Lawrence, Myrl

Subject: FW: City of Eureka Springs Circuit Rider Assistance Program Compliance Plan
Attachments: Circuit Rider Compliance Plan_Eureka Springs_Draft to City_4-21-2020.pdf

From: Loston, Anthony [mailto:Loston.Anthony@epa.gov]
Sent: Wednesday, April 22, 2020 7:14 AM
To: dallen@cityofeurekasprings.org
Cc: Healey, Richard; Saunders, Jerry; Seager, Cheryl; Peters, Carol; Loston, Anthony; Walker, Brent; Bolenbaugh, Jason; McCabe, Kerri; Johnson, Miles; Blanz, Bob; Savitske, Greg; Danny O'Connell; Stephen Clark; Heminway, Seth; VanTil, Barbara; Sarah Hays; eswwtp@yahoo.com; mayor@cityofeurekasprings.org
Subject: City of Eureka Springs Circuit Rider Assistance Program Compliance Plan

Mr. Allen,

Attached is the initial draft of the City's Compliance Plan developed under U.S. EPA's Circuit Rider Assistance Program. This document is a draft in progress and is based on discussions with City representatives and observations made during the initial site visit conducted in February 2020; it may be updated as necessary based on remote advising calls and/or additional site visits.

Danny O'Connell and Stephen Clark with PG Environmental will be coordinating with you directly to continue the technical assistance process. They intend to discuss the content of the Compliance Plan, answer any questions you may have, and clarify how the Circuit Rider Assistance Program will support the City in implementing improvement actions.

Sincerely,

Anthony M. Loston, Environmental Engineer
Arkansas State Enforcement Coordinator, EPA Region VI
EPA Region VI Vessel General Permit Enforcement Coordinator
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City of Eureka Springs, Arkansas
Wastewater Treatment Plant (WWTP)

CIRCUIT RIDER ASSISTANCE PROGRAM
COMPLIANCE PLAN

Revision No. 0
April 21, 2020

Technical assistance provided under contract from:
U.S. Environmental Protection Agency
Office of Compliance
1200 Pennsylvania Avenue
Washington, DC 20460

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TABLE OF CONTENTS

Appendices

I. INTRODUCTION

The United States Environmental Protection Agency (EPA) has developed and implemented two National Compliance Initiatives (NCIs) that focus on long standing non-compliance challenges at wastewater and drinking water facilities in small communities, including those in Indian Country. The "Reducing Significant Non-Compliance (SNC) with National Pollutant Discharge Elimination System (NPDES) Permits" NCI aims to reduce the number of NPDES-permitted facilities in SNC. Likewise, under the "Reducing Non-Compliance with Drinking Water Standards at Community Water Systems" NCI, EPA and state partners aim to help systems in small, often under-resourced, communities to achieve and maintain compliance.

To support these NCIs, EPA is providing compliance assistance via a circuit rider assistance program. Technical assistance providers will provide hands-on, face-to-face technical compliance assistance to operators of small wastewater and drinking water systems to help correct issues that may be causing or contributing to non-compliance. Technical assistance providers will develop a Compliance Plan for each system that includes a facility summary, list of site visit observations and areas of concern, and a prioritized list of activities to help achieve and/or maintain compliance.

On February 26, 2020, Danny O'Connell and Stephen Clark, EPA Contractors with PG Environmental (technical assistance providers), conducted an initial circuit rider site visit to understand the challenges that may be causing and contributing to non-compliance at the City of Eureka Springs (City) Wastewater Treatment Plant (WWTP). The EPA Contractors were joined by representatives from EPA Region 6 and Arkansas Department of Environmental Quality (ADEQ); refer to Appendix 1 for the site visit sign-in sheet. The site visit consisted of discussions with City representatives, document reviews, and a walk-through of the WWTP.

Note: *This initial Compliance Plan is a draft in progress and is based on discussions with facility representatives and observations made during the initial site visit; it may be updated as necessary based on remote advising calls and/or WWTP revisits.*

II. FACILITY SUMMARY

Facility Summary	
Facility	City of Eureka Springs WWTP
Permittee Name	City of Eureka Springs, Arkansas
NPDES Permit No.	AR0021865
Permit Expiration Date	January 31, 2024
Location (Latitude, Longitude)	36.419674, -93.734624
Receiving Waterbody	Leatherwood Creek
Design Flow	0.9 million gallons per day (MGD)
Treatment Type	Screening, grit removal, two-tank sequencing batch reactor (SBR), post-aeration, and ultraviolet disinfection. The City uses chemical addition prior to SBRs for phosphorus removal (alum) and pH adjustment (sodium hydroxide).

Facility Summary	
Service Area and Population Served	The City experiences a seasonal influx of tourists during the non-winter months, especially during summer. The service area is primarily residential with some commercial.
Compliance Status	The City's compliance status has been cyclical for the past three years. The City was in compliance with its NPDES permit at the time of the site visit. However, for the past three years, the City has consistently been in violation during the month of June and then in a state of SNC in July due to effluent violations of monthly average and weekly average ammonia-nitrogen limits. Effluent exceedances for fecal coliform have also occurred at the WWTP.

III. INITIAL SITE VISIT OBSERVATIONS AND AREAS OF CONCERN

This section summarizes the initial site visit observations and associated areas of concern, which are presented in Table 1. The technical assistance providers recognize that some areas of concern will require a capital improvement expenditure. Such improvement actions are beyond the scope of the circuit rider program. However, the technical assistance providers have identified "programmatic" improvements the City could undertake that will promote compliance; these actions fall within the scope of the circuit rider program. For each area of concern, Table 1 identifies the likely capital expenditures as well as the programmatic measures. Where a programmatic measure has been identified, Table 1 refers to the associated "Recommended Improvement Action" table presented in Section 4 of this compliance plan.

Refer to Appendix 2 for photographs that document the site visit and areas of concern, where applicable; some photographs are provided for general context only. Therefore, not all photographs highlight an area of concern.

Table 1. Areas of Concern, Observations, and Improvement Actions

Area of Concern	Observations	Improvement Actions
Lack of a Complete and Formal Process Control Approach for WWTP Operations	1. The City had not fully developed and implemented a formal process control plan; therefore, operational changes were primarily made based on operator intuition and institutional knowledge. a. The City was performing some process control sampling when time allowed (mixed liquor suspended solids (MLSS), settleability) but was not formally trending or analyzing analytical results so that process operations and the possible need for modifications could be evaluated. b. Solids wasting rates were not adjusted based on formal evaluations of process control parameters (e.g., MLSS, settleability). c. The City was not adjusting operational modes based on seasonal differences in wastewater characteristics. d. The City had worked with an outside consultant to adjust operational settings; however, the City reverted to the previous operational settings it was using. e. The City was not adjusting the chemical dosing rates of alum and sodium hydroxide based on a formal diagnostic approach. f. The City was not formally verifying the performance of chemical addition (e.g., no jar tests were being performed to verify the performance of alum addition).	• Programmatic improvement; See: Recommended Improvement Action No. 1 – Develop and Implement a Process Control Plan.
Inflow and Infiltration (I/I) in the Collection System	1. The City's collection system suffers from I/I that causes spikes in influent flow to the WWTP during wet weather, thereby impacting treatment processes. a. The following was documented in the *WWTP Daily Operator Logs* between October 2019 and February 2020: i. On January 11, 2020, effluent flows reached 2.0 MGD (more than twice the WWTP's dry weather design flow) after the City received 2.5 inches of rain. ii. On December 2, 2019, the Lakeside pump station's fine screen auger was jammed (the cause was not documented) and on	• The City should consider seeking funding to conduct a formal sanitary sewer evaluation study (SSES) and implement the associated improvement projects. • Programmatic improvements can be made to identify readily observable sources of I/I. See Recommended Improvement Action No. 2 – Implement

Area of Concern	Observations	Improvement Actions
	December 3, 2019, the pump station's pumps were jammed with rocks. Both of these events indicate possible failures in upstream sewer assets (i.e., sources of inflow). b. The City has periodically discovered aggregate/rocks at the WWTP headworks. c. Elevated influent flows cause the WWTP influent pump station's wet well to overflow. The pump station is located within the WWTP fence line. 2. Arkansas Rural Water has assisted the City in conducting smoke testing of portions of the collection system but, due to funding constraints, were not able to complete testing of the entire collection system. The City prioritized smoke testing the more densely populated areas of the City. 3. The City found evidence of a water leak in the distribution system but has not located the leak (the City has sampling equipment for chlorine and fluoride to identify potable water sources). The City has money budgeted to address the leak. 4. The City's topography is conducive to flash-flooding events. 5. After the WWTP walk-through, the technical assistance providers, City representatives, and site visit attendees walked select areas of the collection system potentially affected by sources of inflow (i.e., areas prone to flooding). The group observed an open city-owned manhole with the cover and safety cones located adjacent to the opening. The City representatives were unaware how long the manhole cover had been removed from the crown and stated they had not removed the manhole cover.	Procedures to Identify Sources of I/I. • The WWTP has several decommissioned assets (clarifier and trickling filter) that could store wastewater during wet weather. See Recommended Improvement Action No. 3 – Repurpose Decommissioned Assets for Wet Weather Operations.
Solids Washout from the SBRs to the Post-Aeration Basin and Receiving Waterbody	1. At approximately 1:30 p.m. on the day of the site visit, a brown-colored plume that appeared to contain wastewater solids was observed in Leatherwood Creek immediately downstream of the outfall. The water upstream of the outfall was clear. a. The EPA contractors revisited the SBRs and downstream process units to evaluate conditions that contributed to the plume. b. Multiple sludge judge readings obtained in the post-aeration basin while the basin was in standby mode (the aerators were turned off) demonstrated	• Programmatic improvements to implement SOPs for the identification and removal of solids; see Recommended Improvement Action No. 4 – Develop and Implement SOPs for Monitoring and Removing Solids from the Post-Aeration Basin.

Area of Concern	Observations	Improvement Actions
	approximately 3 feet of solids in the bottom of the basin. The depth of wastewater in the basin was approximately 9 feet. c. The color of the water in the basin immediately turned brown after the operator activated the aerators, indicating a significant solids concentration. d. The root cause of the solids in the basin was not determined at the time of the site visit (it was unclear if this was due to elevated flows through the plant, improper operating conditions, or both).	
Lack of Operation and Maintenance (O&M) Documentation for the WWTP and Collection System	1. In addition to the lack of formal protocols for process control, the City lacked documentation and tracking mechanisms for the O&M activities that were being performed at the WWTP and in the collection system. For example, the City had not implemented a detailed operations log or work order system. Scheduling and performing WWTP O&M relies primarily on the institutional knowledge of the operators and most maintenance is corrective, not preventive. 2. The technical assistance providers acknowledge that the City experiences various equipment challenges (e.g., solids belt press failures, influent pump station flooding) and operational challenges (extreme I/I) and that these challenges contribute to a backlog of preventative maintenance activities.	• The City should consider seeking funding to implement various equipment upgrades as part of a formal capital improvement plan. • Programmatic improvement; See Recommended Improvement Action No. 5 – Develop and Implement O&M Tools.
Leaking Chemical Feed Pump	1. The sodium hydroxide chemical feed pump in the solids processing building was leaking and spraying 50% sodium hydroxide solution to the surrounding area including the floor, a work bench, and personal protective equipment (PPE; rain jacket and face shield). The cause was not determined at the time of the site visit, but it appeared to be due to a hose and/or pump gasket failure. The operator acquired PPE from another process area prior to shutting down the pump. 2. Some components of the pump were encased in solid sodium hydroxide. The operator mentioned some of the challenges associated with the storage of the sodium hydroxide solution during the lower winter temperatures (i.e., sodium hydroxide can crystalize between 50 and 53.6°F). 3. It appeared that the leaking pump would have impacted the intended dosing rates (the sodium hydroxide was used to adjust influent pH).	• Programmatic measures need to be taken to develop and implement safety protocols associated with chemical storage and handling at the WWTP. To protect their health, operators need to be aware of proper safety protocols for handling and working with sodium hydroxide, including proper PPE measures. • Programmatic improvements to ensure proper chemical dosing rates; see Recommended Improvement Action No. 1 –

Area of Concern	Observations	Improvement Actions
		Develop and Implement a Process Control Plan.

IV. RECOMMENDED IMPROVEMENT ACTIONS

This section identifies possible improvement actions intended to help the City achieve and/or maintain compliance. Each improvement action has been identified in its own table on the following pages. Each table contains the following information:

- Recommended Improvement Action – The primary action to correct the area of concern.
- Area of Concern Addressed – The overall concern in need of corrective action.
- Improvement Goal – The incentive or explanation for why the action is being implemented.
- Recommended Approach – The major actions or steps to implement the recommended improvement action.
- Points of Interest/Variables to Consider – The critical points of interest and variables to be evaluated during the implementation process.
- Document Format – The anticipated format(s) of the data and documents that are expected to be generated during the process.
- Performance Indicators – The mechanisms by which compliance improvement will be measured.
- Potential Barriers to Implementation – The anticipated significant challenges to implementing the recommended improvement action.

The actions described in this section of the compliance plan are recommendations. It is ultimately up to the City, in consultation with ADEQ as appropriate, to decide on the actions necessary to achieve compliance with its NPDES permit requirements. The technical assistance providers will refer the City to appropriate reference and training documents and provide technical assistance where applicable to aid in the implementation of each recommended improvement action.

Recommended Improvement Action No. 1	**Develop and Implement a Process Control Plan**
Area of Concern Addressed	Lack of a Complete and Formal Process Control Approach for WWTP Operations
Improvement Goal	To ensure that operational decision making is informed by operational data
Recommended Approach	• Develop written SOPs and support tools • Collect and trend data • Determine desired operational ranges based on effluent quality
Points of Interest/Variables to Consider	• Incorporate the trouble shooting procedures contained in *Trouble Shooting the Sequence Batch Reactor*, by Michael H. Gerardi. This manual is available to download for free. • The Siemens *Operator/Process Reference Manual* has valuable guidance and troubleshooting procedures; however, the above document contains more extensive monitoring and troubleshooting procedures. • Evaluate if adjusting operational modes based on seasonal differences in wastewater characteristics can improve the effluent quality (e.g., should the react time be lengthened during the summer to account for the increased influent strength) • Understand how to perform key tests and how parameters relate to one another for SBR process control and troubleshooting: o 30-minute Settleability o Dissolved Oxygen (DO), pH, alkalinity, oxidation reduction potential (ORP) o MLSS/Mixed Liquor Volatile Suspended Solids (MLVSS) o Food to Microorganism Ratio (F:M) o Sludge Age (SA) / Mean Cell Residence Time (MCRT) o Sludge Volume Index (SVI) o Microscopic examination • Conduct hydraulic and organic loading analyses • Collect data on weekends during the summer • Implement proper chemical dosing rates and procedures to evaluate dosing rates when they are not known • Implement sludge wasting rates based on operational data • Consider additional operator training
Documentation Format	• Written SOPs (sample collection procedures and frequencies, troubleshooting methodology, etc.) • Operations sheet for data collection and review • Electronic spreadsheet to track and trend process control data
Performance Indicators	• Development and implementation of a Process Control Plan, SOPs, and support tools • Increased amount of data collected • Tracking and trending of process control data

	• Operational ranges determined based on desired effluent quality
Potential Barriers to Implementation	• Staffing (both time and technical expertise) required to collect and trend data and to perform diagnostic evaluations • Some monitoring equipment may need to be purchased to perform process control tests

Recommended Improvement Action No. 2	**Implement Procedures to Identify Sources of I/I**
Area of Concern Addressed	I/I in the Collection System
Improvement Goal	• To identify and address readily observable sources of I/I in the collection system • To improve inventory and mapping of the collection system • To have documentation and datasets to support future collection system rehabilitation projects

Recommended Approach	• Develop and implement a collection system management tool that tracks activities in City manholes and sewer lines
	• Evaluate upstream sewer assets after aggregate/rocks/engineered material are observed in the collection system (this instance indicates possible pipe failures and a potential source of inflow)
	• Implement procedures to prioritize which sewersheds to evaluate
	  o Trend flows at pump stations (e.g., trend pump run hours against rainfall data).
	  o Benchmark dry weather and wet weather flows at key points in the collection system (even visual estimates of flows can be useful)
	• Routinely inspect residential cleanout structures
	• Conduct manhole condition assessments
	• Provide training to other City staff/contractors and citizen outreach regarding the impacts of I/I (this might aid in the identification of obvious issues). City staff/contractors could also provide photographs to WWTP operations staff for formal evaluation
	• Evaluate discharge practices at local breweries to minimize or eliminate discharges during wet weather

Points of Interest/Variables to Consider	• Accuracy and reliability of collection system maps • Use of photographs to benchmark conditions. These can always be used at a later time if the operator does not have time for a full inspection. • Standardized procedures for making manhole observations (e.g., National Association of Sewer Service Companies (NASSCO) condition assessment grading). This will help ensure that different team members are making consistent observations in regard to the severity of defects. • Consider the intensity, duration, and seasonality of wet weather events when trending and benchmarking dry and wet weather flows.
Documentation Format	• Asset inventory • Revised collection system maps (e.g., even hard-copy mark-ups can be useful) • Spreadsheet that trends pump run hours and rainfall data

	• Collection system observation field sheets (e.g. manhole inspection/condition assessment sheet) • Citizen outreach flyers
Performance Indicators	• Decreased influent flows at the WWTP • Decreased impacts to biomass in SBRs • Increased accuracy and reliability of collection system maps • Addition of new assets to inventory or revision of existing asset information
Potential Barriers to Implementation	• Staffing resources (both time and technical expertise)

Recommended Improvement Action No. 3	**Repurpose Decommissioned Assets for Wet Weather Operations**
Area of Concern Addressed	I/I in the Collection System
Improvement Goal	To determine the feasibility of using a decommissioned asset for the equalization of influent flows during wet weather operations
Recommended Approach	• Determine storage capacity of various assets (e.g., clarifier, trickling filter) • Determine what equipment and operational procedures would be needed to implement storage options • Conduct cost-benefit analysis to determine if capital costs should be incurred for wet weather storage or for collection system upgrades • Implement the use of currently decommissioned assets during wet weather operations
Points of Interest/Variables to Consider	• The clarifier has an approximate capacity of 94,000 gallons based on rough estimates of its dimensions (height/depth=10 feet; diameter=40 feet) • The dimensions of the trickling filter were not estimated but it is a much larger vessel than the clarifier. Some capital expenditures will have to be incurred for concrete work.
Documentation Format	• WWTP operations log and/or round sheets • SOPs for wet weather operations associated with collection system operations, divert portions of influent flows to off-line assets, adjustments to the SBR operational cycles, and impacts to the post-aeration basin
Performance Indicators	• Completion of cost-benefit analysis • Stabilization of influent flow rate (reductions in the deviations in magnitude and frequency from average)
Potential Barriers to Implementation	• Capital and equipment costs • Operational costs to modify operations during wet weather (e.g., staffing time and energy use)

Recommended Improvement Action No. 4	**Develop and Implement SOPs for Monitoring and Removing Solids from the Post-Aeration Basin**
Area of Concern Addressed	Solids Washout from the SBRs to the Post-Aeration Basin and Receiving Waterbody
Improvement Goal	To ensure solids are removed from the post-aeration basin and placed back into the SBRs rather than washing out to the receiving waterbody
Recommended Approach	• Conduct routine inspections with a sludge judge of the post-aeration basin (especially after decant cycles and wet weather events) • Develop a documentation format that ensures the operator has checked the post-aeration basin and removed solids as necessary (the *WWTP Daily Operator Log* appears to have room for this). • Install equipment to remove solids • Perform root cause analysis to determine cause of solids washout • Review and modify SOPs to ensure solids are not sent to the post-aeration basin
Points of Interest/Variables to Consider	• Modification of settle and decant cycle times
Documentation Format	• Daily operations logbook • Daily operations round sheets o Sludge judge measurements from multiple locations in the post-aeration basin o Solids removed (yes/no) o Receiving waterbody observations o Recent weather observations (duration and intensity of wet-weather events)
Performance Indicators	• All observations documented on operations round sheets • SOPs have been updated based on root cause analysis
Potential Barriers to Implementation	• Equipment costs (e.g., sump pump to remove solids from the post-aeration basin; the basin lacked equipment to remove solids)

Recommended Improvement Action No. 5	**Develop and Implement O&M Tools**
Area of Concern Addressed	Lack of O&M Documentation for the WWTP and Collection System
Improvement Goal	To ensure the operator has the necessary information, tools, and training to: • Prioritize work and refine maintenance frequencies to optimize staffing resources • Support diagnostic evaluations aimed to prevent future equipment failures • Support future decision making in regard to capital expenditures
Recommended Approach	• Identify and inventory critical processes and equipment • Evaluate maintenance requirements and ensure preventive maintenance activities are scheduled at the appropriate frequencies • Develop and implement documentation formats, scheduling and tracking tools
Points of Interest/Variables to Consider	• Review current and past maintenance performed • Review repeat corrective maintenance activities to help diagnose root-cause issues to move toward a more proactive maintenance approach
Documentation Format	• Formal asset inventory • Daily operations logbook • Daily operations round sheets • Work orders and associated scheduling and tracking mechanism
Performance Indicators	• Critical processes and equipment have been identified and inventoried • Creation of forms that are designed for operators (i.e., user-friendly while in the field)
Potential Barriers to Implementation	• Staffing resources to create forms and accomplish appropriate preventative maintenance schedules

Appendix 1
Initial Site Visit Sign-In Sheet

CIRCUIT RIDER SITE VISIT SIGN-IN SHEET

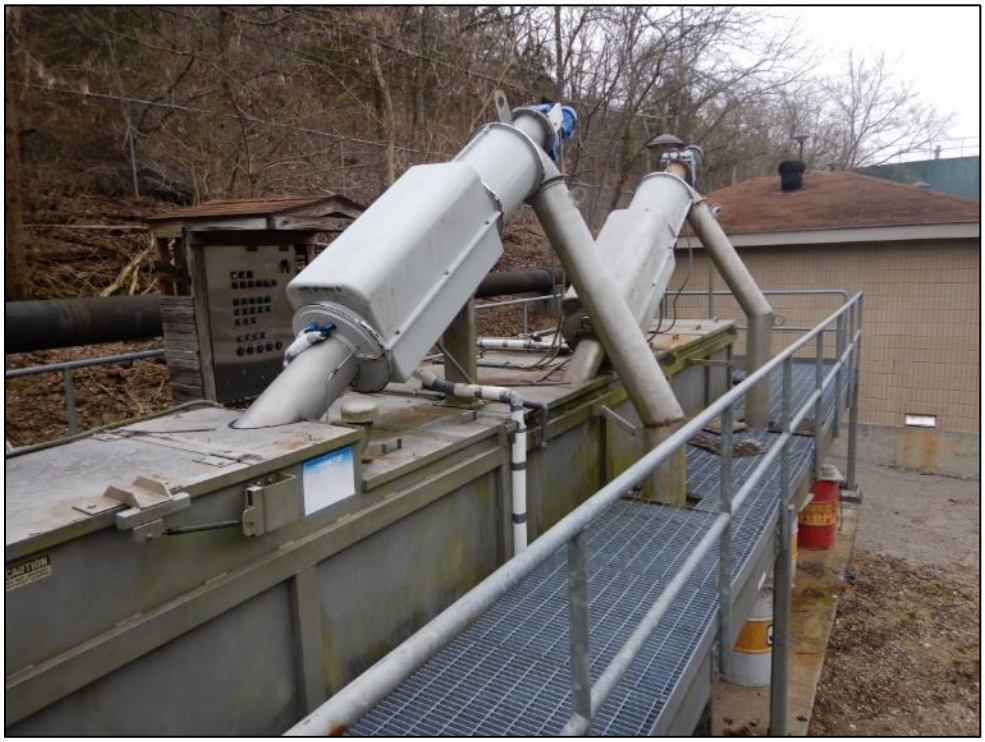
Facility: Eureka Springs

Site Visit Date(s): February 26, 2020

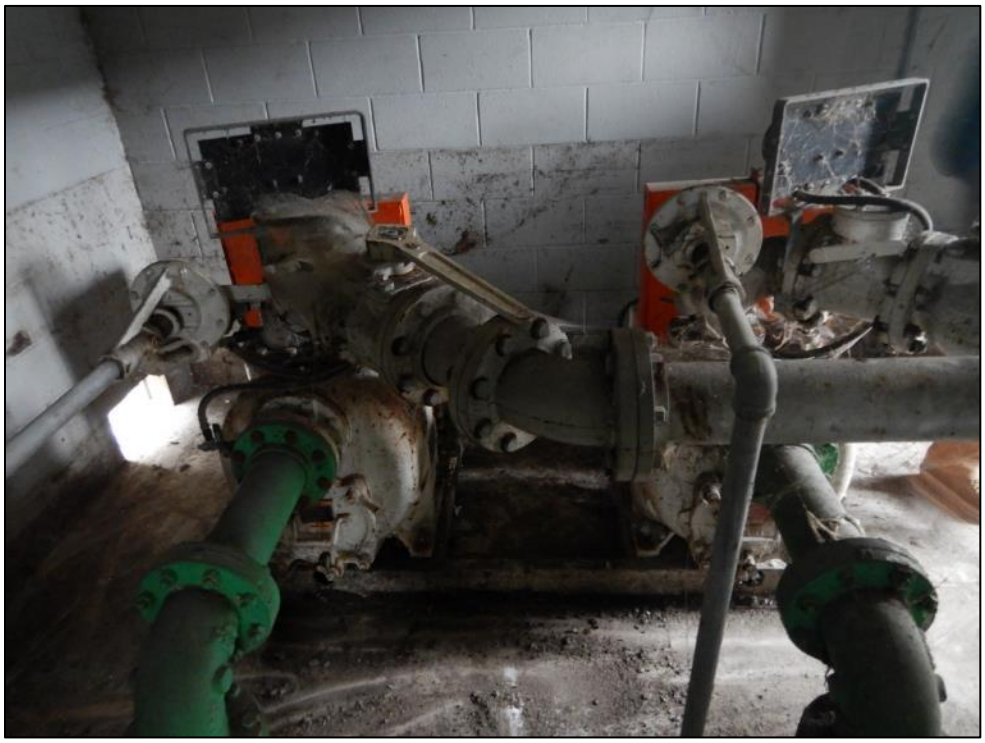
Location: 3174 East Van Buren

Name	Affiliation	Phone	E-Mail
Stephen Clark	PG Environmental (EPA Contractor)	720-789-8046	stephen.clark@pgenv.com
Tony Loston	EPA	214-665-3107	Loston.Anthony@EPA.Gov
Brent Walker	ADEQ	501-837-2068	walker@adeq.state.ar.us
Danny Oconnell	Contractor to EPA PGEnv	720-789-8032	danny.oconnell@pgenv.com
TERRY R. LONG	EUREKA SPRINGS WASTEWATER PLANT MANAGER	479-738-7035	ESWWTP@YAHOO.COM
DWAYNE ALLEN	CITY OF EUREKA SPRINGS	479-253-9600	dALLEN@CITYOFEUREKASPRINGS.GOV
Ken Mullins	"	479-981-2987	kMullins@ " "
Cole Southerland	ADEQ	501-551-3784	Cole.Southerland@adeq.state.ar.us
Garrett Grimes	ADEQ	479-267-0811 ext 16	grimesg@adeq.state.ar.us

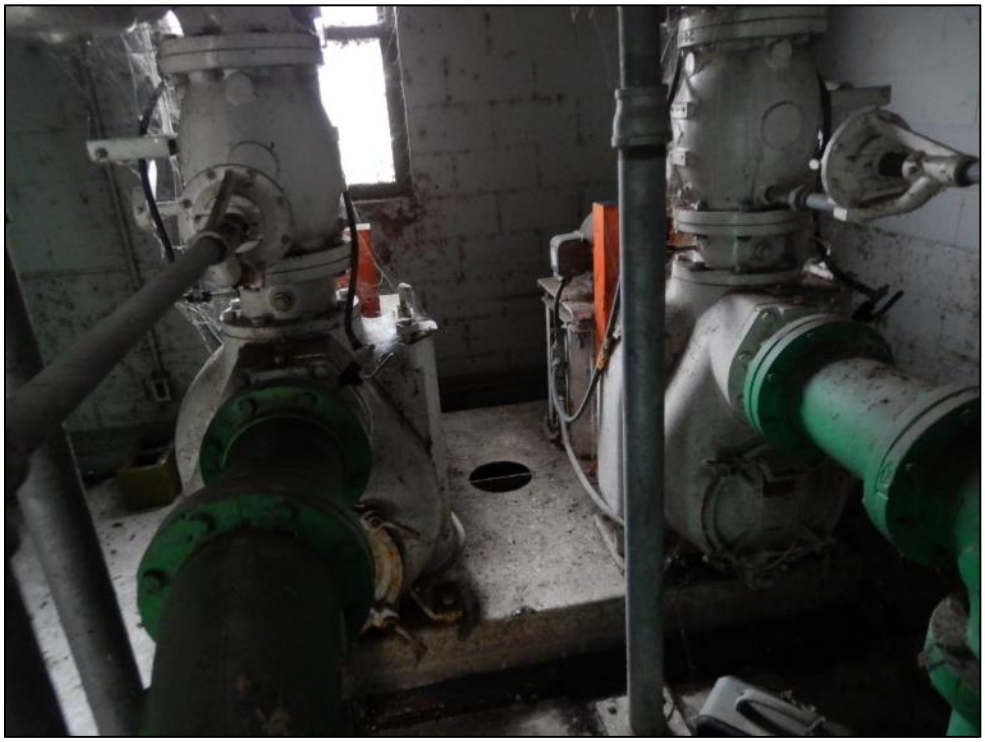
Appendix 2
Photograph Log



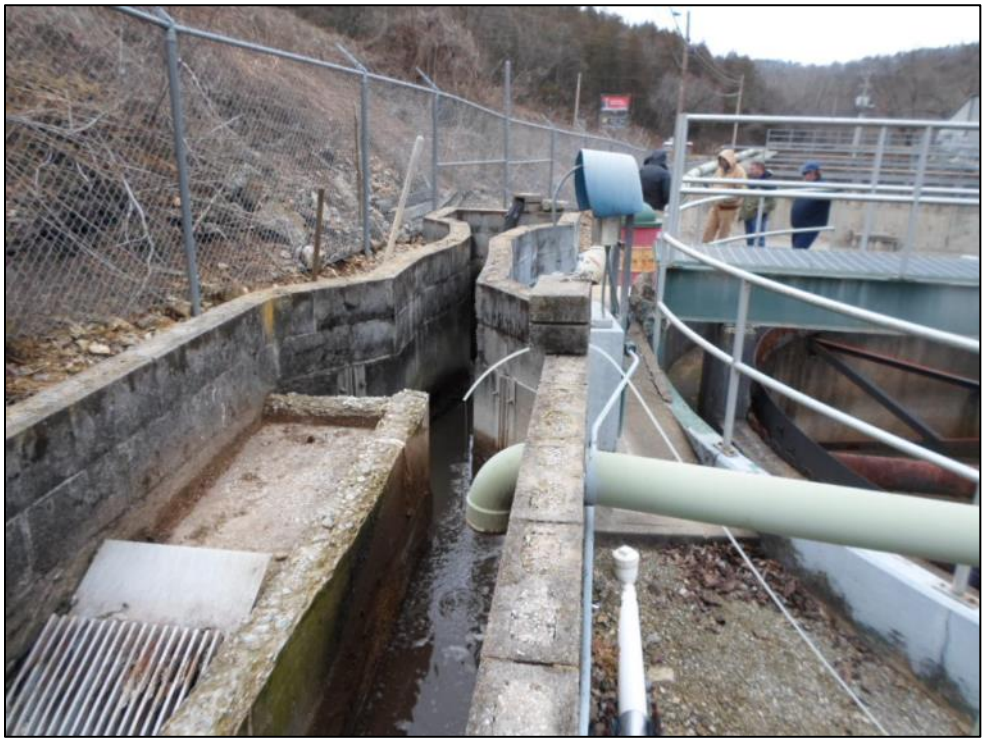
Photograph 1. Headworks screening.



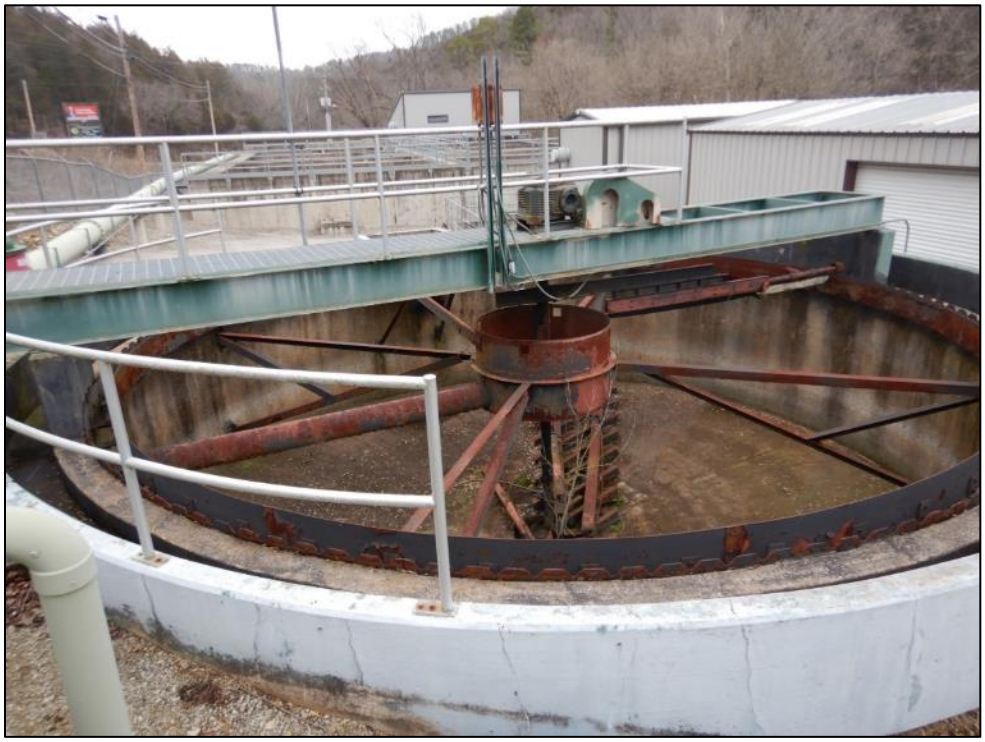
Photograph 2. Influent pump station (lower capacity pumps).



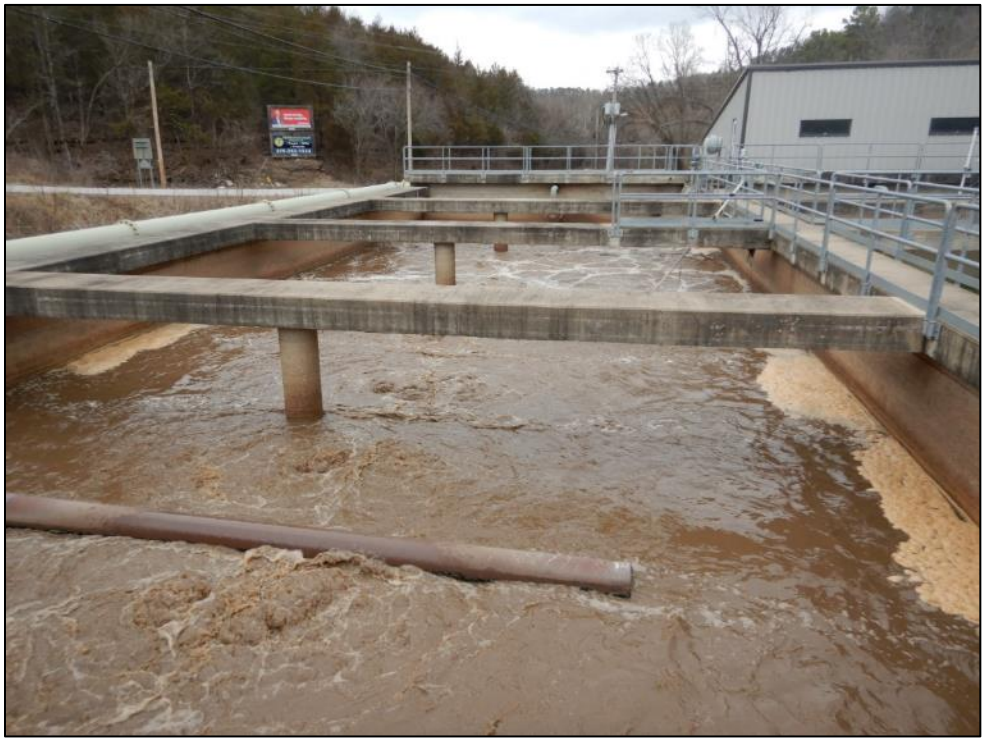
Photograph 3. Influent pump station (higher capacity pumps).



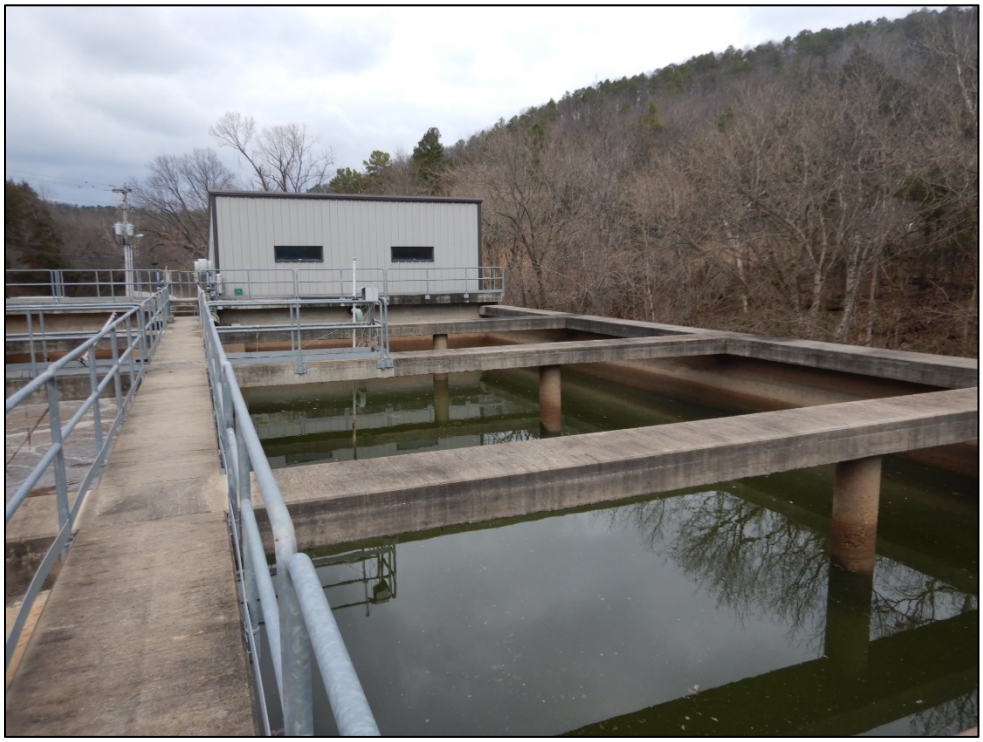
Photograph 4. Influent channel prior to SBRs. The decommissioned clarifier is to the right-hand side.



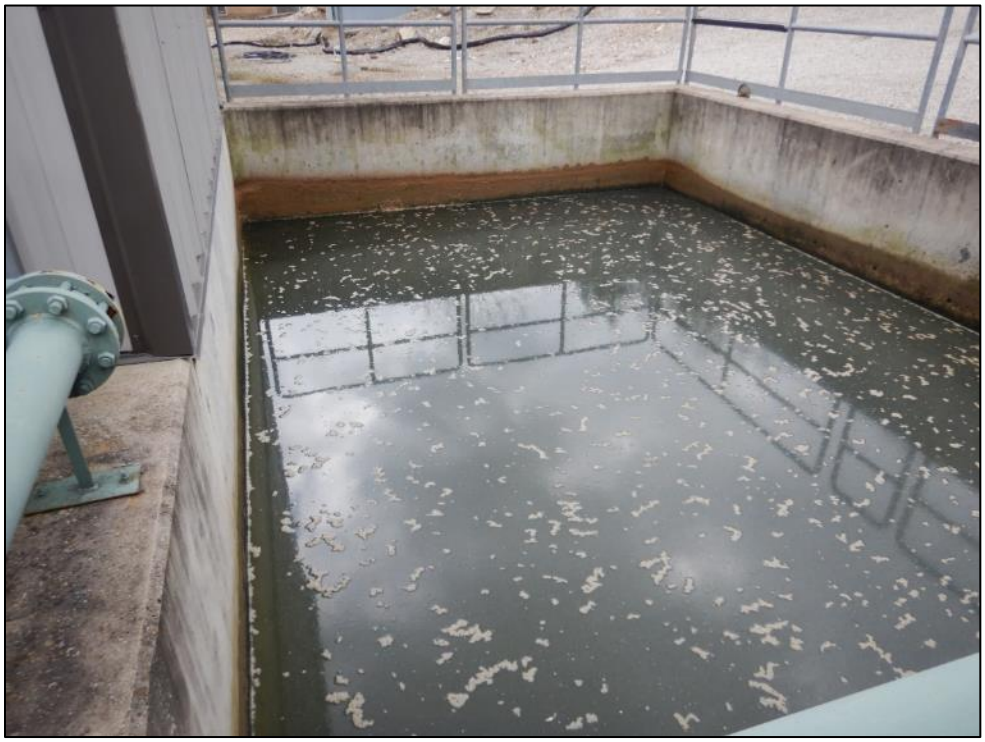
Photograph 5. Decommissioned clarifier that could be used for wet-weather storage.



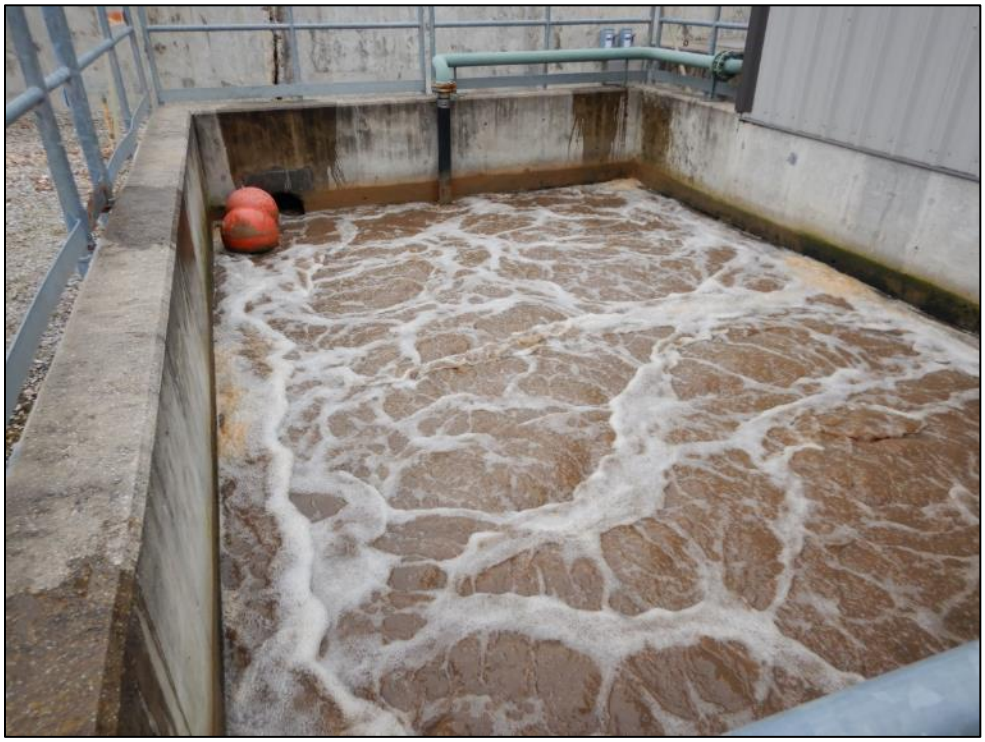
Photograph 6. The western SBR basin during the react mode.



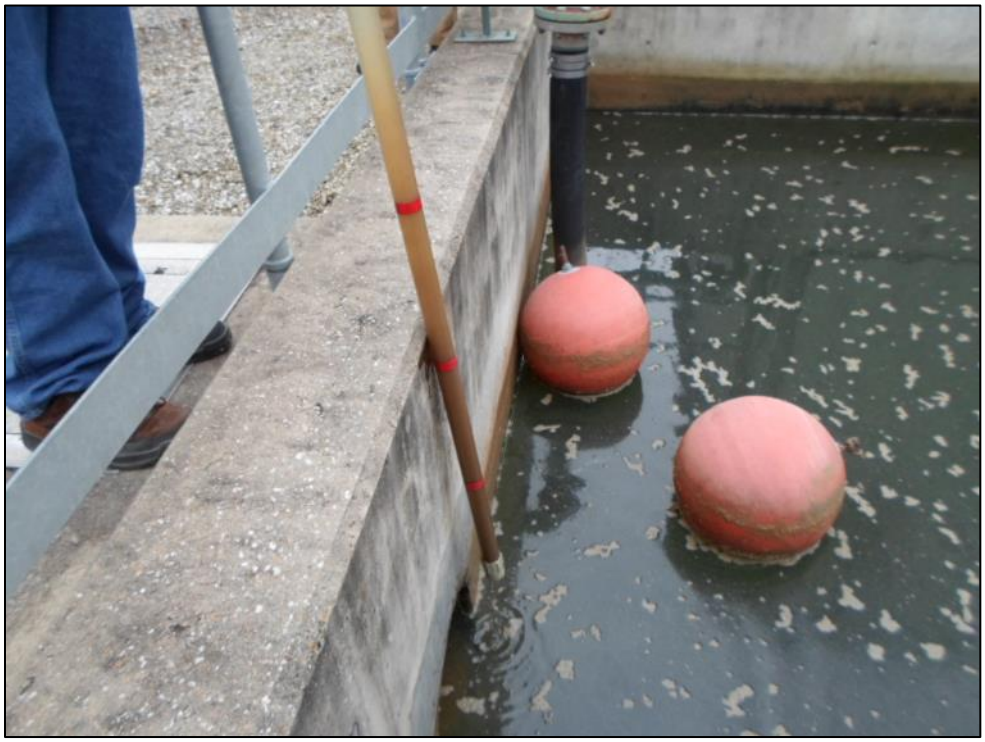
Photograph 7. The eastern SBR basin during the settle mode.



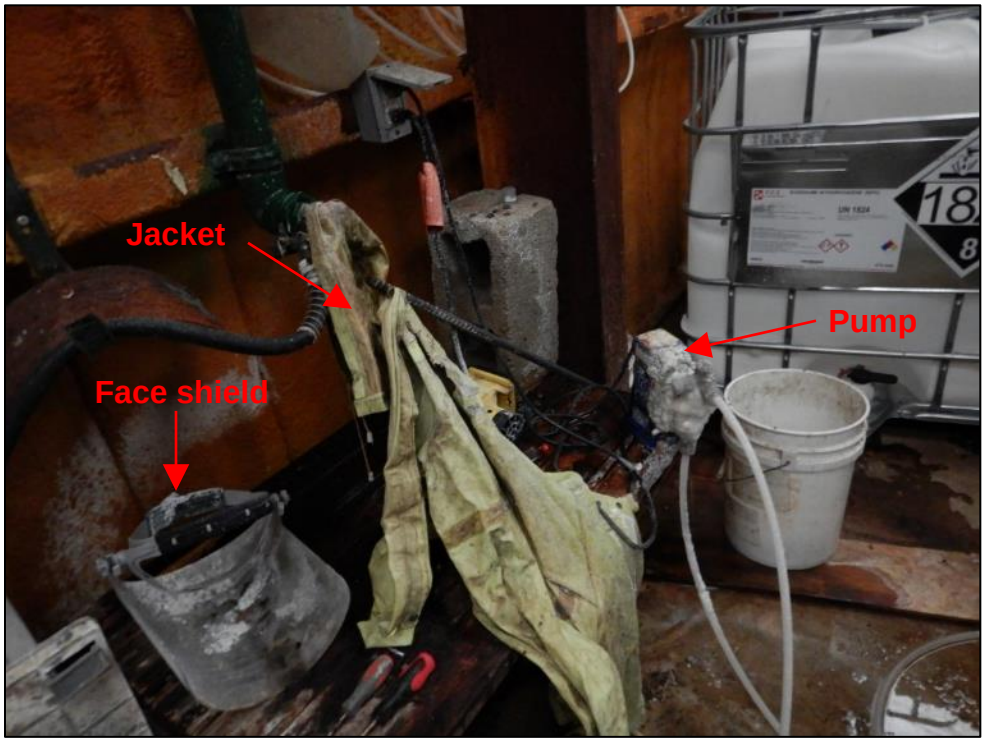
Photograph 8. Post-aeration basin while aerators are off.



Photograph 9. Post-aeration basin while aerators are on.



Photograph 10. Sludge judge measurement taken from the post-aeration basin.



Photograph 11. The sodium hydroxide chemical feed pump was spraying 50% sodium hydroxide solution to the surrounding area, including the jacket and face shield used to handling the sodium hydroxide.

Photograph 12. Decommissioned trickling filter that could be used for wet-weather storage.