Bel Aire Collection System Status Report

August 12, 2025

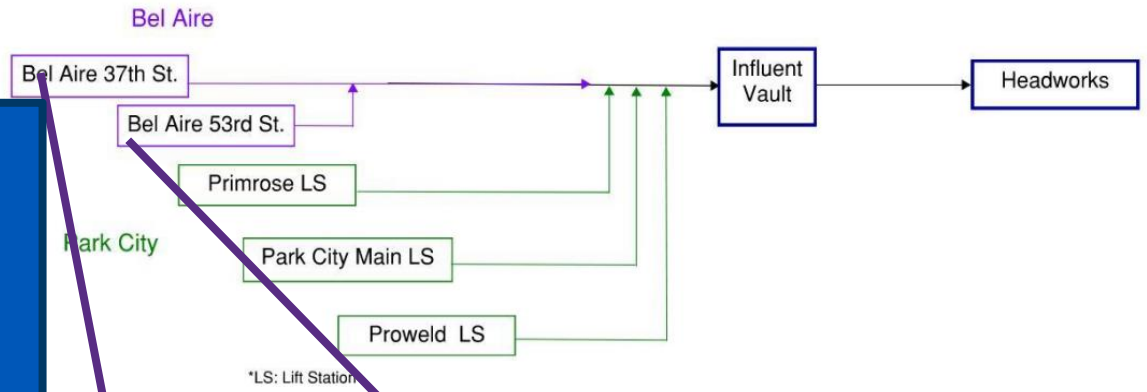
Agenda

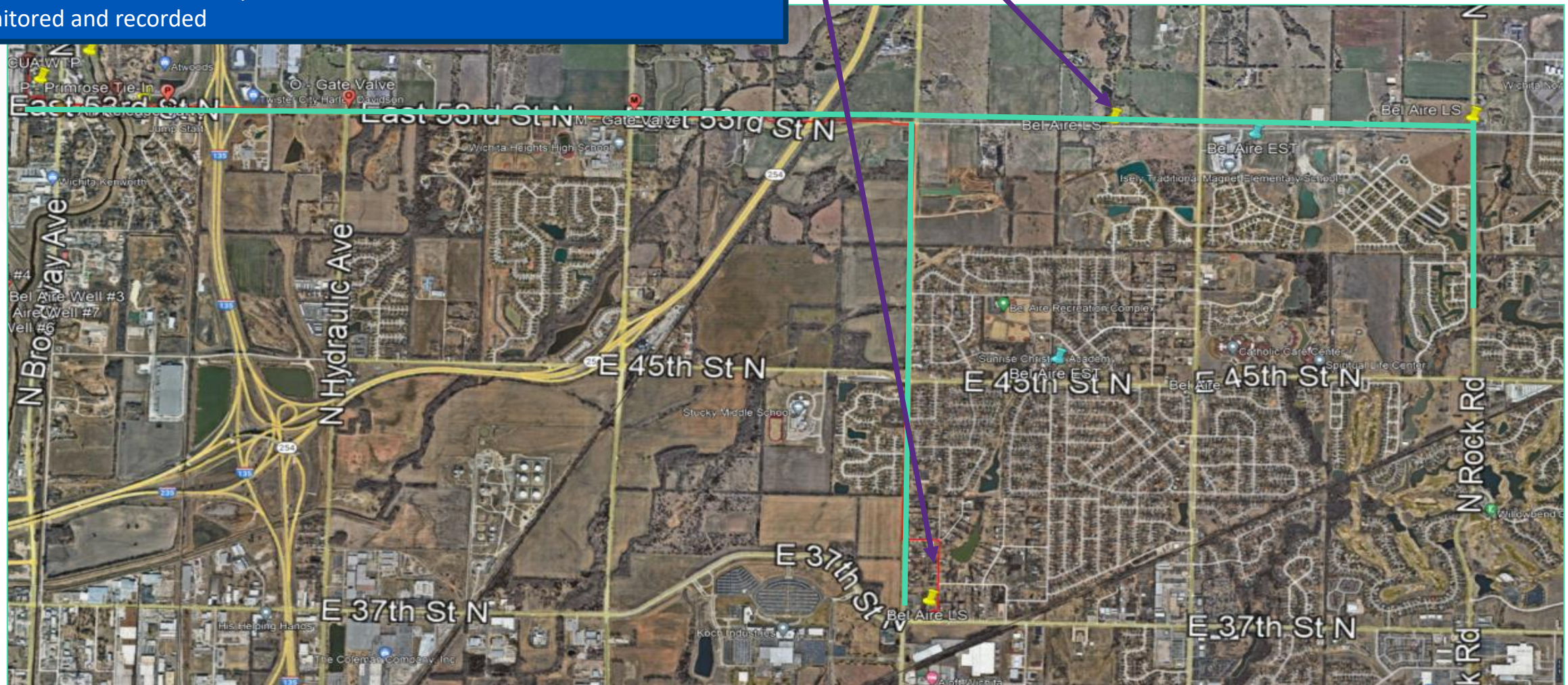
- Lift Station Wastewater Monitoring
- Collection System
  - Odor & Corrosion Control
- Next Steps

Lift Station Wastewater Monitoring

Monitoring Information

- Samples have been collected at B A lift stations since July 2023 (~weekly frequency)
- Starting in January 2025, CCUA began collecting samples at PC lift Stations
- Since July 2025, all sample collection activities are performed by CCUA
- Wastewater Flow Meters replaced at all Lift Stations: flows at all sites monitored and recorded





Monthly Analytical Averages

- **"Domestic Strength Wastewater" with "Extra Strength Wastewater"** shall mean wastewater that exceeds:
- 239 mg/L BOD
- 239 mg/L TSS
- 36 mg/L for Ammonia
- 8 mg/L Phosphorus

Based on the influent design capacity of the Seller's wastewater treatment facility*

	Harding Lift Station – 3800 N. Harding					53rd St. Lift Station – 5859 E 53rd N				
	BOD mg/L	TSS mg/L	NH_3 mg/L	TKN mg/L	TP mg/L	BOD mg/L	TSS mg/L	NH_3 mg/L	TKN mg/L	TP mg/L
January	263	189	44.4	61	6.8	586	1108	41.1	66	8.9
February	332	483	43.7	50.8	6.5	428	891	45.2	64.4	7.45
March	493	779	46.7	56.9	7.25	434	615.5	42.4	53.6	7.6
April	357	487	51	59.7	9.2	379	438	46	57	8.1
May	292	254	89	55	7.4	302	428	73.6	52.8	7.9
June	166	154	22.5	28	3.0	256	494	33	43	5
2025 YTD Avg	**334**	**421**	**51**	**53.1**	**7**	**378**	**565**	**48.7**	**54.2**	**7.2**
2024 Average	**381**	**373**	**42**	**60**	**8.0**	**319**	**382**	**41**	**52**	**7.3**
2023 Average	**397**	**491**	**43**	**66**	**8.0**	**360**	**285**	**38**	**54**	**6**
Literature Ranges	*100 – 400*	*250-850*	*12- 50*	*30 - 80*	*6- 14*	*100 – 400*	*250-850*	*12- 50*	*30 - 80*	*6- 14*
CCUA Targets	*229-334*	*221-440*	*30-40*	*45-73*	*6-8*	*229-334*	*221-440*	*30-40*	*45-73*	*6-8*

*Pg. 2 - Sixth Supplemental Water Supply and Wastewater Service Agreement between CCUA & the City of Bel Aire Kansas

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Monthly Flow - Million Gallons

	Harding/37th MG	53rd St MG	Total Bel Aire Flow	CCUA Influent MG	Percent Flow
January	11.64	5.156	16.796	36.3217	46.2%
February	11.393	4.953	16.346	36.883	44.3%
March	12.25	5.215	17.465	37.701	46.3%
April	14.318	5.407	19.725	41.264	47.8%
May	13.346	5.796	19.142	45.42	42.1%
June	20.535	6.906	27.441	63.191	43.4%
Total YTD	**83.482**	**33.433**	**116.915**	**260.781**	**44.8%**

Bel Aire Wastewater Loading Calculations

	37th & Harding Lift Station							53rd St N Lift Station						
	Flow - MG	BOD MO AVG mg/L	Total MO. BOD lbs.	BOD ES Chgs.	TSS Mo AVG	Total Mo TSS lbs	TSS ES Chgs	Flow - MG	BOD MO AVG mg/L	Total Mo BOD lbs	BOD ES Chgs	TSS Mo Avg mg/L	Total Mo TSS lbs.	TSS ES Chgs
January	11.64	263	25531	$ 698.96	189	18348	$ -	5.156	586	25198	$ 4,476.41	1108	47645	$9,341.98
February	11.39	332	31546	$ 2,650.99	483	45894	$ 5,796.07	4.953	428.5	17700	$ 2,348.36	891	36805	$6,733.21
March	12.25	493	50393	$ 7,792.64	779	79586	$ 13,792.28	5.215	434.25	18886	$ 2,547.61	615.5	26770	$4,093.79
April	14.32	357	42654	$ 4,234.35	486.6	58106	$ 7,391.61	5.407	378.6	17072	$ 1,888.55	437.6	19733	$2,238.94
May	13.35	292	32501	$ 1,769.76	254	28299	$ 424.35	5.796	301.5	14574	$ 906.35	427.8	20676	$2,280.98
June	20.54	166	28387	$ -	154.25	26417	$ -	6.906	255.5	14715	$ 28.51	494.5	28481	$ 367.89
Total Pounds			211012			256650				108148			180112	
Total Charges/ Pollutant			BOD	$ 17,146.70		TSS	$ 27,401.31			BOD	$12,195.79		TSS	$20,168.97
Total Charges ES YTD			$	**76,915.77**										

FORMULAS

Total Pounds = (BOD or TSS result)x (Monthly Flow in MG) x (8.34 CF)

BOD CHG = Total Pounds (mg/L-239) x $0.30

TSS CHG = Total Pounds (mg/L-239) x 0.25

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Loading Contributions to CCUA

	Bel Aire Calculations			*Park City Calculations*			*CCUA*		*LIFT STATIONS TOTALS*
BOD	*Bel Aire BOD Mo. Avg Pounds*	*BA Percent of CCUA influent*	*BA percent of LS Total Pounds*	*Park City BOD Mo. Avg Pounds*	*PC Percent of CCUA influent*	*PC percent of LS Total Pounds*	*CCUA Monthly BOD Conc. Mg/L*	*Total BOD Pounds CCUA Influent*	*Total BOD Pounds calculated from LS*
June	43,102	48%	37%	73,911	83%	63%	170	88,956	117,013

TSS	*Bel Aire TSS Mo. Avg Pounds*	*BA Percent of CCUA influent*	*BA percent of LS Total Pounds*	*Park City TSS Mo. Avg Pounds*	*PC Percent of CCUA influent*	*PC percent of LS Total Pounds*	*CCUA Monthly TSS Conc. Mg/L*	*Total TSS Pounds CCUA Influent*	*Total TSS Pounds calculated from LS*
June	48,976	40%	23%	165,565	135%	77%	233	122,583	214,541

- Lift Station concentrations are higher than CCUA influent concentrations, influencing the calculations
- Differences in loadings between cities could be attributed to Bel Aire's proactive measures

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Collection System Activities
Odor/Corrosion Control Abatement

Areas of Odor and Corrosion Detected

- Odor complaints from residents near the 53rd St. Lift Station (LS) & on Lycee (Webb Rd LS)
- Inspections have found substantial grease build-up in LS wetwells
- Significant corrosion of manhole vaults and lids on sanitary sewer line serving 53rd St N LS
- Odors and corrosion result of excess hydrogen sulfide (H2S) present in the sewage likely due to extended mean residence time of wastewater in the collection system

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Mitigation Efforts: Odors – Corrosion-Grease

Sanitary Sewer Activities Year to Date

Activities	Measurement
Feet of Sewer Lines Cleaned	**9500** feet cleaned
Feet of Sewer Lines Televised	**1200** feet televised
Number of Locations Odalog Measurements	**2** Webb Road force main Injection at Lycee Rock Road Force Main Injection on 53rd St.

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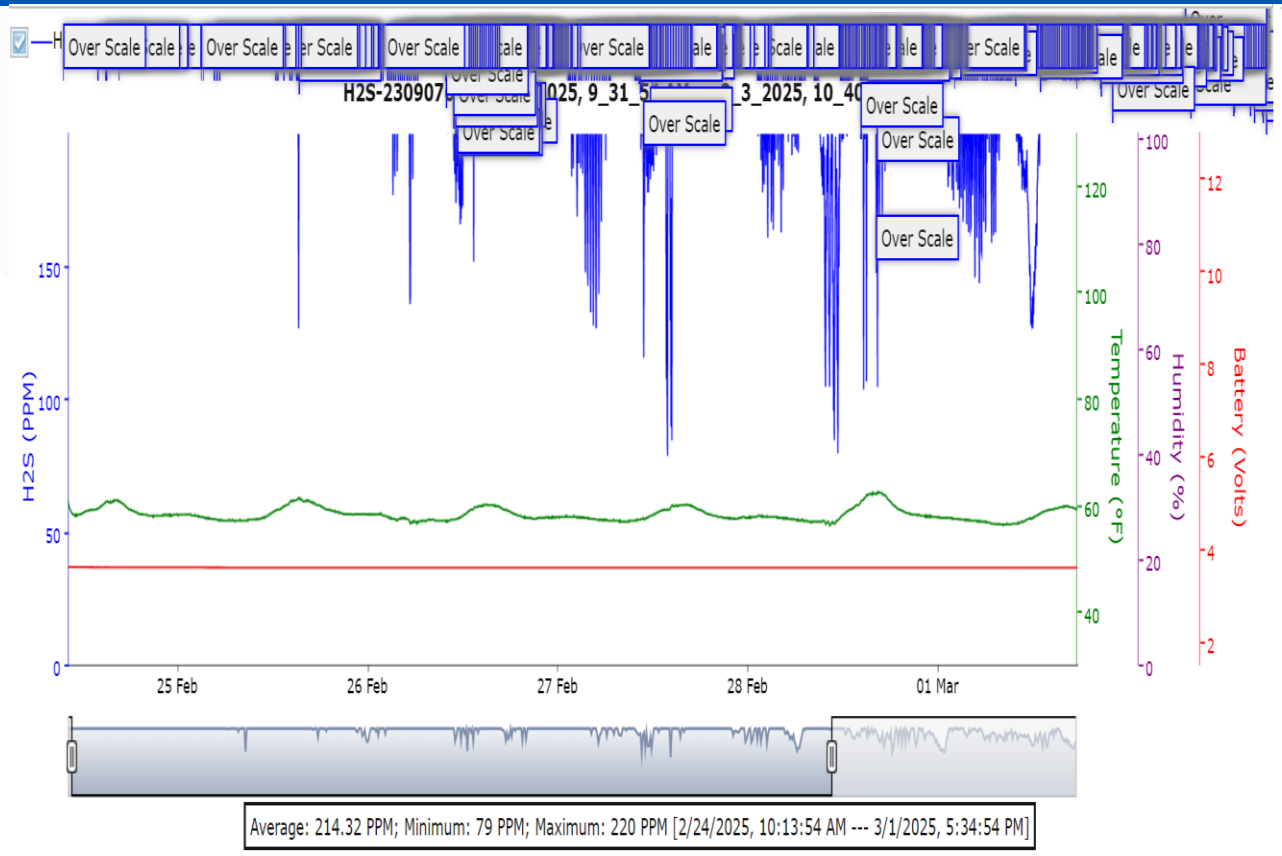
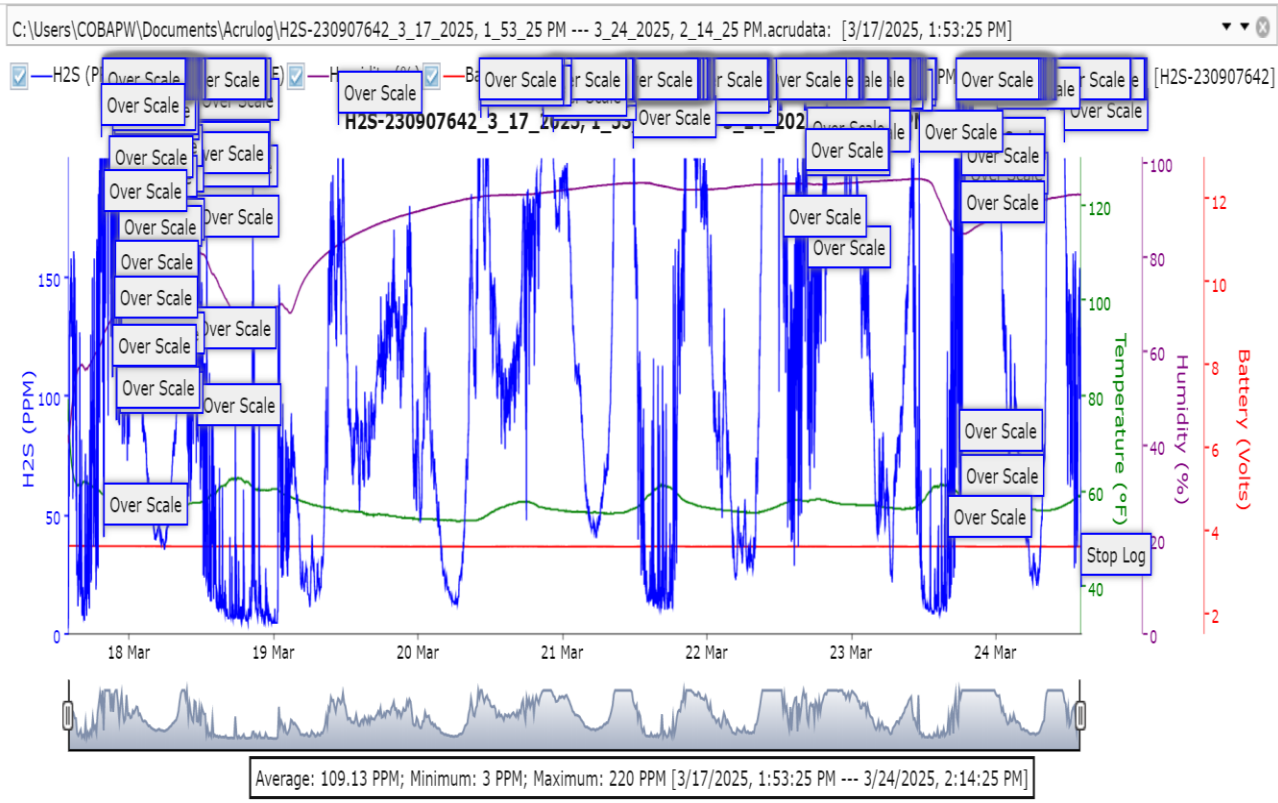
Odalog Results- 53rd Street Sewer Feb & Mar. 2025





Manholes at Rock Rd. Injection site and Downstream of Injection site

Sulfide measurements were above maximum detection

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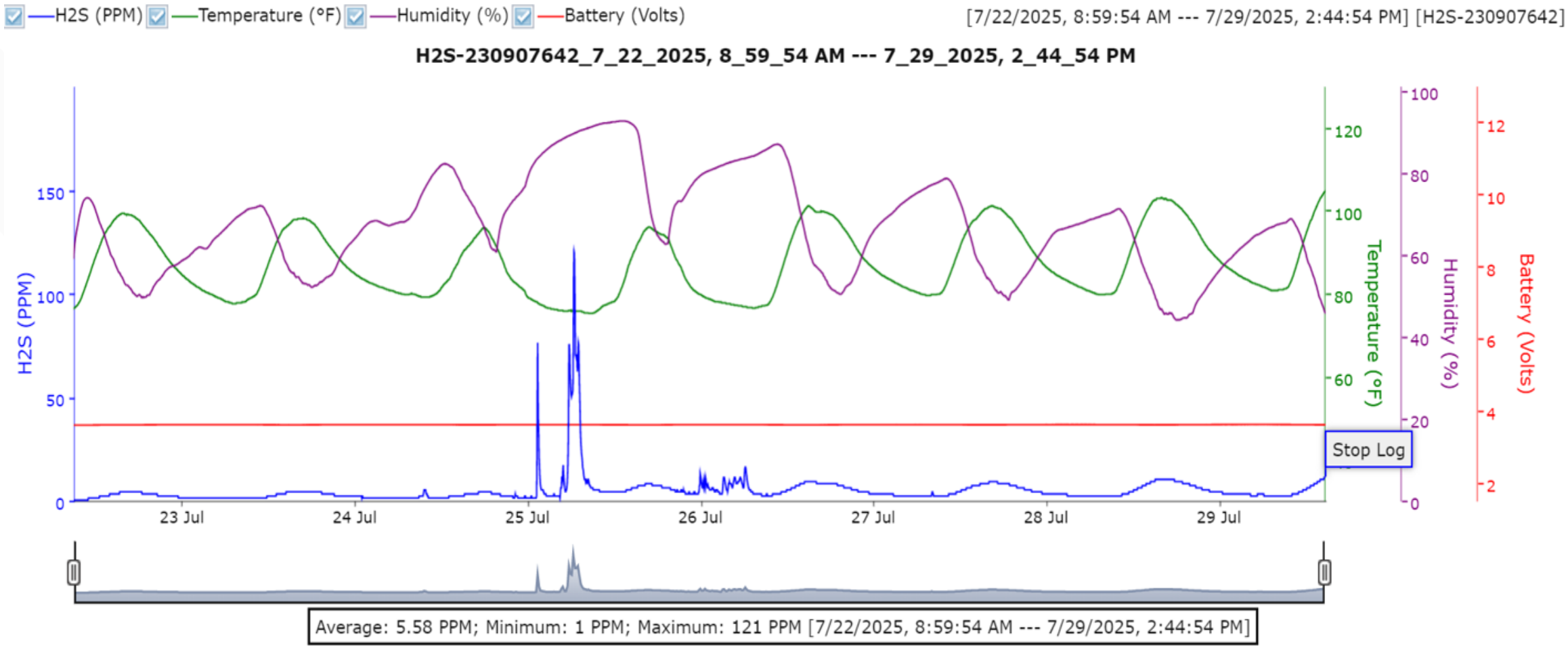
Odalog results at Lycee –July, 2025



Manhole Location – Webb Road LS Force Main Injection Point

Mitigation Efforts: Odors-Corrosion-Grease

Lift Stations Year To Date:

Activities	Measurements
LS Wetwells Cleaned	3
Frequency of Odalog measurements at Wetwells	6
Pumps Replaced	2

- Replaced pump at Harding - New pump at 53rd expected in August
- Bioblocks & Dish Soap additions to wetwells to reduce grease/odors
- Extended Vent Pipes for odor control @ Rock Road and Harding
- Wetwell Aerators at 53rd , Rock Rd, Webb, and Harding
- In July, sampling activities were transferred to CCUA staff

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Webb Road Lift Station

1. Lift Station (LS) designed to receive future flows becomes septic due to extended retention and detention times
2. When wastewater in the lift station is pumped to the LS force main, the wastewater continues to reside in the force main increasing H2S formation
3. Actions Taken to Address Odors & Corrosion:
   - Installed Water Hydrant & Flush Weekly
   - Scheduled Wetwell Cleanings
   - Proposed Chemical Treatment

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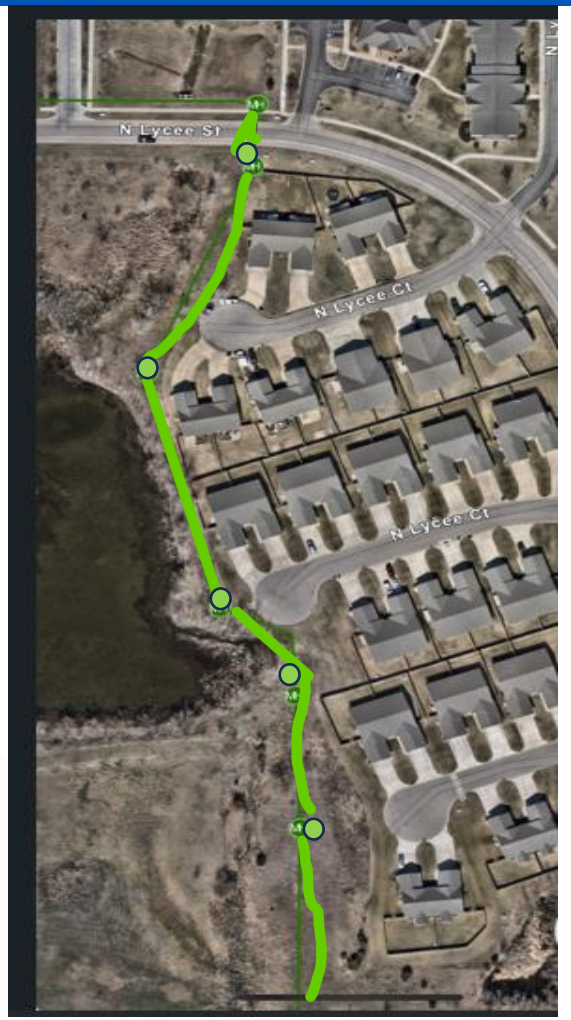
Lycee Manhole Assessment

- Webb Road Lift Station Force Main ties into the gravity line that is west of Lycee (Rock Springs Addition)
- Recent visual inspections of the sanitary sewer manhole vaults is showing signs of corrosion
- Recommend further evaluation to determine best alternatives for manhole rehabilitation



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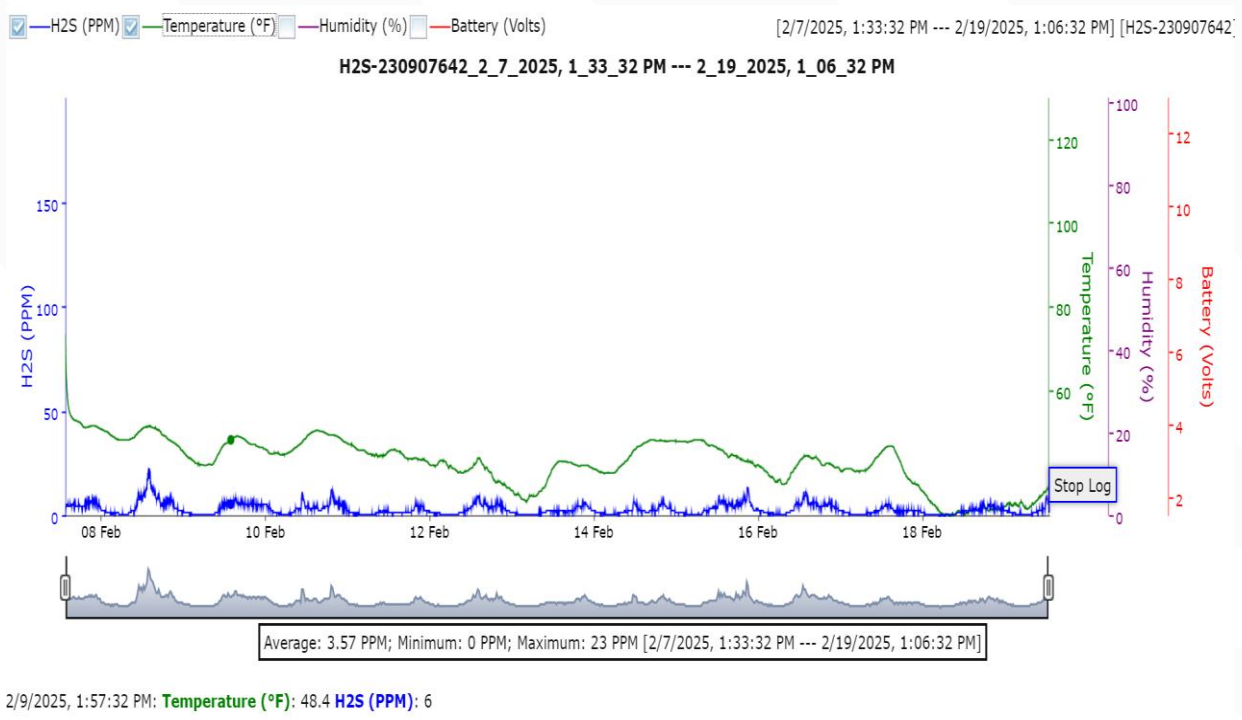
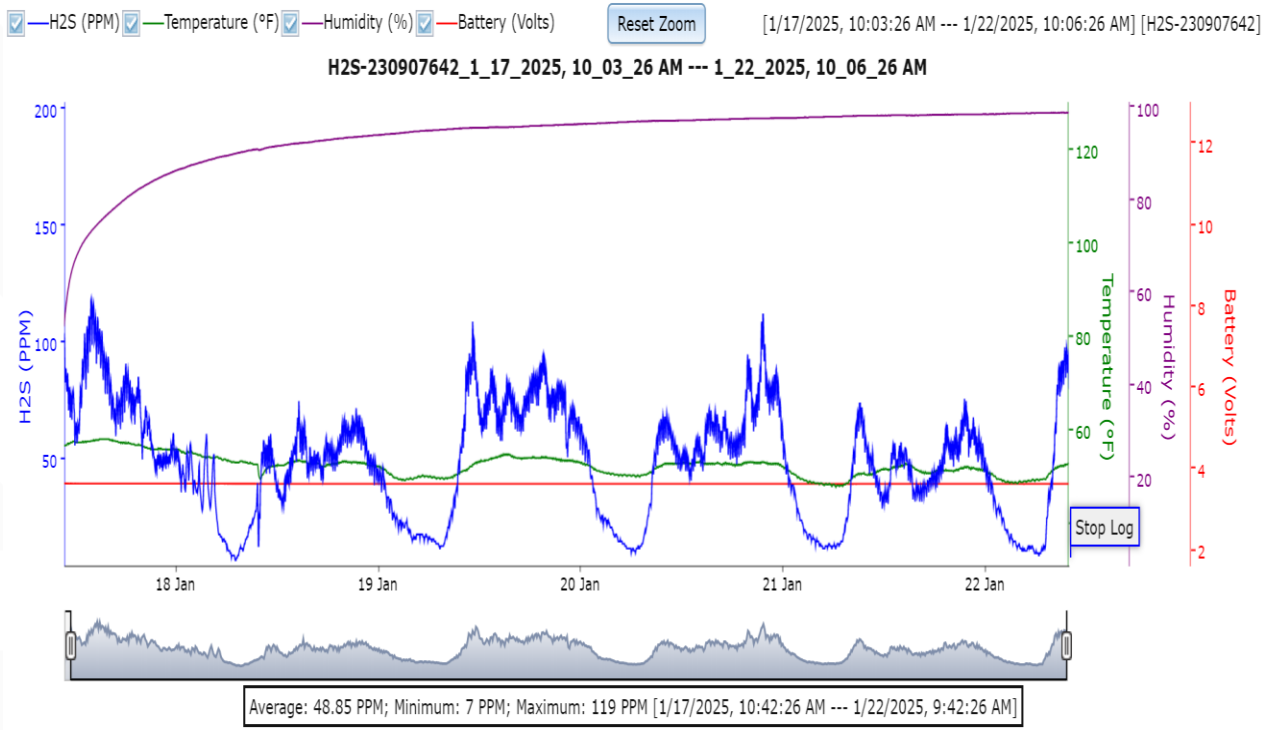
LS Odalog Monitoring Results
Jan & Feb



Rock Rd. LS



53rd St. LS

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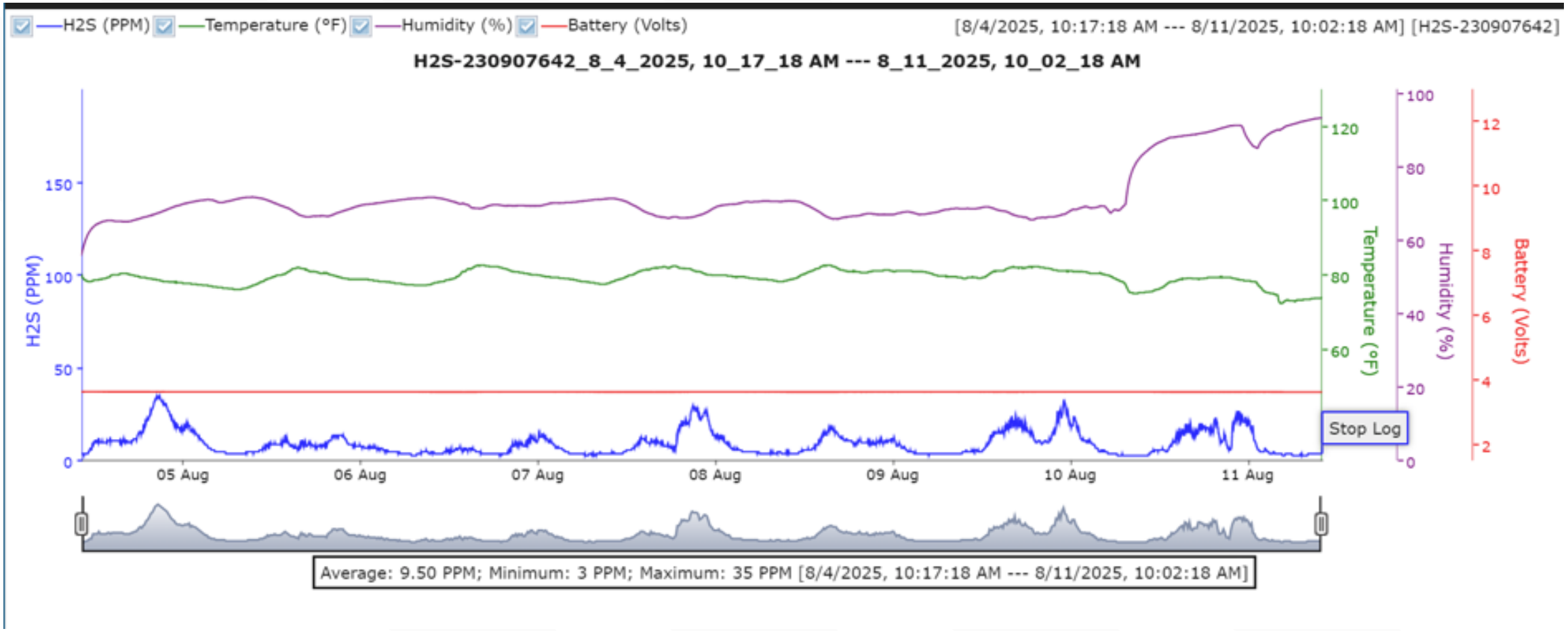
Webb Rd LS Odalog Monitoring Results



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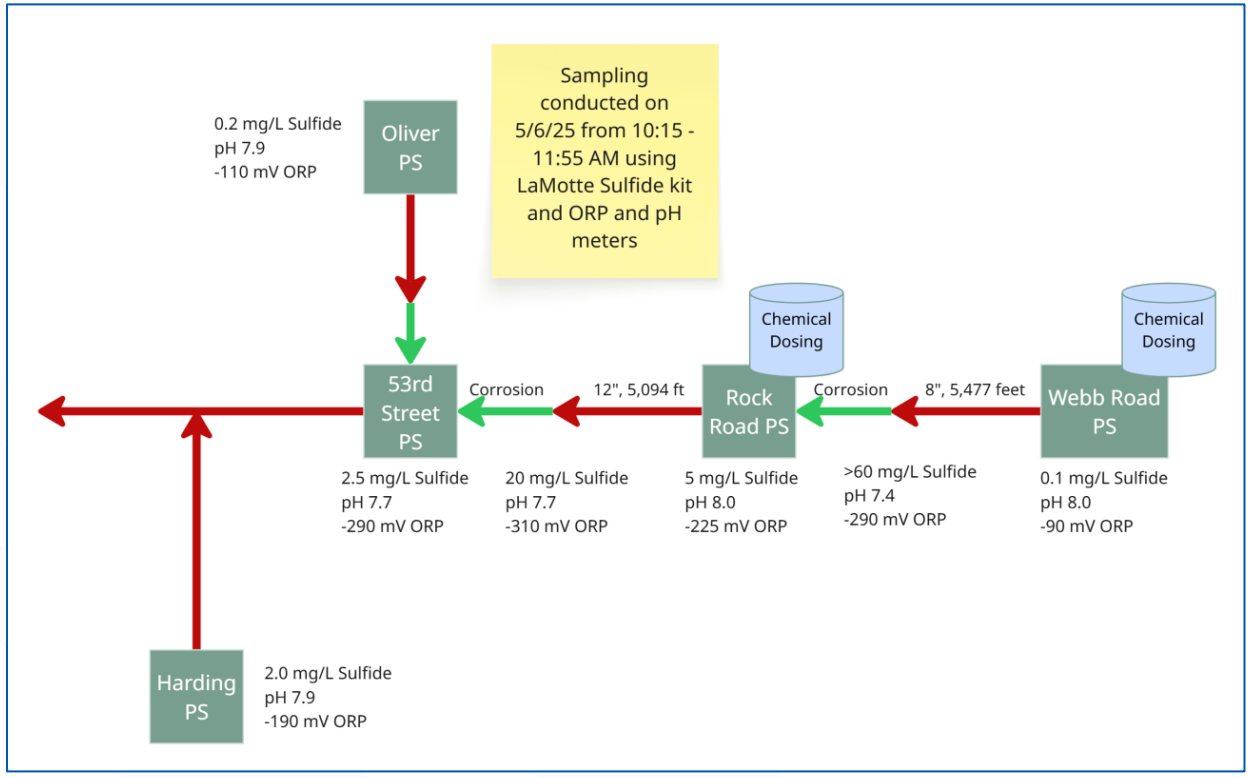
Hydrogen Sulfide (H2S) Control -

TECHNOLOGY	COST	RESULTS/COMMENTS
Aeration	**$4,100/Aerator**	Installed at 3 Lift Stations. Effective in reducing grease cap in wetwell. Limited effect in H2S reduction
Bioaugmentation Bacteria Blocks	**$292/bioblock/LS Replace 30-90 days ($1,168/LS/yr)**	Installed at 3 Lift Stations
Raise Vents, Replace Covers, Add Filter	**$80/vent cover Carbon media replaced every 2 years ~$25**	Installed carbon vent covers at 2 lift stations. Reduction of odors in immediate area
Scheduled Wetwell Cleanings	**2 Staff/ site 2-3 hours**	Starting in July staff implemented a routine cleaning of wetwells, pumping down water levels, power-washing sides and apparatus
Chemical Addition at Lift Station	**Estimate: $75,000/yr**	Odor control service provider submitted pilot to determine effectiveness and dosage rates

Odor Control Chemical Control

The City reached out to USP Technologies to submit a proposal to chemically treat hydrogen sulfide in the collection system to reduce odors and corrosion. Based on the provided information, SulFeLox® appears to be a promising solution for the City's hydrogen sulfide (H_2S) problem in its wastewater collection system It is designed to treat both vaporous H2S (causes odors) and dissolved H2S (causes corrosion).



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Pilot Study Cost Estimate

2 totes of SulFeLox cost estimate: 2 totes of SulFeLox: $24.48/gallon * 2 totes * 300 gallons/tote = **$14,904.00**

Includes:

Installation of peristaltic dosing pumps

Liquid and vapor phase sampling in the collection system for total sulfide, dissolved sulfide, temperature, pH, ORP, and iron residuals (minimum of monthly frequency, more often during trial startup period)

Unlimited on-call technical applications support and guidance will be provided when requested by experienced water treatment professionals

A comprehensive report summarizing findings and recommendations will be prepared and presented at the conclusion of the trial

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Estimated Odor Control Chemical Annual Cost

Dependent on successful outcome of pilot

	2 Totes/Order	6 Totes /Order	13 Totes/Order
Max Dosage - 3 Totes/Mo	$264,384/yr	$134,136/yr	$112,860/yr
Min Dosage 1.5 Totes/Mo	$132,192/yr	$67,068/yr	$56,430/yr

SulFeLox, a low-hazard ferrous chloride product, in 300-gallon totes

- $24.48/gallon ▪ 2 totes per order, 2 stops
- $12.42/gallon ▪ 6 totes per order, 2 stops
- $10.45/gallon 13 totes per order, 2 stops

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Manhole Rehabilitation Project

- City of Bel Aire has identified14 manholes on 53rd St between Prestwick & Oliver for rehabilitation/replacement project
- Council approved a contract in 2023 to perform manhole rehabilitation work which was not completed due to condition of the manholes - found to be in worse state than expected
- Staff sought Engineering Assistance Scope:
  - Manhole Condition Assessment
  - Data Review & Recommendations
  - Prepare Contract Drawings and Specifications
  - Engineer's Opinion of Probable Construction Cost
  - Preliminary Design Submittal & Review
  - Final Submittal

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NEXT STEPS

Pretreatment Program

Staff plans to follow up on User paperwork submittals and inspect Fall, 2025

Wastewater Monitoring Program

Collection transferred to CCUA

Continue to monitor results for true-up

Odor/ Corrosion & Manhole Rehab

Proceed with Pilot & Consider Annual Program

Evaluate Manhole Condition Assessment and Specification Development

CREATE AMAZING.

Collection System Map