

# *Welcome*



## **Restoration Advisory Board (RAB) Meeting**

**Robins Air Force Base (AFB)**

**March 13, 2025**



# **Welcome and Program Introduction**

**Mr. Heyward Singleton  
Installation Co-Chair**



# Acronyms and Abbreviations

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- **AFB**                    **Air Force Base**
- **CAPPR**                **Corrective Action Plan Progress Report**
- **°C**                      **degrees Celsius**
- **Cond**                  **Specific Conductance**
- **DNAPL**                **Dense Non-Aqueous Phase Liquid**
- **EQ**                     **Equalization**
- **EW**                    **Extraction Well**
- **ft**                      **feet or foot**
- **GAC**                  **Granular Activated Carbon**
- **gal**                    **gallon(s)**
- **GWTP**                **Groundwater Treatment Plant**
- **IDW**                  **Investigation Derived Waste**
- **L**                      **liter**
- **LC**                    **Leachate Collection**



# Acronyms and Abbreviations

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- **LF003**            **Landfill Number 3**
- **LNAPL**          **Light Non-Aqueous Phase Liquid**
- **min**             **minute(s)**
- **ml**               **milliliter**
- **mS/cm**         **milliSiemens per centimeter**
- **mV**             **milliVolt**
- **NPDES**         **National Pollutant Discharge Elimination System**
- **NTU**            **Nephelometric Turbidity Unit**
- **ORP**            **Oxidation Reduction Potential**
- **PFAS**          **Per- and Polyfluoroalkyl Substances**
- **PG**             **Professional Geologist**
- **PLC**            **Programmable Logic Controller**
- **QC**             **Quality Control**
- **RAB**            **Restoration Advisory Board**



# Acronyms and Abbreviations

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- **RI** Remedial Investigation
- **SRS** Sustainment and Restoration Services
- **SVE** Soil Vapor Extraction
- **TCE** Trichloroethene
- **Temp** Temperature
- **Turb** Turbidity
- **UFP-QAAP** Unified Federal Policy – Quality Assurance Project Plan



# Restoration Advisory Board

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## Groundwater Treatment Plant General Operations

**John Darsey**  
**GWTP Operator**  
**Bhate Environmental**

**March 13, 2025**



# Agenda

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- **Leachate collection and groundwater extraction**
- **Groundwater treatment**
- **National Pollutant Discharge Elimination System (NPDES) discharge**
- **Discussion**



# Leachate Collection and Groundwater Extraction

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- **Leachate – Liquid that circulates among waste found in landfills**
  
- **Result of process known as leaching**
  - **Liquid passes through landfill waste and extracts various soluble particles and solids**
  - **Fermentation and decomposition processes of organic matter, as well as other soluble materials (e.g., industrial waste)**



# Leachate Collection and Groundwater Extraction

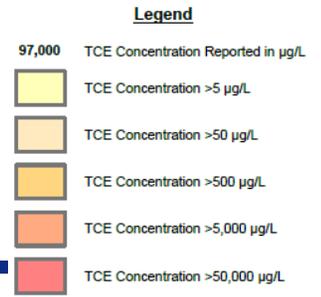
## Well network at Landfill 3 (LF003)

- Leachate Collection (LC) wells are within slurry wall
- Extraction Wells (EW) are outside slurry wall

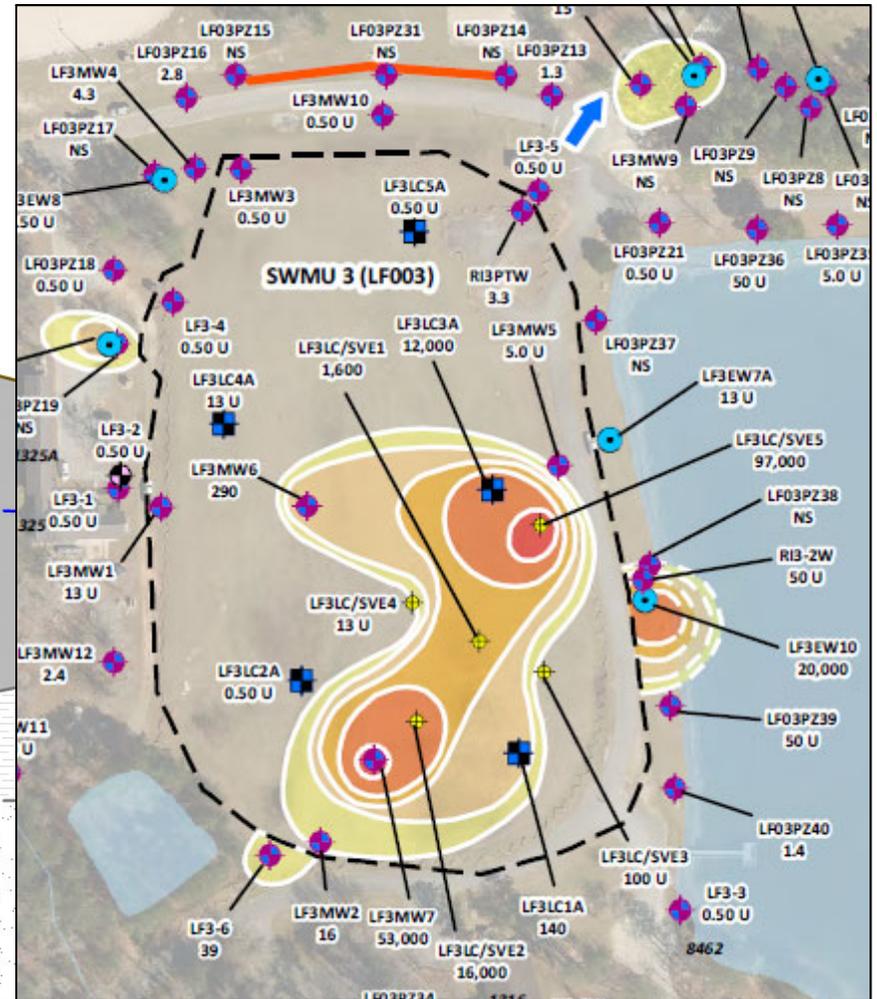
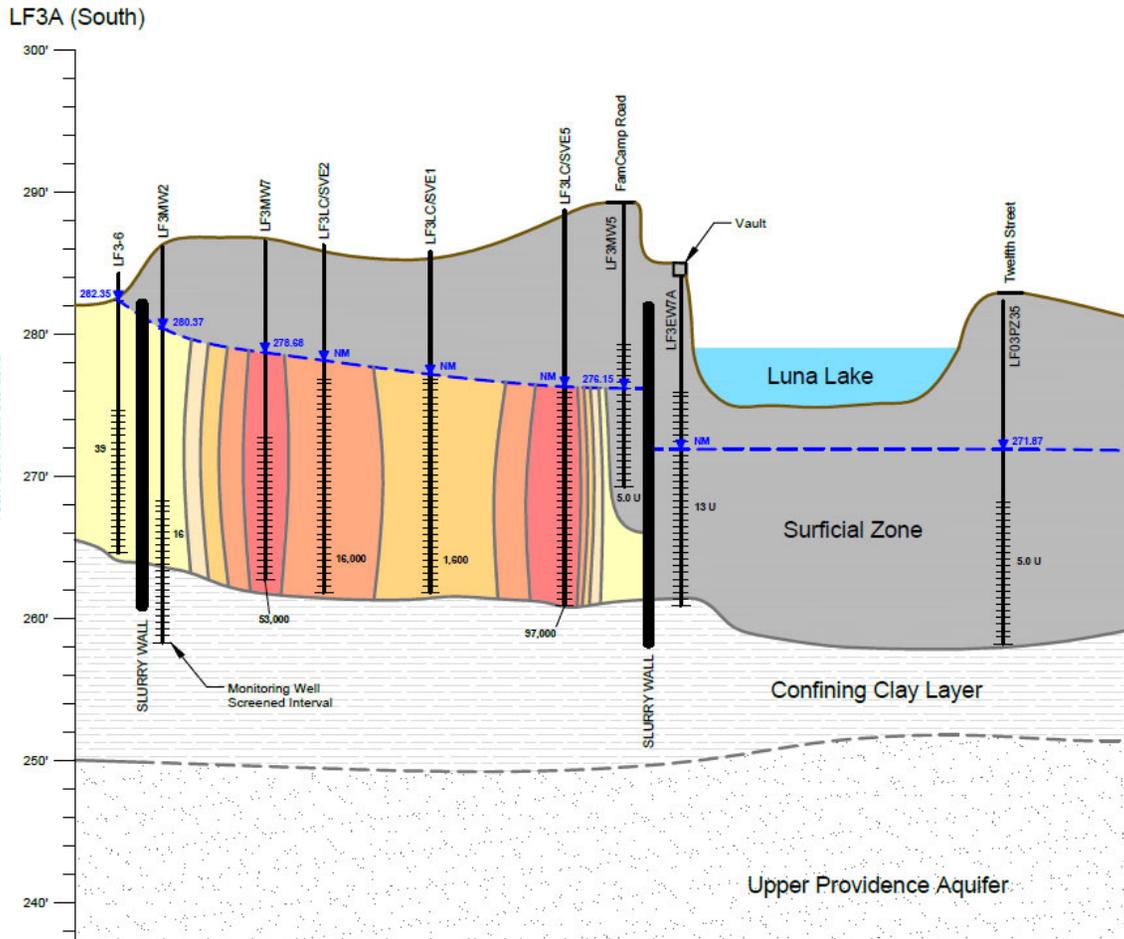




# Leachate Collection and Groundwater Extraction



TCE concentrations in Groundwater at LF003





# Leachate Collection and Groundwater Extraction

- Typical Extraction Well

EW





# Leachate Collection and Groundwater Extraction

- Typical Leachate Collection Well





# Leachate Collection and Groundwater Extraction

- **Wet Well/Transfer Pump**
  - Separates dense non-aqueous phase liquid (DNAPL) from water
    - Trichloroethene (TCE) is a DNAPL
  - Wet well is typically decanted annually, and hazardous waste is disposed of off-site





# Leachate Collection and Groundwater Extraction

- **Oil Water Separator**
  - Separates light non-aqueous phase liquid (LNAPL) from water
    - Benzene is a LNAPL





# Leachate Collection and Groundwater Extraction

- Tie in point for leachate to mix with groundwater
- Building 2





# Leachate Collection and Groundwater Extraction

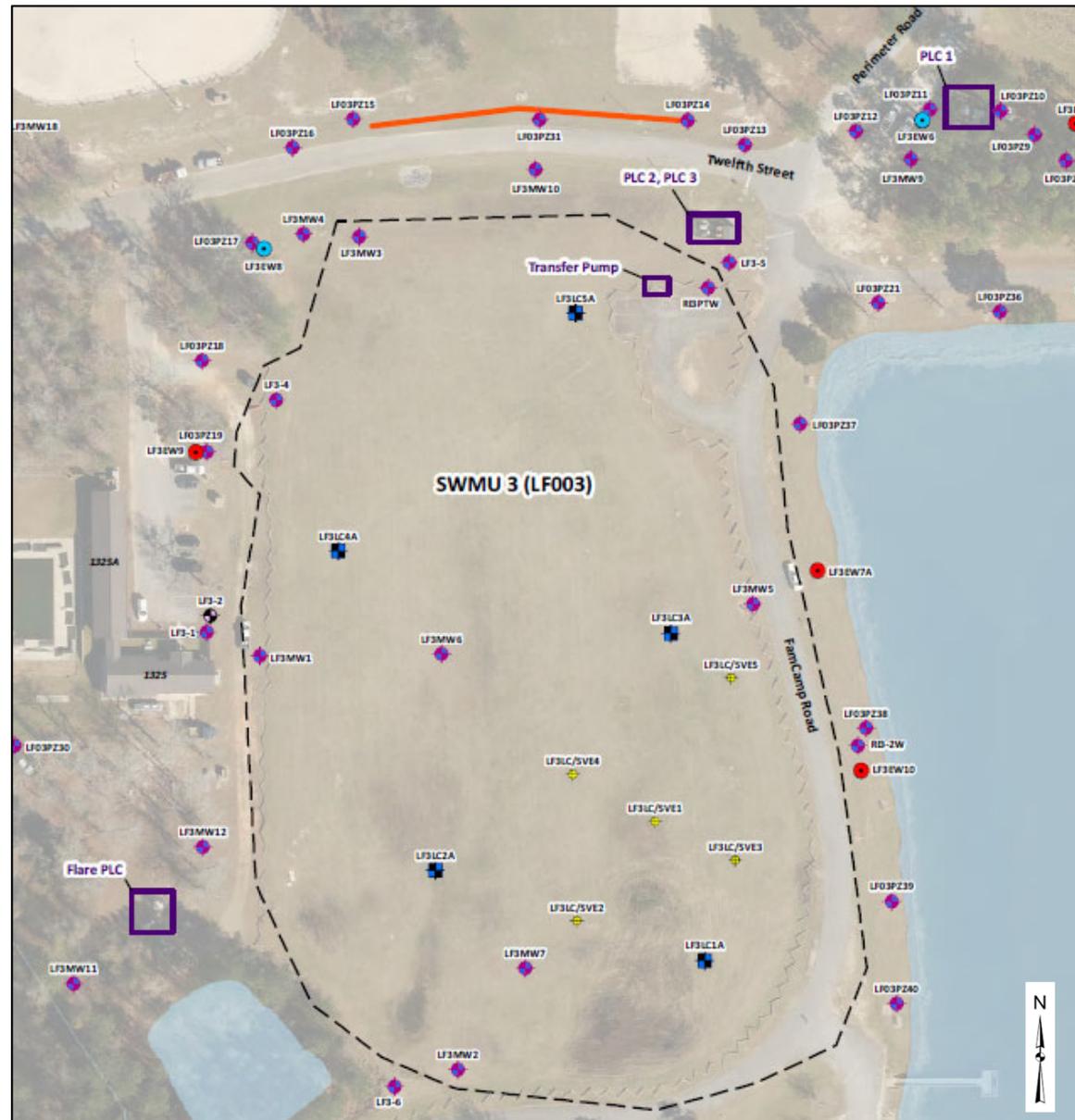
- Extraction well manifold and tie in point to force main
- Building 1
- From here, contaminated water is piped ~3 miles north to the GWTP





# Leachate Collection and Groundwater Extraction

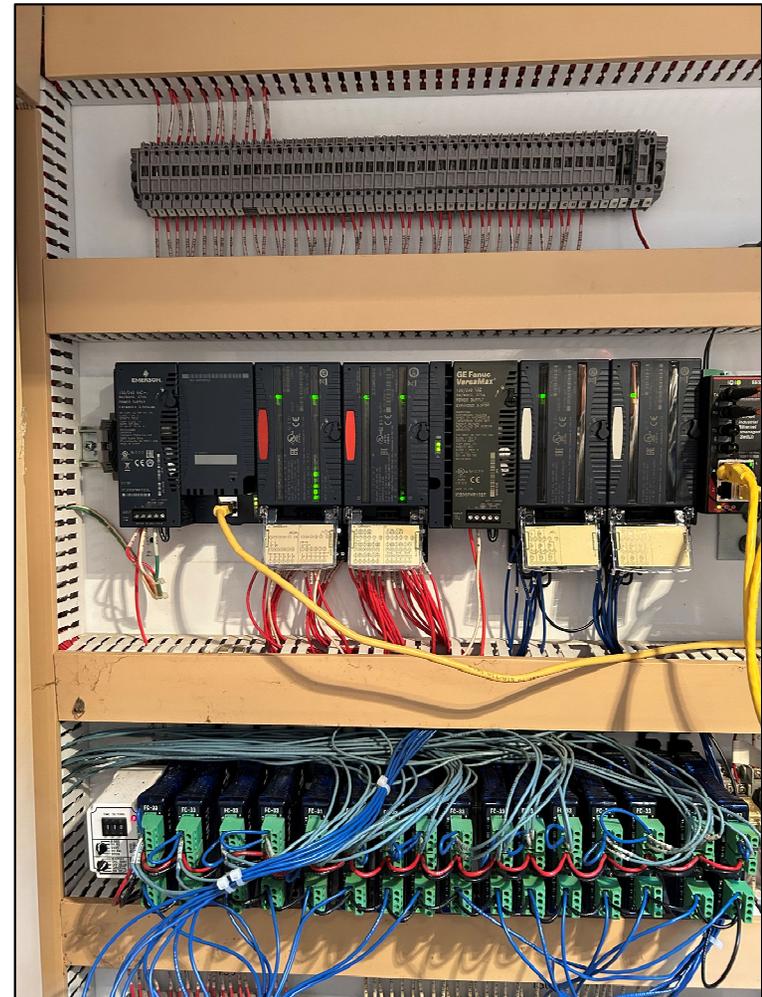
- Programmable Logic Controllers (PLCs)
  - Struck by lightning
  - Protections in place; however, buried connector cable could not be protected
  - Radio transmissions





# Leachate Collection and Groundwater Extraction

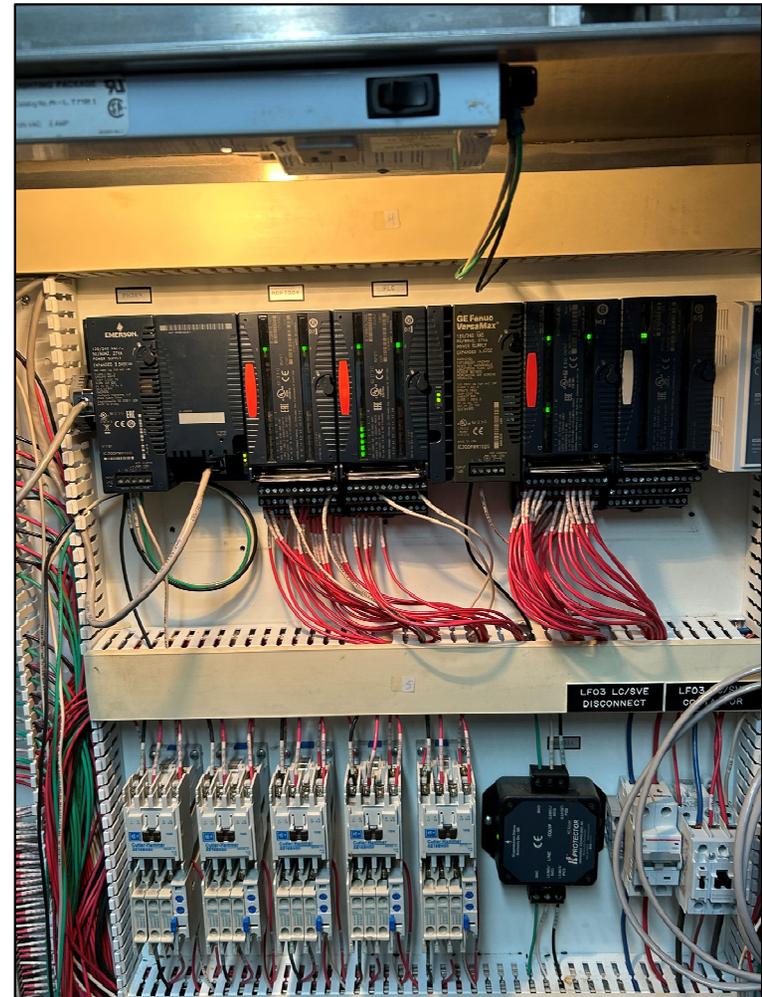
- Newly installed PLC in Building 1
  - PLC 1
    - Controls LF3EW3 through LF3EW7 and LF3EW10





# Leachate Collection and Groundwater Extraction

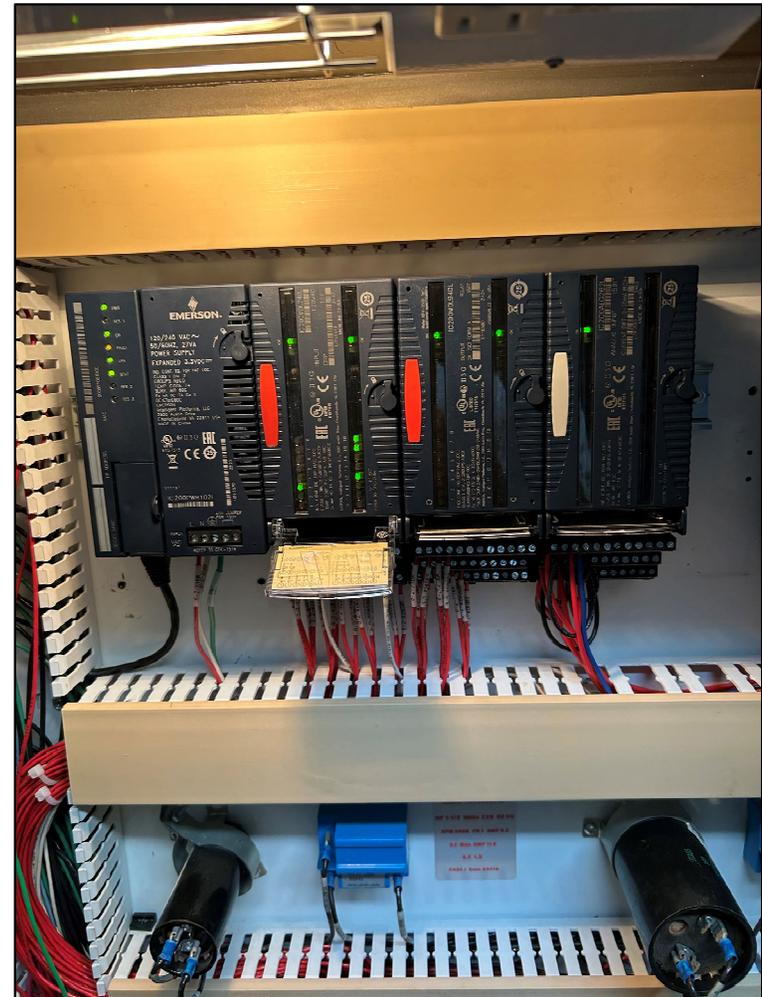
- **Newly installed PLC in Building 2**
  - **PLC 2**
    - Controls LF3LC1A through LF3LC5A, as well as LC/Soil Vapor Extraction (SVE) wells LF3LC/SVE1 through LF3LC/SVE5





# Leachate Collection and Groundwater Extraction

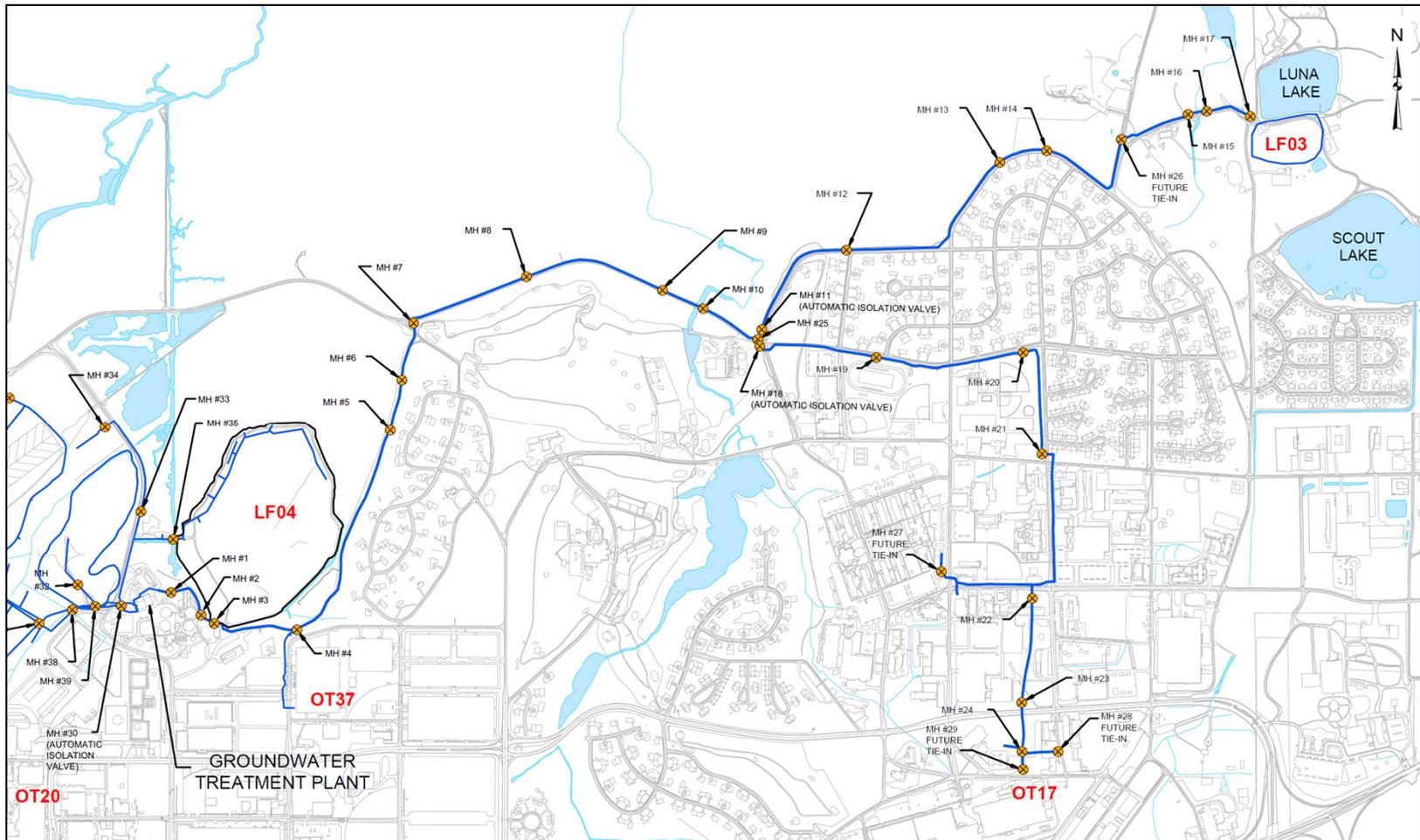
- **New PLC installed in Building 2**
  - **PLC 3**
    - Controls Wet Well/Transfer Pump and LF3EW9





# Groundwater Treatment

- Groundwater is pumped from LF003 to the Groundwater Treatment Plant (GWTP)





# Groundwater Treatment

- **Groundwater is pumped from LF003 to the Equalization Tank (EQ) tank at GWTP**
  - **Flow rate for groundwater treatment controlled by discharge from EQ tank**





# Groundwater Treatment

- **Influent Pumps**
  - Pumps draw water from EQ tank to begin treatment process





# Groundwater Treatment

- **Ozone Skid**
  - Ozone is injected into groundwater stream and is circulated through contact tank





# Groundwater Treatment

- **Mazzei Injector**
  - Injects ozone into water stream





# Groundwater Treatment

- **Ozone generator**
  - Ozone is generated by passing electricity through oxygen
  - First stage of treatment
  - Oxidizer to destroy chemicals in contaminated groundwater





# Groundwater Treatment

- **Air separator**
  - Removes most of nitrogen and other trace gasses
  - Result is 94% oxygen
  - Allows ozone to be generated from oxygen





# Groundwater Treatment

- **Air Compressor**
  - Generates compressed air needed for ozone generation
  - 40 horsepower





# Groundwater Treatment

## ■ Chiller

- Cools ozone generator
- Cooler air provides higher concentration of ozone
- Runs at 61 degrees F





# Groundwater Treatment

- **Granular Activated Carbon (GAC) vessel**
  - Second stage of treatment
  - Used after ozone injection to aid in treatment and to polish treated water



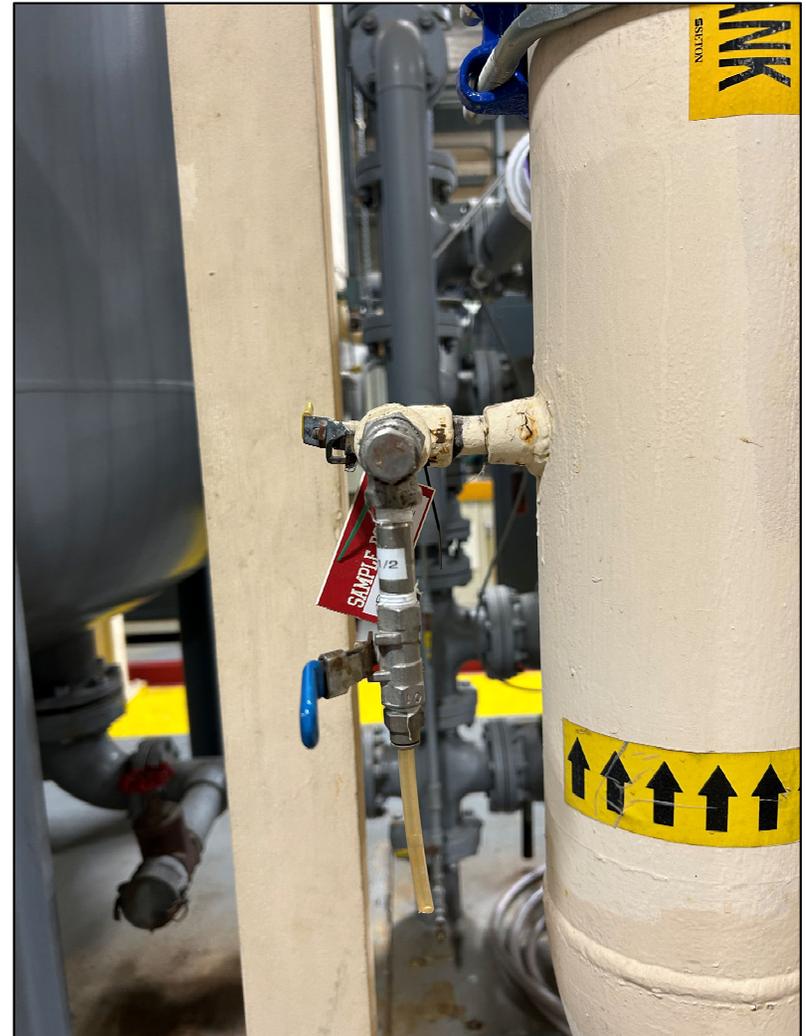


# Groundwater Treatment

## ■ Post-Ozone Sampling



## ■ Post-GAC Sampling





# NPDES Discharge

- **NPDES Outfall 010 - Discharge of treated water**
  - ~100 yards south of GWTP
  - Treated groundwater mixes with treated water from sanitary treatment plant and Industrial Treatment Plant #1 before discharge





# NPDES Discharge

- NPDES samples collected weekly and shipped to laboratory for analysis



STATE OF GEORGIA  
DEPARTMENT OF NATURAL RESOURCES  
ENVIRONMENTAL PROTECTION DIVISION

Page 20 of 39  
Permit No. GA0002852

## A.9. Effluent Limitations and Monitoring Requirements

Beginning on the effective date of the permit, the permittee is authorized to discharge from internal outfall number 010<sup>(1)</sup> – wastewater/groundwater from restoration site LF003, LF003 decontamination water, and investigation derived waste.

Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristics (Units)	Discharge Limitations				Monitoring Requirements <sup>(2)</sup>		
	Mass Based (lbs/day)		Concentration Based (mg/L)		Measurement Frequency	Sample Type	Sample Location
	Daily Avg.	Daily Max.	Daily Avg.	Daily Max.			
Flow (MGD)	Report	Report	--	--	Daily	Continuous	Internal <sup>(3)</sup>
Chemical Oxygen Demand			45	75	1/Week	Grab	Internal <sup>(3)</sup>
Total Suspended Solids	--	--	15	30	1/Week	Grab	Internal <sup>(3)</sup>
Total Phenols	--	--	0.1	0.2	2/Year	Grab	Internal <sup>(3)</sup>
Trichloroethylene (µg/L)	--	--	80.7	80.7	2/Month	Grab	Internal <sup>(3)</sup>
Chloroform	--	--	Report	Report	2/Year	Grab	Internal <sup>(3)</sup>
1,1-Dichloroethane	--	--	Report	Report	2/Year	Grab	Internal <sup>(3)</sup>
1,2-Dichloroethane	--	--	Report	Report	2/Year	Grab	Internal <sup>(3)</sup>
1,2-Dichloroethene	--	--	Report	Report	2/Year	Grab	Internal <sup>(3)</sup>
Methylene Chloride	--	--	Report	Report	2/Year	Grab	Internal <sup>(3)</sup>

The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units and shall be monitored once per week by grab sample.

<sup>(1)</sup> See Special Conditions, Part III.C.2 of this permit.

<sup>(2)</sup> All the parameters must be monitored, at a minimum, at the measurement frequency stated above if there is any discharge. If there is no discharge, state such in the discharge monitoring report in accordance with the reporting requirements in Part 1.D of this permit.

<sup>(3)</sup> The permittee shall sample and analyze the discharge from internal outfall 010 prior to mixing with any other wastestream.



# Discussion

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# Restoration Advisory Board

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## LF003 Fence Replacement and Dig Permits

**Humberto Altamirano**  
**Field Operations Manager**  
**Bhate Environmental**

**March 13, 2025**



# Agenda

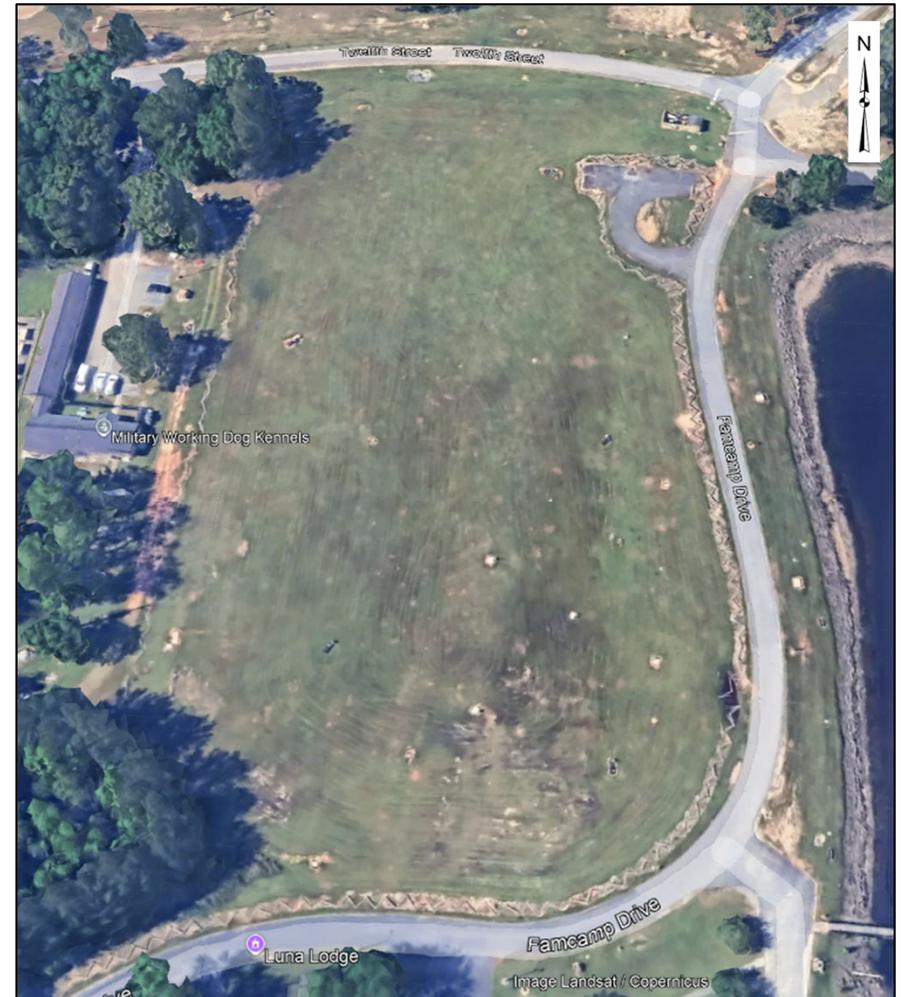
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- **LF003 fence replacement scope of work**
- **Objective**
- **Preparatory phase of work**
- **Split rail fence installation**
- **Recycling stackable split rail fence**
- **Site restoration and demobilization**
- **Discussion**



# LF003 Fence Replacement Scope of Work

- Remove and dispose of approximately 1,500 linear feet of stackable black locust split rail fence
- Install 1,750 linear feet of red cedar split rail fence





# Objective

- Provide institutional controls
- Secure LF003 site from vehicle, equipment, and pedestrian traffic
- Protect LF003 environmental assets
- Enhance appearance of LF003





# Preparatory Phase of Work

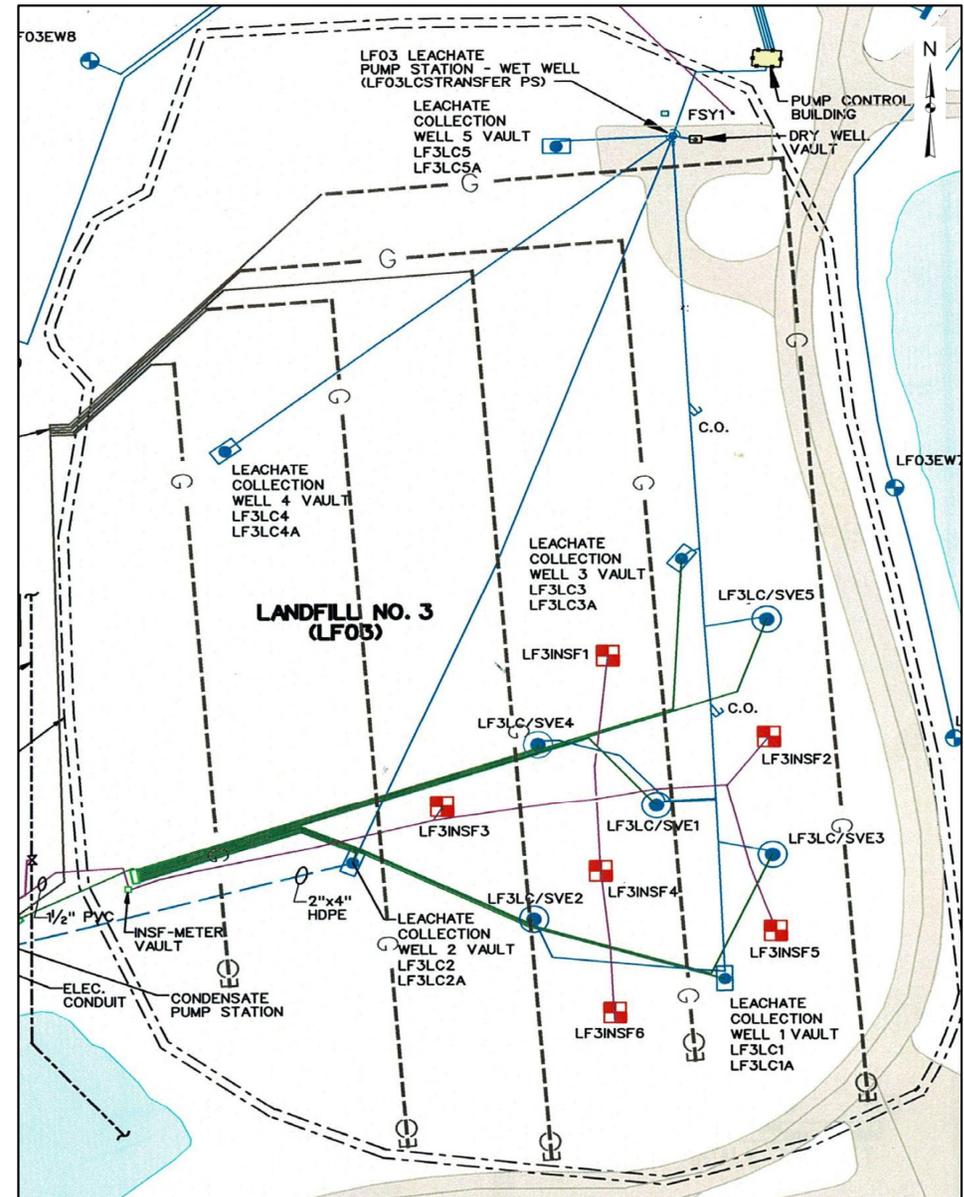
- Personnel – Robins AFB, Bhate, Paulk Landscaping, and A+ Fence
- Site walk
- Layout proposed fence path





# Preparatory Phase of Work

- Identify and locate buried utilities (extraction wells, leachate collection wells, electrical and communication, gas collection, leachate, and groundwater extraction conveyance piping)





# Preparatory Phase of Work

- Submit dig permit to auger through landfill cover to locate approximate depth of landfill geotextile liner
- Locate liner depth and confirm minimum depth to set fence posts meets requirements

BASE CIVIL ENGINEERING WORK CLEARANCE REQUEST (See Instructions on Reverse)		DATE PREPARED 11/25/2024
1. Clearance is requested to proceed with work at BLDG 1324 (Log#: 460610) on Work Order No. <u>TBD</u> , Contract No. _____, involving excavation or utility disturbance per attached sketch. This area has been clearly staked.		
2. TYPE OF FACILITY/WORK INVOLVED		
A. PAVEMENTS	D. FIRE DETECTION & PROTECTION SYSTEMS	G. AIRCRAFT OR VEHICULAR TRAFFIC FLOW
B. DRAINAGE SYSTEMS	E. UTILITY OVERHEAD UNDERGROUND	H. SECURITY
C. RAILROAD TRACKS	F. COMM OVERHEAD UNDERGROUND	I. OTHER
3. DATE CLEARANCE REQUIRED 11/25/2024		4. DATE OF CLEARANCE 11/25/2024
5. SIGNATURE OF REQUESTING OFFICIAL Unk Humberto Altamirano \ ELECTRONICALLY SIGNED \		6. TELEPHONE NO. 478-256-8819
7. ORGANIZATION		
ORGANIZATION	REMARKS (Use Reverse for additional comments)	REVIEWER'S NAME AND INITIALS
A. ELECTRICAL DISTRIBUTION	APPROVED -- Steven Hardin	Steven Hardin
B. HVAC DISTRIBUTION	APPROVED -- Roy Bowden	Roy Bowden
C. WATER DISTRIBUTION		
D. POL DISTRIBUTION	APPROVED -- Barney Carcopa	Barney Carcopa
E. SEWER DISTRIBUTION		
F. ENVIRONMENTAL	APPROVED -- GARY COX	GARY COX
G. PAVEMENTS/GROUNDS	APPROVED -- Alan Harrell	Alan Harrell
H. FIRE PROTECTION		
I. REUSE WATER DISTRIBUTION		
J. OTHER (NATURAL GAS)		
9. SECURITY POLICE		
10. SAFETY		
11. COMMUNICATIONS	APPROVED -- Emory Blount	Emory Blount
12. BASE OPERATIONS	APPROVED -- BILLY MESSER	BILLY MESSER
13. CABLE TV		
14. COMMERCIAL UTILITY COMPANY TELEPHONE GAS ELECTRIC	CONFIRMATION #: 241121-005436	
15. OTHER (Specify) This form is only VALID UNTIL 12/27/2024. Flags/Stakes must be labeled with date and work order/project number. Please remove flags in area when work is complete.		
16. REQUESTED CLEARANCE		APPROVED
17. TYPED NAME AND SIGNATURE OF APPROVING OFFICER (Chief of Operations Flight or Chief of Engineering Flight) GS-09 Sean Spelden \ ELECTRONICALLY SIGNED \		17a. DATE SIGNED 11/27/2024

AF FORM 103, 19940801, IMT-V3

PREVIOUS EDITIONS ARE OBSOLETE.



# Preparatory Phase of Work

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- **Selection and approval of fence material red cedar split rail**
- **Procure fence material**
- **Schedule mobilization of personnel, equipment, supplies, and materials**
- **Submit security clearance for access to Robins AFB for fence contractor personnel**
- **Resubmit dig permit renewal for new fence installation**



# Preparatory Phase of Work



**LF003 Conveyance Piping Utility Locate**



**LF003 Electrical Controls Utility Locate**



# Split Rail Fence Installation

- Mobilization of personnel, equipment, materials and supplies to LF003 site
- Review Health and Safety Plan, Activity Hazard Analysis, and Accident Prevention Plan





# Split Rail Fence Installation

- Fence contractor removal of existing black locust stackable split rail fence
- Fencing material was recycled





# Split Rail Fence Installation

- Red cedar split rail fence installation  
LF003 west perimeter
- Initial and follow up quality control inspections





# Split Rail Fence Installation



**LF003 Southeast View**



**LF003 North View**



# Split Rail Fence Installation



**LF003 Southwest View**



**LF003 South View**



# Recycling Stackable Split Rail Fence

- Black locust split rail fence removed from LF003 was repurposed by Robins AFB to revitalize Treefrog Nature Trail located just south of LF003





# Recycling Stackable Split Rail Fence





# Recycling Stackable Split Rail Fence





# Site Restoration and Demobilization

**LF003 Red Cedar Split Rail**



**Treefrog Nature Trail Black  
Locust Split Rail**





# Discussion

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# Restoration Advisory Board

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## Basewide Sampling Program

**Caitlin Ryan**  
**Environmental Scientist**  
**Bhate Environmental**

**March 13, 2025**



# Agenda

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- **Sampling and analysis plan**
- **Well inspections, repairs, and development**
- **Groundwater sampling**
- **Investigation derived waste (IDW) management**
- **Data validation and reporting**



# Sampling and Analysis Plan

- Sample plan created from approved Corrective Action Plan Progress Report (CAPPR)
- Plan is sent to team chemist and project manager for review
- Chemist places bottle order with lab
- Bottles arrive based on sample schedule

Table 1-1  
 Basewide Groundwater Monitoring Program  
 Annual CAPPR (1 July 2022 - 30 June 2023)  
 Robins AFB, GA

Site Identification	Location Identification	Monitoring Parameters / Frequency									
		Water Levels	LNAPL	VOCs	SVOCs/PAHs	1,4-Dioxane	Chromium	Metals <sup>(1)</sup>	MNA <sup>(2)</sup>	VFA	qPCR
SWMU 3	RI3-4WP	A		A	B			B			
SWMU 3	RI3-5AW	A		A	B			B			
SWMU 3	RI3-6W	A		A	B			B			
SWMU 3	RI3-8W	A		A	B			B			
SWMU 3	RI3-10W	A									
SWMU 3	RI3-11W	A		A	B			B			
SWMU 3	RI3-12W	A		A	B			B			
SWMU 3	RI3-14W	A		A	B			B			
SWMU 3	RI3PTW	A		A	B			B			
SWMU 3	ScoutStaff	A									
SWMU 3	Z3PZ2	A									
Landfill 4	LF4-5	A		Q							
Landfill 4	LF4-6	A		A					A		
Landfill 4	LF4-7	A									
Landfill 4	LF4-8	A									
Landfill 4	LF4-10	A									
Landfill 4	LF4-11	A		Q							
Landfill 4	LF4-14	A									



# Sampling and Analysis Plan

Planned 2025 Schedule  
 Basewide Groundwater Monitoring Program  
 2025 Annual Basewide  
 Robins AFB, GA

Site	Wells To Sample	Water Levels	Duration (work days)*	Purge Water Management	MNA Hold Time Constraints <sup>1</sup>	Timing	Note
Mob & Badge/ Sample Prep/ Maintenance	0	0	4			2/24/25 - 2/28/25	Caitlin and Amber arrive early for prep
B680	0	2	0.10			2/27/25	Prep Week (water levels only)
CG503/SWMU 61	1	4	0.10			2/27/25	Prep Week (one sample, three water levels)
CG504/SWMU 47	0	0	0.80			2/27/2025 - 2/28/25	Prep Week (redevelop two wells before sampling)
Mob & Badge	0	0	0.5			3/3/25	Week 1 Sample teams mob/badge
Flight Line Training	0	0	0.5			3/3/25 - 3/7/25	Week 1 Flight line training TBD
CG504/SWMU 47	17	19	0.57			3/3/25 - 3/4/25	Week 1 (Facility Managers at Building 177)
CG028/SWMU 28	40	87	1.33	PFAS		3/4/25 - 3/5/25	Week 1 (Flight line notification)
DC034/SWMU 36 - Horse Pasture	66	67	2.20		MNA (13)	3/6/25 - 3/8/25	Week 1 (Barn manager and off-site notifications)
OT020/SWMU 20	105	105	3.50	PFAS	MNA (34)	3/10/25 - 3/13/25	Week 2 (Some airfield notifications)
LF003/SWMU 3	83	114	2.77			3/13-14/25 & 3/17/25	Week 2 & 3 (Caitlin and Kayce out 3/17-3/19)
SS040/SWMU 40 (SWMU10B)	21	22	0.90		MNA (4)	3/18/2025	Week 3
OT037/SWMU 62	11	11	0.37			3/19/2025	Week 3
OT017/SWMU 17	85	87	3.50		MNA (18)	3/19/25 - 3/22/25	Week 3 (Flight line notification)
OT041/SWMU 57	19	19	0.80			3/24/2025	Week 4 (Flight line notification)
CG502/SWMU 60	35	35	1.17			3/24/25 - 3/25/25	Week 4 (Flight line notification)
CG501/SWMU 59	34	34	1.50			3/26/25 - 3/27/25	Week 4 (Flight line notification)
LF004/SWMU 4	36	75	1.60	PFAS		3/27/25 - 3/28/25	Week 4
<b>Totals</b>	<b>553</b>	<b>681</b>	<b>26.20</b>				

**NOTES:**

\* Production rate of 30 wells/day with 8 sampling crews the 1st week, 9 crews the 2nd week, 8 crews the 3rd week, and 7 crews the 4th week

If you have an issue with any of the sampling in the areas with a red charge number, be sure to **notify Tammy Hebel** at Geosyntec.

Saturday workdays will be 3/8/25 and 3/22/25

CG028 must be sampled the week of 3/3/25, or at least the 4 wells that are required for the biosparge pilot test; Humberto and John can sample if not trained yet.

LF004 should be sampled last so you don't delay the basewide event; bladder pumps will need to be removed from wells to be sampled/analyzed for PFAS after Basewide sampling is over.



# Sampling and Analysis Plan

- Equipment order placed based on number of teams needed for event
- Rental Company – Pine Environmental based in Atlanta
  - Pine Environmental drives equipment to Robins AFB





# Well Inspections, Repairs, and Development

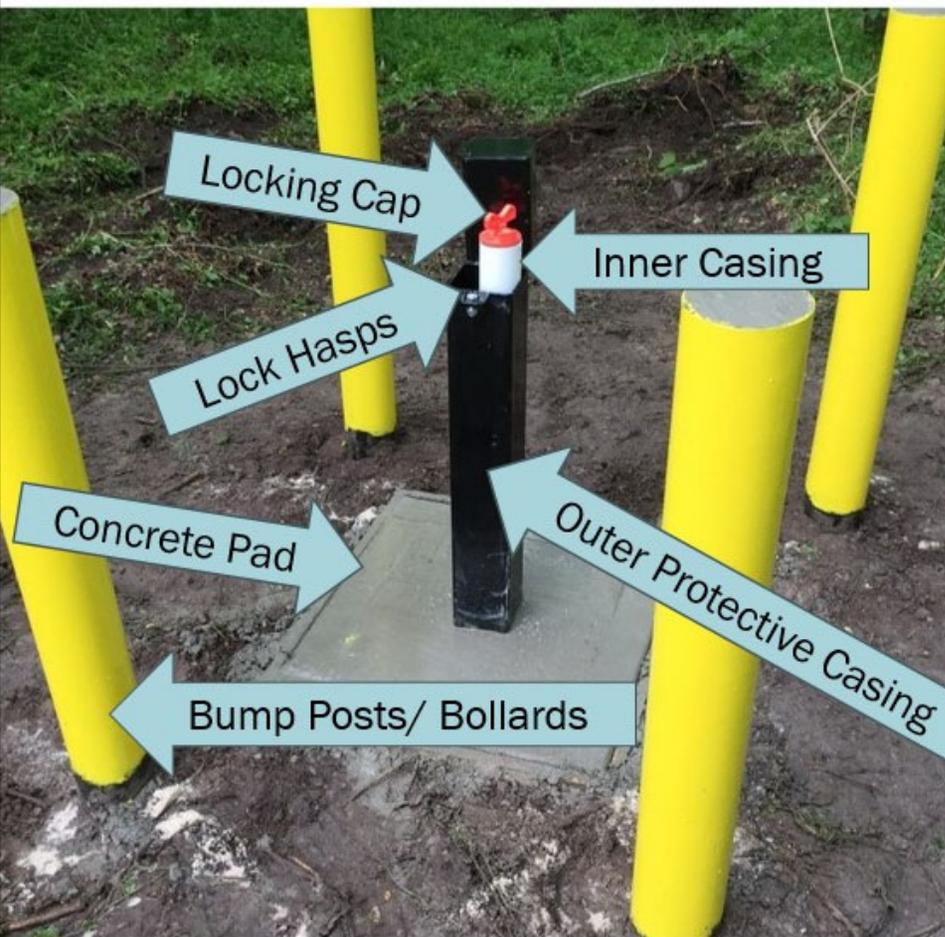
- Well inspection forms are filled out for wells with maintenance needs
- Minor maintenance issues are addressed during basewide sampling event
- When performing maintenance, date is added along with description of maintenance performed

Complete for Above Ground Wells Only		No	Yes	NA	Corrected (date)
Well Casing	1. Is outer protective casing corroded?				
	2. Is outer protective casing dented?				
	3. Is outer protective casing cracked?				
	4. Is outer protective casing loose?				
	5. Is inner casing dented/cracked?				
	6. Is inner casing bent?				
	7. Is inner casing loose? (Annular seal issue)				
Well Security	8. Is the outer protective cover damaged (unable to be closed)?				
	9. Are the lock hasps on the outer cap broken?				
	10. Is the lock missing or damaged?				
Complete for Flushmounted Wells Only		No	Yes	NA	Corrected (date)
Well Cover	11. Is the cover damaged?				
	12. Does the rubber o-ring for the well vault need to be replaced?				
	13. Are bolts missing or stripped?				
	14. Are washers on bolts missing?				
	15. Are the iron rings for the bolts damaged (will bolt screw in)?				
	16. Is water in the vault?				
Well Security	17. Is the cap damaged (unable to be locked, does not provide seal)?				
	18. Is the lock missing or damaged?				
Complete for All Wells		No	Yes	NA	Corrected (date)
Accessibility	19. Is excessive vegetation/overgrowth blocking access to well?				
Well Identification	20. Is the label, tag, or plate missing or illegible?				
Biological Hazards	21. Are there insects/biological hazards on the ground near well pad?				
	22. Are there insects/biological hazards present in well vault?				
Protective bollards (if present)	23. Are protective posts damaged or leaning?				
	24. Do posts require painting?				
Concrete Well Pad	25. Does pad slope towards the well?				
	26. Is the concrete pad cracked or deteriorated?				
	27. Is the pad covered by grass, gravel, soil, or debris?				
	28. Is the pad below surrounding grade?				
	29. Is there erosion or void space under pad?				
Down Hole Conditions	30. Is there any down hole sampling equipment present?				
	31. Are there any obstructions in the well?				
	32. Is there a significant amount of sediment at the bottom of the well? (Does it require re-development)				
Other Conditions	33. Does measuring point need to be clearly marked?				
	34. Does measuring point need to be resurveyed?				
	35. Specify location of measuring point (N, S, E, W):				
	36. Measured total depth of well (ft):				
	37. Installed (as-built) depth of well (ft):				
	38. Measured depth to water (ft btoc):				
	39. Well Pipe Construction Material (circle): PVC      Stainless Steel      Other:				
	40. Well Casing Diameter (circle): 2-inch      4-inch      3/4 -inch      Other:				
	41. Observed Outer Double Casing (circle): No      Yes      Diameter?				

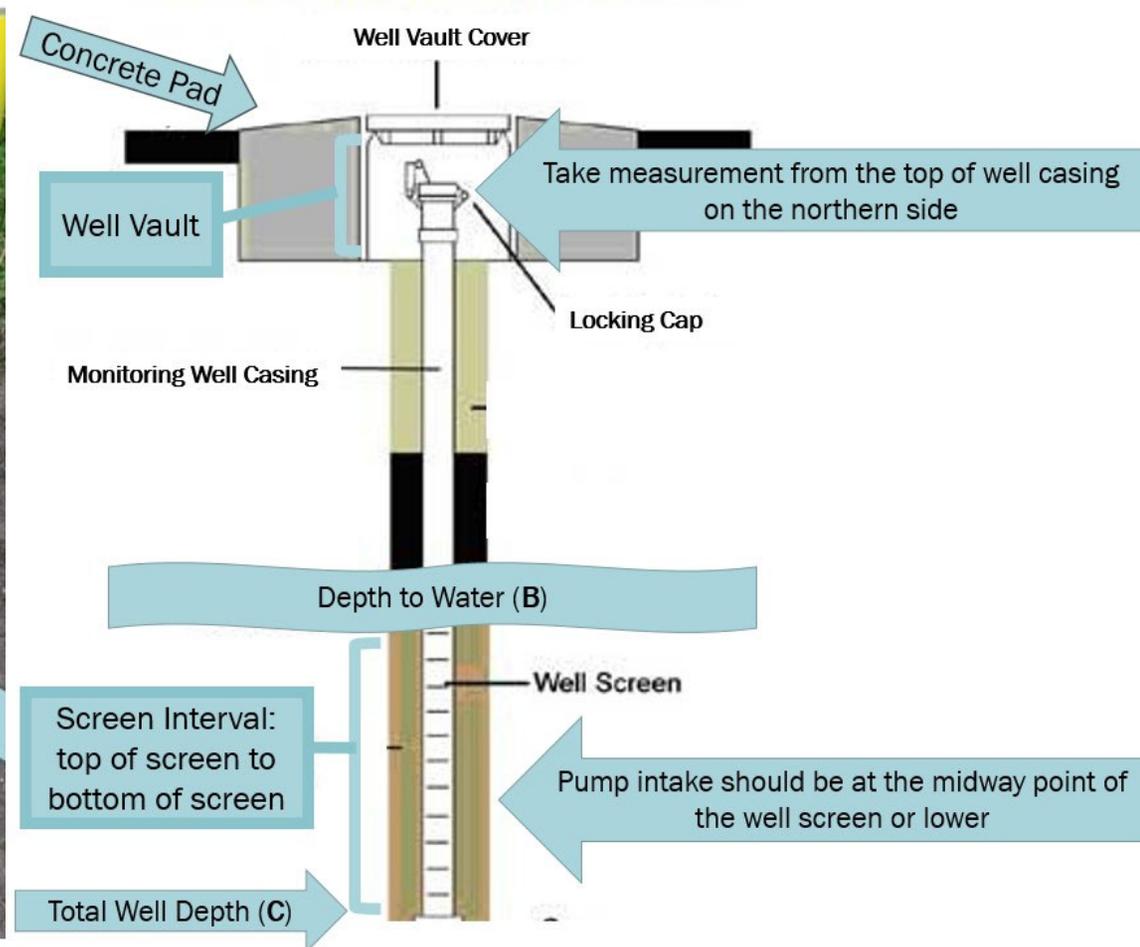


# Well Inspections, Repairs, and Development

## ■ Stick-up Well



## ■ Flush-mount Well





# Well Inspections, Repairs, and Development

- Redevelopment may be necessary for monitoring wells with high turbidity (>10 NTUs)
  - Based on stabilization parameters from 2024, 15 wells were chosen for redevelopment prior to 2025 sampling event

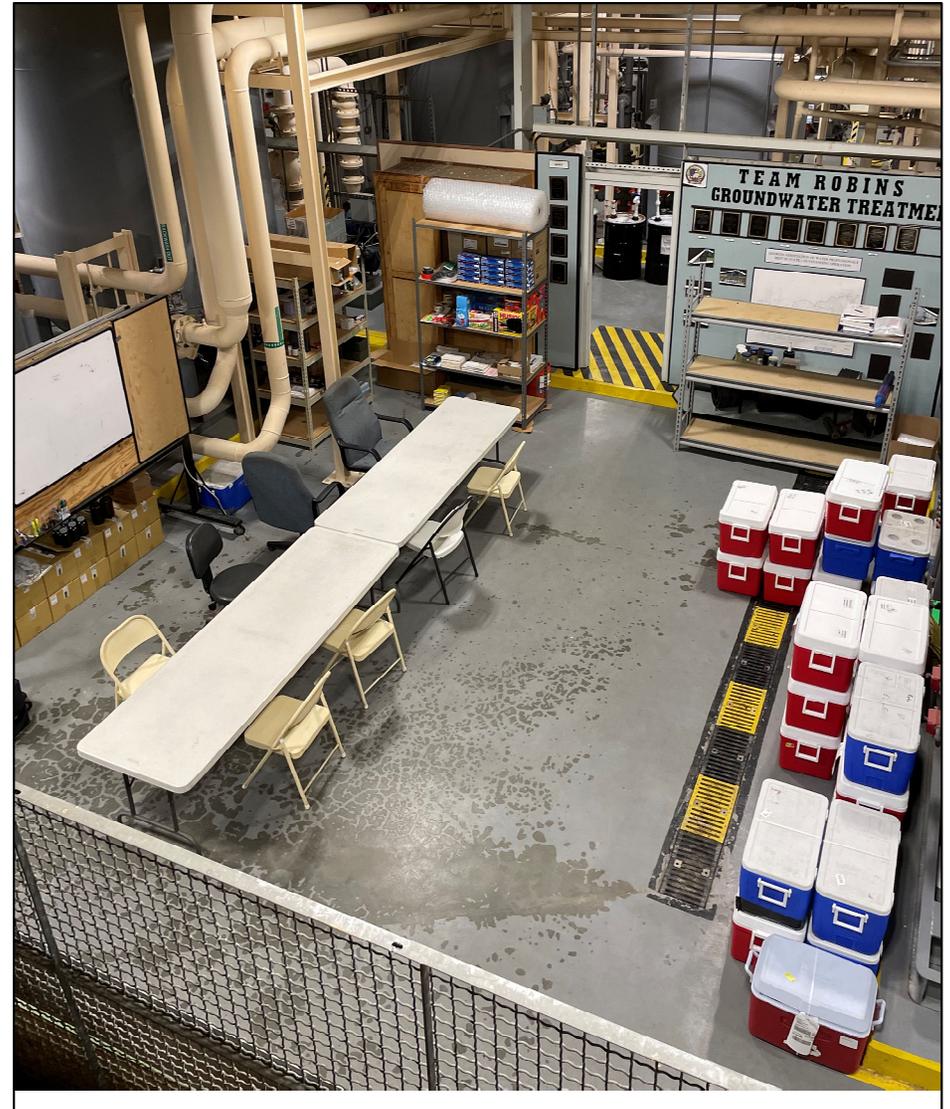




# Groundwater Sampling

## ■ Typical Schedule

- 07:00 – Arrive at GWTP to calibrate and load gear
- 08:00 – Depart to sample wells
- Mid-Day – Package Samples
- Dusk – Return to GWTP
  - Place samples on fresh ice
  - Turn in field forms
  - Manage purge water
  - Unload gear
  - Charge sampling equipment and batteries





# Groundwater Sampling





# Groundwater Sampling

## Low Flow Sampling with Peristaltic Pump

- Extracts water from well using silicon tubing and peristalsis
- Optimal performance in shallow wells
- Pump struggles when pulling water up from depths greater than 30 feet below ground surface

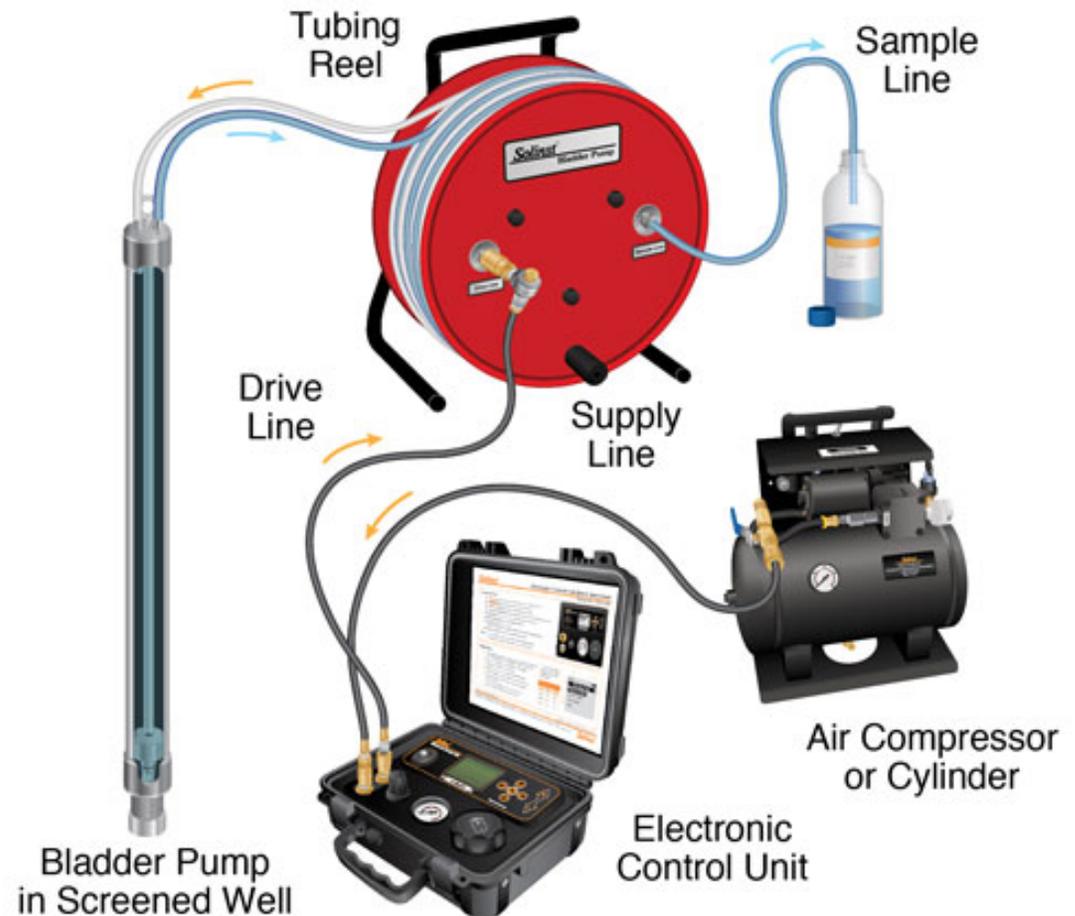




# Groundwater Sampling

- Optimal performance in wells with fully submerged screens
- Extracts water from well by pumping air in increments through an airline and into bladder bag submerged in screened area of well; this forces water up through waterline
- While air pump is cut off, ball valve is activated and bladder bag refills with water

## Low Flow Sampling with Bladder Pump





# Groundwater Sampling

## Well Volume Calculation Example

<b>LOCATION</b>	Site: Robins AFB ORC	Location ID (Site Name): 559 (C9501)	Sample ID: 559W4C_0323								
	Project Name: Basewide Sampling Spring 2023	Weather: overcast, 68°	Date: 3-27-23								
<b>EQUIPMENT</b>	Pump Type: Bladder										
	Water Level Indicator Type: Heron H.O.I.L./Dipper-T2										
	Tubing Type/Diameter (in): 3/8" teflon										
<b>WELL INFO</b>	Casing Type / ID (in): 2" pvc flush-mount	Unit Casing Volume (gal/in ft) (A): 0.16	Initial Depth to Water (ft) (B): 13.58								
	Total Well Depth (ft) (C): 65'	Water Column Thickness (ft) (C-B): 51.42	Well Volume (gal) (A*(C-B)): 8.22								
	Bladder Pump Present (Y/N): Yes	Depth to Pump/Well Bottom (ft): 160'									
	Well Condition: Good	Comments: TOC 0.7" bgs.									
<b>CASING INFO</b>	Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
	Unit Casing Volume (gal/in ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

$$A \times (C - B) = \text{Well Volume}$$

Casing Diameter = 2 inch → Unit Casing Volume = 0.160 gal/ft (A)

Total Depth = 65 ft (C) and Initial Depth to Water = 13.58 ft (B)

$$\text{Well Volume} = \frac{0.160 \text{ gal}}{\text{ft}} \times (65 \text{ ft} - 13.58 \text{ ft}) = 8.22 \text{ gal}$$



# Groundwater Sampling

- Graduated cylinder used to calculate pump rate by filling with water for 15 seconds, then amount of water collected is multiplied by 4 to get pumping rate (mL/min)
- Volume converted to gallons (1 L = 0.26 gallon or 1 gallon = 3.79 L)
- Readings are taken every 5 mins, so pumping rate multiplied by 5 equals volume removed between each reading

## Pumping Rate and Volume Removed

DATE	NAPL Thickness (ft) (if applicable)	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)
3-27-23	0.0	0920	13.58	0.0	200
}		0925	13.65	0.26	200
		0930	13.65	0.52	200
		0935	13.65	0.78	200
		0940	13.65	1.04	200
		0945	13.65	1.30	200
		0950	13.65	1.56	200
		0955	13.65	1.82	200

Example: 50 mL collected in 15 secs or 200 mL/min

$$\frac{200 \text{ mL}}{1 \text{ min}} \times \frac{1 \text{ L}}{1,000 \text{ mL}} \rightarrow \frac{1 \text{ L}}{5 \text{ mins}} \times \frac{0.26 \text{ gals}}{1 \text{ L}} \rightarrow \frac{0.26 \text{ gals}}{5 \text{ mins}}$$



# Groundwater Sampling

## Pumping Rate and Volume Removed

- Samples can be gathered after three consecutive readings meet stabilization criteria

Conversions	Stabilization Criteria			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	≤ 10 NTU or +/-10% if <10 NTU not possible
	Cond	+/- 5%	ORP	+/- 10
				Recorded By: <i>SC</i>

DATE	NAPL Thickness (ft) (if applicable)	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (gal/min)	Temp (C)	DO (mg/l) (remark if negative or >8)	Cond (mS/cm)	pH (remark if <4 or >9)	ORP (mV)	Turb (NTU) (remark if >10)	Remarks (odor, clarity, water level only, etc.)
3/4/25	N/A	1745	13.49	1	180	22.6	0.79	0.05	5.33	82.0	0.06	mostly clear
		1720	13.45	1.25	200	22.4	0.56	0.049	5.34	68.9	0.12	no odor
		1725	13.48	1.5	200	22.3	0.39	0.048	5.34	55.0	0.22	
		1730	13.48	1.75	200	22.3	0.35	0.048	5.36	36.5	0.43	
		1735	13.48	2.00	200	22.3	0.33	0.05	5.36	18.0	0.35	
		1740	13.49	2.25	200	22.3	0.32	0.049	5.36	-2.3	0.23	
		1745	13.43	2.5	200	22.3	0.34	0.049	5.36	-24.5	0.18	
		1750	13.43	2.75	200	22.3	0.31	0.048	5.34	-39.9	0.14	
		1755	13.43	3.00	200	22.3	0.31	0.048	5.36	-59.4	0.12	
		1800	13.41	3.25	180	22.3	0.3	0.048	5.37	-65.7	0.11	
		1805	13.39	3.5	180	22.2	0.3	0.048	5.37	-72.7	0.09	
		1810	13.40	3.75	180	22.2	0.29	0.048	5.37	-79.9	0.10	



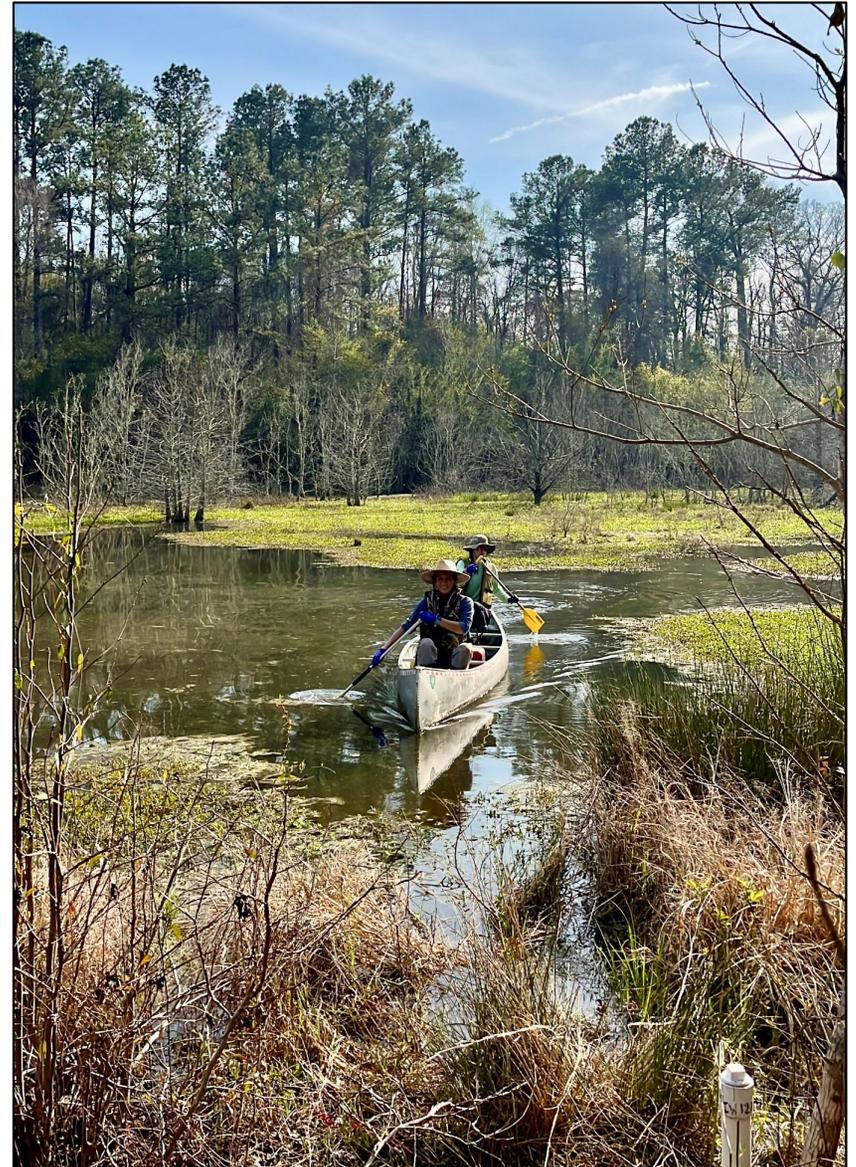


# Groundwater Sampling





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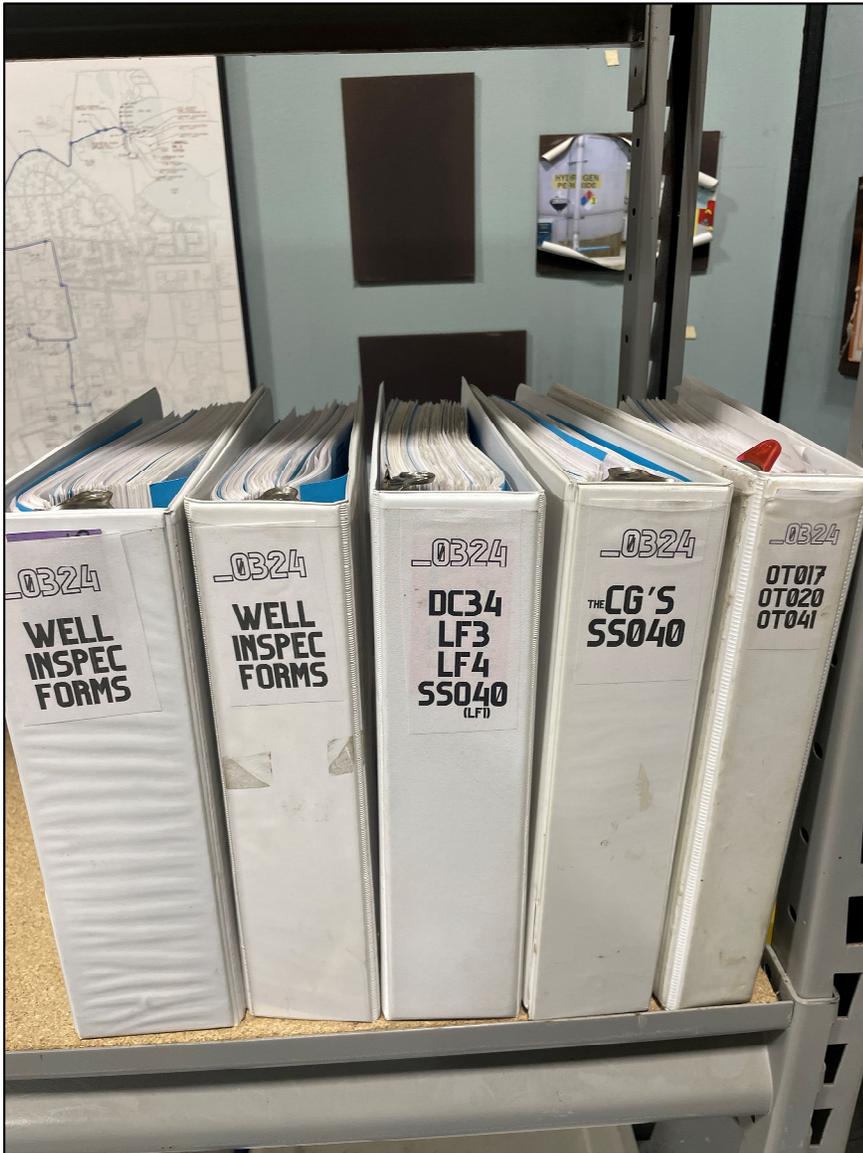


# Groundwater Sampling





# Groundwater Sampling





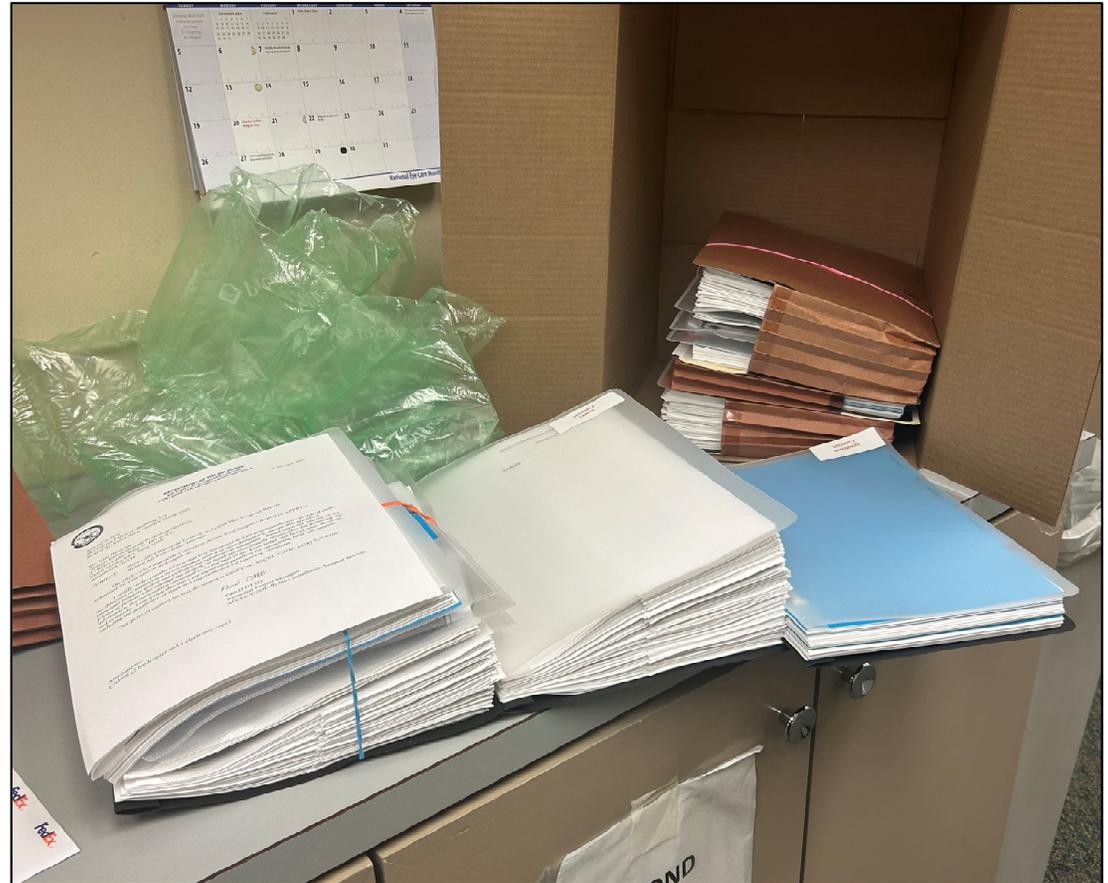
# IDW Management





# Data Validation and Reporting

- Analytical data from lab reports is validated by Synectics and team chemists
- CAPPR is updated annually based on data
  - Consolidated report for 18 RCRA sites at Robins AFB
  - LF004 is reported separately to USEPA because it is a CERCLA NPL site
- Sample plan for next basewide event is based on recommendations
- CAPPR is reviewed by internal QC, Air Force, USACE, and regulators



- 2023-2024 CAPPR was 5,975 pages
- Print version was 693 pages because lab reports and UFP-QAPP are on CD only



# Discussion

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# **New Business and Program Closing**

**Mr. Heyward Singleton  
RAB Installation Co-chair**



# Next RAB Meeting

Thursday, September 11, 2025





**Please...**

**Complete meeting evaluation and  
feedback form and return to sign-in table or leave at seat**

**Leave your name tag at the sign-in table or seat for next  
meeting**

**Thank you!**