wall is provided to minimize impact of river flooding to the plant. Supplemental raw water may be taken from the Kanawha Canal, which receives water from the James River and Tuckahoe Creek.

The plant is essentially split into two interconnected treatment trains, the original WTP built in 1924 (Plant No. 1) and an expansion of the WTP built around 1950 (Plant No. 2). Plant No. 1 and No. 2 are capable of independent operation. Plant No. 1 has a capacity of 60 MGD and Plant No. 2 has a capacity of 72 MGD when fully operational.



Raw water through filtration process

Raw water flows by gravity from the James River at the Williams Island Dam intake through a feeder channel and into the pre-sedimentation basin. Supplemental water from the Kanawha Canal can be directed into the plant, as needed.

Water from the pre-sedimentation basin flows by gravity into raw water basins at the start of each plant which can be operated independently or in parallel. The raw water passes through screens prior to entering the raw water pump wet wells of three raw water pump station buildings. The wet wells provide water to the suction side of four raw water pumps (one building houses two raw water pumps, the other two buildings house one raw water pump each). The raw water pumps discharge water to two separate concrete channels, one that typically serves Plant No. 1 and one that typically serves Plant No. 2. Once the raw water enters the concrete channels, gravity is used to flow through the coagulation, flocculation, sedimentation, and filtration treatment processes of Plant No. 1 and No. 2 and into the clearwell basins located underneath the filtration gallery of each Plant No. 1 and No. 2. At the end of each sedimentation basin, the WTP is provided with inclined plate settlers.

Raw Water Chemicals

The WTP has the ability to feed copper sulfate in the event of algal blooms. In addition, the WTP can feed potassium permanganate for pre-oxidation and powdered activated carbon for taste and odor control at the raw water channel after the raw water pumps.

For flocculation and coagulation, the WTP feeds alum and a polymer to serve as a coagulant aid. Sodium hypochlorite is fed after the inclined plate settlers to provide contact time prior to entering the filters.

Filtration

There are 22 multi-media filters on site, 10 filters serve Plant No. 1 and 12 filters serve Plant No. 2. The filters consist of anthracite, sand, and garnet.

The filter gallery is located underneath the filters and is where associated filter piping, filter controls, filter instrumentation and filtered water pumps are located. Beneath a portion of the filter gallery are the clearwells where water from the filters is stored before being transferred to the finished water basins by the filtered water pumps.

Clearwells

The clearwells are interconnected by pipe. Four filtered water pumps at each Plant (eight total pumps) pump water from the clearwells to two finished water basins. The finished water basins are identified as North- served by water from Plant No. 1 typically and South- served water from Plant No. 2 typically. ("N" pumps in Plant 1; "S" Pumps in Plant 2.)

Finished water pumps deliver water from the finished water basins to the distribution system. Another concrete channel flows water by gravity to the Byrd Park Reservoir from the finished water basins. Korah Pump Stations Nos. 1, 2, and 3 are located on-site at the WTP adjacent to the finished water basins. Two pump stations are located at Byrd Park, provided water via gravity from the finished water basins, and transfer water to the Byrd Park Reservoir.

Finish Water Chemicals

Water is treated with sodium hypochlorite and ammonia upstream of the finished water basins to provide secondary disinfection by chloramination in the distribution system. Lime and caustic are added in the finished water basins for pH control, fluoride for dental health, and zinc orthophosphate for corrosion control

Finished pump general information

Korah No. 1- Sends water to Byrd Park Reservoir (2)

Korah No. 2- Sends water to Cofer Road storage tanks and can send additional supply capacity to Byrd Park Reservoir through a 36-inch tie-in to the Korah No. 1 discharge line. (5)

Korah No. 3- Sends water to Henrico County and if needed to Zone 4 in the City (5)

Emergency Power and Resiliency

Dominion Power Feeds

The WTP and Korah Nos. 1, 2, and 3 are provided with two separate electrical feeds (one above ground, one below ground) from Dominion Power to the main substation at the plant. Feeder lines from this substation supply power to Plant No. 1, Plant No. 2, Korah Pump Stations Nos. 1-3, and Douglasdale sewage pump station.

The WTP utilizes both electrical feeds year-round. Automatic bus ties allow for continued operation in the event that one of the feeds goes down.

Generators

The WTP also has two standby generators to provide the WTP with power to run the critical treatment systems and two treatment trains at a reduced capacity of approximately 50 MGD. The City indicates these generators are 2 MW each. The generators can be activated automatically and power the WTP in the event both Dominion Power Feeds are offline through an Automatic Transfer Switch.

UPS Systems

The WTP utilizes Uninterruptible Power Supply systems to provide emergency backup power to critical equipment such as valve actuators, SCADA, and associated PLCs to allow for a controlled shutdown of the WTP in the event that the plant loses power (both Dominion Power Feeds offline and generators fail).

Waste Handling at WTP

A residuals settling lagoon is located adjacent to the pre-sedimentation basin and receives waste water from the plant's sedimentation basin sludge removal equipment and filter backwash processes. Near the head of the pre-sedimentation basin, there is a sluice gate that allows decanted water from the residuals settling lagoon to recycle back into the pre-sedimentation basin and through the WTP.

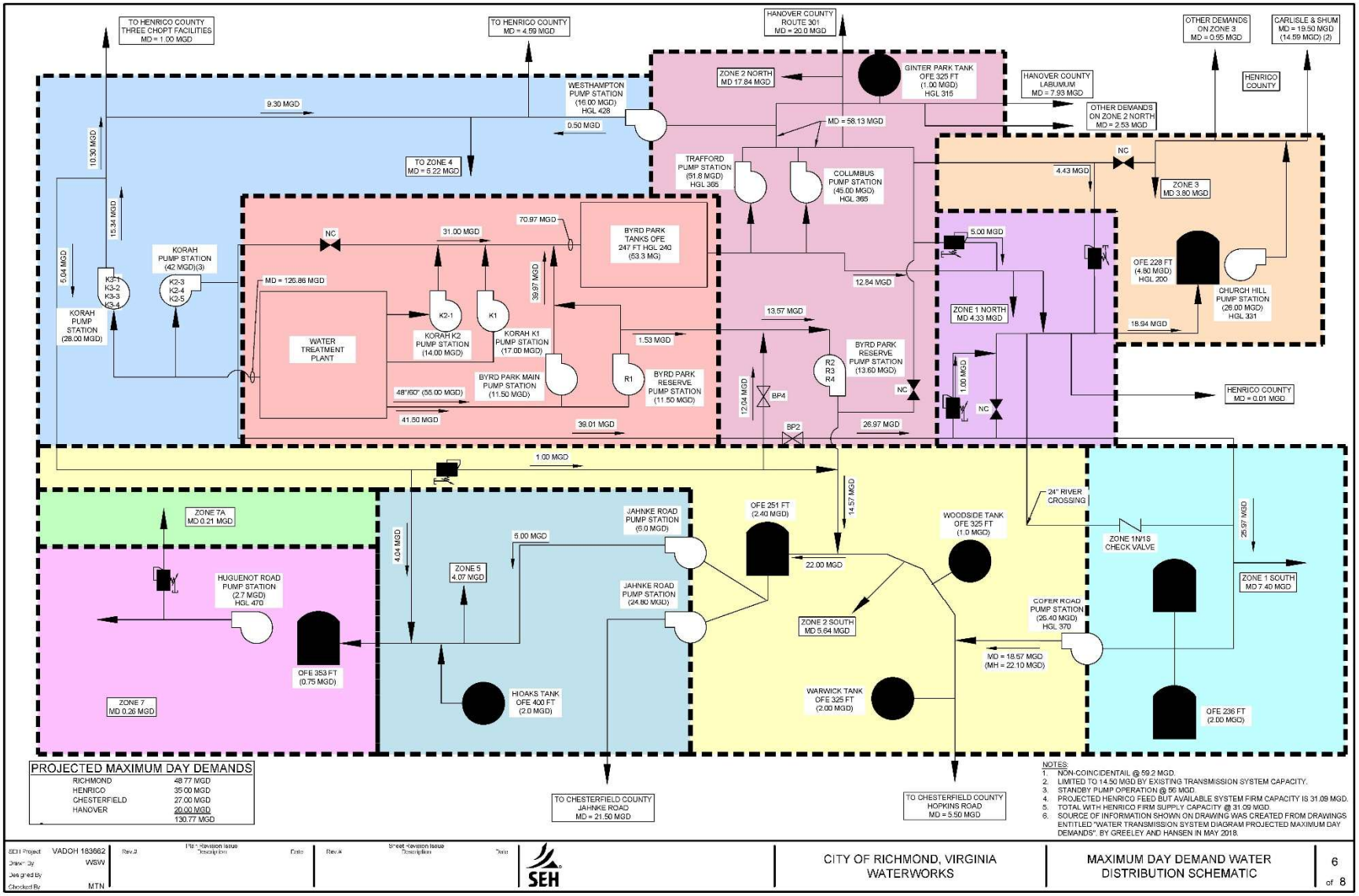
Distribution System

The City has 12 finished water pumping stations and 11 finished water storage facilities in the distribution system. These facilities serve 9 pressure zones.

In addition, Trafford Pump Station is located adjacent to the Byrd Park Reservoir and pumps to the Zone 2 service area. The pump station is manned 24 hours a day and all pump stations and tanks send signals to it.

Byrd Park Reservoir consists of two separate, buried concrete basins and provides water for the Trafford and Columbus Pumping Stations, as well as Zone 1 North, Church Hill tank, and Henrico County. The reservoir was originally constructed in 1874 and was uncovered. The basins were first covered in 1970 and re-roofed in 1982. At the time of the 2026 site visits, one basin was offline for a roof replacement project which reduces the capacity at Byrd Park Reservoir by about half.

A summary of pumping and storage facilities in the distribution system is provided below.



PROJECTED MAXIMUM DAY DEMANDS	
RICHMOND	48.77 MGD
HENRICO	35.00 MGD
CHESTERFIELD	27.00 MGD
HANOVER	20.00 MGD
	130.77 MGD

NOTES:
1. NON-COINCIDENTAIL @ 59.2 MGD.
2. LIMITED TO 14.50 MGD BY EXISTING TRANSMISSION SYSTEM CAPACITY.
3. STANDBY PUMP OPERATION @ 56 MGD.
4. PROJECTED HENRICO FEED BUT AVAILABLE SYSTEM FIRM CAPACITY IS 31.09 MGD.
5. TOTAL WITH HENRICO FIRM SUPPLY CAPACITY @ 31.09 MGD.
6. SOURCE OF INFORMATION SHOWN ON DRAWING WAS CREATED FROM DRAWINGS ENTITLED "WATER TRANSMISSION SYSTEM DIAGRAM PROJECTED MAXIMUM DAY DEMANDS". BY GREELEY AND HANSEN IN MAY 2018.

SEH Project	VADOH 183662	Rev.#	File Revision Issue Description	Date	Rev.#	Sheet Revision Issue Description	Date
Drawn By	WSW						
Designed By							
Checked By	MTN						

SEH

CITY OF RICHMOND, VIRGINIA WATERWORKS

MAXIMUM DAY DEMAND WATER DISTRIBUTION SCHEMATIC

6 of 8

Summary of Sanitary Survey Site Visit Observations from this Inspection

Accolades: The System has taken significant steps to improve communications, culture, and infrastructure since January 2025. ODW-RFO has been on site several times since January 2025 and has observed significant improvements in infrastructure condition, resiliency, housekeeping, training and knowledge of operations, documentation, emergency preparedness, staffing, and communication.

Significant Deficiencies: There were no significant deficiencies observed during the February 2026 sanitary survey

Minor Deficiencies: There were no minor deficiencies observed during the February 2026 sanitary survey

Recommendations: The following recommendations are offered for the February 2026 sanitary survey

Recommendation Number	Facility Inspected	Recommendation	Regulatory Citation	Regulatory Language	Accompanying Photograph (Appendix)
VDH-01	Filters	Filter bed expansion tests are below industry standards of 20-25% bed expansion. The System in planning to replace all filter media in the near future and believes that some of the filter bed expansion difficulties may be due to a loss of filter media over time. Recommend that once the filter media is replaced, the System conduct filter bed expansion tests and if they are still not within 20-25% bed expansion, investigate optimizations to backwash rates and other potential causes of low bed expansion. Over time low bed expansion could lead to mudball formation and reduced filter efficacy.	12VAC5-590-874.K.1	Filtered or finished water shall be applied uniformly across the filter in an upflow direction to provide at least 50% media expansion during all operating conditions. This will normally require backwash flow rates of up to 20 gpm/ft^2 depending on media size, media specific gravity, uniformity coefficient, and water temperature.	None

Recommendation Number	Facility Inspected	Recommendation	Regulatory Citation	Regulatory Language	Accompanying Photograph (Appendix)
VDH-02	Waste Pump No. 2	During the site visit, Waste Pump No. 2 pump appeared to spin backwards when the pump was offline. The System immediately put in a work order to investigate. **Repair was completed as of March 12, 2026.**	12VAC5-590-1065.B.3	Each pump shall have a positive-acting check valve on the discharge side between the pump and shutoff valve or suitable control features to prevent flow reversal	None
VDH-03	Distribution Pump Station Pumps	At the time of inspection Trafford Pump Station Pump No. 1, Columbus Pump Station Pump No. 2, and Westhampton Pump Station Pump No. 4 appeared to be offline. The System placed work orders to investigate each pump. **All pumps were operable as of March 12, 2026.**	12VAC5-590-360.A	The owner shall provide and maintain conditions throughout the entirety of the waterworks in a manner that will assure a high degree of capability and reliability to comply with Part II (12VAC5-590-340 et seq.) of this chapter. This requirement shall pertain to the source water, transmission, treatment, storage, and distribution system facilities and the operation thereof.	None
VDH-04	Water Main Break Procedures	Recommend incorporating new VDH 2-hour reporting	§ 32.1-174.5.	The owner of a waterworks shall report any critical equipment	None

Recommendation Number	Facility Inspected	Recommendation	Regulatory Citation	Regulatory Language	Accompanying Photograph (Appendix)
		requirements for critical equipment failures or malfunctions, effective July 1, 2025 into main break procedures. The 2-hour reporting requirements appear in the Emergency Response Plan, however the main break procedures may need to be revised to include the requirements		failure or malfunction or contaminant release to the Office as soon as practicable but no more than two hours after discovery.	
VDH-05	Standard Operating Procedures	As the new SOPs are being used, document any feedback from staff and revise documents as necessary to improve clarity, accuracy, and usability of the documents. Due to the large number of documents, items such as consistent formatting, ensuring all applicable pre-requisites and references are included, consistent use of terminology, roles and responsibilities, and including procedures for activities that may have been unforeseen in the original drafting process should improve over time as the documents are more routinely used, particularly by newer staff.	12VAC5-590-450	Waterworks operation comprises the constant oversight and management of the facilities and personnel. Consideration shall be given to such factors as the competency of personnel; water quality, including drinking water standards; WTP maintenance and cleanliness; analytical laboratory control; and the operation and maintenance of the facilities, including WTP equipment, distribution system equipment, and piping. As the complexity of the waterworks increases, so does the expertise and skill required of the operating staff.	None

Recommendation Number	Facility Inspected	Recommendation	Regulatory Citation	Regulatory Language	Accompanying Photograph (Appendix)
VDH-06	Fluoride Feed	Over 2025, the System cautiously resumed fluoride feed after the January 2025 event and April 2025 fluoride event by starting the fluoride feed at lower dosages (between 0.3 mg/L-0.5 mg/L) and slowly increasing dosage to the target dosage of 0.7 mg/L over the course of the year. **Fluoride currently within target dosage.** When fed, fluoride concentrations should be maintained above 0.6 mg/L with a target of 0.7 mg/L during normal operations.	12VAC5-590-510.D	The board recommends that all community waterworks in the Commonwealth deliver the optimum fluoride ion concentration as determined by the U.S. Department of Health and Human Services.	None
VDH-07	Cybersecurity	Software patches are installed on OT devices when feasible, however some software may be outdated and unable to patch. Recommend identifying software that can't be patched, evaluate criticality, and plan for upgrades if needed.	12VAC5-590-725.1.c	Adequate hardware shall be in place to allow a high degree of SCADA and computer system reliability and data security	None
VDH-08	Cross Connection Control Program	Recommend incorporating process to	12VAC5-590-600.A	The owner shall establish and implement	None

Recommendation Number	Facility Inspected	Recommendation	Regulatory Citation	Regulatory Language	Accompanying Photograph (Appendix)
		track and document review of CCCP that is required every 5 years (may not need to revise every 5 years, but need to document that has been reviewed). **System indicates they can integrate into existing databases**		a CCCP consistent with the extent of the distribution system and the consumers served by the waterworks. The owner shall review the CCCP and written cross-connection control plan not less than every five years and update it as necessary to satisfy the requirements of this chapter.	

Appendix

Summary of Sanitary Survey Site Visit Notes

December 16, 2025 Walkthrough

Generator and Substation

- Electrical substation project was in progress to replace/rehab the substation (Figure 1)
- Automatic transfer switch was installed to allow automatic activation of the generators should both substation feeds go down. The transfer switch was tested and worked successfully. (Figure 2)
- Substation and generator status and alarms routed to SCADA to allow quick review of power status by operations.
- System operates with both electrical feeds connected at all times, eliminated winter vs summer mode.
- Bus ties are tested and maintained per manufacturer recommendations
- Contractor obtained to do preventative maintenance on generators
- System indicates no observed power blips or flickers in the past few months, when there is a blip operators understand they must call maintenance immediately
- Verified that the System is on the key customer list for Dominion Power, high priority to re-establish power if lost
- Generators can store approximately 2,250 gallon of fuel on site, equates to around 32 hours at a flow rate of 45 MGD. System indicates there are resources available nearby to resupply if needed.
- Implemented poor weather standard operating procedures (SOPs) and weekly standing call on Fridays to discuss any potential weather events and other items that may impact operations during the weekend or prior to known weather events and System preparations.

UPS Systems

- UPS systems for both Plant 1 and Plant 2 replaced with upgraded systems and successfully tested. If activated, able to do a controlled shutdown of filters (Figure 3)
- UPS system for Plant 1 moved from closet (Figure 3)
- Implemented new UPS system checks and PM schedules
- Integrated into SCADA to notify if UPS systems lose power

Raw Water Meter

- New magnetic flow meter installed on raw water

January 8, 2026 CCCP Review

- System indicated submitted updated CCCP to ODW-RFO May 7, 2025. Was not reviewed by ODW-RFO. Reviewed and approved January 9, 2026
- CCCP and implementation robust, all activities tracked and all documents standardized and acceptable
- Procedures in place to provide cross connection review as part of new construction process
- Administrative staff assist in sending out reminder letters to backflow prevention device owners about upcoming testing deadlines, enter test results into database
- Conduct on-site inspections for compliance with CCCP as needed
- Have authority to discontinue water service if needed, attempt to work with customers to get items resolved prior to needing to shut off water
- Failed backflow prevention device tests are followed-up and resolved
- **Recommended process to track and document review of CCCP that is required every 5 years (may not need to revise every 5 years, but need to document that has been reviewed). System indicates they can integrate into existing database**

January 26, 2026 Cybersecurity Review

- Gannett Fleming conducted an assessment March 2025
- Recently hired SCADA Operations Manager position to oversee WTP and wastewater plant SCADA and other Operational Technology (OT) in-house. Part of focus is on cybersecurity.
- Implemented items such as individual log-ins on OT systems, changing default login passwords, installing software patches, drafting written SOPs
- When there is staff separation, it goes through HR and the IT department notifies SCADA Operations Manager. Removes staff logins from OT equipment once notified
- WTP systems backed up every night to an online network attached storage, retained for 3 years
- OT and IT on completely separate networks, networks segmented

- Staff required to take cybersecurity training courses annually, implemented participation in cybersecurity webinars from EPA and others
- SCADA system has separate active directory
- Permissions for staff can be customized, based on position some staff may have higher levels of access than others
- Subscribed to vendor vulnerability alerts, weekly CISA vulnerability messaging
- Require OT vendors to take into consideration cybersecurity as part of contract/procurement process
- Working on in time security monitoring and intrusion detection on top of existing capabilities. OT side has windows logging in place, IT side does have security log collection
- No sensitive data on OT side, IT side encrypted where needed
- **Patches are installed when feasible, some software may be outdated and unable to patch. Recommend looking into software that can't be patched and evaluate criticality and if planning for upgrades is needed.**

February 23-25, 2026 WTP Site Visit

Pre-visit Document Review

- Population provided in line with US Census data, up to date. SDWIS updated January 29, 2026
- Bacteriological Sample Siting Plan, Disinfection Byproduct Monitoring Plan, Lead and Copper Sampling Plan all up to date and reflect current population and sample size and frequency
- All compliance and enforcement documents up to date in SDWIS
- All inventory in SDWIS current and up to date
- Monthly Operation Reports (MORs) reviewed, not exceeding 80% permitted capacity
- Previously observed individual filter turbidities reach 2.0 and appear to have a cap at 2.0. That appears to have been resolved, no observations after June 2025
- Chlorine Contact calculations verified to be accurate and reflect current treatment trains
- System plans to conduct annual water audits going forward, current water loss rate in line with national average
- System inspects all distribution system valves every 5 years (20% annually)

- System holds highest possible ISO rating for fire protection, tests 50% of fire hydrants annually
- System targets full system flush every 3 years and does targeted flushing based on water quality concerns, after repairs, at dead ends, and at critical facilities
- System is developing program to conduct unidirectional flushing in areas of the distribution system where unidirectional flushing is feasible
- System owns hydraulic model and uses contractor to update and maintain model. Model is calibrated using fire hydrant testing, data from SCADA system, field data, and customer usage data
- **For future consideration, recommend investigating utilizing the hydraulic model to model water quality in the distribution system, if not already being done. May help with optimizing WTP and distribution operations, flushing operations, emergency planning, etc**
- System conducts routine filter drop tests and filter bed expansion tests
- System is planning to incorporate filter rise tests in the near future to verify backwash flow rates
- **Filter bed expansion is below industry standards of 20-25% bed expansion. System is planned to replace all filter media in the near future and believes that a loss of filter media over time may contribute to low bed expansion percentages. Once filter media is replaced, filter bed expansion tests should be conducted to verify increased bed expansion and if not within 20-25% investigate optimizations to backwash rates to minimize potential for mudball formation over time**
- Tank inspections are conducted every 5 years in line with industry recommendations
- Last tank inspection conducted in 2023, System is addressing recommendations in inspection reports with rehabilitation projects that are in the current Capital Improvement Plan
- All operator license information is current and System has adequate staffing to cover illness, vacations, retirements, etc
- System has detailed main break repair procedures which include documentation procedures
- **Recommend incorporating new 2 hour VDH reporting requirements effective July 1, 2025 into main break documents**
- System keeps adequate spare inventory on hand in a warehouse and can also procure inventory easily, if needed
- System has an active meter replacement program

- System utilizes satellite leak detection services and intends to perform satellite leak detection on a biannual basis to supplement traditional on the ground leak detection methods. The satellite service helps identify areas where on the ground leak detection teams should focus
- System has established customer complaint response procedures
- Historical PFAS sampling results would be in compliance with current proposed PFAS Rule limits
- **Operation Permit dated December 27, 1996. Update to permit in progress, draft of waterworks description sheet provided to System for review**

Document Review, Management Questions

- Emergency Response Plan drafted September 30, 2025. Looks to be comprehensive and take into account many potential emergency scenarios. Provides contact information for critical contacts, including ODW-RFO. Includes 2-hour reporting requirements.
- Training tracked through online training database. Can assign training to staff and track completion (onboarding, recurring training, etc.)
- Staff appear to have completed all major mandatory training
- SOPs have been drafted for all major operational and maintenance activities
- **Recommend as SOPs are being used, take feedback from staff and revise documents as necessary to improve clarity, accuracy, and usability of the documents. Due to the large number of documents, items such as consistent formatting, ensuring all applicable pre-requisites and references are included, consistent use of terminology, roles and responsibilities, and including procedures for activities that may be unforeseen should improve over time as the documents are more routinely used, particularly by newer staff who may not have the institutional knowledge of the WTP of older staff**
- Hard copies of SOPs, Emergency Response Plan, etc. available and accessible
- System is a member of VA WARN
- System has seen improvement in recruiting operations staff, particularly in recruiting Class 1 Operators
- System has monetary incentives for obtaining each Class of operator license
- System supports operator CPEs through online courses, WaterJAM, Sacramento Manual correspondence course, etc
- Operations shifts have been upgraded since last inspection, each shift has 4 operators- 2 Class 1 operators and 2 junior operators

- Increase in operators per shift allows for more frequent walkthrough of plant, more visual inspection of all equipment over course of shift
- A float shift of operators has been started that work during the day and assist with tasks including maintaining housekeeping of plant, chemical feed calibrations, etc. Can also cover shifts if needed
- Active safety program in place
- System indicates improved communication and coordination between maintenance and operations; emergency operations and WTP, WTP and upper leadership, System and consecutive systems
- System looking to hire emergency planner, a newly created position. Will be responsible for keeping up with Emergency Response Plan, continuity plans, emergency operations, etc
- Leadership have remote access to view SCADA system, provide more oversight over plant operations by higher levels of leadership
- System has active Asset Management and Capital Improvement Plan
- System is working with ODW on drafting waterworks business operation plan (WBOP), in process

Pre-sedimentation Basin

- Floodwall tested by Army Corps of Engineers
- No chemical totes observed near pre-sedimentation basin (Figure 4)
- No trash buildup observed at travelling screen collection bins (Figure 5)
- Dredging projects planned for waste lagoon and pre-sedimentation basin in March 2026
- Elevated raw water turbidity compared to average due to recent rain/snow events, no issues with treatment observed
- Copper sulfate SOP drafted, minimal use of copper sulfate
- Plant growth on earthen berm appeared to be minimized (Figure 6)
- System scheduled to install water quality monitoring at head of pre-sedimentation basin to provide advanced time to react to water quality data

Intake Basins/Raw Water Pumps

- Flow only from Pre-sedimentation basin, no flow from canal
- No issues observed at raw water basins (Figure 7)
- Screens at raw water pumps all new, project mostly complete only punch-list items remain (Figure 8)

- Raw water pump shaft safety guards all in place and intact (Figure 9)
- No bird droppings or trash observed in raw water pump buildings, all buildings clean and orderly (Figure 10)
- All pumps operable
- Permanganate being fed year round downstream of raw water pumps (Figure 11)

Coagulation/Flocculation/Sedimentation

- Walkway between Plant 1 and Plant 2 from raw water pump buildings to WTP main building had repaired the sealant between concrete sections (Figure 12)
- Concrete in raw water channel to rapid mixers appeared to be repaired
- No vegetation observed growing in raw water channel
- No spare parts observed outside
- Trac-Vac sludge removal system runs on a schedule, no issues with sludge accumulation observed
- Raw water magnetic meter was replaced, tested, and flow pacing of all chemicals besides polymer feed has been implemented
- System indicates flow pacing has smoothed out chemical feed dosage trending, no large swings in dosaging
- All flocculation motors are in service and available (Figure 13)
- No issues observed with flocculation formation, settling
- System has instituted routine proactive cleaning of sedimentation basins and plate settlers. Scheduled quarterly basin cleaning
- No chemical totes observed near flocculators (Figure 14)
- Turbidimeters for settled water moved closer to sample point, shortens travel time to analyzer to provide more accurate readings
- While sedimentation basins down for cleaning, System traced existing caustic lines that feed to raw water and determined they were still intact and viable. System indicated they will have the ability to feed alkalinity adjustment in the form of caustic feed in the event there is a drop in raw alkalinity that may impact coagulation efficacy
- Online pH probe for flocculation basin reading on SCADA appeared inaccurate, System investigated and resolved the issue quickly with a recalibration of the probe.

Filters

- Backwash observed, no issues with automatic sequence during backwash. No issues observed with filter during backwash
- 21 of 22 filters were operational during time of visit, with remaining filter having an active word order and being actively repaired
- Concrete upgrade project in procurement to address concrete concerns on walkway near Plant 2 filters
- System has scheduled replacement of all piping inside filter rooms on Plant 1 side to remove corroded pipes. Corrosion appears to be from chlorine in the air of the enclosed rooms from the filters
- System also has plans to recoat corroded backwash piping in filter gallery
- System has replaced all filter appurtenance impacted from January 2025 with new equipment
- Backwash valves have been replaced or scheduled for replacement
- Filter to waste valves are in the process of being replaced, should provide better seal
- Upcoming filter project to replace all filter media with new media, replace all hydraulic filter valves on Plant 2 with electric valves
- No active leaks observed in concrete in the filter gallery, no biological growth observed
- Filter turbidimeters have been replaced with new equipment that have approved analytical methods (Figure 23)
- After around June 2025, there were no instances of individual filter turbidity readings of 2.00 NTU or greater on the monthly operation reports. Appeared to be a SCADA issue. System indicated they investigated signal span and have corrected previously observed issue
- System has resumed filter drop tests, backwash expansion tests. Plans to incorporate routine filter rise tests in 2026.
- Some of the obsolete electrical wires and associated equipment that were previously observed in the filter gallery have been removed as much as feasible and cleaned up (Figure 15)
- No active leaks or biological growth observed (Figure 16, Figure 17)
- Backwash waste area appeared to have less standing water (Figure 19)

Clearwell

- Reviewed clearwell surge analysis technical memo which provides recommendations for reducing risk of clearwell flooding. System indicated they will schedule to follow the following recommendations
    - Concrete analysis shows that several areas can be sealed or gasketed to reduce locations that water may escape during a flood without damage to concrete slab
    - Installation of ultrasonic clearwell level sensors (completed- Figure 18) and connection of new ultrasonic sensors and existing bubbler level sensors to SCADA. Will allow System to create controls to automatically and safely shutdown the WTP before the clearwell reaches flood levels
    - Moving vacuum priming equipment for pumps, a majority of pump electrical components above grade to reduce potential impacts if flooding does occur
    - Replacement of all four existing backwash waste pumps. Two of the pumps will be replaced with dry pit submersible pumps that can run underwater and assist with dewatering if flooding does occur
    - Replacement of emergency dewatering pumps with pumps that can handle the head differential without losing prime to allow for more efficient dewatering if flooding does occur

Filtered Water Pumps

- Project to move new vacuum priming systems upstairs
- Pumps have been painted, no visible rust
- Minimal standing water observed, all pump seal water was routed to nearby floor drains
- All pumps available for use

Finish Water Basins

- All walkways into finish water basins have curbing, solid walkways to prevent dirt from falling into water (Figure 20)
- Walkways appeared clean with no debris observed (Figure 20)
- No scum observed at end of basins (Figure 21)
- System instituted routine cleaning of basins
- Previously observed obsolete PVC lines have been removed (Figure 22)
- Finish water basin lighting appears to have improved, brighter inside basins

Treatment

- All chemicals except polymer are now flow paced
- Polymer transfer pumps have been secured, rooms appear to be cleaner than previously observed
- No active leaks observed at sodium hypochlorite or alum storage tanks, area appears clean with no crystallized chemical observed on the floor or around manways (Figure 24)
- Alum feed pumps all appear functional, no leaks or mess observed (Figure 25)
- No active chemical leaks observed at Korah pump stations
- System conducts routine calibration and feed rate testing of chemical feed pumps, spreadsheets observed
- Zeta meter equipment is scheduled to be replaced within 1 year with newer model
- Certified lab staff come to the WTP and calibrate operations lab equipment like fluoride probe
- Free ammonia test results observed over past year, no values above 0.1 mg/L observed over past 6 months or so
- Analyzers appeared to be calibrated per manufacturer recommended frequency
- All standards and reagents appear to be unexpired
- Project to replace day tanks above Plant 2 filter console area scheduled, area sectioned off to minimize access. No active leaks observed
- No leaks observed at caustic feed pumps
- Project scheduled to replace caustic storage tanks
- Project planning to install 3 liquid lime storage tanks
- All areas looked clean and orderly. SDS documentation available
- Pipe loop for corrosion control optimization and studies installed, will startup in March 2026

Fluoride

- Over 2025, system resumed fluoride feed and after overfeed event, began to slowly feed fluoride (0.3 mg/L- 0.5 mg/L) and gradually increase to target dosage of 0.7 mg/L near the end of the year once flow pacing started. **Recommend a minimum of 0.6 mg/L, maximum of 0.9 mg/L, and a target of 0.7 mg/L**

- Load cell replaced in fluoride bulk storage tank
- Project planned to move fluoride feed pumps upstairs and provide a fluoride day tank
- No leaks observed, all pumps operable

Disinfection

- CT calculations reviewed and verified to accurately reflect operations at WTP
- Nitrification plan developed and instituted
- >0.2 mg/L chlorine residual leaving WTP
- Grab samples, online analyzers, and SCADA readings align
- System can measure monochloramine in operations lab
- System reports chlorine residuals with compliance bacteriological tests

Waste Handling

- Current sanitary holding tank and pump system provided with containment and planned to be replaced to pump sanitary waste directly without holding tank (Figure 27)
- System reports recycle flows on MORs using flows at waste lagoon, typically below 10% of total treated water flow. Recycle flow discharges at head of presedimentation basin, a lot of detention time prior to entering WTP raw water pumps. Direct measurement of recycle flow not done at discharge site due to water discharging through a sluice that connects waste lagoon and presedimentation basin
- Waste lagoon dredging project to start in March
- Waste pump No. 2 check valve appeared to need repair, pump observed spinning backwards momentarily. **Recommend investigation and repair of check valve at Waste Pump No. 2**

Korah 1/Korah 2/Korah 3

- Pumps look to be painted, no major corrosion observed (Figure 28)
- All pumps operable
- Minimal standing water
- All appurtenances look OK

Monitoring/Reporting Verification

- All sample schedules, locations, and frequencies correct

- Operator logbook documentation greatly improved, more detailed and includes more operational information throughout the day
- A pH reading issue observed on SCADA that was subsequently corrected
- System reports all water quality parameters required to confirm optimized corrosion control treatment for lead and copper

Distribution

- Byrd Park Reserve Pump Station observed a 2-inch valve that was leaking
- Powerwash project planned for Woodside Tank, all tanks scheduled for rehabilitation and/or repair in Capital Improvement Plan
- **Trafford Pump 1, Columbus Pump 2, and Westhampton Pump 4 appeared to be offline, System put in work order to investigate and repair as needed**
- System was aware of overflow discharge locations, all locations appeared to be screened
- Distribution system pumps appeared to be painted and no major signs of corrosion (Figure 30)
- Housekeep in distribution system appears to be improved, no signs of trash
- Byrd Park Reservoir roof replacement project for first half of reservoir should be completed by 2027. Second half to start after
- Fence was placed around Westhampton Pump Station, no indication of anyone camping on lot as previously observed
- Emergency power indicator should be updated in SDWIS for all applicable pump stations
- All tank lots were in acceptable condition
- The west section of Trafford Pump Station was under construction

Status of Past Deficiencies, Observations

Significant Deficiencies- 2025 VDH Sanitary Survey

Observation Number	Facility Inspected	2025 VDH ODW Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
VDH-01	Raw Water Meters	Staff indicated raw water meters were unreliable and were not confident enough in the measured flow values to flow pace coagulant dosage through SCADA. Raw water chemical dosages, including coagulant dosages, are critical for the adequate treatment of surface water sources and rely on raw water flow measurements for accurate dosage of coagulant. Currently dosages are manually calculated utilizing filter flow rates and dosages adjusted manually.	Raw water mag meter replaced, flow pacing of all chemical feeds except polymer online.	Resolved	None
VDH-02	Plant 1 Filters	Filter No. 6 appeared to have an active leak through the concrete in the filter pipe gallery. Prolonged leaking could potentially compromise the concrete and result in failure of the filter.	Concrete repair completed, no active leak observed.	Resolved	Figure 16
VDH-03	Plant 1 Filters	There appeared to be an active leak in the pipe gallery that appeared to have either biological growth or just appeared slimy. The leak should be investigated.	Concrete repair completed, no active leak or biological growth observed	Resolved	Figure 17
VDH-04	Backwash Waste Pumps	One pump was out of service and removed from its pedestal. A significant leak was observed coming from the isolation valve body (with a mat appearing to divert water away from an electrical box) and through the temporary cover plate. The check valve needs to be investigated, as do the gate valve and cover plate. Failure of the cover plate could result in flooding in the backwash waste pump area and pipe gallery.	Backwash Waste Pumps all installed (no leaks observed December 2025), Pump No. 2 needs to be investigated and repaired as needed (February 2026). **Update: Check valve was replaced March 2026**	Resolved	Figure 19

Observation Number	Facility Inspected	2025 VDH ODW Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
VDH-05	Pipe Galleries	Sanitary sewage storage tanks housed in filter gallery area with no secondary containment. Raw sewage could potentially enter the clearwell through access hatches and penetrations into the clearwell if the sanitary sewage storage tank failed without secondary containment.	Concrete containment curb installed around tank. Project to remove sanitary sewage storage tanks and replace with direct pumping to sewage pump station in planning stages.	Resolved	None
VDH-06	Clearwell/Filtered Pump Wells	No overflow piping observed for Plant 1 or Plant 2 filtered water clearwell. This means there is no ability to route overflowing clearwell water away from flooding the pipe gallery area. When water in the clearwell reaches overflow levels, water floods the pipe gallery area through the clearwell vents and other pipe penetrations and access hatches and bolted covers. It is likely that a portion of this water migrates back into the clearwell, along with potential contamination from the floor and pumping equipment. This is a potential cross connection that should be mitigated by minimizing flooding events in the pipe gallery and keeping the area clean. COR should conduct an engineering evaluation to determine if sealing of pipe penetrations, access hatches, and other means of entry into the clearwell is advisable.	Engineering evaluation drafted, recommendations provided, and System planning to execute recommendations in the next 2 years. Includes installation of monitoring and control equipment to reduce chance of clearwell reaching flood levels, and installation of new waste pumps and dewatering pumps to allow more efficient dewatering if necessary. All identified cracks and penetrations sealed and continued	Resolved	None

Observation Number	Facility Inspected	2025 VDH ODW Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
			evaluation incorporated into active filter upgrade project as proactive quality assurance		
VDH-07	Finished Water Basin	The walkway on Plant 2 at the end of the basin did not appear to have a solid base beneath the grating, allowing dirt to fall directly into the finished water from shoes, etc. A solid base should be installed beneath the grating. Scum was observed in the water at the end of the aeration basins. The source of the scum should be investigated and addressed.	Solid base observed, scum was not observed. Basins now on a cleaning frequency	Resolved	Figure 20 Figure 21
VDH-08	Warwick Road Tank	A piece of wood is supporting an altitude valve where a concrete support is heavily deteriorated. The wood and concrete support are not adequate, and a more permanent repair should be made. Damage to the valve or associated piping may impair tank operations.	Concrete support pillar repaired	Resolved	Figure 29
VDH-09	Distribution System Tanks	Several tanks equipped with overflows that were piped to stormwater drains and sanitary sewer with no knowledge of backflow prevention provided. COR should investigate connection and determine degree of hazard and provide appropriate protection.	System investigated and provided adequate protection as needed	Resolved	None
VDH-10	Multiple Locations	There are various pumps, valves, piping, and other equipment that appear to have severe corrosion that may result in failure of the critical infrastructure. COR should conduct a condition assessment of all their assets in both the WTP and distribution system and identify what assets need repair, rehabilitation, or replacement.	Pumps, valves, and other equipment appeared to be repainted with no corrosion observed where painted. Waste pumps appeared to have some corrosion but are scheduled to be replaced with new equipment	Resolved	Figure 30
VDH-11	Filter Instrumentation	Hach turbidimeters (FilterTrak 660sc and 1720E) appear to be obsolete by the company, making it harder	Turbidimeters replaced with newer units, units	Resolved	Figure 23

Observation Number	Facility Inspected	2025 VDH ODW Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
		to obtain parts for maintenance and repair. System should investigate replacement of units as they reach end of life. Some turbidimeters appeared to be replaced with Rosemount Clarity II turbidimeters which appear to still be supported, but do not comply with EPA method 180.1 or other approved analytical methods listed in 40 CFR Parts 141 and 143 and should be replaced with EPA compliant versions of the turbidimeters. Standardization of equipment would help with keeping spare parts. The individual filter turbidimeters are averaged together to calculate combined filter effluent turbidity for compliance purposes. COR may be in violation of the Virginia *Waterworks Regulations*. 12VAC5-590-480 B indicates "Testing for regulatory compliance purposes shall use an EPA-approved analytical method found in 40 CFR Parts 141 and 143."	are approved for use in EPA method or other approved analytical methods		

Minor Deficiencies- 2025 VDH Sanitary Survey

Observation Number	Facility Inspected	2025 VDH ODW Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
VDH-12	General Housekeeping	General housekeeping issues at treatment plant and distribution system facilities including used latex/nitrile gloves on the ground in various locations at the WTP, debris in both the WTP and distribution system, furniture and other general storage in the pipe gallery area at the WTP, soda bottles, food wrappers, homemade mouse trap at Trafford Pump Station, bird droppings in raw water pump station 4, etc. COR should institute routine housekeeping checks and address any housekeeping issues as they arise. It may be beneficial to divide the WTP and the pump stations into sectors and assign specific individuals or teams housekeeping responsibilities of that sector. Develop written expectations on what condition is expected and provide methods and tools to meet those expectations.	Housekeeping has greatly improved, no trash or debris observed in WTP. All areas looked clean and orderly	Resolved	Figure 10
VDH-13	Raw Water Source	Chemical totes were observed on the bank of the pre-sedimentation basin at what looked like a construction staging area with no secondary containment. It was not observed what was inside the totes, but previous inspection reports indicated polymer. Leaks from the totes and potential runoff from construction would impact raw water quality. Totes should be provided with secondary containment or relocated.	No chemical totes observed	Resolved	Figure 4
VDH-14	Copper Sulfate	Copper sulfate addition is not applied per a standardized procedure. System should incorporate testing of copper levels in raw water and finished water. Raw water levels should be tested prior to application to determine dosage needs. System may also want to coordinate with wasteWTP to determine if more stringent copper residual levels are required.	SOP developed for addition of copper sulfate, but copper sulfate hasn't been applied in several seasons	Resolved	None
VDH-15	Powdered Activated Carbon (PAC)	PAC is not applied per a standardized procedure. System should establish benchmarks for when PAC is added, dosage to add, and how to apply the dosage to the water. Scenarios for feeding PAC to address taste	SOP developed, System planning to order PAC in the near future	Resolved	None

Observation Number	Facility Inspected	2025 VDH ODW Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
		and odor events, algal bloom events, and removing organic compounds should be developed. PAC addition equipment should be tested on a routine basis to verify it will be functional if needed.			
VDH-16	Raw Water Pumps	The screen that protects persons from the rotating motor shaft for Raw Water Pump 2 was dislodged and laying on the floor. This is a safety issue for personnel. The screen should be re-installed and an evaluation of potential safety hazards throughout the WTP and distribution system conducted and identified hazards remedied.	Screens observed intact	Resolved	Figure 9
VDH-17	Permanganate Feed	The plant still does not have the ability to check permanganate residuals. To measure permanganate residuals, the plant can use free chlorine DPD methods and 0.45-micron filters. This assumes no chlorine introduced to the raw water at the point of sample collection. 1. Filter raw water through a 0.45-micron filter and use the filtered water to zero a spectrophotometer. 2. Add a free chlorine DPD powder pillow to the sample and measure free chlorine residual. 3. Multiple the value by 0.893 to convert free chlorine readings to permanganate residual readings	System is looking into online permanganate residual analyzer and has permanganate SOP developed. Began to use free chlorine DPD method in the interim.	Corrective action completed-equipment procured, SOP developed, and feeding system tested and operational; implementation pending confirmation of analytical method by external laboratory	None
VDH-18	Concrete condition	The walkway that separates the Plant 1 and Plant 2 side of the concrete raw water and applied water channels had visible separation of sealant between the concrete sections and cracking was observed at various locations on the walkway. Some concrete appeared to be crumbling in the channel. Concrete spalling was observed underneath the walkway in the Plant 2 Filter area near the sedimentation basin area. Exposed rebar was observed. Deterioration of the concrete walkway	Walkway between Plant 1 and Plant 2 raw water channels repaired with sealant added between concrete sections. Concrete in raw water channel repaired.	Walkway repair completed. Concrete deterioration incorporated into Capital Improvement Plan, construction expected by May 2027	Figure 12

Observation Number	Facility Inspected	2025 VDH ODW Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
		could pose a safety hazard and may also damage the filters. Cracks observed in concrete around filters. The condition of the concrete should be evaluated and repaired or replaced where need is identified.	Plans in place to replace concrete walkway in Plant 2 filter area. Walkway surface cracks were filled.		
VDH-19	Applied Water	Chemical totes were observed over grates at the front of the sedimentation basin area and appeared to have residue on the spouts indicating they were discharging at some point. The totes appeared to hold polymer and appeared to discharge into the applied water prior to going to the filters. The flow rate would not be able to be calculated or reliably dosed through a spout with no measurement equipment. COR should cease the practice of utilizing ad hoc methods for chemical addition to the water treatment process.	No chemical totes observed	Resolved	Figure 14
VDH-20	Plant 1 Filters	During a backwash, the air scour supply valve appeared to be stuck in the travel cycle and the operators had to manually operate the valve above the filter. This along with the manual operation of valves to complete the filter backwash due to damage sustained during flooding requires a lot of effort up and down stairs and the use of two operators. Repairing filter related valves and making them more reliable would free up some operator time and effort.	No issues during observed backwash with automatic backwash sequence	Resolved	None
VDH-21	Filter Turbidimeters	There were 3 non-consecutive, non-combined filter effluent instances found in MORs submitted in 2024 where the maximum turbidity is 2.00 NTU, no instances of going above 2.00 NTU. Waterworks Regulations require comprehensive performance evaluation following the exceedance of two consecutive measurements for individual filter turbidity. System should evaluate the signal span for the filter turbidimeters and verify that the span exceeds 2.0 NTU, with a recommended span of 0-5.0 NTU. If the span is correct, the system should evaluate data logging equipment and MOR data completion	Instances appeared to stop around June 2025, no turbidity readings of 2.0 NTU after that time	Resolved	None

Observation Number	Facility Inspected	2025 VDH ODW Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
		equipment to ensure they are able to report above 2.0 NTU turbidities.			
VDH-22	Filter Operations	System should resume routine filter drop tests, filter rise tests, and backwash expansion tests.	Filter drop tests and backwash expansion tests have been resumed. System plans to start filter rise test soon. **Update: System started filter rise tests March 2026**	Resolved	None
VDH-23	Ammonia Feed	Ammonia is fed upstream of the aeration basin, meaning the basins are chloraminated and not free chlorine. COR should provide CT calculations for Plants 1 and 2 to document the overall log inactivation of giardia. The calculations should show how volumes of each segment evaluated were determined and the type of disinfectant used in the evaluation.	CT calculations reviewed and verified to be accurate	Resolved	None
VDH-24	Fluoride Feed	Fluoride feeders have been offline since the January 6 event due to their location in the flooded area. Fluoride feeders should be put back into service as soon as possible or provide proper notice of the intent to discontinue fluoridation permanently.	Fluoride feeders back in service and feeding	Resolved	None
VDH-25	Chemical Day Tanks, Chemical Feeders	Evidence of chemical leaks were still observed in various areas of the WTP: • Plant 2 filter console area roof appeared to be leaking a chemical with formation of mineral deposits observed • Sodium hypochlorite bulk tanks in West Chemical Building at the manway flanges • Polymer room for Plant 1 and Plant 2 • Caustic feed pump fittings • Alum chemical feed pumps COR should promptly take corrective action to address each chemical leak, including cleaning up	No active chemical leaks observed at sodium hypo bulk tanks, polymer room, caustic feed, alum feed.	Resolved	Figure 24 Figure 25

Observation Number	Facility Inspected	2025 VDH ODW Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
		chemical residues and chemicals in secondary containment areas.			
VDH-26	Chemical Feeders	Staff indicate calibration of chemical feed pumps is not typically conducted on a routine basis. Some items such as chemical feed pump calibration fall to operation staff while other calibrations fall to maintenance staff. Maintenance staff have clearly defined preventative maintenance schedules which are documented in a database; operation staff do not have similar clearly defined schedules and documentation. All equipment including chemical feeders should be maintained and calibrated according to manufacturer's recommendations.	Chemical feed pump calibration being done, observed calibration data in spreadsheet and in routine activities done by operators	Resolved	None
VDH-27	Finished Water Basin	Temporary hoses from the bypass pumps used during the January 6 event observed touching the water and doors were propped open. System was scheduled to remove pumps and associated hosing later in the week.	Temporary hoses removed	Resolved	None
VDH-28	Instrumentation	Amperometric chlorine analyzers were reading 0.0 mg/L or appeared to read high (4.9 mg/L) in several locations. COR should develop Standard Operating Procedures (SOP) for routine calibration of the analyzers. This SOP should include documentation that the work has been performed.	Analyzers appeared to be in agreement with bench readings, SOP developed	Resolved	None
VDH-29	WTP Equipment	Filter equipment and filtered water pump equipment was either damaged during the January 6 flooding event or were out of service due to performance issues. • Filter loss of head transmitters appeared to need repair. This included filters 4, 6 and 7. • Filter 7 rate of flow valve needed to be rebuilt. • Issues with Filter 9 air scour valve and rate of flow sensor needed to be addressed. • Filter 21 rate of flow meter needed to be addressed. • South filtered water pumps S2, S3, and S4 were offline and in need of repair	Equipment repaired and functional. Replaced backwash valve on Plant 1 side, working on Plant 2 side. Replacing all filter to waste valves on all filters. Filter media replacement planned.	Resolved	None

Observation Number	Facility Inspected	2025 VDH ODW Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
		COR had identified equipment issues and should work to address those current issues. COR should conduct a condition assessment and develop proactive plans to rehabilitate or repair aging infrastructure rather than a 100% reactive plan to address infrastructure failures as they occur.			
VDH-30	Operations	SOPs should be developed for all critical functions required in the WTP including for operations, maintenance, electrical, and instrumentation. SOPs should include information related to safety procedures, potential hazards, staff responsibilities, and required equipment along with the procedures to execute the activity. A good resource for developing these types of SOPs can be found at https://www.epa.gov/sites/default/files/2015-06/documents/g6-final.pdf	SOPs developed	Resolved	None
VDH-31	Operations	Logbooks mainly are used for flow and chemical dosage changes. Logbooks should also be used to record beginning of shift, names on shift, alarm response, communications with wholesale suppliers, rounds, unusual occurrences, weather, equipment repairs and equipment online/offline, etc. White out should be avoided.	Logbook documentation greatly improved and includes items mentioned	Resolved	None
VDH-32	WTP and distribution pump stations	Standing water and corrosion observed on pumps. Dust observed throughout the pump stations including Korah pump stations, Byrd Park Main and Reserve pump stations, Trafford Pump Station. The standing water is possibly from pump seal or gland water, leaking valves, dripping taps. Pump seal water should be piped to a drain with appropriate air gap to avoid forming puddles, which are a hazard.	Standing water minimized and pumps appeared to be painted with no corrosion observed. Pump seal water routed to floor drains	Resolved	None
VDH-33	Distribution System Tanks	The exterior of tanks at Jahnke Road, Warwick Road, Ginter Park appeared to have some rusting. COR should follow recommendations detailed in 2023 tank inspections related to exterior and interior coatings of distribution system tanks.	Tank rehab projects in Capital Improvement Plan and scheduled	Corrective action initiated, incorporated into Capital Improvement Plan	None

Observation Number	Facility Inspected	2025 VDH ODW Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
VDH-34	Jahnke Road Tank	Water was leaking into a vault on-site on to an electrical box. This could cause damage to the electrical box and poses a safety hazard. COR should eliminate the leak.	Not observed during site visit	Resolved	None
VDH-35	Woodside Tank	Overflow manhole was full of water and a tire was in the manhole. Staff indicated kids would play on drainage structure, fence was put up. Manhole should be cleared.	Manhole clear, no standing water observed	Resolved	None
VDH-36	Distribution System Tanks	Overflow and drain screens should be verified to be small mesh screen or replaced with small mesh screen. A small mesh screen prevents insects and vermin from entering the tank and introducing contaminants.	Overflows and drains include screens	Resolved	None
VDH-37	Emergency Response	An Emergency Response Plan was developed by a contract engineer in 2021; however, it is not widely distributed, and plant staff are unaware of emergency response procedures. The plan should be reviewed, revised, and distributed. Tabletop exercises related to emergency response planning should be conducted on a routine basis.	Emergency Response Plan updated 2025, is available to staff at WTP. Tabletop exercises planned at least annually	Resolved	None

Recommendations- 2025 VDH Sanitary Survey

Observation Number	Facility Inspected	2025 VDH ODW Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
VDH-38	Raw Water Source	The earthen berm that separates the waste lagoon from the pre-sedimentation basin was observed to have growth including shrubs and small trees. The root systems of the vegetation may compromise the integrity of the earthen berm and impact raw water supply capacity. COR should evaluate	Growth of shrubs appeared to be reduced	Resolved	Figure 6

Observation Number	Facility Inspected	2025 VDH ODW Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
		condition of the berm and if the vegetation poses a threat.			
VDH-39	Raw Water Intake	WTP staff noted that COR does not have an easement to access the intake located north of the Williams Island Dam that consists of four head gate valves and channel. COR should try to obtain easement so that they may access the infrastructure and address any concerns with the valves or channel.	System has access to intake, but no formal easement documentation. System has started negotiations with landowner	Corrective action initiated- property access agreement under active negotiation with landowner. Progress is dependent on third party (landowner)	None
VDH-40	Intake Basin	A sluice gate that separates two sides of intake basin was leaking. This appeared to have water actively flowing into the construction area. The leak should be addressed.	Construction completed, leak not observed	Resolved	None
VDH-41	Alum Feed	Alum feed observed to be through hoses routed on top of the concrete walkway in a temporary type of configuration. It was unclear how the hoses were routed to the chemical pumps. System should investigate replacing hoses with more permanent hard piping arrangement in a manner that reduces potential for tripping and for accidental damage to the hoses/piping.	Temporary hoses replaced with permanent hard piping	Resolved	None
VDH-42	Inline Rapid Mixers/Spare Parts	A spare inline rapid mix unit was observed outside under snow and exposed to the elements. Spare parts should be stored in an indoor warehouse to keep them in good condition and free	Spare unit stored appropriately	Resolved	**Error! Reference source not found.**

Observation Number	Facility Inspected	2025 VDH ODW Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
		of contamination in case they are needed.			
VDH-43	Filter Effluent Valves	The orientation of the filter effluent valves appears to be inconsistent, either due to space constraints or other considerations. In addition, the valves are not accessible from the pipe gallery walkway requiring operators to climb down a ladder to manually operate. This makes it difficult to manually close these valves in the event of an emergency. Recommend having the effluent valves accessible at the walkway and in a consistent configuration, if possible.	No change- infrastructure constraints make changing valve orientation impossible without major reconstruction	Acknowledged- existing physical infrastructure constraint; operation procedures updated and long term resolution incorporated into Capital Improvement Plan	**Error! Reference source not found.**
VDH-44	Filter Effluent Valves	Consideration should be made for selection of valves that fail closed in the event of power loss as a backup in the event of a power loss event and failure of the UPS system to initiate a controlled shutdown. This would provide an extra layer of resiliency in the event of a power failure.	Fail safe valve positions completed as part of filter project that also replaced UPS systems	Resolved	None
VDH-45	Backwash Waste Pumps	A new check valve was observed in the area on a wood pallet. The open end was filled with water of unknown origin. The part should be disinfected prior to installation.	No unused check valve observed	Resolved	**Error! Reference source not found.**
VDH-46	Filtered Water Pumps	Operators must manually operate filtered water pumps, and they occasionally lose prime, making placing the pumps online a more tedious	SOPs for operating filtered water pumps and staff training implemented to ensure operators able	Corrective action completed- filtered water pump SOPs improved and staff trained. Broader pump	None

Observation Number	Facility Inspected	2025 VDH ODW Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
		process. Making sure these pumps can be activated quickly is one way to mitigate flooding events.	to activate quickly. Vacuum priming systems will be relocated upstairs In upcoming project, will be easier to operate.	station automation incorporated into Capital Improvement Plan	
VDH-47	Pipe Galleries	A water heater appeared to have floated during the flood and lodged itself between the wall and a ledge. It appeared to be connected to electrical still, but unknown if it was in use. The water heater should be relocated or if not in use, removed.	Water heater not observed at time of visit	Resolved	**Error! Reference source not found.**
VDH-48	Godwin Pumps/Dewatering Pumps	COR staff indicated that the Godwin Pumps may not be able to pump out water in the flood zone until it reaches a higher level and are undersized compared to filter flow rates. COR should investigate to determine if the pumps are adequately located or sized to enable dewatering in the event of a flood.	System plans to replace dewatering pumps with pumps that can better operate with the head conditions experienced at the WTP	Corrective action in progress under Capital Improvement Plan- incorporated into project to also address HNTB-24. Design 75% complete with construction expected by August 2027	None
VDH-49	Free Ammonia	ODW reviewed February 2025 data sheets and observed 3 instances out of 40 readings where free ammonia were above 0.1 mg/L. Free ammonia should be below 0.1 mg/L when leaving the plant to reduce nitrification opportunities in the distribution system ODW recommends COR investigate the plant controls	Past 6 months, no free ammonia readings observed above 0.1 mg/L, flow pacing instituted	Resolved	**Error! Reference source not found.**

Observation Number	Facility Inspected	2025 VDH ODW Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
		and flow pacing of chemical feeds to optimize chemical dosing feedback loops to reduce the need to manually adjust chemical feed pump rates.			
VDH-50	Aeration Basin	A PVC line that appears to be an old chemical feed line looked to be abandoned and partially submerged in the finished water. Recommend removal.	PVC line removed when aeration basin cleaned	Resolved	Figure 22
VDH-51	Polymer Room- Plant 1	A transfer pump that transfers polymer from the tote to a calibration column that acts as a day tank is balancing on a bracket but does not appear to be secure. The transfer hosing is also much longer than needed for transferring from the tote to the column. Recommend securing the pump.	Transfer pump secured and room cleaned	Resolved	**Error! Reference source not found.**
VDH-52	Computer/Server in Plant 1 Polymer Room	A server computer was observed in the polymer room which is warmer than the rest of the plant. Warm temperatures and exposure to leaks or chemicals may impact performance of the computer. Recommend relocation of the computer.	Server computer located to a dedicated server closet	Resolved	**Error! Reference source not found.**
VDH-53	Incompatible Chemicals Plant 1	Sodium hypochlorite and alum are in the same room and are incompatible chemicals. Recommend moving chemicals into separate areas if possible.	Space constraints make move to separate areas difficult. For example, in order to install pipe loop equipment, system had to fully remove dry lime feeders and install in	Corrective action completed. Physical space constraint documented- chemical segregation impracticable. Risk mitigated through SOPs and chemical handling protocols	None

Observation Number	Facility Inspected	2025 VDH ODW Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
			that footprint because there were no other locations available		
VDH-54	Backflow Prevention Devices	There were some backflow prevention devices at the plant that had some minor leaking through the relief port. This is possibly due to debris in the valves or improper seating of the valves. Backflow prevention devices should be evaluated and repaired or replaced if needed. Testing should be conducted after any repair or replacement.	Backflow prevention devices tested annually, test activities observed in database. No leaking at devices observed	Resolved	None
VDH-55	Cross Connection Inventory at WTP	System should inventory all water outlets at the plant and determine degree of hazard and appropriate protection required. If existing protection does not meet this requirement, it should be installed and maintained as necessary.	System has conducted this activity	Resolved	None
VDH-56	Instrumentation	Filter PLC enclosures are supposed to be pressurized with clean air to prevent corrosion. This does not appear to be occurring due to issues with the air supply.	Filter PLC enclosures are no longer pressurized and air supply removed	Resolved	None
VDH-57	UPS System	The filter drain actuator valves do not appear to be connected to the UPS system. In a power failure, if a filter drain valve is open, there is possibility of flooding through the open valve overflowing the wastewater system.	UPS system upgrade and all critical filter appurtenances connected o UPS system and tested	Resolved	None
VDH-58	UPS System	The turbidity pumps for Plant 2 are connected to the UPS	UPS system upgrade and all critical filter	Resolved	None

Observation Number	Facility Inspected	2025 VDH ODW Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
		system. During a power failure, the turbidity pumps may not be necessary and be an unnecessary load on the UPS system. Recommend evaluation of need for turbidity pumps on the UPS system.	appurtenances connected to UPS system and tested		
VDH-59	Controls- Korah Pump Stations	The controls in the Korah Pump Stations appear to be obsolete and do not have off the shelf parts available. A vendor rebuilds the circuit boards. Recommend investigating the need to upgrade controls in the pump station.	System investigated need and further evaluation is underway as part of Capital Improvement Plan. All controls are operable	Corrective action completed. Controls inspected, confirmed operational, and maintained. Capital replacement to be evaluated through Capital Improvement Plan prioritization process	None
VDH-60	Safety	Extension cords used in plant in various locations, exposed to water, potential electrical hazard. Replace extension cords with permanent outlets and power wiring.	No extension cords observed in hazardous areas	Resolved	**Error! Reference source not found.**
VDH-61	Safety	Open electrical boxes and panels were observed in various locations in the distribution system and treatment plant and are potential electrical hazards	Not observed at time of visit	Resolved	**Error! Reference source not found.**
VDH-62	Staffing	WTP operates as two parallel plants (Plant 1 and Plant 2). Operations are highly manual. Staffing should be evaluated to reflect configuration of the plant .	Operations staff now has 4 operators per shift and float shift during day to provide adequate coverage for both Plant 1 and Plant 2	Resolved	None
VDH-63	Backup Power WTP	The generators should be verified to always have availability, independent of main power/switchgear	Automatic transfer switch installed and tested. System indicates current	Resolved	None

Observation Number	Facility Inspected	2025 VDH ODW Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
		availability. In the event of a switchgear failure, generators should have redundancy to power plant through another power pathway. The generators should be provided with automatic transfer switch instead of manual operation. The generator size should be evaluated. Currently the plant can only pump around 50 MGD if on generator power. As part of the process of evaluating an automatic transfer switch, logic should be provided to ensure the generator doesn't fault when the plant is running above 50 MGD.	generator limitation is so that only one generator runs at a time for redundancy purposes, but can run both in parallel if needed to pump over 50 MGD		
VDH-64	Backup Power WTP	Alarms at the electrical substation should be communicated remotely to the plant, particularly alarms that may be related to switch gears that may impact main feed to the plant.	Alarms and status routed to SCADA	Resolved	None
VDH-65	Operations	Operators are not trained or provided authority to operate generators, manipulate electrical switch gears, or address simple instrumentation issues. During night shift, there is typically no individual available on-site to operate generators, electrical or handle instrumentation issues. This increases response time to	Automatic transfer switched installed on generator, plant operates on both power feeds year round and switch gears tested on recommended frequency. System indicates no power blips observed	Resolved	None

Observation Number	Facility Inspected	2025 VDH ODW Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
		address these types of needs. It is recommended that the system investigate the ability to place electrical, maintenance, instrumentation staff on shifts or have availability during emergency events.	recently. Maintenance staff placed on shift if severe weather predicted, and on-call otherwise		
VDH-66	Operations	Flow pacing of chemicals is not practiced for many chemical feeds due to the unreliability of raw water flow meters and other flow meters in the plant. Operators are manually adjusting chemical feed rates. Addressing the reliability of flow meters and resuming flow pacing of chemicals is recommended.	Flow pacing of chemicals started	Resolved	None
VDH-67	Operations	Not all operators have ability to submit work orders and staff indicated some work orders were not addressed in a timely manner. Recommend training operators as part of onboarding and providing access to submit work orders to all trained operators and to provide routine updates on the status of work orders and estimated timelines for completion.	Operators trained and have ability to submit work orders. Work orders more timely completed and communication between operations and maintenance improved. Weekly meetings to provide updates	Resolved	None
VDH-68	Columbus Pump Station	A PLC screen in the building shows a setpoint of 0.00 psi, however the discharge pressure was observed to be 40.39 psi. This discrepancy should be investigated.	Not observed at time of visit	Resolved	None
VDH-69	Byrd Park Main Station	Graffiti observed on exterior of building, evidence of potential vandalism to water system	Not observed at time of visit	Resolved	None

Observation Number	Facility Inspected	2025 VDH ODW Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
		facilities. With the main reservoir that supplies the water system nearby, security and prevention of vandalism are important and should be evaluated.			
VDH-70	Jahnke Road Pump Station	Sump pump piping in a vault was leaking and water was discharging into the vault.	Not observed at time of visit	Resolved	**Error! Reference source not found.**
VDH-71	Ginter Park Tank	Cathodic protection did not appear to be functioning and should be investigated.	Not observed at time of visit	Resolved	None
VDH-72	Hi Oaks Tank	Communications equipment was placed on a metal chair and covered in dust. A more permanent mounting configuration should be explored.	Not observed at time of visit	Resolved	**Error! Reference source not found.**
VDH-73	Huguenot Pump Station	Discharge valves dump water through a hose into the drain without an air gap. Potential cross-connection. Recommend providing air gap.	Not observed at time of visit	Resolved	None
VDH-74	Columbus Pump Station	Leaf blowers were being used to remove dust from equipment. Airborne dust could get into electrical systems and cause shorts.	Not observed at time of visit	Resolved	None
VDH-75	Church Hill Tank	The April 2023 tank inspection report indicates the interior mixing system duckbill valves are in a constant open position. This may decrease mixing efficiency of the interior mixing system. The report recommends replacing the duckbills.	Included in CIP for tank rehab projects	Resolved	None
VDH-76	Warwick Road Tank	The April 2023 tank inspection report indicates that the catwalk	Included in CIP for tank rehab projects	Resolved	None

Observation Number	Facility Inspected	2025 VDH ODW Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
		floor in the tank has a large hole and was reported in the previous tank inspection and did not appear to be addressed. The report recommends replacing the catwalk floor.			
VDH-77	Valve Vaults	Valves and piping in valve vaults in the distribution system including Woodside Road, Jahnke Road, and Huguenot Road tanks are heavily corroded and show signs of being submerged in water. Valve vaults should be kept dry and equipment re-coated to slow down additional corrosion.	Valve vaults appeared relatively dry at time of visit (recent waterline did not appear to show submergence of piping), piping appeared to be re-painted. System indicates all sump pumps have been replaced and verified operational	Resolved	Figure 31
VDH-78	Backup Power Distribution System	Locations with dual power feeds should verify that both feeds are available and there is no switching between single power feed and dual power feed depending on season.	Verified	Resolved	None
VDH-79	Distribution System Backflow Prevention Devices	While WTP testable devices appear to have been tested in the last year, devices in the distribution system do not appear to be tested on an annual basis. The devices should be placed on an annual work order like the plant devices.	All devices appeared to be tested	Resolved	None
VDH-80	Infrastructure	Many of the equipment in the system is aged and obsolete, meaning it is difficult to source parts commercially. Obsolete equipment should be replaced	System has replaced numerous equipment with newer equipment in 2025 and into 2026,	Corrective action in progress under Capital Improvement Plan, numerous equipment already	None

Observation Number	Facility Inspected	2025 VDH ODW Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
		to increase ability to source off the shelf parts in an emergency.	ongoing projects to upgrade all critical equipment in Capital Improvement Plan	replaced with newer equipment	
VDH-81	Infrastructure	In various locations at the plant and in the distribution system, old equipment that is not in use remains abandoned in place. This creates some confusion as to what is used, what is not used. Obsolete equipment should be uninstalled and removed.	Obsolete wiring and equipment has been removed where feasible	Resolved	Figure 15
VDH-82	Communications/Servers/PLCs	Computers serving as servers and other communication equipment are in precarious locations or exposed to heat and dust. Recommend COR to survey SCADA, PLC, and communications equipment at each site for appropriate protection.	Not observed at time of visit- all computers properly located	Resolved	None
VDH-83	SCADA	System heavily relies on third party to handle SCADA issues. Should consider having some SCADA subject matter experts on staff that are able to address issues in real time.	Two OT positions created and filled, one dedicated solely to WTP	Resolved	None
VDH-84	Nitrification Plan	A nitrification plan should be developed to evaluate distribution water quality and develop action items based on that water quality to minimize nitrification concerns in the system.	Nitrification plan submitted and approved July 22, 2025	Resolved	None
VDH-85	Resiliency	The James River serves as the sole source of water for the	No other significant raw water sources	Acknowledged, no other significant raw	None

Observation Number	Facility Inspected	2025 VDH ODW Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
		WTP. The system should investigate the ability to not only feed water to wholesale systems but to accept water from wholesale systems in an emergency. This may provide additional sources that can supplement the James River if it were to be impacted.	available besides James River. System has routine meetings with wholesale water systems, some projects have been discussed by wholesale systems to have ability to reduce strain on Richmond in an emergency	water sources available besides James River. Wholesale systems investigating ways to put less strain on Richmond system in an emergency	
VDH-86	Lead and Copper Rule	The Lead and Copper Materials Survey/Sample Site List should be updated to include an adequate number of lead service lines and internal lead pipe or copper pipe with lead solder lines. It is recommended that the City identify more than the minimum 50 sample sites required for triennial reduced monitoring and ideally more than 100 sample sites in the event that 6-month monitoring is required in the future. COR should conduct triennial reduced compliance sampling between June and September 2025 at 50 minimum sample sites with 50% of the sample sites consisting of lead service lines and 50% consisting of internal lead pipe or copper pipe with lead solder lines.	Updated plan approved May 6, 2025	Resolved	None
VDH-87	Population	The system should evaluate waterworks population served and number of service connections on an annual basis and provide this information on	Population confirmed, number of compliance samples verified correct	Resolved	None

Observation Number	Facility Inspected	2025 VDH ODW Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
		the monthly operation report. This information should be current to ensure proper number of compliance samples are collected.			
VDH-88	Resources	Staff at the WTP reported difficulty with communication and lighting during the power outage and flooding event. Resources should be provided to allow for adequate communication and visibility between staff in the pipe gallery and at the control rooms.	Lighting in filter gallery improved, radios provided that can operate in all locations of the WTP	Resolved	None
VDH-89	Security	• At the Accusonic Raw Water Flow Meter (Model 8510+), the IP address and password related to the equipment was observed on the front panel. • Remote locations such as pump stations have human machine interfaces without passwords and computers without passwords. These locations also may not have door contacts to alarm that doors have been opened. • Operations staff observed utilizing the internet on computer next to computer with SCADA to control plant equipment. System	New OT staff have developed policies and procedures to improve cybersecurity at the System including separate accounts for IT and OT; separation of OT and IT equipment; individual login for SCADA screens; etc. All HMI locations now require passwords Fencing placed around Westhampton Pump Station and Warwick Road Tank. Security measures increased in distribution system.	All cybersecurity related items have been resolved. Fencing placed around Westhampton Pump Station and Warwick Road Tank. Remaining corrective actions in progress under Capital Improvement Plan. Other distribution system infrastructure security items to be evaluated and addressed with tank and pump station rehab projects in Capital Improvement Plan.	**Error! Reference source not found.**

Observation Number	Facility Inspected	2025 VDH ODW Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
		should verify that computer networks are air-gapped so that activity from internet use does not put SCADA controls at risk. • Many HMI screens at both the WTP and at remote locations without door contacts lack passwords. • Bars observed on outside of Warwick Road Tank and Ginter Park Tank that can potentially act like a ladder and allow anyone to climb to the bowl of the tank, safety concern. • The gate keycard and callbox at Church Hill Pump Station do not appear to be functional and were reported to have never been setup. • No fencing provided and on-site visit someone appeared to be camped out on the patio. • Some remote sites including Huguenot tank, Westhampton Pump Station do not have fencing and no door contacts.			

Observation Number	Facility Inspected	2025 VDH ODW Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
		Someone appeared to be camped out on the patio at Westhampton Pump Station. • COR should survey each site computer systems for implementation of security measures including cybersecurity controls.			

Status Update Items on 2022 EPA Inspection Report

Areas of Concern

Observation Number	Facility Inspected	2022 EPA Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
AOC-1	Pre-sedimentation Basin	Recycled water flows by gravity from the lagoon to the pre-sedimentation basin through a manually operated sluice gate without flow measurement.	System reports recycle flows on MORs using flows at waste lagoon, typically below 10% of total treated water flow. Recycle flow discharges at head of presedimentation basin, a lot of detention time prior to entering WTP raw water pumps. Direct measurement of recycle flow not done at discharge site due to water discharging through a sluice that connects waste lagoon and presedimentation basin	Discharge point is not like typical recycle point at rapid mix, more detention time and volume to mix with. Volumes typically much smaller than total volume of pre-sed basin. System should investigate optimizations in flow measurements during future projects, but consider resolved	**Error! Reference source not found.**
AOC-2	Pre-sedimentation Basin	System Representatives were not aware of the lagoon dredge process water discharge location, and there are no flow measurements of process water from that operation	System is more aware of dredging process and flow measurements	Resolved	**Error! Reference source not found.**

Observation Number	Facility Inspected	2022 EPA Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
AOC-3	Pre-sedimentation Basin	There is not a means for water to bypass the pre-sedimentation basin from the intake north of Dam and the Kanawha Canal cannot be used as a sole source.	Kanawha Canal can be used downstream of pre-sed basin. Gates can open to discharge canal to raw water pumps wetwells. Would need to utilize intake north of dam, however. Limited alternatives for source water if intake can't be utilized.	Resolved	**Error! Reference source not found.**
AOC-4	Pre-sedimentation Basin	The pre-sedimentation basin is not equipped with any means to remove sludge, and it does not appear to be on a regular maintenance schedule like the adjacent residuals settling lagoon.	Pre-sedimentation basin will be dredged and will be on regular maintenance schedule like settling lagoon	Corrective action completed- formal basin maintenance program established and implemented prior to consent order	**Error! Reference source not found.**
AOC-5	Raw Water	The System analyzes for pH, turbidity, and alkalinity in the raw water. The System does not conduct any other periodic monitoring of raw water to test for potential contaminants.	System has project to install some water quality monitoring at head of pre-sedimentation basin as part of dredging project. Enhanced raw water quality monitoring implemented at WTP	Resolved	**Error! Reference source not found.**

Observation Number	Facility Inspected	2022 EPA Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
AOC-6	Raw Water	Canal water flows by gravity without flow measurements. System Representatives stated that use of the Canal creates differences in water quality, and there is no prescribed procedure to adjust treatment for these instances.	No change for flow measurements. WTP can do jar tests to adjust treatment if Canal water is used	Resolved	**Error! Reference source not found.**
AOC-7	Treatment	July 2022 data sheets reflected several instances where free ammonia exceeds 0.1 mg/L, with a maximum of 0.41 mg/L.	For past 6 months, no instances of free ammonia above 0.1 mg/L	Resolved	**Error! Reference source not found.**
AOC-8	Rapid Mix	There were not any redundant mixers for the flash mixer at each plant in the channel.	Spare mixer equipment available in spare parts storage. Can utilize older flash mixer equipment at head of flocculators if needed as a last alternative	Resolved	**Error! Reference source not found.**
AOC-9	Raw Water Meter	The flow meters were unreliable and inaccurate while flow is critical in determining chemical dosing. Jar tests not completed on a regular schedule or required by the operators; they are only conducted as needed.	Raw water mag meter replaced and jar testing implemented on a regular schedule, flow pacing of chemicals started	Resolved	**Error! Reference source not found.**
AOC-10	Treatment	The System intended for potassium permanganate treatment based on seasonal needs, however, the treatment was out of service on two separate checks during the inspection due to an instrumentation failure. Potassium permanganate residuals are not tested in	System feeds potassium permanganate year round now. Residuals not tested, but System looking into online analyzer	Resolved	Figure 11

Observation Number	Facility Inspected	2022 EPA Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
		treated water to confirm proper dosage.			
AOC-11	Treatment	The chemical line for caustic soda in the Korah 1 Pump Station had crystalized product on the exterior and the area was taped off. The SH-1-3 tank and the tank fill line had active leaks at the time of inspection. EPA observed leaking aluminum sulfate in the bulk storage area.	No active leaks observed for caustic, alum, sodium hypochlorite	Resolved	**Error! Reference source not found.**
AOC-12	Treatment	The aluminum sulfate storage capacity may be less than a 30-day supply based on the production rate. The capacity of the bulk and day tanks are 155,000 gallons. The System uses 14,000 gallons/day of aluminum sulfate, providing an 11-day supply.	Less than 30 day supply approved by ODW due to site limitations and availability of reliable supplier	Resolved	**Error! Reference source not found.**
AOC-13	Operations	Operators do not have an updated SOP to reference for chemical treatment processes; System Representatives explained there may be an SOP in the operator control room although it is dated from the 1990s. Polymer is not flow-paced and must be manually adjusted.	SOPs developed and up to date, training provided. Polymer is still manually dosed, however all other chemicals are flow paced	Resolved	**Error! Reference source not found.**

Observation Number	Facility Inspected	2022 EPA Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
AOC-14	Treatment	System utilizes chloramination for disinfection but has not developed formalized steps to respond to chloramination disinfection issues such as nitrification. The System has experienced unexplained coliform positive samples recently, and there is no plan or procedure in place to respond to or investigate the cause these events. System Representatives stated that the chlorine residuals in these areas was high and there are observed instances of high free ammonia in the operator logs.	Nitrification Plan approved July 22, 2005	Resolved	**Error! Reference source not found.**
AOC-15	Treatment	Copper sulfate is added to the basin without a process for testing water quality before or after application, or in the treatment process. System Representatives stated that 50-pound bags are added without a measured application	SOP developed, but copper sulfate hasn't been added so unable to fully test new SOP	Resolved	**Error! Reference source not found.**
AOC-16	Treatment	PAC is added without a formal procedure for dosage or application periods.	SOP developed	Resolved	**Error! Reference source not found.**
AOC-17	Filters	Concrete structures above filter beds had hairline cracks throughout. Structural debris was observed on the center wall inside of Filter 16.	Project underway to address filter upgrades and address long-term infrastructure condition. Hairline cracks repaired	Corrective action completed- structural repairs completed prior to consent order. Filter upgrade project underway to address long-term infrastructure condition	**Error! Reference source not found.**

Observation Number	Facility Inspected	2022 EPA Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
AOC-18	Filters	The filter beds are contained in an enclosed structure subject to the humidity and chlorine from the filter bed water; the exposed unpainted air scour piping had severe rust and corrosion damage.	Piping to be replaced in upcoming project	Corrective action in progress- filter upgrade project underway to address long-term infrastructure condition	**Error! Reference source not found.**
AOC-19	Filters	The System completes filter rise tests, filter drop tests, and filter expansion tests, as required by VDH to confirm operational flowrates. Assessments to identify and address maintenance preventatively are not completed.	Filter drop and filter expansion tests resumed and reviewed recent results. Plans to begin filter rise tests in near future. Preventative maintenance activities completed more frequenty	Resolved	**Error! Reference source not found.**
AOC-20	Filters	System Representatives explained that filters are returned to service from filter-to-waste after a backwash procedure when turbidity is less than 0.1 NTU and any filter performance not less than 0.1 NTU is addressed. However, EPA observed Filter 16 turbidity increase above 0.1 NTU in the minutes following its return to service.	No exceedance of 0.1 NTU after backwash observed at site visit	Resolved	**Error! Reference source not found.**
AOC-21	Filters	There are several instances in the MORs that demonstrate a filter in use with turbidity in excess of 0.1 NTU as do not exceed 2.00 NTU. Turbidimeters appear to be set to a maximum read level of 2.00 NTU for an unknown reason.	System reported was an issue with SCADA, was corrected. No values near 2.00 NTU observed in MORs since summer 2025	Resolved	**Error! Reference source not found.**

Observation Number	Facility Inspected	2022 EPA Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
AOC-22	Finish water pumps	EPA observed significant corrosion at the base of Pumps 1, 2, and 3 that move water from the clearwell to the finished water basin.	Corrosion appears to be addressed and pumps repainted	Resolved	None
AOC-23	Finished Water Basins	Debris collected at the door base and was easily tracked inside, and the landing area had dirt and debris and portions without a baseboard or other barrier to prevent it from falling into the finished water basin.	Baseboards installed and intact, no debris observed at door	Resolved	Figure 20
AOC-24	Byrd Park Reservoir	The valve pit between the two cells of the reservoir was flooded. The valve pit shares common walls with the reservoir cells, and the walls are penetrated by multiple pipes. System Representatives were not informed of the flooding and did not know the cause, indicating the valve pit is not inspected on a regular basis.	Reservoir under construction for roof replacement project, not able to visit. System indicates contamination risk addressed and inspection program established prior to consent order	Resolved	None
AOC-25	Byrd Park Reservoir	The reservoir does not have an overflow and the installation of one is not included in any upcoming capital improvement projects.	Reservoir under construction, not able to visit. Overflow was included in plans of roof replacement project. System indicates overflow deficiency was remediated prior to consent order	Resolved	None

Observation Number	Facility Inspected	2022 EPA Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
AOC-26	Distribution System	System Representatives were not able to locate overflow pipe at Warwick Road Tank, indicating they are not inspected regularly. A potential overflow outfall point was not accessible due to heavy vegetation. System Representatives stated that the overflow may be connected to a sanitary sewer line; EPA could not inspect air gap, screening, or connection location to ensure protection from contaminants.	System located overflows and removed heavy vegetation. Overflows screened with air gap	Resolved	None
AOC-27	Distribution System	Inside the Warwick Road Tank tower at ground level, a 16" valve was installed on the tank transmission main connection above grade. EPA observed several pieces of wood stacked to create an insignificant support structure; it did not appear to be functional.	Concrete pillar repaired	Resolved	Figure 29
AOC-28	Distribution System	The overflow pipes at Cofer Road Tanks were equipped with a weighted, screened cover; however, the weight was not heavy enough to provide an adequate seal to the overflow pipe.	Adequate seal observed	Resolved	None
AOC-29	Distribution System	EPA only observed rough mesh on the overflow pipe for Jahnke Road tank that was large enough to allow pests into the finished water storage.	Adequate screening observed	Resolved	None

Observation Number	Facility Inspected	2022 EPA Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
AOC-30	Distribution System	EPA could not confirm the location of the overflow pipe at Huguenot Road Tank. There were three potential overflow pipes; only one was screened properly but it was blocked with debris. The condition of the pipes and surrounding area indicate they are not inspected regularly.	System located overflows and removed heavy vegetation. Overflows screened with air gap	Resolved	None
AOC-31	Distribution System	The overflow pipe at Ginter Park tank was located underground in an access hatch, but no backflow prevention was visible. System Representatives were not aware if backflow prevention was installed.	System evaluated hazard and plans to resolve as part of tank rehabilitation project	Planned as part of tank rehab projects scheduled in Capital Improvement Plan	None
AOC-32	Distribution System	EPA observed dirt and debris across the floor from the ceiling renovation, as well as buckets of oil waste and other trash throughout the pump station. EPA also observed a hose on a threaded tap connected to a finished water line; the hose was resting in an area that was wet from other leaks in the pump station, indicating potential for contamination during pressure loss.	Areas observed were clean of dirt and debris, no cross connections	Resolved	None
AOC-33	Distribution System	System Representatives stated that the tanks were last inspected in 2017; however, reports reflect the inspections were performed in 2015. Clearwells and finished water basins were not included in the tank inspection reports provided.	Tanks inspected April 2023 and are on 5 year inspection frequency	Resolved	None

Observation Number	Facility Inspected	2022 EPA Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
AOC-34	Distribution System	Overgrown vegetation was observed at the Jahnke Road Tank and Huguenot Tank within proximity and/or overhanging. There is potential for damage to the structure in storm conditions.	No overgrowth observed at time of visit	Resolved	None
AOC-35	Distribution System	The Byrd Park Main Pump Station is not tied to SCADA and requires manual operation. There were several housekeeping concerns at the pump station. There were not adequate logs or recordkeeping at the pump station for operator activities.	System plans to tie station to SCADA in upcoming project scheduled for 2027. Housekeeping and recordkeeping appear to have improved	Corrective action in progress- SCADA tie in part of upcoming project scheduled for 2027. Housekeeping and recordkeeping corrective actions completed	None
AOC-36	Distribution System	The building that houses Korah Pump Station #2 and #3 had active water drainage to the floor from at least two sources. The pump for Korah 1-2 had exposed wiring.	No exposed wiring observed, no active water leaks observed. Standing water minimized	Resolved	Figure 28
AOC-37	Management	No inventory of service line materials exists; only 100 sample sites were identified in 1992. Ground truthing activities are not conducted to ensure proper Tier levels for sample sites to ensure current material of service lines.	Lead service line inventory submitted, System using statistical methods and modeling to try and reduce number of unknown material service lines in distribution system which includes verification of a statistically significant subset of service lines	Resolved	None

Observation Number	Facility Inspected	2022 EPA Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
AOC-38	Management	Population served at the System is determined by Census data, which determined a population of 226,000 in 2020. The System's RTCR sampling plan uses a population of 220,000, thereby impacting the number of compliance samples to be collected.	Population reported matches current Census data, RTCR sample size is accurate	Resolved	None
AOC-39	Management	System Representatives discussed five recent total coliform positive results. The results were not formally evaluated to identify the cause.	Nitrification plan approved and will identify potential areas of distribution system that may have low chlorine residuals, high free ammonia residuals, high nitrate residuals and target flushing, tank turnover, etc. in area to address	Resolved	None
AOC-40	Backflow Prevention	Tags on several backflow prevention devices throughout the System were failed and/or out of date for annual inspections.	Backflow prevention device test dates up-to-date in database, tags in system were up-to-date a majority of the time	Resolved	None
AOC-41	Backflow Prevention	EPA observed several hoses without vacuum breakers that were tied to a finished water line throughout the plant and the distribution system.	Not observed at time of inspection. Hoses not connected when not in use, did not observe connection without vacuum breaker	Resolved	None

Observation Number	Facility Inspected	2022 EPA Observation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
AOC-42	Maintenance	System Representatives stated that flow meters at the pump stations are verified as needed. Work orders from 2022 show preventative maintenance calibration of some pH analyzers and turbidimeters, but no chlorine analyzers. The chemical pump output is overseen by operators who submit work orders for maintenance if they sense output is not correct. Calibrations are not on a regular schedule.	Calibration and preventative maintenance conducted on manufacturer recommended frequency	Resolved	None
AOC-43	Maintenance	Work orders from 2022 only reflect some preventative maintenance activities, and they are not used to track all maintenance activities or operational status. System Representatives explained that the CMMS system does not allow for an inventory of critical assets out of service. EPA observed several flocculators, filters, and pumps out of service with no forecasted date to return to service, potentially impacting overall capacity.	Work order system improved and can be used to track all maintenance activities	Resolved	None
AOC-44	Management	The ERP references out-of-date information and needs updated. Both the DPU EOM and the System's ERP need to be finalized and signed for full implementation.	ERP updated in 2025, all information appeared to be up-to-date	Resolved	None

Status Update of Recommendations from HNTB Report

Recommendation Number	Facility Referenced	HTNB Recommendation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
HTNB-1	Electrical Power Feed	Operate the WTP in Summer Mode all the time or at least during storm events that have risks of power outages (DPU has indicated that this has been implemented as the normal operating mode moving forward).	WTP is utilizing both Dominion power feeds at all times	Resolved	None
HTNB-2	Electrical Power Feed	Develop a Bus Tie/ ATS failure plan, ensure all electrical staff are properly trained on the plan, and clearly display the plan on each bus tie cabinet (SG 6 and SG 7). (DPU has indicated that Operations staff has been trained in switchgear operation and transitioning the WTP plant to generator power).	SOP developed, staff trained, and copy of procedures near bus tie cabinets	Resolved	None
HTNB-3	Staffing	Review staffing plans and consider staffing the WTP with mechanical and electrical staff during storm events that have risks of power outages. If staffing at this level is not feasible, at minimum implement all other recommendations and develop severe storm event response protocol with requirement that maintenance staff on call during storm events can respond in 30minutes or less. (DPU has indicated that Plant Maintenance has developed a	During emergency events and in advance of severe weather, WTP will staff maintenance staff on shifts along with operations 24/7 until event clears. Maintenance staff on call otherwise.	Resolved	None

Recommendation Number	Facility Referenced	HTNB Recommendation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
		Storm Preparation SOP that would staff WTP with mechanical and electrical staff if the EOC (Emergency Operations Center) is activated by the City).			
HTNB-4	UPS System	Provide a filter effluent valve UPS with a parallel duplicate backup UPS in each plant, all with a minimum runtime of one (1) hour, and ensure that both function as intended to close all filter effluent valves on loss of power. Size the UPS to close all filter valves simultaneously. In lieu of a backup UPS, a small backup generator could be considered to provide backup power in the event of the first UPS failing. The UPS sizing and operation should meet the requirements of Chapter 7 of the Virginia Electrical Code (2020) for Legally Required Systems. (DPU has hired another consultant to update the UPS units and it is currently in active design)	UPS systems upgraded with minimum runtime of one hour and tested to close all filter effluent valves on loss of power. UPS system appropriately sized to close all filter valves simultaneously.	Resolved	Figure 3

Recommendation Number	Facility Referenced	HTNB Recommendation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
HTNB-5		Install a SCADA UPS with a minimum runtime of at least one (1) hour. The UPS sizing and operation should meet the requirements of Chapter 7 of the Virginia Electrical Code (2020) for Legally Required Systems. (DPU has hired another consultant to update the UPS units, and it is currently in active design)	UPS systems upgraded with minimum runtime of one hour and tested to close all filter effluent valves on loss of power. UPS system appropriately sized to close all filter valves simultaneously.	Resolved	Figure 3
HTNB-6	SCADA	Change the SCA DA programming in Plant 1 to match that of Plant 2 so that the filter effluent valves are set to manual, and the manual set point is set to zero when SCADA is on UPS power.	SCADA systems modified so that filter effluent valves operate similarly in both Plant 1 and Plant 2 when SCADA is on UPS power	Resolved	None
HTNB-7	Operations	Develop an SOP for operators to manually shut down the SCADA system if a failure appears imminent to safeguard against a hard shutdown.	SOP developed and appeared to be adequate to allow manual shut down of SCADA system. Operators training plans include SOP	Resolved	None
HTNB-8	Filters	Verify filter effluent valve fail safe positions are set to close or reprogram to close.	As part of UPS upgrade and SCADA modifications, filter effluent valve fail safe positions set to close	Resolved	None
HTNB-9	Clearwells	Add clearwell high level floats that signal control system to override filter effluent valve commands to close the valves. An engineered design is required to ensure that the WTP operates as designed with the addition of these floats.	Ultrasonic level sensors installed at clearwells and tied to SCADA. Will be programmed to shut down plant if clearwell levels approach flood levels	Corrective action underway- ultrasonic level sensors installed	Figure 18

Recommendation Number	Facility Referenced	HTNB Recommendation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
HTNB-10	Filters	Ensure all filter valve actuators are rated as watertight and provide seal -tight fitting and conduit drain fitting prior to the seal-tight fitting within 10-inches of the actuator body. Install a breather fitting near the basement ceiling. Inspect the seal-tight fittings initially after one (1) month and then annually to check if water intrusion has occurred. (DPU has indicated that this has been completed).	Filter valve actuators replaced, other filter activities planned as part of filter upgrade project unerway	Resolved	None
HTNB-11	Filters	Install visual indicators of filter effluent valve positions with remote open/close switch for each at locations in each control room or basement that are safely accessible by operators in the event of minor flooding. (DPU has indicated that this has been completed).	Visual indicators of filter open/close at valve (red/green) and on SCADA. Remote open/close through SCADA, increased power feed resiliency	Resolved	None
HTNB-12	Management	Review and re-evaluate organizational structure of operations and maintenance staff at the WTP. (DPU has indicated that that WTP operations and maintenance staff organization charts are currently undergoing revisions).	Organizational structure revised, additional operations staff added each shift and float shift added. Communications between operations and maintenance appears to have improved	Resolved	None
HTNB-13	Operations	Develop written SOPs for plant operation, establish a comprehensive training system for staff on SOPs, and implement a regular update schedule for the SOPs.	SOPs developed, recommend revising as they are being used and feedback provided	Resolved	None

Recommendation Number	Facility Referenced	HTNB Recommendation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
HTNB-14	Operations	Develop standardized agenda for start of shift or shift change meetings with the input of plant staff. Agenda should include safety and emergency operating plan reminders as well as a log or record of all shift meetings.	Shift change meetings have been standardized, appear to have improved hand-off communications through meeting and better use of logbook for documenting activities that occurred during shift	Resolved	None
HTNB-15	Management	Implement seasonal risk assessment. Involve all WTP staff to identify potential risks to assets based on seasonal conditions and remind them of emergency procedures.	Routine meetings, including weekly meetings scheduled to discuss potential risks and conduct preparations as needed	Resolved	None
HTNB-16	Management	Implement reoccurring formal training for WTP management staff, including emergency response	Training plans developed for staff through online portal and includes recurring training for various items including emergency response. Progress of training can be evaluated using the online portal	Resolved	None
HTNB-17	Management	Review safety program for all staff. Refer to 12VAC5-590-560 for minimum requirements.	Safety program reviewed and safety program staff have been on-site to evaluate	Resolved	None
HTNB-18	Management	Expand DPU Emergency Operations Manual to include scenario-specific and process-specific actions for plant staff to follow during emergency events. Ensure plan is kept	Emergency Preparedness Plan includes various scenarios and how to respond. Plan readily accessible in control	Resolved	None

Recommendation Number	Facility Referenced	HTNB Recommendation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
		current and readily accessible per 12VAC5-590-505.	room and in computer. Training of operations staff incorporated into training program		
HTNB-19	Management	Develop an emergency staffing plan for DPU facilities in cases of emergency situations. Ensure operations, maintenance, and leadership staffing have coverage while providing adequate relief.	Staffing plan in case of emergency has been tested in recent predicted snow events, includes increased manpower as needed. Increased amount of operators on shift and include a float shift	Resolved	None
HTNB-20	Management	Evaluate existing Master Plan, Capital Improvement Plan, and other planning efforts for the WTP. Determine which recommended projects have been completed and which have been deferred. Of the deferred projects, develop a plan to re -prioritize the implementation of these projects based on criticality. (DPU has indicated that they are beginning this process).	Leadership have updated Capital Improvement Plan and other planning efforts and have developed projects to address critical infrastructure needs. There are many projects in various stages of planning, design, procurement, and execution	Resolved	None
HTNB-21	Management	Perform a holistic review of the planning, engineering, and procurement processes for capital projects within DPU. Determine inefficiencies in these processes and develop an action plan to address or correct the found inefficiencies.	Procurement of critical equipment and parts appears to have improved in both speed to fulfill and in quickly identify needs and submitting procurement requests	Resolved	None

Recommendation Number	Facility Referenced	HTNB Recommendation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
HTNB-22	Management	Develop a crisis communication plan. The plan should include the following at minimum: Establish clear protocols for communicating with staff and internal stakeholders during a crisis,ensuring all staff are informed and aligned with the DPU's response strategy.	System has developed a communication procedures document as part of the SOP development effort	Resolved	None
HTNB-23	Management	Develop clear protocols for communicating with external stakeholders and to ensure key stakeholders (including regulatory agencies) and wholesale customers (Henrico, Chesterfield,and Hanover) are notified immediately in the event of a WTP outage, using multiple communication channels, as appropriate, to ensure timely dissemination of information. Regular training of relevant staff on this plan and expectations of communication responsibilities during an emergency. Regularly review and update contact information to maintain accuracy and effectiveness. (The City has engaged another consultant to assess its emergency communications during crisis response).	System has developed a communication procedures document as part of the SOP development effort. System has established a cadence for meeting with wholesale customers	Resolved	None

Recommendation Number	Facility Referenced	HTNB Recommendation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
HTNB-24	Dewatering	Install dewatering pumps, such as hydraulic-driven pumps, which avoid high suction head issues affecting the priming of the existing dewatering pumps. Dewatering pumps should also have higher flow rates than the existing dewatering pumps, 3,000 to 6,000 gpm is recommended, and permanent piping that routes water away from the plant basements.	Technical memo developed and recommends installing dewatering pumps that can function adequately with the head conditions at the WTP. System plans to create projects based on technical memo recommendations	Corrective action in progress- incorporated into Capital Improvement Plan	None
HTNB-25	Staffing	Review staffing plans and consider the addition of a float operator to each shift. so that typical staffing is four (4) operators per shift. If there is an issue getting coverage for an operator that needs a day off, there are always a minimum of three (3) operators.	System now has 4 operators per shift, with 2 being Class 1 operators. Also started a float shift of operators during the day to assist with coverage as needed.	Resolved	None
HTNB-26	Electrical	Raise as many critical electrical systems above the plant basements as practical.	Project developed and planned to raise as many critical electrical systems above the plant basements as feasible	Corrective action in progress- incorporated into Capital Improvement Plan	None
HTNB-27	Generators	Provide an automatic transfer system for the existing backup generator system (DPU has Long-term indicated that this is included as part of a current capital project).	Automatic transfer switch installed and tested successfully	Resolved	Figure 2

Recommendation Number	Facility Referenced	HTNB Recommendation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
HTNB-28	Clearwell	Seal clearwells as much as possible by repairing any cracks or spalling in the concrete and sealing any pipe penetrations and hatches to reduce the flow rate at which water from the clearwells can flood the basement.	Technical memo developed and confirmed concrete slab in portions of clearwell can handle potential pressures if pipe penetrations and hatches sealed and gasketed. System plans to create projects based on technical memo recommendations	Corrective action completed- all identified cracks and penetrations sealed. Continued evaluation incorporated into active filter upgrade project as proactive quality assurance	None
HTNB-29	Maintenance	Restructure PM schedule to reduce PM overlap for the same set of assets.	System evaluated PM schedules, continues to work on moving to a preventative maintenance stance vs. reactive maintenance stance	Resolved	None
HTNB-30	Asset Management	Develop and implement an asset management plan that includes maintenance and replacement of water system assets, both in the WTP and out in the distribution system.	Asset management plan developed	Resolved	None

Status Update of Recommendations from SEH Root Cause Analysis Report

Recommendation Number	Facility Referenced	SEH Recommendation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
SEH-5.2.1.1.a	Electrical Power	Address the immediate causes of plant shutdown following the power failure through the following: a. Eliminate the use of “winter mode” as normal mode of power.	See observations in HTNB status update	Resolved	None
SEH-5.2.1.1.b	Electrical Power	b. Implement a UPS preventative maintenance schedule.	UPS preventative maintenance schedule developed and implemented	Resolved	None
SEH-5.2.1.1.c	Filters	c. Ensure that all relevant filter valves are closed by the control system upon loss of power, including valves that may be open during a backwashing cycle.	See observations in HTNB status update	Resolved	None
SEH-5.2.1.1.d	Generators	d. Provide an automatic transfer system for the existing backup generators.	See observations in HTNB status update	Resolved	Figure 2

Recommendation Number	Facility Referenced	SEH Recommendation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
SEH-5.2.1.2	Electrical Equipment	Address the underlying vulnerability that critical electrical equipment is not in spaces that are subject to clearwell overflows and flooding. We understand that DPU has proposed relocating certain electrical equipment up to the ground level, but current plans leave the pumps and motors in the basement. The pumps and motors are not immersion rated and will still be at risk. Relocating the motors to the ground level is recommended to ensure that no active intervention is required either by the operators or control system to protect them from clearwell overflows. Relocating the motors will require replacing the pumps with a different style and will be a costly project. Refer to the concurrent Richmond WTP Condition Assessment Report (SEH, 2025) for more detail and opinion of cost.	Technical Memo developed with recommendations to increase resiliency and redundancy of flood prevention items to minimize risk. Engineer in technical memo indicates moving all pump and motor assets out of basement not feasible due to space and cost limitations, so an increase in redundancy and resiliency is recommended. Includes utilizing both power feeds from Dominion year round, installation of automatic transfer switch for generators, upgrade of UPS systems (Power redundancies); installation of level sensors in clearwell tied to SCADA for automatic shutdown of WTP before flooding occurs, sealing and gasketing of existing penetrations into clearwell to reduce amount of flooding; installation of	Engineering solutions incorporated into Capital Improvement Plan. Contract engineers consulted and technical memo developed. Practicable modifications endorsed by system engineering staff included in Capital Improvement Plan scope in lieu of full motor relocation	None

Recommendation Number	Facility Referenced	SEH Recommendation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
			submersible pumps and dewatering pumps to increase amount of water that can be pumped in the event of a flood		

Recommendation Number	Facility Referenced	SEH Recommendation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
SEH-5.2.1.3	WTP	Recommend investing in improving automation at the plant. Although automation exists at the WTP, it is not used for many processes. Manual operation is often less precise and requires significantly more operator attention. Additional automation enables optimization and frees the operators up to complete more tasks. Successfully automating systems requires the operators to trust the computer systems and equipment. Critical equipment deficiencies like the inaccurate influent flowmeters require prompt resolution through maintenance activities or emergency procurement. Otherwise, the plant staff will become disengaged and develop less efficient and less reliable manual workarounds.	Flow pacing of chemical feeds except polymer has started, automation has improved and allows for more consistent dosing and operations	Resolved	None

Recommendation Number	Facility Referenced	SEH Recommendation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
SEH-5.2.1.4	Clearwell	Conduct a structural evaluation of the clearwell top slab for differential pressure conditions that result when the clearwell level rises. We note that some portions of the top slab are pressurized at design water surface elevations shown on the hydraulic profile and are further pressurized when the water level is elevated during disruptions in pumping capacity.	Technical memo developed that includes evaluation of slab	Resolved	None
SEH-5.2.2.1	Filters	Where hydraulic valves are used, provide a local means of supplying hydraulic pressure through booster pumps and/or stored in pressure tanks.	Project to replace hydraulic valves with electric valves planned	Replacement program underway- all hydraulic actuators being replaced with submergence-rated electric actuators under active capital project	None
SEH-5.2.2.2	Filters	Consider replacing hydraulic actuators with electric actuators rated for submergence as protection for clearwell floods as they reach their end of life.	Project to replace hydraulic valves with electric valves planned	Replacement program underway- all hydraulic actuators being replaced with submergence-rated electric actuators under active capital project	None
SEH-5.2.3.1	Staffing	Review staffing levels during normal operations. DPU increased staffing following this event.	Staffing levels increased	Resolved	None

Recommendation Number	Facility Referenced	SEH Recommendation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
SEH-5.2.3.2	Operations	We recommend DPU develops additional SOPs prioritizing those related to the most critical processes at the facility with a goal of generating SOPs for all standard and emergency procedures. Generating SOPs allows for the transfer of individual knowledge to institutional knowledge and assists with training and standardization. Include the following SOPs as a start: a. Managing clearwell level; b. Restarting the plant from shutdown, including restarting/operating on emergency generator power; and c. Note: DPU is in the process of generating SOPs for number of processes at the date of writing of this report, revised SOPs related to backup generator operation were shared with SEH, additional SOPs are expected to follow shortly.	SOPs developed and operators trained	Resolved	None

Recommendation Number	Facility Referenced	SEH Recommendation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
SEH-5.2.4.1	Maintenance	Continue transition to proactive maintenance program for all plant assets. Develop a formal asset management plan. Re-evaluate current work order system to identify if other key assets are missing from the system. Solicit input from experienced operations and maintenance field personnel.	Actively transitioning to proactive maintenance. Asset management plan developed.	Corrective action underway	None
SEH-5.2.4.2	Operational Technology	Implement preventative maintenance schedule for network switches (either by DPU staff or third-party contractor). Activities to include annual driver updates, review of existing equipment for the need to replace based on obsolete models.	System hired 2 SCADA/OT related positions in 2025. Implemented preventative maintenance schedules.	Resolved	None
SEH-5.2.5.1	Management	Conduct regular coordination meetings with bulk water customers to review emergency notification and capital projects which affect customers. Regularly test emergency notification channels. Additionally, periodic coordination meeting to review operations, upcoming projects, emergency preparedness, etc. may be beneficial.	System has routine cadence for meeting with bulk water customers	Resolved	None
SEH-5.2.5.2	Management	Maintain hard copies of emergency plans and manuals in areas accessible to the control rooms.	Hard copies and electronic copies available to the control rooms	Resolved	None

Recommendation Number	Facility Referenced	SEH Recommendation	2026 VDH ODW Observation	Status	Accompanying Photograph (Appendix A)
SEH-5.2.5.3	Management	Review Emergency Response Plans and Operations Manuals and make plans more site specific. Solicit input from experienced operations and maintenance field personnel.	Emergency Response Plan updated in 2025, more site specific	Resolved	None
SEH-5.2.5.4	Management	Conduct emergency response training and exercises in accordance with the Emergency Response Plan recommendations.	Emergency response training planned annually as part of training requirements	Resolved	None
SEH-5.2.5.5	Management	Develop plans for various power failure scenarios, including the loss of each main feeder and loss of the Bus Tie. Train electrical staff on the plans.	Power loss SOPs developed	Resolved	None
SEH-5.2.5.6	Staffing	Review staffing levels during declared States of Emergency. Review whether a qualified electrician should be on site during declared States of Emergency.	Increased staffing levels during States of Emergency at System including placing maintenance staff on shift. Tested during snow events in 2026	Resolved	None
SEH-5.2.5.7	Management	Update the Emergency Operations Manual Checklist 36. Destruction/Failure of any part of the Water System. Add thresholds and clear guidelines for notifications, develop an SOP for a major failure at the water plant. Include a schedule for review and training with plant staff.	SOP for major failure at WTP developed, training assigned and completed	Resolved	None

Photographs

Figure 1. Electrical substation

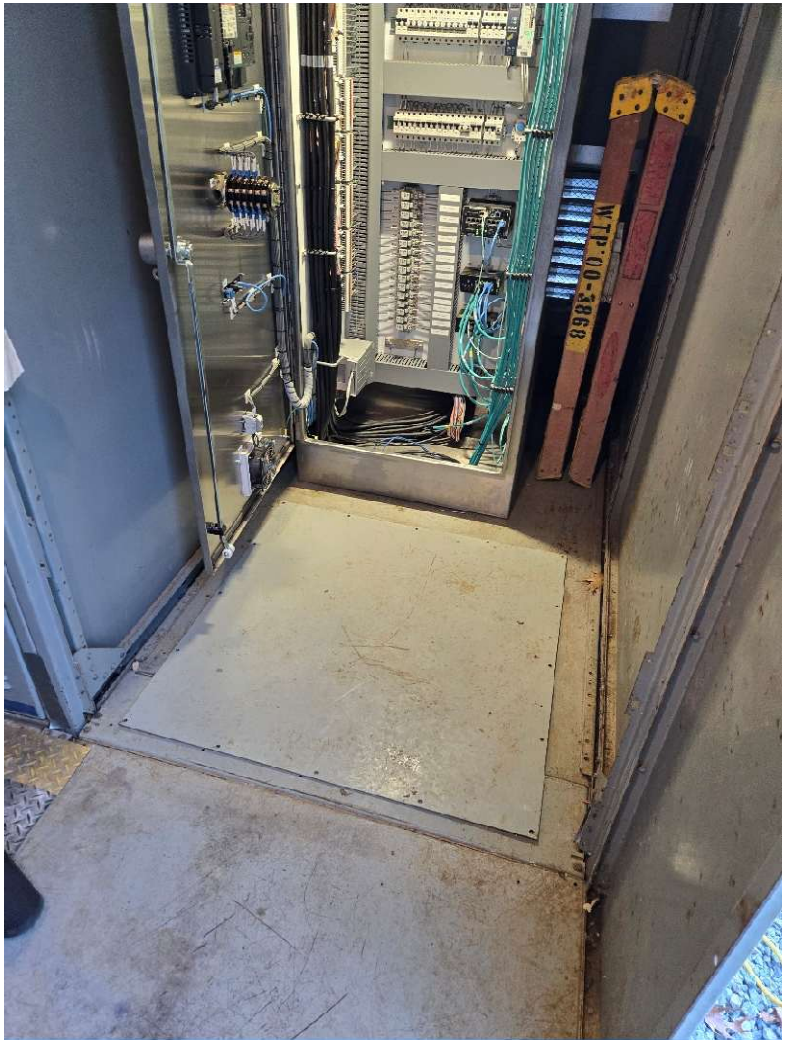


Figure 2. Automatic transfer switch installed

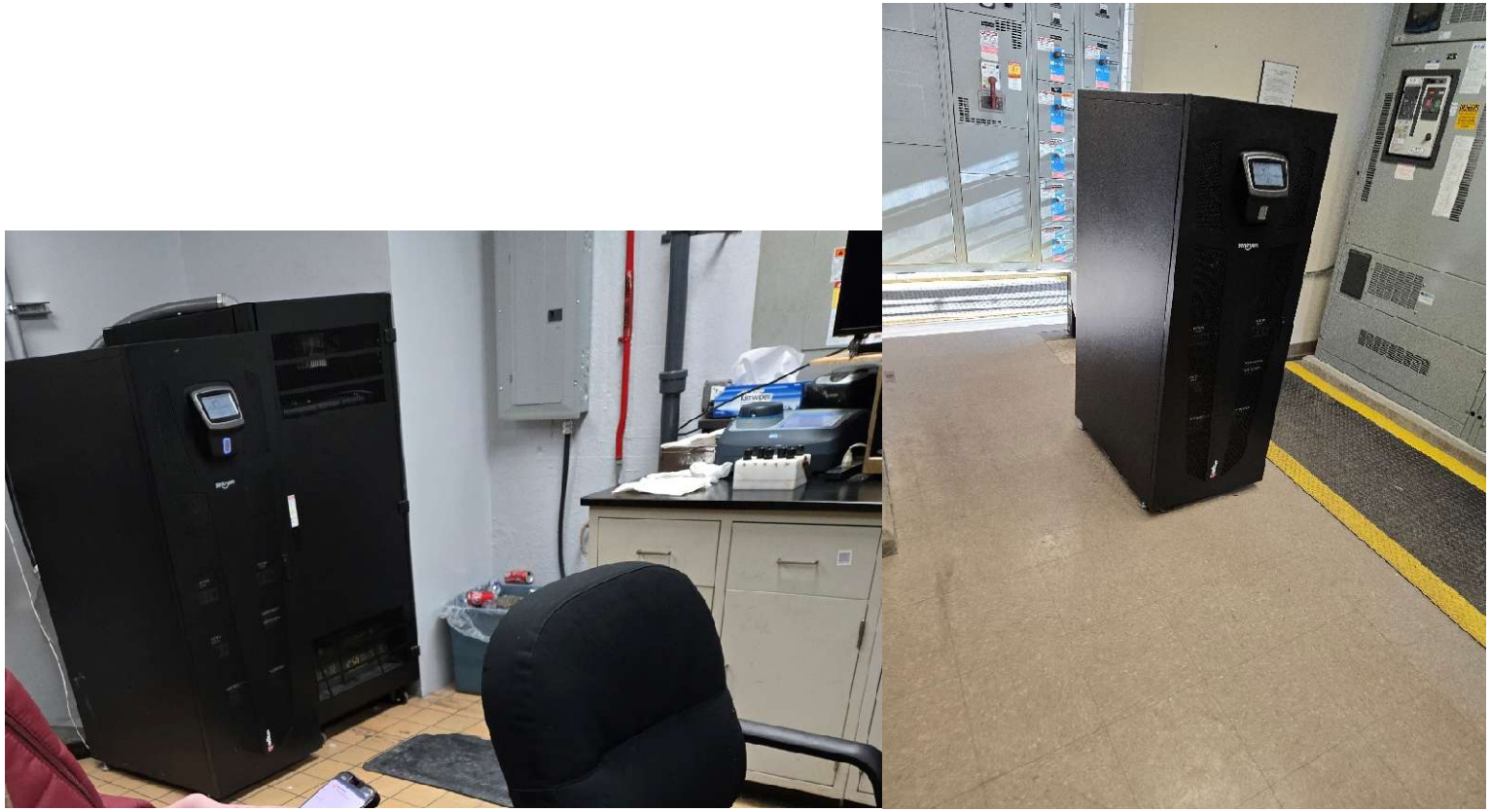


Figure 3. UPS systems upgraded. Plant 1 (left), Plant 2 (right)

Figure 4. Chemical totes at pre-sed(2025 left), No chemical totes observed (2026 right)

Figure 5. Pre-sed traveling screens

Figure 6. Earthen berm between lagoon and raw water intake channel (2025 left), Shrubs less growth observed (2026 right)

Figure 7. Raw water basins

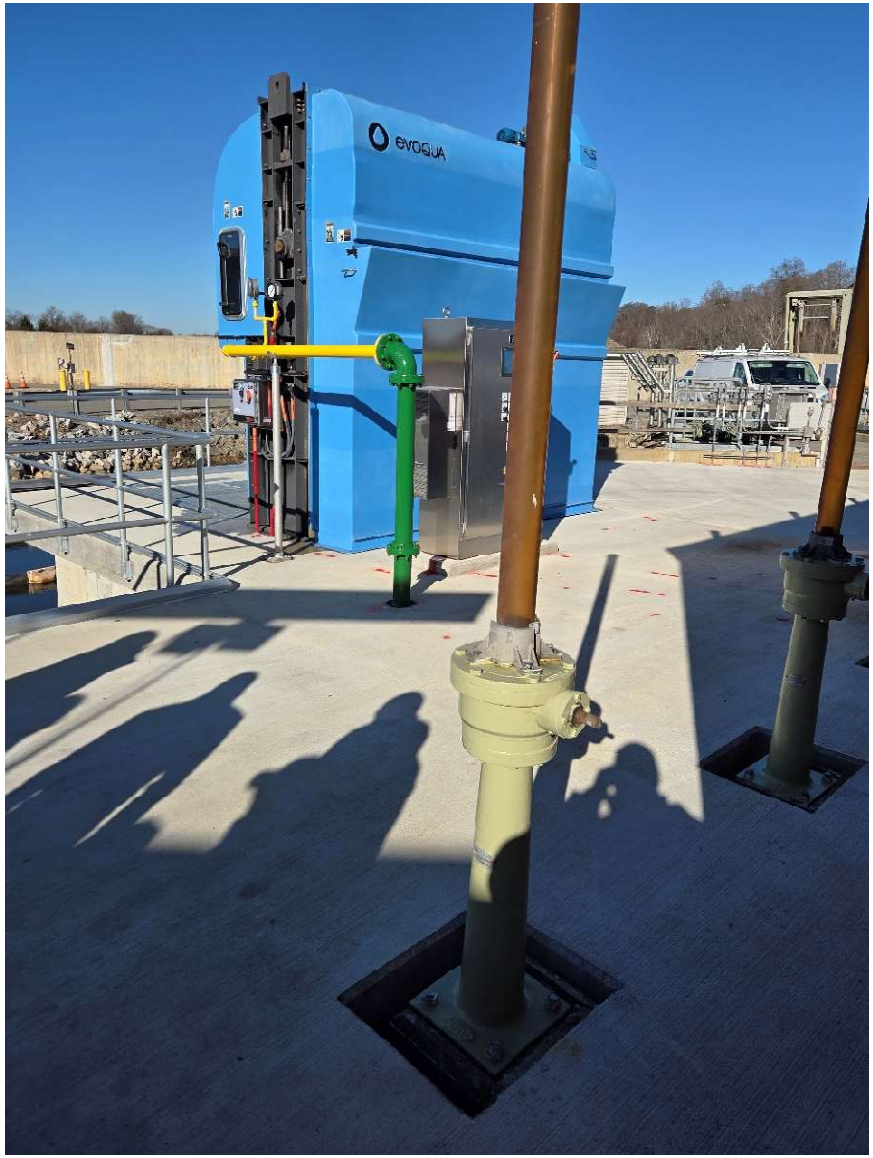


Figure 8. New raw water screens

Figure 9. Raw pump motor screen (2025 left), Screen intact, all raw water pumps checked (2026 two photos on right)

Figure 10. Housekeeping- Bird droppings (2025 left), Cleaner area observed (2026 right)

Figure 11. Permanganate feed year-round

Figure 12. Sedimentation basin walkway (2025 left), sealed (2026 right)

Figure 13. Floculators

Figure 14. Chemical totes near sedimentation basins (2025), No totes observed (2026)

Figure 15. Obsolete equipment abandoned in place (2025), Wiring removed as much as possible (2026)

Figure 16. Filter 6 leaking through wall (2025); No leak observed (2026)

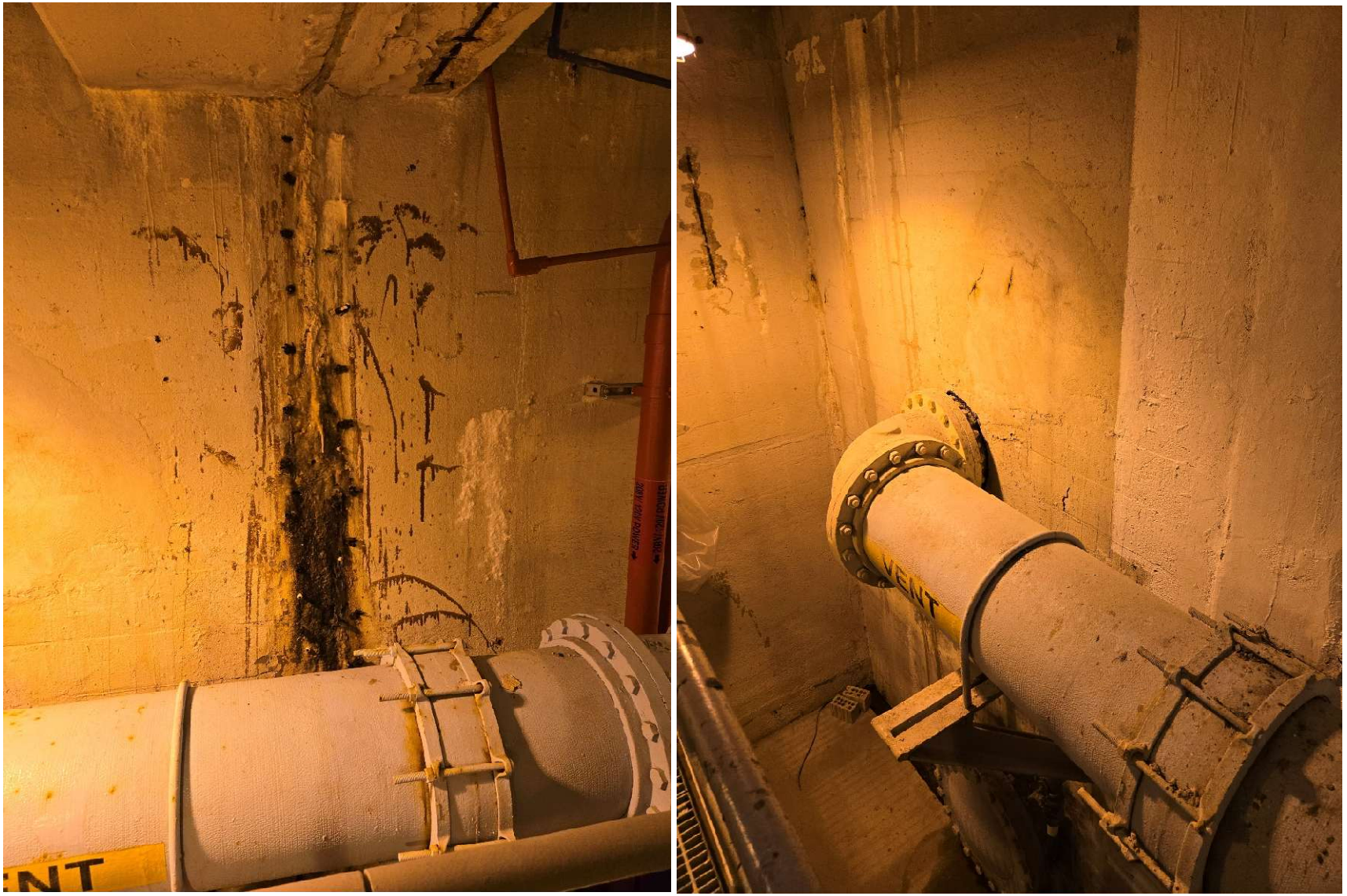


Figure 17. Leak and biological growth (2025); No leak observed (2026)

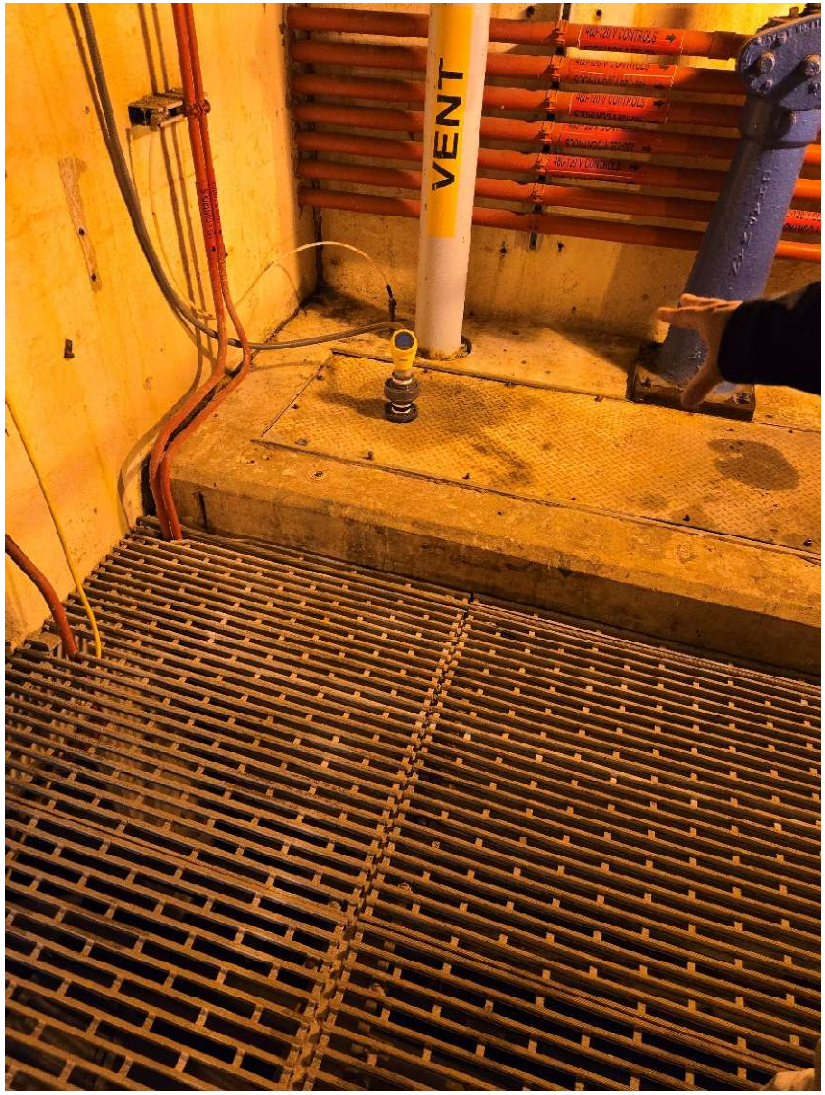


Figure 18. Ultrasonic level sensor for clearwell

Figure 19. Backwash waste area (2025); (2026)

Figure 20. Water beneath grates visible, no solid base on walkway (2025); Grates covered (2026)

Figure 21. Scum observed end of aeration basin (2025); Not observed (2026)

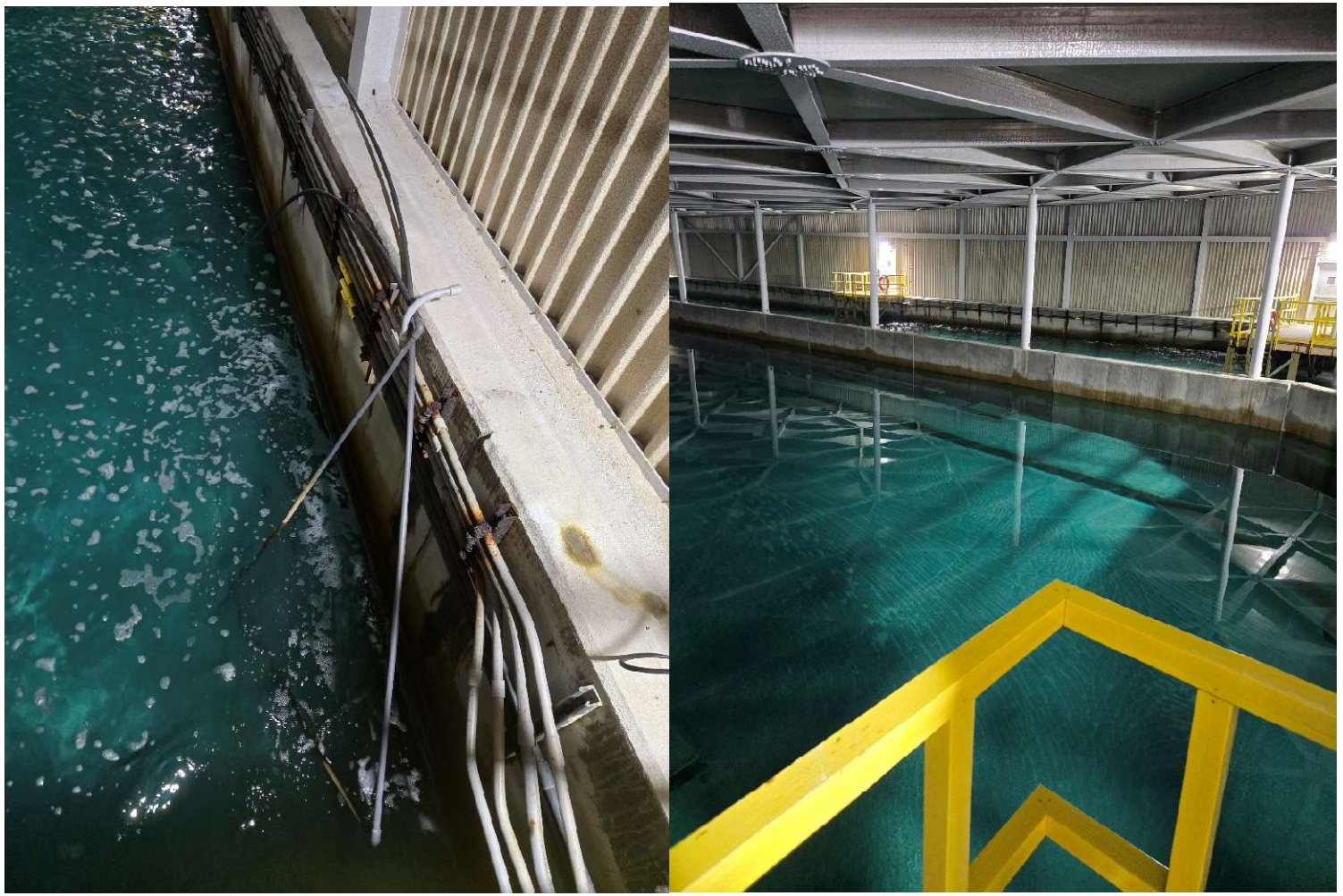


Figure 22. PVC pipe in water (2025), No hanging piping observed on sides (2026)

Figure 23. Obsoleted turbidimeters (2025), New turbidimeters (2026)

Figure 24. Chemical leaks (2025), Not observed (2026)

Figure 25. Chemical leaks (cont.) (2025), Not observed (2026)

Figure 26. Pipe loop installation

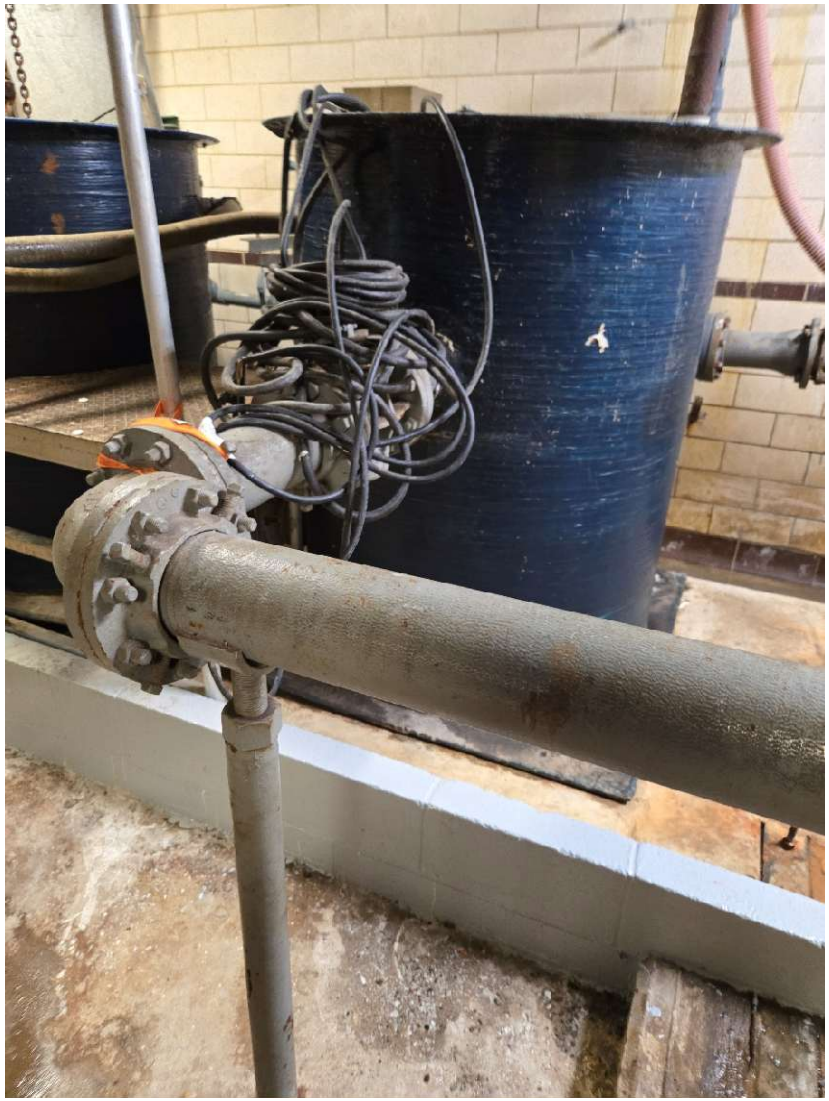


Figure 27. Sanitary waste storage tank with concrete containment curbing

Figure 28. Korah Pump Stations

Figure 29. Wood supporting valve due to eroded concrete support (2025), Support repaired (2026)

Figure 30. Corrosion at several pumps (2025), Pumps painted and no visible corrosion (2026)

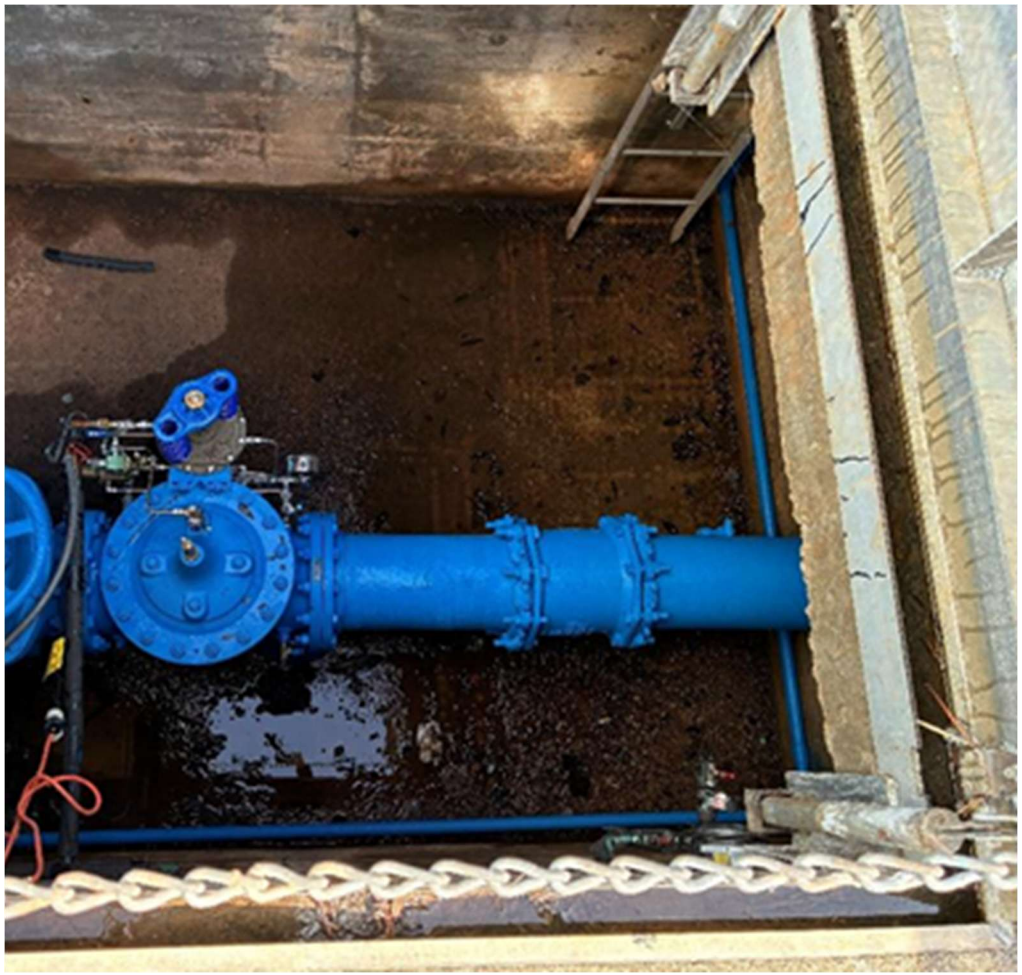


Figure 31. Valve vault in Distribution System

Finished Survey Questions

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Treatment

RICHMOND WTP

1	**Treatment - Are suitable sampling taps available? (upstream and downstream of each treatment process)**	✓
2	**Treatment - Is an adequate entry point tap available?**	✓
	Located in New Korah pump station	
3	**Treatment - Is appropriate and operable testing equipment available?**	✓
4	**Treatment - Does the waterworks have an operations and maintenance manual/SOP manual?**	✓
	Updated 2025, all operators required to train and sign when complete.	
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?**	✓
	ODW approved having less than 30 days storage on-site for lime	
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?**	✓
	Flow pacing has been repaired for chemical pacing. Coagulant aid is set manually at low dose and is introduced between the flash mix and the flocculation chambers.	
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)**	✓
	ODW approved having less than 30 days storage on-site for lime	
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?**	REC
	System was cautious on starting fluoride back up after overfeed event- started dosing below 0.7 mg/L and gradually worked up to 0.7 mg/L residual over course of 2025. Now maintaining closer to 0.7 mg/L- recommended not going below 0.6 mg/L	
30	**Fluoride - Is a functioning scale and loss of weight recorder provided for the fluoride feed system?**	✓
	Load cell in fluoride storage replaced	
31	**Fluoride - Is an operable anti-siphon device installed on the fluoride feeder?**	✓
	Peristaltic feed pumps	
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)**	✓
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?**	✓

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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)** Mixer in raw water channel, alum introduced just ahead of mixer.	✓
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**	✓
65	**Flocculation - adequate baffling/compartmentalization (No evidence of vortexing or basin short-circuiting), and plant can operate with basin out of service**	✓
66	**Flocculation - Equipment in good physical condition** All flocculators available, no exposed wires visible	✓
67	**Flocculation - Coagulation process control procedures adequate** System looking to replace zeta meter with newer model by end of year	✓
68	**Clarification - Clarification VOP goals been met for the past 12 months** Not eligible for 2025 VOP award	✓
69	**Sedimentation Basins - Good flow distribution between basins/No short-circuiting or overloads**	✓
70	**Sedimentation Basins - No evidence of floc shear at the stilling wall?**	✓
71	**Sedimentation Basins - Good floc settleablity, no/minimal floc carry-over observed**	✓
72	**Sedimentation Basins - No excessive sludge accumulation, cleaning frequency is adequate** Trac vac system on automated timer	✓
73	**Sedimentation Basins - Equipment in good physical condition**	✓
103	**Gravity Filtration - Media depth and condition monitored and adequately maintained** Filter media replacement project planned	✓
104	**Gravity Filtration - Filtration rate routinely drop tested or rate-of-flow meter calibrated, and filtration rate maintained within permitted limit** Drop tests are now completed monthly in a sequence that has all filters checked over a year period.	✓
105	**Gravity Filtration - Surface wash backflow preventer provided with up-to-date test records, if surface wash is provided** Surface wash not utilized; air scour is method in use	✓
106	**Gravity Filtration - Do MORs indicate that filter backwash frequency based on plant established maximum values (headloss, time, turbidity, particle counts, etc.)?** Backwash triggers include any of the following as needed to maintain filtration integrity: Head loss above established filter recommendations, (typically 6 ft headloss), filtered turbidity =/> 0.10 NTU, time in service =/> 100 hours.	✓
107	**Gravity Filtration - No indications of filter backwash performance issues (no boils or media loss during backwash, well distributed media after)** Filter expansion below 25-30%, System indicates it is possibly due to historical media loss. Media replacement project planned- after complete determine if filter expansion improves. Waste pump appeared to spin backwards, check valve needed to be investigated. Check valve was replaced by system between 2/25/26-3/12/26	REC
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)**	✓
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** Not eligible for VOP	✓
113	**Gravity Filtration - Backwash VOP goals met for the past 12 months** Not eligible for VOP	✓
163	**Clearwell - Access protected from contamination**	✓

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164 **Clearwell - Overflow not subject to flooding, and downturned and protected with a screen, or otherwise adequately protected** ✓

No overflow, if clearwell goes into overflow then it will flood basement. System is implementing multiple redundancies (power redundancy, clearwell sensor tied to SCADA and shutdown if near overflow, sealing penetrations, etc.) to minimize risk of overflow/flood

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** ✓

No overflow, if clearwell goes into overflow then it will flood basement. System is implementing multiple redundancies (power redundancy, clearwell sensor tied to SCADA and shutdown if near overflow, sealing penetrations, etc.) to minimize risk of overflow/flood

168 **Clearwell - Hatch(s) secure** ✓

169 **Clearwell - Viewing port with light** ✓

170 **Clearwell - Cleaning adequate, no sediment present** ✓

Sediment was present; however, this can be normal with aged or degrading filters. Plans to address filter repair and Clearwell maintenance are being developed. There was NO floating debris observed in the Clearwell.

171 **Clearwell - Good physical condition** ✓

Previously indicated cracks have been repaired

172 **Finished water/intermediate pumps - all operable and in good physical condition** ✓

North finish water pumps available: N1, N2, N3. Pump N4 is down for maintenance. Pumps of this size require laser alignment, work on motor base will need to be completed to meet tolerances.

All South finish water pumps are available: S1, S2, S3, S4

173 **Finished water/intermediate pumps - Pressure gauges, check valve, shut off valve provided/operable** ✓

174 **Finished water pumps - Flow meter operable** ✓

Flow meter readings are collected at midnight, and daily flows are reported on MORs

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** ✓

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** ✓

vapors filter through barrel of water outdoors near filling station.

185 **NH4 - Ammonia storage tank spill containment structure condition** ✓

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.)** ✓

Emergency power updated 2025; 45 MGD max output from plant on emergency power.

221 **Treatment - Overall general operation adequate** ✓

52 **Chlorine - Is the chlorine contact tank in service?**

53 **Chlorine - Is the chlorine contact tank in good condition?**

178 **NH4 - Ammonia cylinder repair kit available**

Liquid ammonia is stored in three, welded steel storage tanks. Appropriate ammonia supply plumbing and pump repair items are a available

Distribution

DISTRIBUTION SYSTEM

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?** ✓

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5	**CCCP evaluated every 5 years and updated if necessary to meet the requirements of section 600 of the regs** Updated CCCP approved in 2026, recommend documenting review completion every 5 years even if no revisions made. System indicates they can use existing databases to track this	REC
6	**CCCP plan document date or approval date is 2022 or more recent? (in compliance with 2021 regs)**	✓
7	**Is the vault drain/sump pump functioning? (is there evidence of standing water?)**	✓
8	**If the meter is a consecutive connection, Is there an operable sample tap?**	✓
9	**Are operators able to safely enter the vault for inspection, maintenance and repairs? (adequate ladder, confined space equipment and training if applicable)**	✓
10	**Is access to the vault / chamber locked or otherwise secured?**	✓
11	**Is there bypass piping and isolation valves available for master meter maintenance?**	✓
12	**Are there operable pressure gauges present? (for PRV or altitude valve)**	✓
13	**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)**	✓
14	**Is the meter in the vault operational? (recommend recording meter reading in comments)**	✓
15	**Are individual service meters provided for all connections?**	✓
16	**Is a service meter calibration and replacement program in effect?**	✓
17	**Is a flushing program in place? (unidirectional preferred)** Investigating doing unidirectional flushing where possible	✓
18	**Is an isolation valve exercising program in place?**	✓
19	**No evidence of less than 20 psi at service connections or other pressure problems?** Not since 2025 BWA events	✓
20	**Does the waterworks follow ODW guidelines for disinfection, sampling, and Boil Water Advisories following a main repair (see ODW Field Manual)?**	✓
21	**Are water audits (water loss/leakage calculation) routinely performed?** Currently calculates water loss using customer billing and water production, plan to conduct annual water audits using industry standards going forward	✓
22	**Was the average leakage (real losses) over the past 12 months less than or equal to 30%?** 15.2% unaccounted for water	✓
23	**Are fire flow tests routinely performed and communicated to the waterworks?**	✓
25	**Are plans, sketches, or maps with valve & master meter locations available?**	✓
26	**Inspected records of repairs, flushing, hydrant testing, and water audits, and confirmed that they are addequate and maintained (kept) for at least 5 years?**	✓

Finished Water Storage

CHURCH HILL (5 MG TANK)

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?**	✓
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.)**	✓

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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)	✓
	Concrete tank	
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	✓

COFER ROAD (2.0 MG TANK)

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?	✓
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	✓

COFER ROAD (2.1 MG TANK)

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?	✓
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?	✓

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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	✓

GINTER PARK (1MG ELEV TANK)

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?	✓
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	✓

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WOODSIDE (1MG ELEV TANK)

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?**	✓
4	**Are pictures of the tank interior provided? Are there indications of problems? (Floating debris, deteriorated lining, corrosion evident, excess sediment, etc.)**	✓
	Corrosion in tank interior noted in most recent inspection. System has tank rehabs on CIP, planned to address	
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?**	✓
	Implemented 5 year inspection/rehab frequency	
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**	✓

WARWICK ROAD (1MG ELEV TANK)

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?**	✓
4	**Are pictures of the tank interior provided? Are there indications of problems? (Floating debris, deteriorated lining, corrosion evident, excess sediment, etc.)**	✓
	Corrosion in tank interior noted in most recent inspection. System has tank rehabs on CIP, planned to address	
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?**	✓

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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	✓

STRATFORD HILLS (0.25 MG ELEV TANK)

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?	✓
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	✓

JAHNKE ROAD (2.5 MG TANK)

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?	✓
4	Are pictures of the tank interior provided? Are there indications of problems? (Floating debris, deteriorated lining, corrosion evident, excess sediment, etc.)	✓
	Corrosion in tank interior noted in most recent inspection. System has tank rehabs on CIP, planned to address	
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?	✓

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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)**	✓
	Corrosion noted in most recent inspection. System has tank rehabs on CIP, planned to address	
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**	✓
	Concrete foundation deterioration noted in last inspection, planned for rehab	

HUGENOT ROAD (0.75MG TANK)

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?**	✓
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**	✓

HIOAKS (2 MG ELEV 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?	✓
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	✓

BYRD PARK 55 MG RESERVOIR

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?
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?

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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	

Pumps

JAHNKE 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.	✓

CHURCH HILL 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.	✓

KORAH PUMP STATION NOS. 1, 2 & 3

1	Is the pump station lot in reasonable condition? (mowed, accessible, no inappropriate storage- i.e. chemicals, water diverted away) Korah Pump Stations located at WTP	✓
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)	✓

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6 **Are the pumps maintained properly? (Maintenance log, food grade oil/grease, sounds okay, and not leaking)** ✓

Pump maintenance activities tracked in Mainsaver database, creates work orders based on recommended frequency of activity

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.** ✓

On WTP grounds, WTP has generator along with 2 power feeds from Dominion

COFER ROAD 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.** ✓

BYRD PARK PUMP STATION & RESERVE P.S.

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.** ✓

TRAFFORD 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)** ✓

Pump No. 1 offline. System put in work order and pump was repaired as of 3/12/26

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?** ✓

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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.**	✓

COLUMBUS 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)** Pump No. 2 offline. System put in work order and pump was repaired as of 3/12/26	✓
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.**	✓

WESTHAMPTON PUMP STATION

1	**Is the pump station lot in reasonable condition? (mowed, accessible, no inappropriate storage- i.e. chemicals, water diverted away)** Fencing added to keep out people from camping on site	✓
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)** Pump No. 4 offline. System put in work order and pump was repaired as of 3/12/26	✓
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.**	✓

HUGUENOT ROAD 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?**	✓

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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?** Updated and added new sites 2025/2026	✓
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 Cl - Are grab samples collect at least weekly for routine verification checks for each on-line analyzer?**	✓
11	**Continuous Cl - Are results of grab sample verification checks within the larger of +/- 0.1 mg/L or +/- 15%?**	✓
12	**Continuous Cl - Are records of calibration recorded and maintained for 3 years?**	✓
13	**Continuous Cl - 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)** DPD using Hach colorimeter	✓
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?** SOPs drafted for operator activities	✓
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)**	✓
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)**	✓
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)**	✓
29	**All turbidity measurements below limit (compliant with regulations and operation permit conditions)**	✓

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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**	✓
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)**	✓
39	**Chlorine residuals, pH, temperature, flowrate, and clearwell level monitored and controlled in range to meet inactivation requirements**	✓
40	**Fluoride monitoring adequate (equipment in good condition, calibrated in accordance with manufacturer recommendations, online analyzer corresponds to bench if applicable)** Certified lab staff come to calibrate fluoride probe weekly	✓
41	**Adequate backflow protection at lab sinks (air gap or vacuum breaker), etc.**	✓
42	**Laboratory in good general condition**	✓
43	**Public Notices and Certification Forms submitted and are up to date in SDWIS**	✓

Management and Operation

1	**Are the waterworks facilities and appurtenances in good operating condition? (source, treatment, and distribution facilities without defect) (triennial assessment - mandatory question)** Minimal equipment offline for repair, corrosion appeared to have been removed from most pumps and repainted	✓
2	**Does the system meet Waterworks Regulations design and construction standards? (unpermitted construction or modification) (triennial assessment - mandatory question)** No unpermitted construction or modifications	✓
3	**Does the waterworks meet all established National Primary Drinking Water Standards, and has taken action to prevent recurrence of past violations? (triennial assessment - mandatory question)**	✓
4	**Did the owner issue Public Notice if required?**	✓
5	**Has the waterworks either not received significant deficiencies, or completed timely correction of all significant deficiencies? (triennial assessment - mandatory question)**	✓
6	**Did the waterworks address recommendations from recent sanitary surveys? (triennial assessment - mandatory question)**	✓
7	**Free of complaints since the last inspection? (explain or summarize any complaints reported to ODW or the waterworks in the comments)** Large city, has established complaint response procedures	✓
8	**Does the waterworks have a written policy for responding to customer complaints? (triennial assessment - mandatory question)** Recently revised	✓
9	**Does the waterworks have an emergency response plan that has been tested and is routinely updated?** Updated September 30, 2025	✓
10	**Does the Emergency Response Plan include background information with a system description and diagram (including facility addresses), and is it up to date?**	✓
11	**Does the Emergency Response Plan include hazard analysis (recommend that analysis is performed with locality emergency manager) that addresses adverse weather events?**	✓
12	**Does the Emergency Response Plan include an emergency contact list including all critical emergency contacts (recommend including all contacts from the Waterworks Emergency Response Plan Template available on the ODW website)?**	✓
13	**Does the Emergency Response Plan include action plans to address all risks identified in the hazards analysis? (recommend using EPA hazards specific checklists)?**	✓

Finished Survey Questions

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14 **Does the Emergency Response Plan include a Continuity of Operations plan, specifically roles and responsibilities?** ✓

15 **Does the Emergency Response Plan include advisory (BWA, etc.) templates and procedures for non-english speaking populations?** ✓

16 **Is the Emergency Management Plan for Extended Power Outage current?** ✓

17 **Waterworks is aware of VA WARN (if not, inform the waterworks that this network can aid waterworks in response to emergencies, see vawarn.org)** ✓

18 **Waterworks is a member of VA WARN** ✓

19 **Are all plans and reports up to date and implemented (eg. BSSP, LCR Plan, CCCP, CCR, Sampling, etc.)? (triennial assessment - mandatory question)** No Severity

Plans updated 2025 and 2026. Recommend incorporating process to track and document review of CCCP that is required every 5 years (may not need to revise every 5 years, but need to document that has been reviewed). System indicates they can integrate into existing databases

20 **Does the waterworks have sufficient licensed operator coverage for sick leave and vacation? (triennial assessment - mandatory question)** ✓

Four operators per shift; each shift has two class 1 operators. There is a "floating" operator team available to cover planned absences as well as emergency call outs.

Operator count: 23 of 24 operators on staff.

21 **No problems with personnel turnover** ✓

Management stated no trouble in finding operators

22 **Are there records of an active ongoing staff training program? (staff should review the training plan records)** ✓

All operators required to complete training through the City of Richmond's training software/program. Signature required at completion.

23 **Have all operators attended a technical training seminar or conference at least once per year, over the past 3 years? (triennial assessment - mandatory question)** ✓

Training is made available to operators in person and on-line. Richmond DPU provides an account to each operator through waterotter.com. Other resources include Sacramento Water courses through the California Rural Water Association.

24 **Did operators appear to be adequately trained for their roles?** REC

As the new SOPs are being used, document any feedback from staff and revise documents as necessary to improve clarity, accuracy, and usability of the documents. Due to the large number of documents, items such as consistent formatting, ensuring all applicable pre-requisites and references are included, consistent use of terminology, roles and responsibilities, and including procedures for activities that may have been unforeseen in the original drafting process should improve over time as the documents are more routinely used, particularly by newer staff.

25 **Is there an active safety program?** ✓

26 **Clear lines of communication established with managers, plant and system operators?** ✓

Communication and knowledge base much improved

27 **Is the system's management generally responsive to operator requests for training, equipment, or other needs?** ✓

28 **Does the waterworks have records demonstrating that preventative maintenance tasks are scheduled and performed?** ✓

Tasks recorded in MainSaver

29 **Does the waterworks have a written Asset Management Plan? (triennial assessment - mandatory question)** ✓

30 **Have all item in the Asset Management Plan been completed by the specified deadlines? (staff should review the Asset Management Plan to evaluate)** ✓

31 **Does the waterworks have a written Capital Improvement Plan? (triennial assessment - mandatory question)** ✓

32 **Is a reserve fund established to cover necessary replacements or Capital Improvements? (triennial assessment - mandatory question)** ✓

33 **Have all item in Capital Improvements Plan been completed by the specified deadlines? (staff should review the Capital Improvements Plan to evaluate)** ✓

34 **Does the waterworks have at least 45 days cash on-hand to cover expenses? (triennial assessment - mandatory question)** ✓

35 **Is the waterworks budget independent from subsidization by general funds, sewer funds or other funding sources? (triennial assessment - mandatory question)** ✓

PILOT utilized by City- payment in lieu of taxes to City from utility

36 **Have the waterworks' rates been adjusted in the past three years? (triennial assessment - mandatory question)** ✓

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37 **Does the waterworks have a WBOP that is up to date and implemented?** ✓

ODW working on WBOP with system- in process

38 **Are all service connections equipped with operational meters and is there a water accountability program in place? (triennial assessment - mandatory question)** ✓

39 **Did the waterworks consistently operate within 80% of its permitted capacity? (not exceeded for 3 consecutive months) (triennial assessment - mandatory question)** ✓

Rated for 132 MGD

40 **Has the waterworks operated within their Operation Permit capacity since the last inspection? (if not, explain in comments)** ✓

41 **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., attended adequate number of days per week)** ✓

4 operators per shift, each shift has two class 1 operators. Four relief operators on site M-F.

42 **Adequate criteria and procedures established for plant shut down in case of unit process failure/significant overall quality degradation** ✓

43 **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** ✓

44 **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)** ✓

45 **Does the waterworks routinely perform cybersecurity assessments and address gaps identified?** REC

New program/hire to implement cyber security training. 2025 assessment by consultant. Software patches are installed on OT devices when feasible, however some software may be outdated and unable to patch. Recommend identifying software that can't be patched, evaluate criticality, and plan for upgrades if needed.

46 **No other management and operations issues noted during the survey.** No Severity

Recommend incorporating new VDH 2-hour reporting requirements for critical equipment failures or malfunctions, effective July 1, 2025 into main break procedures. The 2-hour reporting requirements appear in the Emergency Response Plan, however the main break procedures may need to be revised to include

Operator Compliance

1 **Does the designated operator have an unexpired Virginia DPOR waterworks operator license of at least the same class as the waterworks?** ✓

All licensed operators license up to date and verified

2 **Sufficient number of adequately licensed operators to cover all shifts** ✓

4 operators per shift (2 class 1, 2 junior), 1 float shift

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.** ✓

36

2 **Is the waterworks Operation Permit up-to-date? (if no, describe changes needed in comments)** ✓

Working on updating OP, current OP from 1996

3 **Is the Waterworks Description Sheet up-to-date? (if no, describe changes needed in comments)** ✓

4 **Is SDWIS inventory data current? (update while in the field if possible, or note changes needed in comments to update upon returning to the office)** ✓

5 **SDWIS data review - No unaddressed exceedances (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** ✓

6 **SDWIS Data Review - Sample schedule types, frequencies, and number of samples correct** ✓

7 **SDWIS Violation & Enforcement Action data current?** ✓

8 **No other safety issues or concerns noted during the inspection** ✓

Sources

RAW WATER INTAKE

44 **Observed source water quality does not present potential treatability issues** ✓

Elevated turbidity due to recent snow/rain but no issues with treatment at WTP

45 **No activities or pollution sources in the immediate intake area represent a potential health risk** ✓

Finished Survey Questions

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46	**Condition of screen, adequate cleaning** Large screen at pre-sedimentation channel clean and in working. New finer screens installed just ahead of raw water pumps. Raw water pumps were adequate.	✓
47	**Condition of intake and associated structures** Could not evaluate	✓
48	**Intake components do not restrict the ability of the waterworks to meet present demand**	✓
49	**All raw water pumps maintained and operable, protected from flooding and vandalism**	✓
50	**Present water demand does not exceed the permitted source capacity**	✓
51	**Source Water Assessment is up-to-date (no changes have occurred that result in a change to the susceptibility determination)**	✓
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	**No contamination events since last survey**	✓