HRSD SWIFT Research Center (SRC) Quarterly Report on SWIFT Water Quality Targets

This report documents SWIFT Water Quality results for recharge operations from April 1 – June 30, 2023. The compliance requirements are documented in HRSD's SWIFT Underground Injection Control Inventory Information Package (UIC-IIP) submitted to EPA Region III in January 2018. These requirements are noted in Tables 1-4 and reflect an update to the monitoring and compliance evaluation for Total coliform.

Figures 1 and 2 and Table 6 provide a summary of the data from the referenced quarter of operations relative to the SWIFT Water Quality Targets. Table 6 represents a summary of all analytes that were present above the laboratory reporting limit. A detailed table identifying the parameters monitored for the purpose of evaluating compliance with the SWIFT Water Quality Targets can be found as an Appendix to this report.

Parameter	Proposed Regulatory Limit	Non-Regulatory Action/Goal
EPA Drinking Water Primary Maximum Contaminant Levels (MCLs)	Meet all primary MCLs	N/A
Total Nitrogen	5 mg/L Monthly Average; 8 mg/L Max Daily	Secondary Effluent Critical Control Point (CCP) Action Limit for Total Inorganic Nitrogen (TIN) = 5 mg/L-N; CCP Action Limit for SWIFT Water Total Nitrogen (TN) = 5 mg/L-N
Turbidity	Individual Filter Effluent (IFE) < 0.15 NTU 95% of time and never >0.3 NTU in two consecutive 15 min measurements	CCP Action Limit IFE of 0.15 NTU to initiate backwash or place a filter in standby
Total Organic Carbon (TOC)[1]	4 mg/L Monthly Average; 6 mg/L Maximum Daily	Critical Operating Point (COP) Action Limit to Initiate GAC Regeneration
Total Coliform[2]	<2 CFU/100 mL for 95% of calendar month observations, applied as the 95th percentile	N/A
E.coli	Non-detect	N/A
TDS[3]	N/A	Monitor PAS Compatibility

Table 1: SRC Regulatory and Monitoring Limits for SWIFT Water

[1] Regulatory limit applies to the TOC laboratory analysis which is collected at a minimum frequency of 3 times per week.

[2] The Total Coliform (TC) monitoring and compliance evaluation reflects an update effective in January 2020 following consultation with the Virginia Department of Health and EPA Region III UIC staff.

[3] No limit for Total Dissolved Solids (TDS) proposed as the primary driver is aquifer compatibility. The concentration of TDS in SWIFT Water at the SRC generally ranges from 500-850 mg/L.

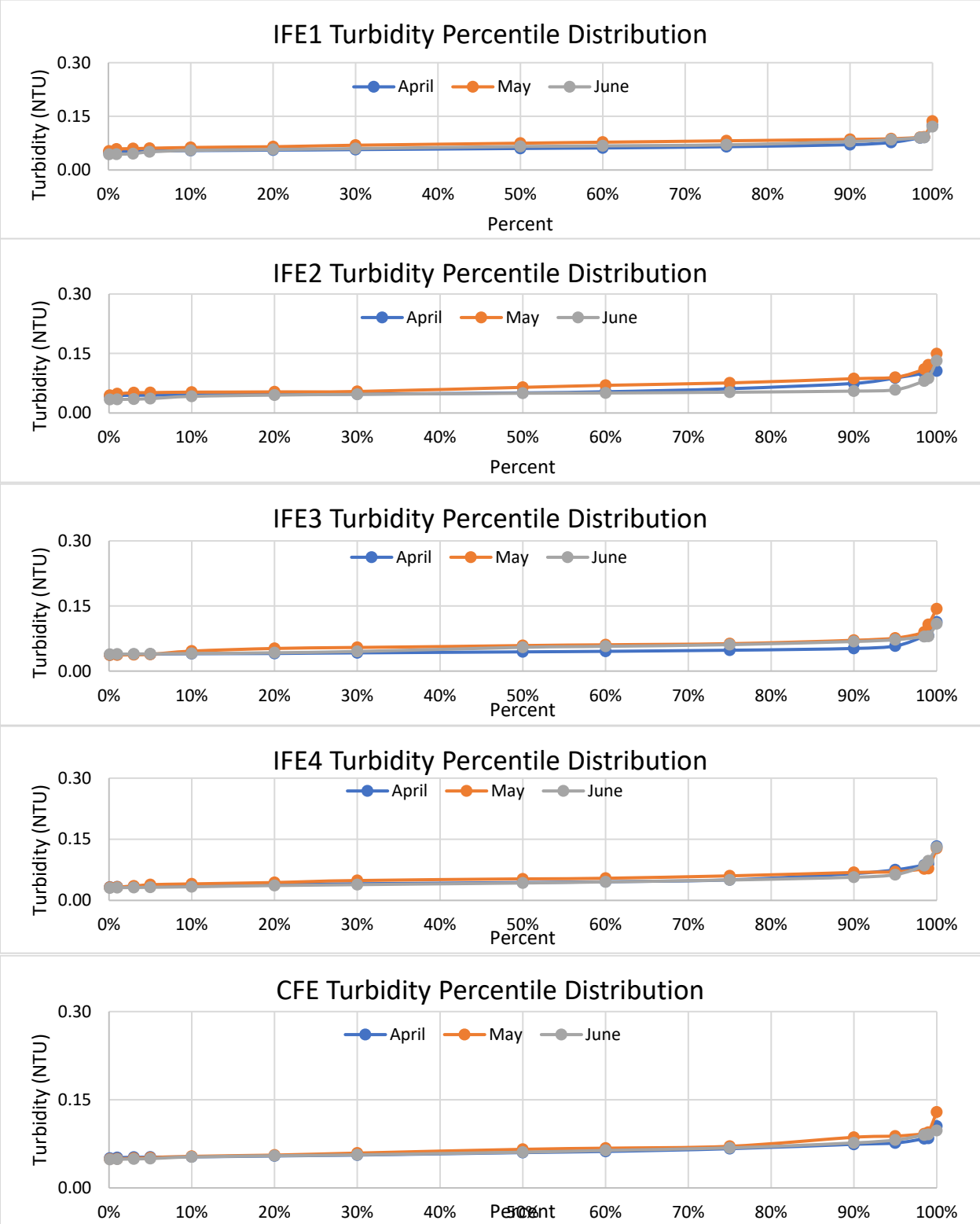

Figure 1: Percentile distribution of 15-minute average Individual Filter Effluent (IFE) Turbidities for Biofilters 1-4 (IFE1-4) and Biofilter Combined Filter Effluent (CFE). There were no 15-minute periods in this quarter with biofilter effluent turbidity values greater than 0.3 NTU. The 95% measured value for each biofilter IFE and the CFE was less than 0.15 NTU for each month in this quarter.

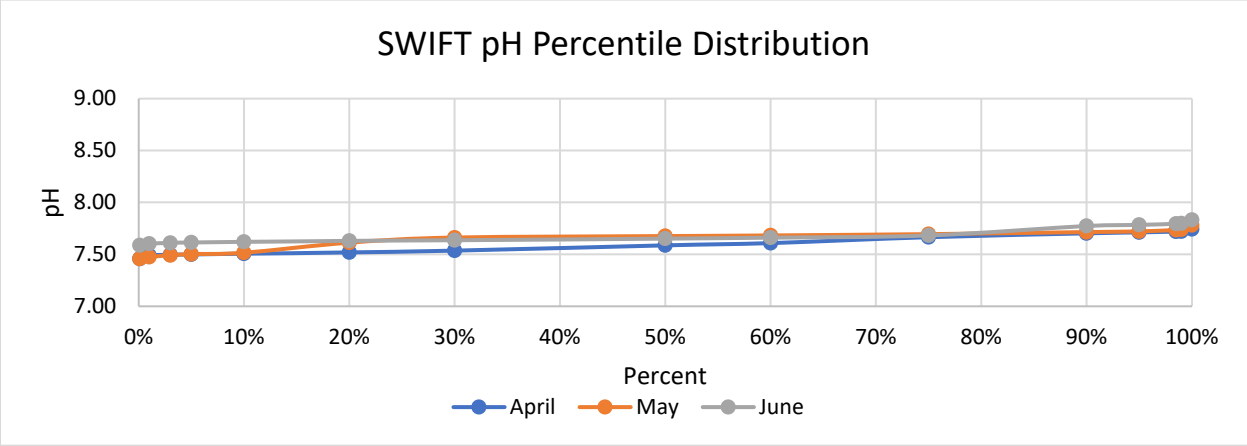

Figure 2: Distribution of Monthly SWIFT Water pH values.

Monitoring at the SRC also includes monitoring for performance indicators as documented in Table 2.

Constituent	Category	Trigger Value	Unit	Notes
1,4-Dioxane	Public Health	1	µg/L	CCL4; CA Notification Limit
17-β-Estradiol	Public Health	0.9[1]	ng/L	CCL4
DEET	Public Health	200	µg/L	MN Health Guidance Value
Ethinyl Estradiol	Public Health	280[1]	ng/L	CCL4
NDMA	Public Health	10	ng/L	CCL4; CA Notification Limit
Perchlorate	Public Health	6	µg/L	CA Notification Limit
PFOA+PFOS	Public Health	70	ng/L	CCL4; EPA Health Advisory
TCEP	Public Health	5	µg/L	MN Health Guidance Value
Cotinine	Treatment Effectiveness	1	µg/L	Surrogate for low molecular weight, partially charged cyclics
Primidone	Treatment Effectiveness	10	µg/L	
Phenytoin	Treatment Effectiveness	2	µg/L	
Meprobamate	Treatment Effectiveness	200	µg/L	High occurrence in wastewater treatment plant effluent
Atenolol	Treatment Effectiveness	4	µg/L	
Carbamazepine	Treatment Effectiveness	10	µg/L	Unique structure
Estrone	Treatment Effectiveness	320	ng/L	Surrogate for steroids
Sucralose	Treatment Effectiveness	150	mg/L	Surrogate for water soluble, uncharged chemicals with moderate molecular weight
Triclosan	Treatment Effectiveness	2,100	µg/L	Chemical of interest

[1] Identified as "To Be Determined" in the UIC-IIP. Since that time, threshold values were identified in *Monitoring Strategies for Constituents of Emerging Concern (CECs) in Recycled Water, Recommendations of a Science Advisory Panel, 2018; SCCWRP Technical Report 1032.*

Table 2: SRC Non-Regulatory Performance Indicators

Pathogen Log Removal Value (LRV) is not strictly regulated but the SRC has been designed and is operated to achieve at least 12 LRV for viruses and 10 LRV for *Cryptosporidium* and *Giardia* through a combination of advanced treatment processes and soil aquifer treatment. Table 3 provides a treatment process pathogen LRV summary for recharge conditions. Table 4 provides additional monitoring that is being completed to document compliance with the LRVs for ozone and UV.

Parameter	Floc/Sed (+BAC)	Ozone	BAC+GAC	UV	Cl2	SAT	Total
Enteric Viruses	2	0-3 (TBD)	0	4	0-4	6	12-19
Cryptosporidium	4	0	0	6	0	6	16
Giardia	2.5	0-1.5 (TBD)	0	6	0	6	14.5-16

Table 3: SRC Pathogen LRV for Potomac Aquifer System (PAS) Recharge.

Ozone LRV
Ozone Influent Temperature
Ozone Influent Flow
Liquid Phase Ozone Concentration[1]
Contact Time
CT
UV LRV
UV Intensity, each reactor
UVT, GAC Combined Effluent
Reactor Flow, each
Calculated Dose, each Lamp
Status, each

[1] The ozone liquid phase probe is verified with lab grab samples performed at least once per week.

Table 4: Additional Monitoring to Support Ozone and UV LRV. All data are collected as continuous measurements. The 15-minute LRV data is submitted in Table 6.

Critical Control Points

The SRC incorporates Critical Control Points (CCP) throughout the treatment process, per Attachment G of UIC-IIP, to verify that treatment goals are being met at each of the individual processes. A violation of any CCP means that the SRC may not be producing water that meets the treatment goals and will trigger a diversion of the SWIFT Water so that it is not directed to the recharge well. In most instances, the SRC will continue to operate through the CCP violation, but the SWIFT Water will be diverted back to the Nansemond Plant chlorine contact tanks (CCT).

CCPs have alert values at which point the operator is expected to take action to correct the performance as well as the alarm values at which point an automated response will trigger action and prevent flow from going to the recharge well. Both

the alert and alarm values will be measured consistently for a specified duration before action is taken so that blips in online analyzers do not trigger action. The specific values for the alert and alarm levels will be configured as adjustable set points in the Distributed Control System (DCS) and optimized as needed to meet the water quality requirements.

Table 5 shows the current CCPs in effect at the SRC. Modifications have been made to the CCPs since startup as compared to the original design documents in order to optimize their performance. No modifications to the CCPs were made this quarter. Each of the modifications from previous quarters was discussed in the relevant quarterly report for the period.

Parameter	Alert Value	Alarm Value	Unit	Action
Critical Control Points (CCPs)				
Influent Pump Station Conductivity	1,400	1,600	microSiemens per centimeter	Place Biofilters in Filter To Waste
Influent Pump Station Total Inorganic Nitrogen	4.0	5.0	mg/L-N	Place Biofilters in Filter To Waste
Influent Pump Station Turbidity	3.5	5.0	NTU	Place Biofilters in Filter To Waste
Preformed Chloramine Failure on Injection	N/A	Failure	mg/L	Divert SWIFT Water
Total Chlorine Post Injection upstream of ozone	2.0	1.0	mg/L	Divert SWIFT Water
Chloramine injection upstream of ozone	2.0	1.0	mg/L	Divert SWIFT Water
Ozone Feed	N/A	Failure	N/A	Open Biofilter Backwash Waste Valve
Ozone Contactor Calculated LRV – Virus	<120% LRV Goal	≤110% LRV Goal	%	Open Biofilter Backwash Waste Valve
Biofilter Individual Effluent Turbidity	0.1	0.15	NTU	Place That Biofilter in Filter To Waste
Biofilter Combined Filter Effluent Turbidity	0.1	0.15	NTU	Place Biofilters in Filter To Waste
GAC Combined Effluent TOC, instantaneous online analyzer	4.0	5.0	mg/L	Divert SWIFT Water
UV Reactor Dose	<120% of Dose Setpoint	<105% of Dose Setpoint	%	Divert SWIFT Water
GAC Combined Effluent Nitrite	0.25	0.50	mg/L-N	Divert SWIFT Water
SWIFT Water TN	4.5	5.0	mg/L-N	Divert SWIFT Water
Ozone dose	70	80	lbs/day	Place Biofilters in Filter To Waste
Tasting System Free Chlorine CT	<110% of Required CT	<100% of Required CT	mg-min/L	Shut Down Tasting System
Tasting System Total Ammonia	0.1	0.3	mg/L-N	Shut Down Tasting System

Table 5. Critical Control Points for the SRC

Table 6. SWIFT Water Quality Monitoring. Results of detected analytes.

Parameter	Units	Maximum Contaminant Level (MCL) or MCL Goal (MCLG) where numerical MCL not expressed. Values noted for indicator compounds are non-regulatory screening values	Minimum Report Level[1]	Required Monitoring Frequency	April 2023			May 2023			June 2023		
					Average[2]	Maximum	Number of Samples	Average[2]	Maximum	Number of Samples	Average[2]	Maximum	Number of Samples
Regulatory Parameters													
Total Nitrogen (TN)	mg/L	NA	0.50	Daily[3]	3.63	4.74	28	3.30	4.37	30	3.29	4.27	29
NO_3	mg/L	10	0.20	Daily[3]	3.47	4.20	28	3.04	3.86	30	3.17	4.27	28
Turbidity	NTU	NA	0.01	Continuous					**Figure 1**				
Total Organic Carbon (TOC)	mg/L	NA	1.00	3x/Wk[3]	2.09	2.40	15	2.67	3.10	22	2.64	3.09	21
pH		NA	NA	Continuous					**Figure 2**				
TDS[4]	mg/L	Potomac Aquifer System Range: 694-8,720	2.5	Monthly		512	1		514	1		574	1
Microorganisms													
Total Coliform[5]	MPN/100 mL	MCLG = 0	1	Daily[3]	<1	<1	27	<1	2	29	<1	<1	28
Disinfection Byproducts													
Bromate	µg/L	10	0.25	Monthly		1.1	1		0.62	1		1.36	1
Trihalomethanes													
Bromodichloromethane	µg/L		1.00	Monthly		<1.00	1		1.59	1		1.61	1
Bromoform	µg/L		1.00	Monthly		2.46	1		1.91	1		3.77	1
Chloroform	µg/L		1.00	Monthly		<1.00	1		<1.00	1		<1.00	1
Dibromochloromethane	µg/L		1.00	Monthly		2.37	1		3.59	1		4.45	1
Total Trihalomethanes	µg/L	80				4.83	1		7.09	1		9.84	1
HAAs													
Dichloroacetic acid	µg/L		0.60	Monthly		1.41	1		2.24	1		1.25	1
Trichloroacetic acid	µg/L		0.20	Monthly		<0.20	1		0.31	1		<0.20	1
Monochloroacetic acid	µg/L		0.60	Monthly		0.88	1		1.19	1		<0.60	1
Bromoacetic acid	µg/L		0.40	Monthly		0.58	1		<0.40	1		0.67	1
Dibromoacetic acid	µg/L		0.20	Monthly		4.88	1		3.59	1		5.55	1
Total Haloacetic Acids	µg/L	60				7.76	1		7.33	1		7.47	1
Disinfectants[6]													
Monochloramine (as Cl_2)	mg/L	4		Continuous	0.02	0.03		0.01	0.04		0.01	0.02	
Chlorine (as Cl_2)	mg/L	4		Continuous	2.09	2.42		2.45	2.99		2.27	2.80	
Inorganic Chemical													
Arsenic	µg/L	10	0.50	Monthly		0.41	1		0.34	1		<0.50	1
Barium	mg/L	2	0.005	Monthly		0.007	1		0.007	1		0.008	1
Fluoride	mg/L	4.0	0.050	Monthly	0.661	0.804	23	0.767	0.893	27	0.785	1.02	29
Organic Chemicals													
Endothall	µg/L	100	5.0	Monthly		<5.0	1		<5.0 *3	1		5.1 *-	1

Table 6. SWIFT Water Quality Monitoring. Results of detected analytes.

Parameter	Units	Maximum Contaminant Level (MCL) or MCL Goal (MCLG) where numerical MCL not expressed. Values noted for indicator compounds are non-regulatory screening values	Minimum Report Level[1]	Required Monitoring Frequency	April 2023			May 2023			June 2023		
					Average[2]	Maximum	Number of Samples	Average[2]	Maximum	Number of Samples	Average[2]	Maximum	Number of Samples
Radionuclides													
Beta particles and photon emitters	pCi/L	4 mrem/yr[7]	3.04*	Monthly		10.9	1		13.5	1		18.8	1
Non-regulatory Performance Indicators													
Public Health Indicators		**Trigger Limits**											
1,4-dioxane	µg/L	1	0.06	Quarterly	0.09	0.1	4	0.06	0.08	5	0.06	0.08	4
DEET	ng/L	200,000	10	Quarterly		PENDING							
Tris(2-carboxyethyl)phosphine (TCEP)	ng/L	5,000	10	Quarterly		PENDING							
Perchlorate	µg/L	6	0.50	Quarterly		0.63	1						
Treatment Efficacy Indicators		**Trigger Limits**											
Cotinine	ng/L	1,000	10	Quarterly		PENDING							
Primidone	ng/L	10,000	5.0	Quarterly		PENDING							
Phenytoin (Dilantin)	ng/L	2,000	20	Quarterly		PENDING							
Meprobamate	ng/L	200,000	5.0	Quarterly		PENDING							
Atenolol	ng/L	4,000	5.0	Quarterly		PENDING							
Carbamazepine	ng/L	10,000	5.0	Quarterly		PENDING							
Sucralose	ng/L	150,000,000	1000	Quarterly		590	1		2600 H	1		1700 H	1
Additional Monitoring (Ozone & UV LRV)					Average	Minimum		Average	Minimum		Average	Minimum	
Ozone Virus LRV				Continuous	4.55	4.08		4.50	3.88		4.55	4.08	
Ozone Giardia LRV				Continuous	2.34	2.09		2.27	1.96		2.19	1.95	
UV Dose Reactor 1	mJ/cm^2			Continuous	>186	>186		>186	>186		>186	>186	
UV Virus LRV Reactor 1				Continuous	>4	>4		>4	>4		>4	>4	
UV Dose Reactor 2	mJ/cm^2			Continuous	>186	>186		>186	>186		>186	>186	
UV Virus LRV Reactor 2				Continuous	>4	>4		>4	>4		>4	>4	

[1] When minimum reporting limits varied during the quarter, the highest minumum reporting limit used is identified.

[2] Analytical results less than the reporting limit were treated as zero for the purposes of the averaging calculation.

[3] Daily samples are typically not collected on days in which there is no or limited recharge. TOC sample collection occurs routinely on Monday through Friday when recharging. Limited or inconsistent recharge impacts the collection of daily samples, particularly for the microbiological samples collected for total coliform and E coli which have limited holding time requirements. In April, limited or no recharge impacted 3 days of sampling. In May, limited or no recharge impacted 2 days of sampling. In June, limited or no recharge impacted 2 days of sampling.

[4] TDS of the Potomac Aquifer System is based on the averages within the upper, middle and lower Potomac Aquifer as determined during baseline montioring.

[5] The total coliform detection of 2 MPN/100 mL in May 2023 was likely a result of sample contamination. The operator failed to follow established procedure in the collection of the sample. Corrective action was taken.

[6] The maximum residual disinfectant level (or MRDL) MCL for monochloramine and chlorine are based on annual averages.

[7] The measurement unit for beta particles and photon emitters is pCi/L while the MCL is expressed as mrem/yr. Per EPA's Implementation Guidance for Radionuclides (EPA 816-F-00-002, March 2002), the screening threshold for beta particles and photon emitters is 50 pCi/L. If sample concentrations exceed 50 pCi/L, each individual beta particle and photon emitter is converted from pCi/L to mrem using the EPA designated conversion tables, currently available in the referenced document.

* MDC - Minimum Detectable Concentration (Radiochemistry).

Contract Laboratory Flags:

*- : LCS and/or LCSD is outside acceptance limits, low biased.

*3 : ISTD response or retention time outside acceptable limits.

H : Sample was prepped or analyzed beyond the specified holding time

Recharge Statistics

The total volume recharged during this operational period was 54.9 million gallons. The backflushed volume was 7.2 million gallons for a net recharge of 47.7 million gallons (Figure 3). Brief backflushing periods occur as part of routine well maintenance on an approximate daily basis. From the start of operation through the end of this reporting period, the SRC has recharged a total volume of 751.7 million gallons.

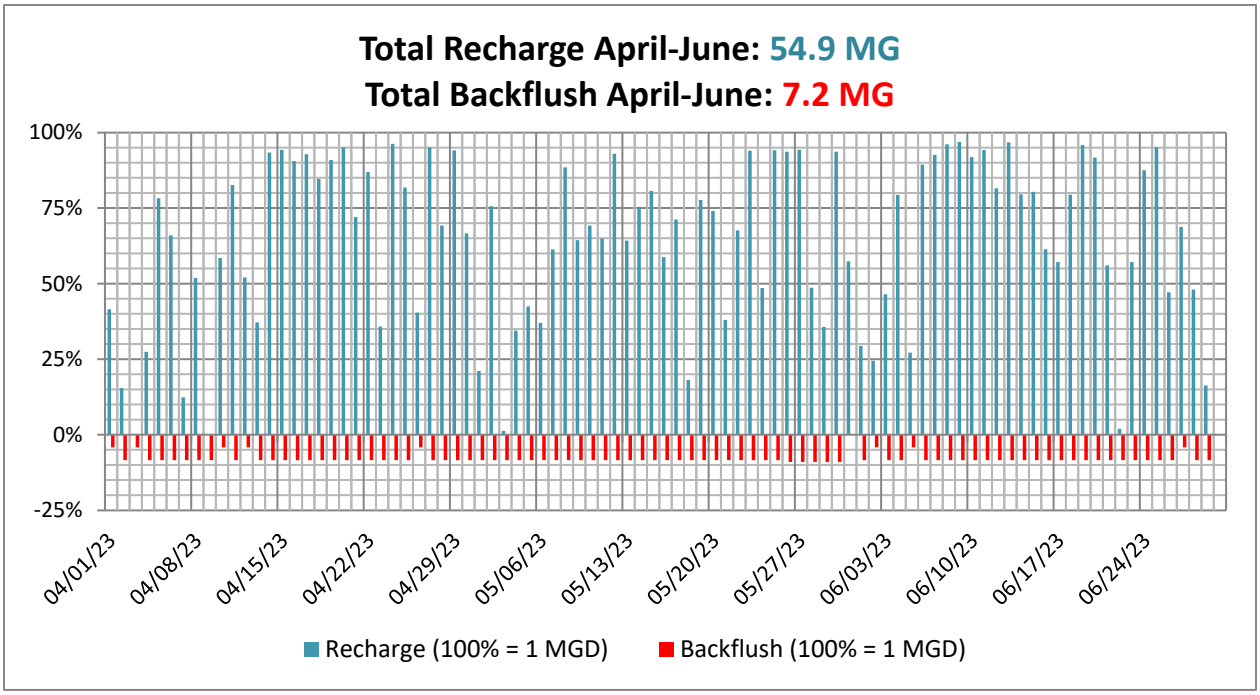

Figure 3: Recharge and Backflush Volumes, April 1 – June 30, 2023

HRSD has developed an internal target to recharge 75% of a SWIFT facility's operational capacity. This is a particularly relevant planning target for full-scale operations and HRSD is striving to meet this target at the SRC. Operational redundancies will exist at full-scale facilities (e.g., multiple recharge wells) which will likely result in a higher rate of recharge at full-scale. Integration of the new well, NP_MAR_01 into the SRC system is complete and the new well has been in operation since November 1, 2022. The recharge rate for NP_MAR_01 is currently 650 gpm (0.94 MGD).

Figure 4 depicts the operational activity for this monitoring period identifying the percentage of operational time spent in recharge as well as the general factors precluding recharge.

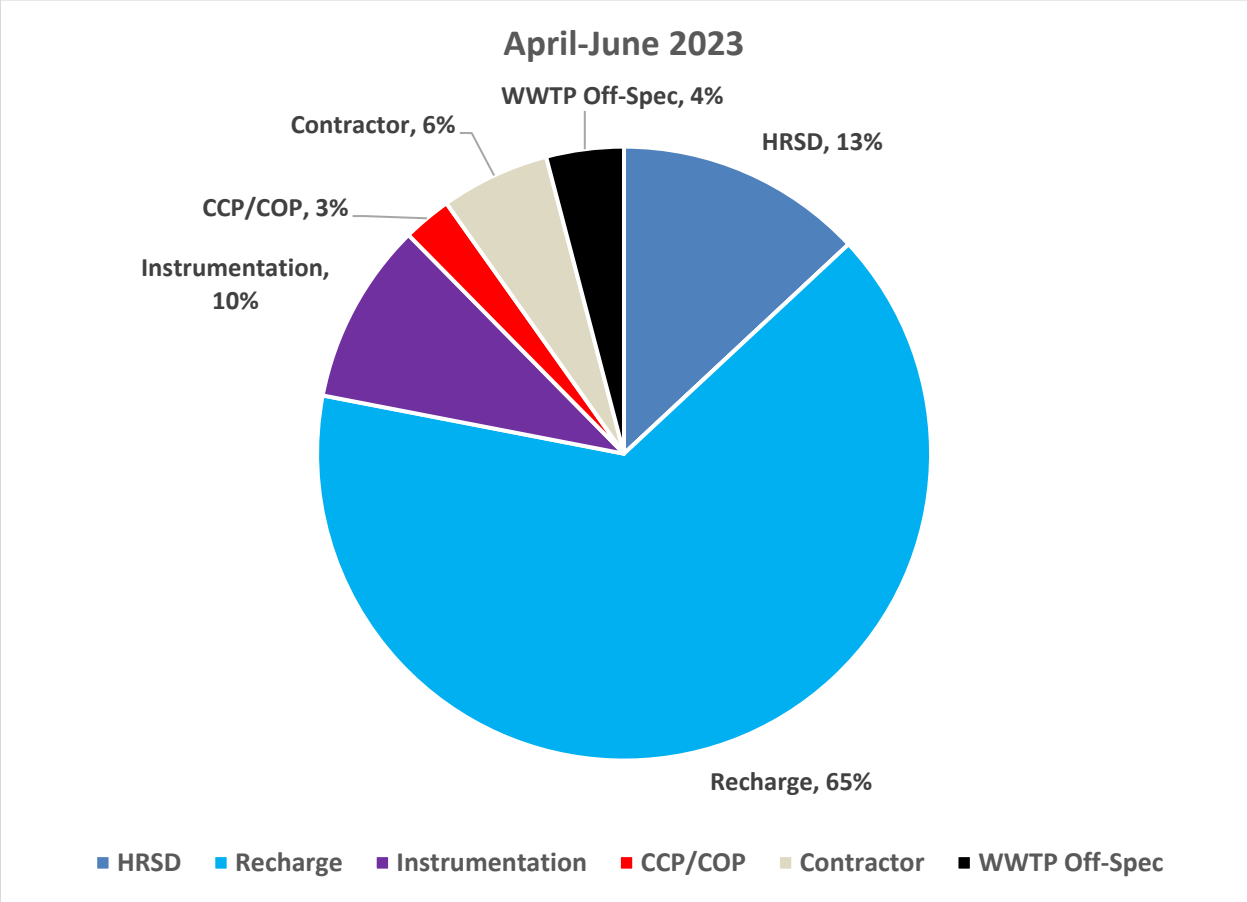

Figure 4: Operational activity for monitoring period. Notes: *Recharge*: Recharge of SWIFT Water; *WWTP Off-Spec*: Influent to the SWIFT facility (wastewater facility secondary clarifier effluent) does not meet influent quality requirements (e.g., elevated TOC or TN, or WWTP repairs; *HRSD*: Broad category covering activity within SWIFT facility that may lead to shut-down (e.g., maintenance and repairs, operational problems); *CCP/COP*: Critical Control Point/Critical Operating Parameter threshold triggered, diverting SWIFT Water from recharge well (e.g. elevated conductivity on SRC influent, elevated TOC/TN in SWIFT Water, low LRV, etc.); *Contractor:* Recharge suspended to accommodate contractor activity at the AWT and/or recharge well; *Instrumentation*: On-line analyzer and/or instrumentation maintenance and repair.

Conventional Monitoring Wells

The conventional monitoring wells located in the upper, middle and lower zones of the Potomac Aquifer (MW-UPA, MW-MPA, and MW-LPA, respectively) are located approximately 400 – 500 ft from the recharge well and have been routinely monitored to detect the arrival of the recharge front. Based upon Total Organic Carbon (TOC) observations, the recharge front reached MW-UPA in late fall 2020 and MW-MPA in mid-late summer 2021 (Figure 5).

Travel time to MW-UPA was confirmed through a bromide tracer study initiated in July of 2020. Bromide from this tracer study was identified in MW-UPA beginning in April 2022. Travel time in days is difficult to estimate due to the frequent recharge stoppages. We can, however, relate travel time to a recharge volume equivalent. From July 2020

until the bromide appeared in MW-UPA in April 2022, approximately 230 million gallons of SWIFT Water was recharged.

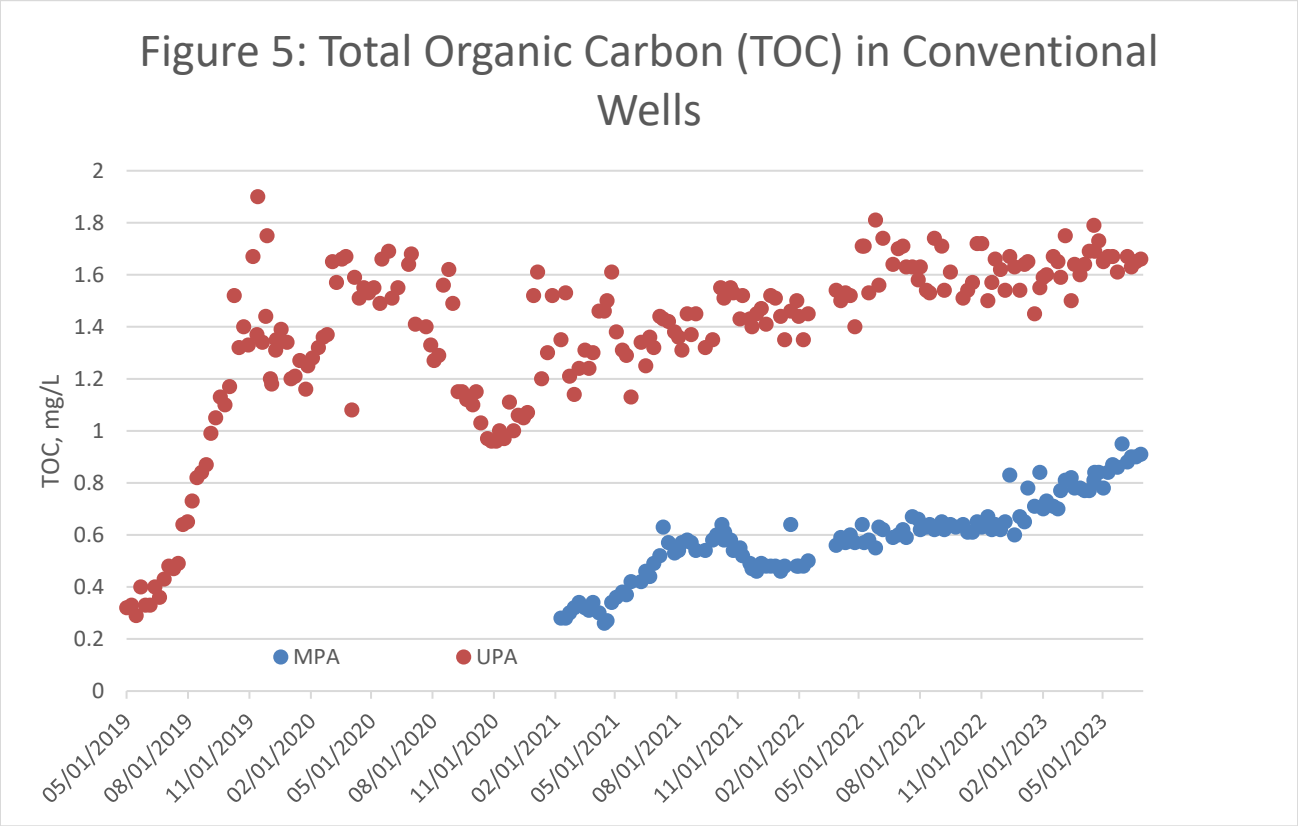

Figure 5: TOC concentration in the Upper and Middle Potomac conventional monitoring wells, MW-UPA and MW-MPA. Based on travel time studies using a conservative tracer, SWIFT Water recharged in the 3rd quarter of 2021 roughly approximates the groundwater represented in this quarter's conventional well monitoring. The SWIFT Water average TOC concentration for July - September 2021 was 3.12 mg/L, with a maximum of 4.03 mg/L (n = 53).

In this monitoring period, two indicator compounds were observed in the conventional monitoring wells, MW-UPA: 1,4-dioxane and PFOA. The analytical data for several of the indicators for MW-UPA, including sucralose, was unavailable at the time of this publication due to data turnaround delays with the contracted laboratory. This data will be updated in the next quarterly report.

1,4 dioxane and sucralose have been observed frequently in MW-UPA since November 2019 while PFOA was first observed in MW-UPA in Quarter 2 of 2022. PFOA was observed for the first time in MW-MPA during the 2nd quarter of 2023, with the most recent value in June 2023 reported as 3.0 ng/L. The reported values for 1,4 dioxane, sucralose, and PFOA are less than the action thresholds ("trigger values") identified in Table 2 of this report. Results for all regulatory parameters are less than the PMCL and all regulated organics are non-detect. Arsenic observations are described in further detail in a subsequent section.

In last quarter's report, there was a transient detection of 1,4 dioxane in MW-LPA, with a concentration of 0.13 µg/L in one sample while the remaining twelve samples were <

0.06 µg/L. In this quarter, there again was a single sample result of 0.13 µg/L while the remaining thirteen samples were < 0.06 µg/L. HRSD will continue to monitor MW-LPA to evaluate the arrival of SWIFT Water. Also in the previous quarter, there appeared to be sample contamination related to PFOS in MW-LPA. All results for this quarter were < 2.0 ng/L.

Using 230 million gallons of recharge volume as a proxy for travel time, we can estimate that the SWIFT Water appearing in MW-UPA was recharged at some point during Quarter 3 of 2021. For 1,4-dioxane, the average concentration observed in SWIFT Water during this time period was 0.32 µg/L. The decreasing trend observed in MW-UPA (Figure 6) is consistent with the reduction seen in SWIFT Water associated with early efforts to optimize 1,4-dioxane removal through the biofilters. Since that time, HRSD has further improved 1,4-dioxane removal in SWIFT Water, with results in this reporting quarter of < 0.10 µg/L (Table 6). This decreasing trend of 1,4-dioxane in MW-UPA is expected to continue, reflecting the reduction in SWIFT Water.

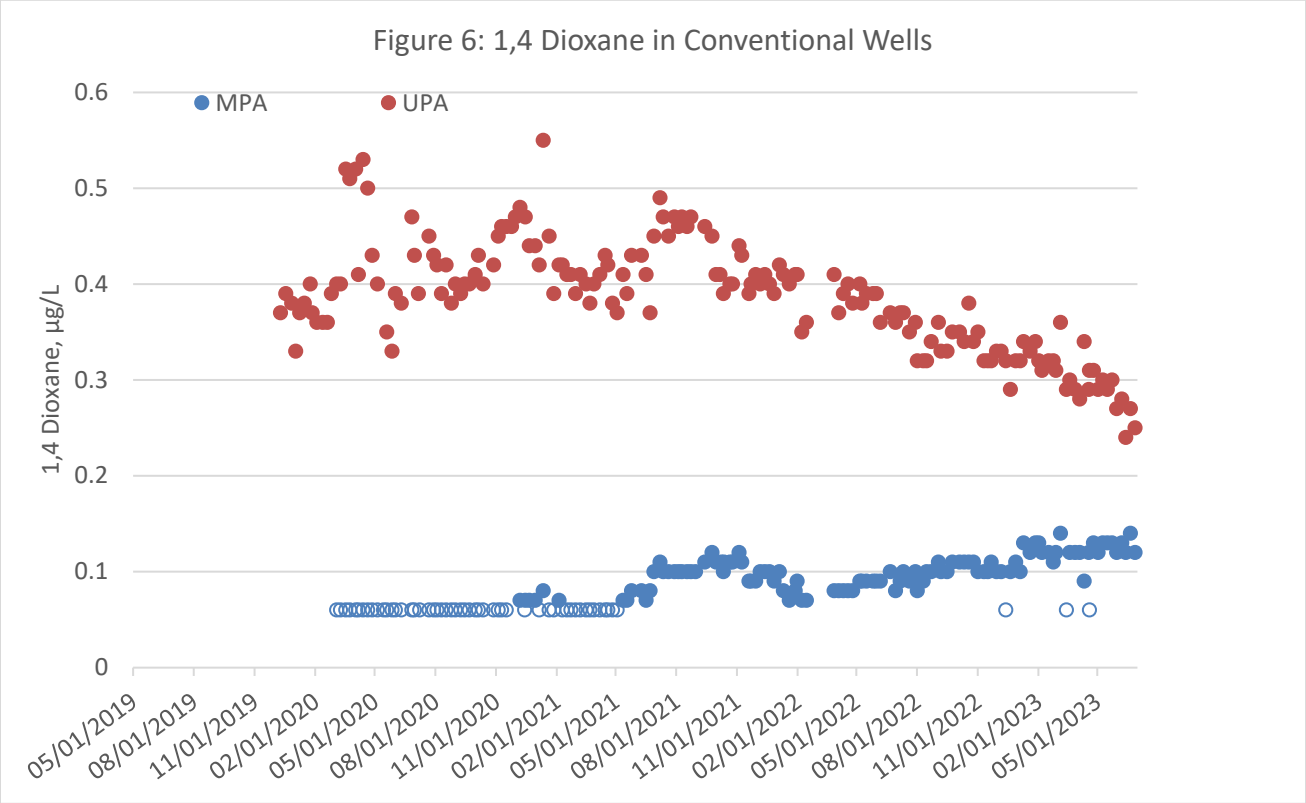

Figure 6: 1,4 dioxane trending in MW-UPA and MW-MPA. Open circles represent data that is less than the reporting limit. Based on travel time studies using a conservative tracer, SWIFT Water recharged in the 3rd quarter of 2021 roughly approximates the groundwater represented in this quarter's conventional well monitoring. The SWIFT Water average 1,4-dioxane concentration for July - September 2021 was 0.32 µg/L, with a maximum value of 0.40 µg/L (n = 12). More recently, the SWIFT Advanced Water Treatment system has been optimized to enhance the removal of 1,4 dioxane, routinely achieving concentrations of $\leq$ 0.10 µg/L.

In Quarter 3 of 2021, the available data on sucralose and PFOA in SWIFT Water is much more limited, with three data points for sucralose and a single quarterly data point

for PFOA. The trends for sucralose and PFOA in MW-UPA and MW-MPA is presented in Figures 7 and 8, respectively.

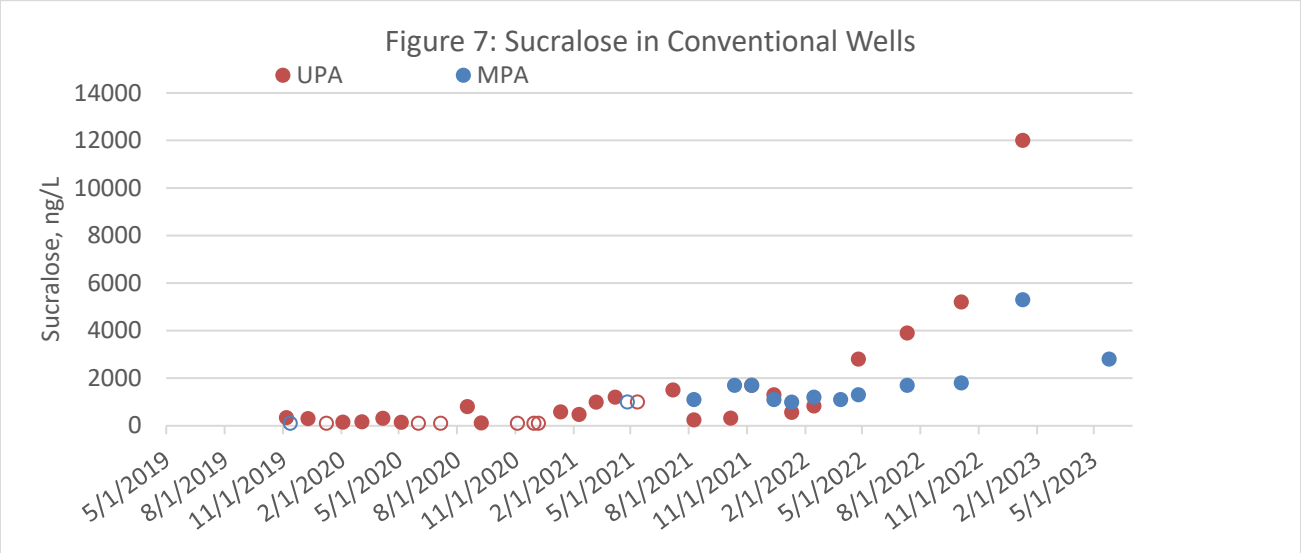

Figure 7: Sucralose trending in MW-UPA and MW-MPA. Open circles represent data that is less than the reporting limit. Based on travel time studies using a conservative tracer, SWIFT Water recharged in the 3rd quarter of 2021 roughly approximates the groundwater represented in this quarter's conventional well monitoring. The SWIFT Water average sucralose concentration for July – September 2021 was 15,133 ng/L, with a maximum value of 24,000 ng/L (n = 3). Sucralose data was not available in MW-UPA at the time of this publication and will be updated with the next quarterly report.

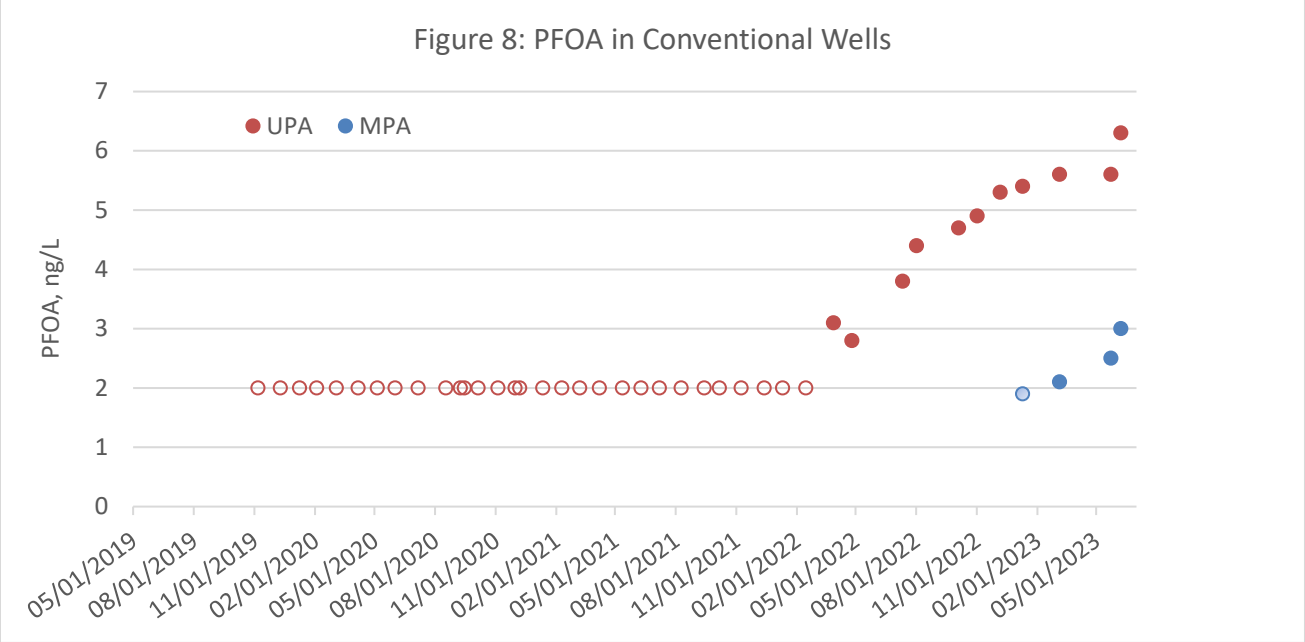

Figure 8: PFOA trending in MW-UPA. Open circles represent data that is less than the reporting limit. Based on travel time studies using a conservative tracer, SWIFT Water recharged in the 3rd quarter of 2021 roughly approximates the groundwater represented in this quarter's conventional well monitoring. The SWIFT Water PFOA concentration for July - September 2021 was 8.5 ng/L (n = 1).

It is important to note that until July of 2022 when EPA released interim Health Advisory Limits (HAL) for PFOA and PFOS, HRSD's operational controls for these compounds were based upon the previous HAL of 70 ng/L PFOA+PFOS. HRSD is working to optimize GAC performance to maintain PFOA and PFOS below 4 ng/L, each (refer to Potomac Aquifer Recharge Oversight Committee Meeting Minutes December 2022 for additional information).

Arsenic in MW-SAT Update

Although MW_SAT is not sampled for regulatory compliance, it represents a location proximal to the recharge well providing a snapshot of transient geochemical reactions that might not otherwise be observed in more distal monitoring wells. HRSD continues to monitor arsenic (As) concentrations in MW-SAT on a monthly frequency, focusing on representative screen intervals 1, 2, 4, 9, 10 and 11. Concentrations continue to remain below the Safe Drinking Water Act (SDWA) Primary Maximum Contaminant Level (PMCL) of 10 µg/L on a running annual average basis. Screens 1, 2, 4, and 11 remain below 2 µg/L, consistent with typical concentrations observed in these screen zones. Screens 9 and 10, however, have shown some recent elevated As trends. The running annual average As concentrations in screens 9 and 10, while recently elevated, are well below the SDWA PMCL (4.4 µg/L and 2.5 µg/L, respectively); however, as with previous elevated episodes at screen 9, these observations offer an opportunity for further learning about As mobilization associated with SWIFT recharge.

Screen 9

Samples from screen 9 indicated a steady upward trend over the first two quarters of 2023. The November 29, 2022 sample contained an As concentration of 1.78 µg/L. The May 23, 2023 sample concentration reached 7.94 µg/L at which point HRSD initiated weekly sampling for As at screen 9. Subsequent samples in May and June saw the concentrations steadily come down to 3.52 µg/L in late June, which is in the normal range for screen 9. Weekly sampling will continue through July to confirm concentrations remain in the normal range. Figure 9 below illustrates the As trend over the previous three quarters in screen 9 of the SAT well.

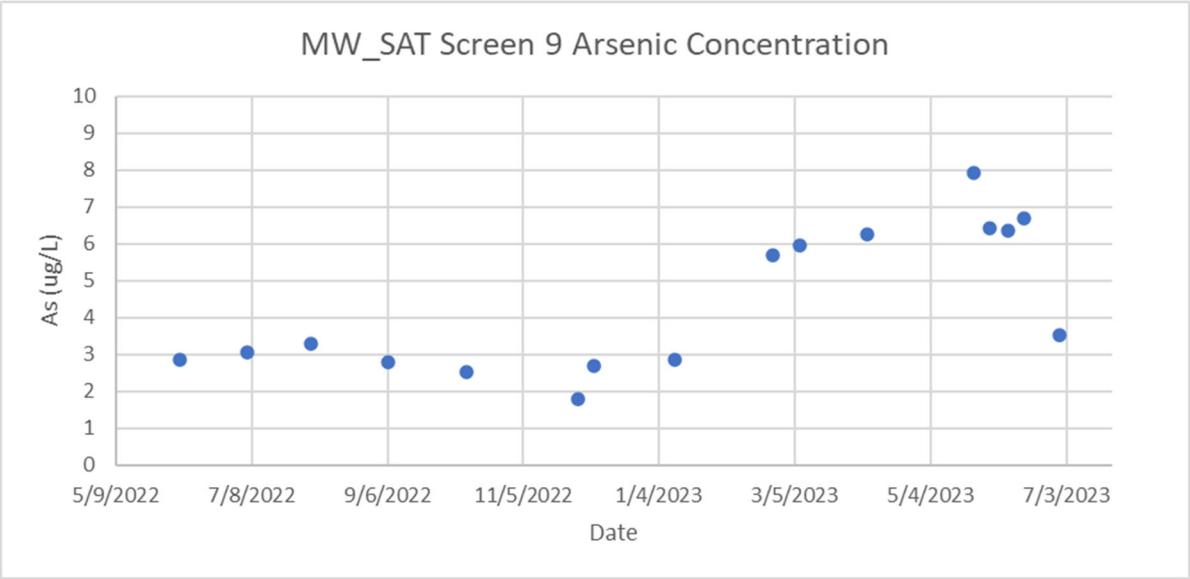

Figure 9, MW_SAT screen 9 arsenic concentration over the previous year

Screen 10

Samples from screen 10 in the first quarter of 2023 remained below 1.45 µg/L, consistent with typical observed values. The May 2023 sample, however, indicated an increase in As concentration to 7.12 µg/L, well above historical concentrations. HRSD initiated weekly sampling for As in screen 10, with subsequent samples having lower concentrations. In late June the concentration had fallen to 5.34 µg/L. Weekly sampling will continue at screen 10 until concentrations return to normal values. Figure 10 below illustrates the As trend over the previous year in screen 10 of the SAT well.

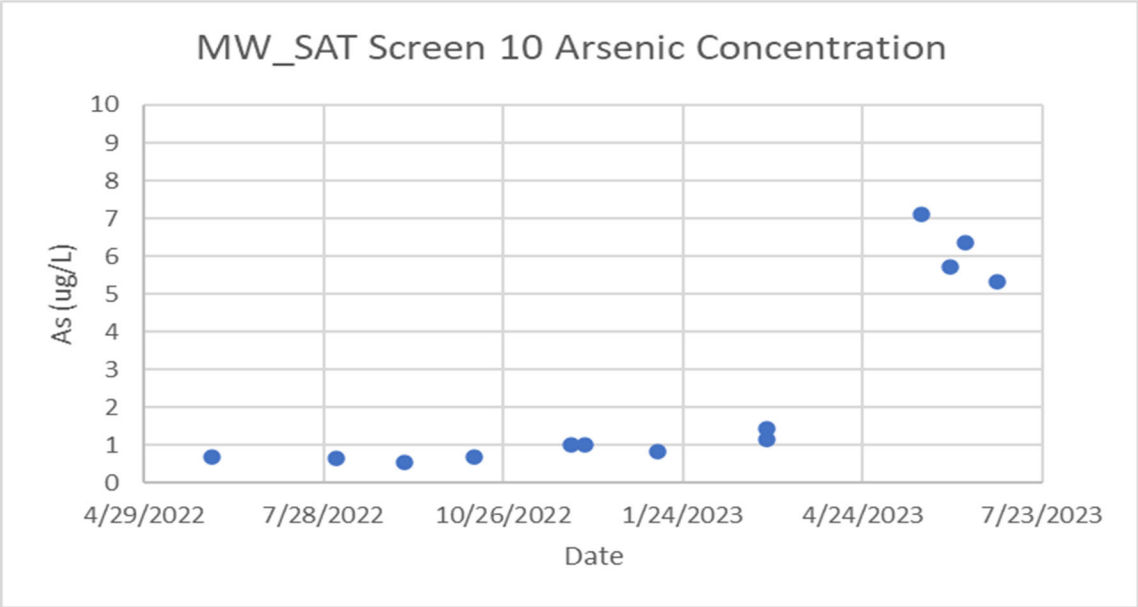

Figure 10, MW_SAT screen 10 arsenic concentration over the previous year

Discussion

The trends in As observed in screens 9 and 10 of MW_SAT over the first two quarters of 2023 are coincident with the start-up of the new full-scale recharge well, NP_MAR_01. It is likely that drilling activities, aquifer conditioning specifically, along with a new flow path to MW_SAT are the cause of the minor, short-term increases in As concentrations.

Aquifer conditioning and As mobilization

The aquifer is conditioned to strengthen interstitial clays that reside in the aquifer sands (less than 10% of the sediment, present at the time of deposition). The native groundwater is brackish with elevated total dissolved solids (TDS), displaying a sodium chloride type chemistry. SWIFT Water has much lower TDS; recharging this more dilute water into the aquifer can cause destabilization of these clays, fragmenting them where they can pile up and clog pore throats in the aquifer. This happens within a few feet around the wellbore which has an immediate and irreversible negative effect on the permeability and capacity of the well.

To mitigate this concern, HRSD conditions the aquifer around the recharge well by introducing aluminum chlorohydrate (ACH) into the well. Aluminum (+3 charged cations) from the ACH exchange with the sodium (+1 charged cations) in the clays, which results in a much stronger bond and keeps the clays from destabilizing (Figure 11).

The ACH fluid has a low pH of approximately 3. This pH is much lower than the pH of the SWIFT Water and the native environment, which is between pH of 7 and 8. This depressed pH is below the solubility limit for iron and arsenic and can cause these metals to mobilize. In addition, the low pH can dissolve the hydrous ferric oxide (HFO) coatings established from recharging the SWIFT Water to passivate aquifer minerals and mitigate As mobilization. Melting these HFO surfaces can also release As.

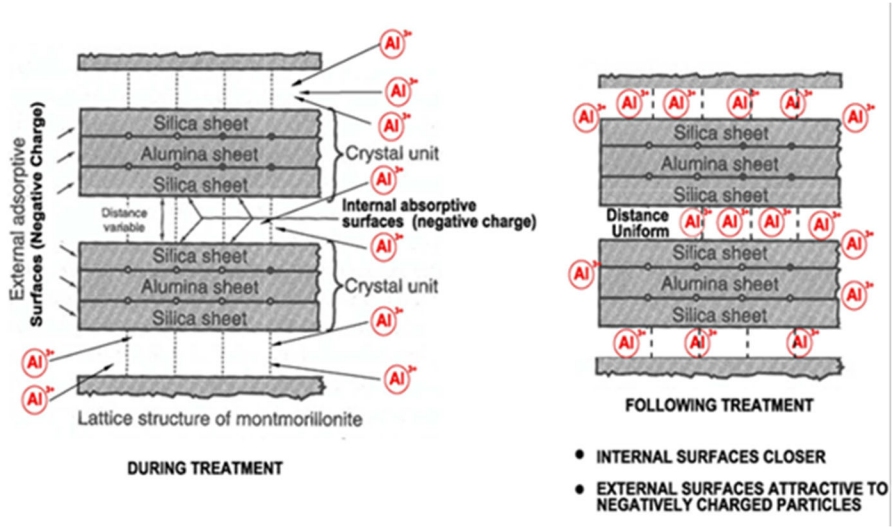

Figure 11, Conditioning of aquifer interstitial clays with aluminum chlorohydrate (ACH); aluminum ions replace sodium ions between the layers of the clay structure providing a stronger bond.

The impact from conditioning the aquifer with ACH represents a temporary perturbation to the system. The As concentrations in both screen 9 and screen 10 are returning to normal as the temporary effects of the ACH treatments subside.

New flow path to MW_SAT

Historical values for As from MW_SAT screen 10 have not exceeded 2 µg/L, even when spikes in the concentration at screen 9 have been observed. The relatively steep increase from 1.45 µg/L to 7.12 µg/L is well outside the typical range. This can be attributed to the change in recharge location. Water flowing across the screens at MW_SAT is coming from a new location as primary recharge changed from recharge well TW-1 to recharge well NP_MAR_01 (see Figure 12). The SWIFT Water ® recharged into NP_MAR_01 takes a different path to MW_SAT, flowing past a different aquifer sediments than the path from TW-1 to MW_SAT. This new path likely contains some aquifer material that acts as a source of As for the sand lenses associated with screen 10. This new pathway, along with the effects of the ACH conditioning fluid, have led to the recent increase in As observed in screen 10.

Figure 12, SWIFT Research Center Well Locations; Recharge water from NP_MAR_01 takes a different path to MW_SAT

The elevated As concentrations observed in MW_SAT screens 9 and 10 are well below the SDWA PMCL running annual average and have not been observed in the corresponding MW_MPA or MW_LPA conventional monitoring wells (As concentrations remain below 1 µg/L). HRSD will continue to monitor and evaluate As in these representative screen intervals of MW-SAT.

Parameter	Units	Maximum Contaminant Level (MCL) or MCL Goal (MCLG) where numerical MCL not expressed. Values noted for indicator compounds are non-regulatory screening values	Minimum Report Level[1]	Required Monitoring Frequency	April 2023			May 2023			June 2023		
					Average[2]	Maximum	Number of Samples	Average[2]	Maximum	Number of Samples	Average[2]	Maximum	Number of Samples
Regulatory Parameters													
Total Nitrogen (TN)	mg/L	NA	0.50	Daily[3]	3.63	4.74	28	3.30	4.37	30	3.29	4.27	29
NO_3	mg/L	10	0.20	Daily[3]	3.47	4.20	28	3.04	3.86	30	3.17	4.27	28
NO_2	mg/L	1	0.01	Daily[3]	<0.01	<0.01	28	<0.01	<0.01	30	<0.01	<0.01	28
Turbidity	NTU	NA	0.01	Continuous	**Figure 1**								
Total Organic Carbon (TOC)	mg/L	NA	1.00	3x/Wk[3]	2.09	2.40	15	2.67	3.10	22	2.64	3.09	21
pH		NA	NA	Continuous	**Figure 2**								
TDS[4]	mg/L	Potomac Aquifer System Range: 694-8,720	2.5	Monthly		512	1		514	1		574	1
Microorganisms													
Total Coliform[5]	MPN/100 mL	MCLG = 0	1	Daily[3]	<1	<1	27	<1	2	29	<1	<1	28
E. coli	MPN/100 mL	NA	1	Weekly	<1	<1	27	<1	<1	29	<1	<1	28
Cryptosporidium	oocysts/L	Treatment Technique, MCLG = 0	0.0976	Quarterly		<0.103	1						
Giardia lamblia	oocysts/L	Treatment Technique, MCLG = 0	0.0976	Quarterly		<0.103	1						
Legionella	MPN/100 mL	Treatment Technique, MCLG = 0	1.0	Quarterly		<1.00	1						
Disinfection Byproducts													
Bromate	µg/L	10	0.25	Monthly		1.1	1		0.62	1		1.36	1
Chlorite	mg/L	1.0	0.100	Monthly		<0.10	1		<0.10	1		<0.10	1
Trihalomethanes													
Bromodichloromethane	µg/L		1.00	Monthly		<1.00	1		1.59	1		1.61	1
Bromoform	µg/L		1.00	Monthly		2.46	1		1.91	1		3.77	1
Chloroform	µg/L		1.00	Monthly		<1.00	1		<1.00	1		<1.00	1
Dibromochloromethane	µg/L		1.00	Monthly		2.37	1		3.59	1		4.45	1
Total Trihalomethanes	µg/L	80				4.83	1		7.09	1		9.84	1
HAAs													
Dichloroacetic acid	µg/L		0.60	Monthly		1.41	1		2.24	1		1.25	1
Trichloroacetic acid	µg/L		0.20	Monthly		<0.20	1		0.31	1		<0.20	1
Monochloroacetic acid	µg/L		0.60	Monthly		0.88	1		1.19	1		<0.60	1
Bromoacetic acid	µg/L		0.40	Monthly		0.58	1		<0.40	1		0.67	1
Dibromoacetic acid	µg/L		0.20	Monthly		4.88	1		3.59	1		5.55	1
Total Haloacetic Acids	µg/L	60				7.76	1		7.33	1		7.47	1

Parameter	Units	Maximum Contaminant Level (MCL) or MCL Goal (MCLG) where numerical MCL not expressed. Values noted for indicator compounds are non-regulatory screening values	Minimum Report Level[1]	Required Monitoring Frequency	April 2023			May 2023			June 2023		
					Average[2]	Maximum	Number of Samples	Average[2]	Maximum	Number of Samples	Average[2]	Maximum	Number of Samples
Disinfectants[6]													
Monochloramine (as Cl_2)	mg/L	4		Continuous	0.02	0.03		0.01	0.04		0.01	0.02	
Chlorine (as Cl_2)	mg/L	4		Continuous	2.09	2.42		2.45	2.99		2.27	2.80	
Inorganic Chemical													
Antimony	µg/L	6	2.00	Monthly		<2.00	1		<0.50	1		<2.00	1
Arsenic	µg/L	10	0.50	Monthly		0.41	1		0.34	1		<0.50	1
Asbestos	MFL	7	0.18	Monthly		<0.18	1		<0.18	1		<0.18	1
Barium	mg/L	2	0.005	Monthly		0.007	1		0.007	1		0.008	1
Beryllium	µg/L	4	0.10	Monthly		<0.10	1		<0.10	1		<0.10	1
Cadmium	µg/L	5	0.10	Monthly		<0.10	1		<0.10	1		<0.10	1
Chromium (total)	µg/L	100	1.50	Monthly		<1.00	1		<1.50	1		<1.00	1
Copper	mg/L	1.3 (action level)	0.005	Monthly		<0.005	1		<0.005	1		<0.005	1
Cyanide (total)	µg/L	200	5	Monthly		<5	1		<5	1		<5	1
Fluoride	mg/L	4.0	0.050	Monthly	0.661	0.804	23	0.767	0.893	27	0.785	1.02	29
Lead	µg/L	15 (action level)	0.20	Monthly		<0.10	1		<0.10	1		<0.10	1
Mercury	µg/L	2	0.10	Monthly		<0.10	1		<0.10	1		<0.10	1
Selenium	µg/L	50	5.00	Monthly		<5.00	1		<5.00	1		<5.00	1
Thallium	µg/L	2	0.20	Monthly		<0.20	1		<0.10	1		<0.20	1
Organic Chemicals													
Acrylamide	µg/L	Treatment Technique, MCLG = 0	0.10	Monthly		<0.10	1		<0.10	1		<0.10	1
Alachlor	µg/L	2	0.098	Monthly		<0.097	1		<0.098	1		<0.098	1
Atrazine	µg/L	3	0.098	Monthly		<0.097	1		<0.098	1		<0.098	1
Benzo(a)pyrene (PAHs)	µg/L	0.2	0.020	Monthly		<0.019	1		<0.020	1		<0.020	1
Di(2-ethylhexyl) adipate	µg/L	400	0.59	Monthly		<0.58	1		<0.59	1		<0.59	1
Di(2-ethylhexyl) phthalate	µg/L	6	0.59	Monthly		<0.58	1		<0.59	1		<0.59	1
Hexachlorocyclopentadiene	µg/L	50	0.098	Monthly		<0.097	1		<0.098	1		<0.098	1
Hexachlorobenzene	µg/L	1	0.098	Monthly		<0.097	1		<0.098	1		<0.098	1
Simazine	µg/L	4	0.069	Monthly		<0.068	1		<0.069	1		<0.069	1
Carbofuran	µg/L	40	0.90	Monthly		<0.90	1		<0.90	1		<0.90	1
Oxamyl (Vydate)	µg/L	200	1.0	Monthly		<1.0	1		<1.0	1		<1.0	1
Chlordane	µg/L	2	0.10	Monthly		<0.10	1		<0.10	1		<0.10	1
Endrin	µg/L	2	0.0098	Monthly		<0.0097	1		<0.0098	1		<0.0098	1
Heptachlor	µg/L	0.4	0.039	Monthly		<0.039	1		<0.0098	1		<0.0098	1
Heptachlor Epoxide	µg/L	0.2	0.019	Monthly		<0.019	1		<0.010	1		<0.010	1
Lindane	µg/L	0.2	0.020	Monthly		<0.019	1		<0.020	1		<0.020	1
Methoxychlor	µg/L	40	0.098	Monthly		<0.097	1		<0.098	1		<0.098	1
Toxaphene	µg/L	3	0.50	Monthly		<0.50	1		<0.50	1		<0.098	1

Parameter	Units	Maximum Contaminant Level (MCL) or MCL Goal (MCLG) where numerical MCL not expressed. Values noted for indicator compounds are non-regulatory screening values	Minimum Report Level[1]	Required Monitoring Frequency	April 2023			May 2023			June 2023		
					Average[2]	Maximum	Number of Samples	Average[2]	Maximum	Number of Samples	Average[2]	Maximum	Number of Samples
PCB Arochlor1016	µg/L		0.080	Monthly		<0.080	1		<0.080	1		<0.080	1
PCB Arochlor1221	µg/L		0.10	Monthly		<0.10	1		<0.10	1		<0.10	1
PCB Arochlor1232	µg/L		0.10	Monthly		<0.10	1		<0.10	1		<0.10	1
PCB Arochlor1242	µg/L		0.10	Monthly		<0.10	1		<0.10	1		<0.10	1
PCB Arochlor1248	µg/L		0.10	Monthly		<0.10	1		<0.10	1		<0.10	1
PCB Arochlor1254	µg/L		0.10	Monthly		<0.10	1		<0.10	1		<0.10	1
PCB Arochlor1260	µg/L		0.10	Monthly		<0.10	1		<0.10	1		<0.10	1
Total Polychlorinated Biphenyls (PCBs)	µg/L	0.5				<0.10	1		<0.10	1		<0.10	1
2,4-D	µg/L	70	0.10	Monthly		<0.10	1		<0.10	1		<0.10	1
Dalapon	µg/L	200	1.0	Monthly		<1.0	1		<1.0	1		<1.0	1
Picloram	µg/L	500	0.10	Monthly		<0.10	1		<0.10	1		<0.10	1
2,4,5-TP (Silvex)	µg/L	50	0.10	Monthly		<0.10	1		<0.10	1		<0.10	1
Dinoseb	µg/L	7	0.10	Monthly		<0.10	1		<0.10	1		<0.10	1
Pentachlorophenol	µg/L	1	0.040	Monthly		<0.040	1		<0.040	1		<0.040	1
Dioxin (2,3,7,8-TCDD)	pg/L	30	3.9	Monthly		<3.9	1		<3.9	1		<3.9	1
Diquat	µg/L	20	0.40	Monthly		<0.40	1		<0.40	1		<0.40	1
Endothall	µg/L	100	5.0	Monthly		<5.0	1		<5.0 *3	1		5.1 *-	1
Epichlorohydrin	µg/L	Treatment Technique, MCLG = 0	1.0	Monthly		<1.0	1		<1.0	1		<1.0	1
Glycophosphate	µg/L	700	6.0	Monthly		<6.0	1		<6.0	1		<6.0	1
Benzene	µg/L	5	1.00	Monthly		<1.00	1		<1.00	1		<1.00	1
Carbon Tetrachloride	µg/L	5	1.00	Monthly		<1.00	1		<1.00	1		<1.00	1
Chlorobenzene	µg/L	100	1.00	Monthly		<1.00	1		<1.00	1		<1.00	1
1,2-dibromo-3-chloropropane (DBCP)	µg/L	0.2	0.02	Monthly		<0.02	1		<0.02	1		<0.02	1
o-Dichlororbenzene	µg/L	600	1.00	Monthly		<1.00	1		<1.00	1		<1.00	1
p-Dichlorobenzene	µg/L	75	1.00	Monthly		<1.00	1		<1.00	1		<1.00	1
1,2-Dichloroethane	µg/L	5	1.00	Monthly		<1.00	1		<1.00	1		<1.00	1
1,1-Dichlororethylene	µg/L	7	1.00	Monthly		<1.00	1		<1.00	1		<1.00	1
cis-1,2-Dichloroethylene	µg/L	70	1.00	Monthly		<1.00	1		<1.00	1		<1.00	1
trans-1,2-Dichloroethylene	µg/L	100	1.00	Monthly		<1.00	1		<1.00	1		<1.00	1
Dichloromethane	µg/L	5	1.00	Monthly		<1.00	1		<1.00	1		<1.00	1
1,2-Dichloropropane	µg/L	5	1.00	Monthly		<1.00	1		<1.00	1		<1.00	1
Ethylbenzene	µg/L	700	1.00	Monthly		<1.00	1		<1.00	1		<1.00	1
Ethylene Dibromide (EDB)	µg/L	0.05	0.02	Monthly		<0.02	1		<0.02	1		<0.02	1
Styrene	µg/L	100	1.00	Monthly		<1.00	1		<1.00	1		<1.00	1
Tetrachloroethylene	µg/L	5	1.00	Monthly		<1.00	1		<1.00	1		<1.00	1
Toluene	µg/L	1,000	1.00	Monthly		<1.00	1		<1.00	1		<1.00	1
1,2,4-Trichlorobenzene	µg/L	70	1.00	Monthly		<1.00	1		<1.00	1		<1.00	1
1,1,1-Trichloroethane	µg/L	200	1.00	Monthly		<1.00	1		<1.00	1		<1.00	1
1,1,2-Trichloroethane	µg/L	5	1.00	Monthly		<1.00	1		<1.00	1		<1.00	1
Trichloroethylene	µg/L	5	1.00	Monthly		<1.00	1		<1.00	1		<1.00	1
Vinyl Chloride	µg/L	2	1.00	Monthly		<1.00	1		<1.00	1		<1.00	1
Total Xylene	µg/L	10,000	3.00	Monthly		<3.00	1		<3.00	1		<3.00	1

Parameter	Units	Maximum Contaminant Level (MCL) or MCL Goal (MCLG) where numerical MCL not expressed. Values noted for indicator compounds are non-regulatory screening values	Minimum Report Level[1]	Required Monitoring Frequency	April 2023			May 2023			June 2023		
					Average[2]	Maximum	Number of Samples	Average[2]	Maximum	Number of Samples	Average[2]	Maximum	Number of Samples
Radionuclides													
Alpha particles	pCi/L	15	1.89*	Monthly		<1.89 U	1		<1.74 U	1		<1.58 U	1
Beta particles and photon emitters	pCi/L	4 mrem/yr[7]	3.04*	Monthly		10.9	1		13.5	1		18.8	1
Radium 226	pCi/L	5 (226+228)	0.420*	Monthly		<0.380 U	1		<0.420 U	1		<0.280 U	1
Radium 228	pCi/L	5 (226+228)	0.970*	Monthly		<0.970 U	1		<0.800 U	1		<0.710 U	1
Uranium	µg/L	30	0.10	Monthly		<0.10	1		<0.10	1		<0.10	1
Strontium-90	pCi/L	NA	0.630*	Monthly		<0.369 U	1		<0.630 U	1		<0.548 U	1
Tritium	pCi/L	NA	386*	Monthly		<386 U	1		<351 U	1		<363 U	1
Non-regulatory Performance Indicators													
Public Health Indicators		**Trigger Limits**											
1,4-dioxane	µg/L	1	0.06	Quarterly	0.09	0.1	4	0.06	0.08	5	0.06	0.08	4
17-β-estradiol	ng/L	0.9	0.51	Quarterly		<0.51 H	1						
DEET	ng/L	200,000	10	Quarterly		PENDING							
Ethinyl estradiol	ng/L	280	0.95	Quarterly		<0.51 H	1						
Tris(2-carboxyethyl)phosphine (TCEP)	ng/L	5,000	10	Quarterly		PENDING							
NDMA	ng/L	10	2.00	Quarterly	<2.00	<2.00	4	<2.00	<2.00	5	<2.00	<2.00	4
Perchlorate	µg/L	6	0.50	Quarterly		0.63	1						
Perfluorooctanoic Acid (PFOA)	ng/L	70 (PFOA+PFOS)	2.0	Quarterly		<2.0	1		<2.0	1		<1.9	1
Perfluorooctanesulfonic Acid (PFOS)	ng/L	70 (PFOA+PFOS)	2.0	Quarterly		<2.0	1		<2.0	1		<1.9	1
Treatment Efficacy Indicators		**Trigger Limits**											
Cotinine	ng/L	1,000	10	Quarterly		PENDING							
Primidone	ng/L	10,000	5.0	Quarterly		PENDING							
Phenytoin (Dilantin)	ng/L	2,000	20	Quarterly		PENDING							
Meprobamate	ng/L	200,000	5.0	Quarterly		PENDING							
Atenolol	ng/L	4,000	5.0	Quarterly		PENDING							
Carbamazepine	ng/L	10,000	5.0	Quarterly		PENDING							
Estrone	ng/L	320,000	10	Quarterly		<0.51 H	1		<10 H	1		<10 H	1
Sucralose	ng/L	150,000,000	1000	Quarterly		590	1		2600 H	1		1700 H	1
Triclosan	ng/L	210,000	50	Quarterly		<50	1		<50 H	1		<50 H	1
Additional Monitoring (Ozone & UV LRV)					Average	Minimum		Average	Minimum		Average	Minimum	
Ozone Virus LRV				Continuous	4.55	4.08		4.50	3.88		4.55	4.08	
Ozone Giardia LRV				Continuous	2.34	2.09		2.27	1.96		2.19	1.95	
UV Dose Reactor 1	mJ/cm^2			Continuous	>186	>186		>186	>186		>186	>186	
UV Virus LRV Reactor 1				Continuous	>4	>4		>4	>4		>4	>4	
UV Dose Reactor 2	mJ/cm^2			Continuous	>186	>186		>186	>186		>186	>186	
UV Virus LRV Reactor 2				Continuous	>4	>4		>4	>4		>4	>4	

Parameter	Units	Maximum Contaminant Level (MCL) or MCL Goal (MCLG) where numerical MCL not expressed. Values noted for indicator compounds are non-regulatory screening values	Minimum Report Level[1]	Required Monitoring Frequency	April 2023			May 2023			June 2023		
					Average[2]	Maximum	Number of Samples	Average[2]	Maximum	Number of Samples	Average[2]	Maximum	Number of Samples

[1] When minimum reporting limits varied during the quarter, the highest minumum reporting limit used is identified.

[2] Analytical results less than the reporting limit were treated as zero for the purposes of the averaging calculation.

[3] Daily samples are typically not collected on days in which there is no or limited recharge. TOC sample collection occurs routinely on Monday through Friday when recharging. Limited or inconsistent recharge impacts the collection of daily samples, particularly for the microbiological samples collected for total coliform and E coli which have limited holding time requirements. In April, limited or no recharge impacted 3 days of sampling. In May, limited or no recharge impacted 2 days of sampling. In June, limited or no recharge impacted 2 days of sampling.

[4] TDS of the Potomac Aquifer System is based on the averages within the upper, middle and lower Potomac Aquifer as determined during baseline montioring.

[5] The total coliform detection of 2 MPN/100 mL in May 2023 was likely a result of sample contamination. The operator failed to follow established procedure in the collection of the sample. Corrective action was taken.

[6] The maximum residual disinfectant level (or MRDL) MCL for monochloramine and chlorine are based on annual averages.

[7] The measurement unit for beta particles and photon emitters is pCi/L while the MCL is expressed as mrem/yr. Per EPA's Implementation Guidance for Radionuclides (EPA 816-F-00-002, March 2002), the screening threshold for beta particles and photon emitters is 50 pCi/L. If sample concentrations exceed 50 pCi/L, each individual beta particle and photon emitter is converted from pCi/L to mrem using the EPA designated conversion tables, currently available in the referenced document.

* MDC - Minimum Detectable Concentration (Radiochemistry).

Contract Laboratory Flags:

*- : LCS and/or LCSD is outside acceptance limits, low biased.

*3 : ISTD response or retention time outside acceptable limits.

H : Sample was prepped or analyzed beyond the specified holding time

U : Result is less than the sample detection limit.

eurofins | Drinking Water Testing

July 27, 2023

Hampton Roads Sanitation District
Li Zhang
Laboratory Manager
1432 Air Rail Ave
Virginia Beach, VA 23455

Re: Failure to meet reporting deadline for samples.

Li Zhang,

Eurofins Eaton Analytical, LLC South Bend (EEA-SB) received samples from Hampton Roads Sanitation District for Radiological analyses and PPCP NEG and POS testing. The following is the list of Hampton Roads Sanitation District sample ID:

SRC_SWIFT 041123 – Collected 04/11/2023 – Received 04/12/2023
SRC_MW_LPA - Collected 04/19/2023 – Received 04/20/2023
SRC_MW_UPA - Collected 04/19/2023 – Received 04/20/2023
SRC_MW_MPA - Collected 04/19/2023 – Received 04/20/2023
SRC_SWIFT 060623– Collected 06/06/2023 - Received 06/07//2023

Both of these sample sites had tests in EEA-SB's Radiological and LCMS departments. The reason for this long turnaround is the overall sample load capacity.

Radiological samples were backed up due to instrument capacity and preparation challenges. EEA recently purchased an additional instrument to increase capacity. That instrument will be validated in the next few weeks once external reference standards have been received.

PPCP samples for NEG are currently getting on the instrument in time, but the processing of all of the samples has fallen behind due to staffing levels compared to current incoming capacity. EEA-SB has made strides to bring on new hires and new equipment in the LCMS department, but those actions have not yet made significant improvement in turnaround time. PPCP POS method was just brought online for testing July 21, 2023 due to the same issues. EEA-SB will continue to evaluate options in order to catch the sample load up again.

Sincerely,

Bill Reeves

Bill Reeves
Quality Assurance Manager
williamreeves@ET.eurofinsUs.com