



Hazen and Sawyer
4287 Spruill Avenue, Suite 101
N. Charleston, SC 29405 • 843.744.6467



Central Berkeley WWTP 9-mgd Expansion Project Preliminary Engineering Report

SRF #496-32
Final SRF PER
Berkeley County Water & Sanitation
Hazen No. 30557-021
June 27, 2024

Table of Contents

1. General Information	1-1
1.1 Contact Information.....	1-1
1.2 Service Area	1-1
1.3 Number and Type of Customers.....	1-1
2. Discussion of Need.....	2-1
3. Project Alternatives.....	3-1
3.1 Alternative 1: “No Action” Alternative.....	3-1
3.2 Alternative 2: Regionalization	3-1
3.3 Alternative 3: Plant Expansion.....	3-1
4. Cost and Effectiveness Analysis of Alternatives	4-1
5. Selected Alternative and Design Criteria	5-1
5.1 Influent Wastewater Characteristics	5-1
5.1.1 Influent Flow.....	5-1
5.1.2 Influent Concentrations and Loads.....	5-2
5.1.3 Influent Temperature	5-4
5.1.4 Design Criteria	5-5
5.2 Liquid Train Treatment Facilities.....	5-6
5.2.1 Influent Force Main and Flow Meters	5-6
5.2.2 Preliminary Treatment Facility (PTF).....	5-6
5.2.2.1 Screening	5-6
5.2.2.2 Grit Removal	5-7
5.2.3 Oxidation Ditches.....	5-7
5.2.4 Secondary Clarifiers.....	5-8
5.2.5 Return Activated Sludge Pumping.....	5-9
5.2.6 Disinfection	5-10
5.2.7 Effluent Pump Station	5-11
5.3 Solids Train Treatment Facilities	5-12
5.3.1 Solids Loading Rates	5-12
5.3.2 Sludge Holding Tank	5-12
5.3.3 Dewatering Equipment	5-13

5.3.3.1	Centrate Equalization	5-14
5.3.4	Dewatering Feed Pumps	5-15
5.3.5	Polymer Storage and Makeup Units	5-16
5.3.5.1	Slops Management	5-17
5.3.6	Disposal	5-17
5.4	Standby-by Power and Electrical Building	5-18
6.	Cost Estimate of Selected Alternative	6-1
7.	Location Map	7-1
8.	Planning Area Map	8-1
9.	Other DHEC Sections	9-1
10.	Environmental Evaluation and Public Participation	10-1
11.	Federal Flood Risk	11-1

List of Tables

Table 4-1:	Alternatives Cost and Effectiveness Summary	4-1
Table 5-1:	Influent Flows and Peaking Factors	5-2
Table 5-2:	Influent BOD ₅ Concentrations and Loads	5-2
Table 5-3:	Influent TSS Concentrations and Loads	5-2
Table 5-4:	Influent NH ₃ -N Concentrations and Loads	5-3
Table 5-5:	Allowable Leachate Loads to the CBWWTP	5-3
Table 5-6:	Leachate Loads to the CBWWTP	5-3
Table 5-7:	Leachate Concentrations	5-4
Table 5-8:	Leachate Contribution to the CBWWTP	5-4
Table 5-9:	Domestic Contribution to the CBWWTP	5-4
Table 5-10:	Reported Influent Temperature	5-5
Table 5-11:	Influent Flow Design Criteria for 9-mgd Expansion	5-5
Table 5-12:	Domestic Influent Design Concentrations and Loads for 9-mgd Expansion	5-5
Table 5-13:	Combined Influent Design Concentrations and Loads for 9-mgd Expansion	5-6
Table 5-14:	Screening Design Criteria	5-7
Table 5-15:	Grit Removal Design Criteria	5-7
Table 5-16:	Oxidation Ditch Design Criteria	5-8
Table 5-17:	Secondary Clarifier Dimensional Criteria	5-9
Table 5-18:	Secondary Clarifier Loading Rates	5-9
Table 5-19:	RAS Pump Station Design Criteria	5-10
Table 5-20:	UV Disinfection Design Criteria	5-11
Table 5-21:	Effluent Pump Station Design Criteria	5-11
Table 5-22:	Sludge Production Rates at 9-mgd Plant Capacity	5-12

Table 5-23: Sludge Holding Tank Design Criteria	5-13
Table 5-24: Dewatering Equipment Design Consideration	5-14
Table 5-25: Anticipated Dewatering Hours of Operation at 9-mgd Plant Capacity	5-14
Table 5-26: Dewatering Feed Pumps Design Consideration	5-15
Table 5-27: Grinder Design Consideration	5-15
Table 5-28: Polymer System Design Criteria	5-16
Table 5-29: Solids Conveyance Preliminary Design Criteria	5-17
Table 6-1: Construction Cost Estimate	6-1
Table 6-2: Total Project Cost Estimate	6-1

List of Figures

Figure 5-1: Daily and 30-day Moving Average Influent Flow	5-1
Figure 7-1: Location Map	7-1
Figure 7-2: Site Map	7-2
Figure 8-1: CBWWTP Service Area	8-1
Figure 11-1: CBWWTP Area Flood Map	11-1

List of Appendices

- Appendix A: Cost and Effectiveness
- Appendix B: Environmental Evaluation Records
- Appendix C: Public Meeting Documentation

1. General Information

Berkeley County owns and operates the Central Berkeley Wastewater Treatment Plant (CBWWTP). The CBWWTP was originally constructed in 2009 to treat a permitted capacity of 3 million gallons per day (mgd) and was expanded in 2020 to treat 6 mgd. The current annual average flow to the CBWWTP is approximately 2.7 mgd.

The CBWWTP is located at 158 Central Berkeley Drive, Moncks Corner, South Carolina 29461. The plant employs a conventional activated sludge process configured as an oxidation ditch followed by secondary clarification. Final treated effluent discharges into the West Branch of the Cooper River under the National Pollutant Discharge Elimination System (NPDES) Permit No. SC0039764.

1.1 Contact Information

Owner: Berkeley County Water and Sanitation
212 Oakley Plantation Drive
Moncks Corner, South Carolina 29461
Contact: Ryan Gatlin, EIT, Director of Engineering
(843) 719-2319
ryan.gatlin@berkeleycountysc.gov

Engineer: Hazen and Sawyer
735 Johnnie Dodds Blvd., Suite 102
Mt. Pleasant, SC 29464
Contact: Emma Martin, PE
(843) 414-1405
emartin@hazenandsawyer.com

1.2 Service Area

Berkeley County owns and operates three wastewater treatment plants serving customers in Berkeley County. The CBWWTP provides wastewater treatment for the central portion of Berkeley County.

1.3 Number and Type of Customers

The CBWWTP serves approximately 5,290 customers from the surrounding communities. The County's service area lies within the Santee watershed. The CBWWTP receives primarily domestic wastewater with some industrial wastewater including landfill leachate from the BCWS landfill.

2. Discussion of Need

There are three primary drivers to expand the CBWWTP. These drivers include improved process efficiency, enhanced dewatering, and service area growth.

1. The influent screens at the CBWWTP perform poorly and allow large debris to pass through the process. The debris then impacts the treatment quality and durability of downstream processes. The CBWWTP headworks facility needs to be upgraded to ensure screenings are adequately captured at the head of the facility to protect the downstream processes and equipment.
2. The CBWWTP currently employs a rotary fan press (RFP) to dewater sludge prior to landfill disposal. The RFP has historically had a low throughput capacity and produces a very wet cake. These two concerns result in a process bottleneck, higher disposal costs, and more frequent trips to the landfill. The sludge dewatering process needs an upgrade to improve operational efficiency and reduce the impact on the landfill.
3. The CBWWTP has experienced significant growth in recent years. The CBWWTP requires additional treatment capacity to accommodate the current and anticipated growth, while staying in compliance with the plant's NDPES permit.

3. Project Alternatives

The alternatives analysis evaluates three alternatives to address the needs discussed in Section 2. The “No Action” alternative discusses the impact of not expanding or improving the CBWWTP. The remaining alternatives include plant expansion and regionalization with existing infrastructure. The subsequent sections discuss each alternative listed below.

1. “No Action” alternative
2. Regionalization
3. Plant Expansion

3.1 Alternative 1: “No Action” Alternative

Under the “No Action” alternative, there will be no treatment plant expansion or improvements to meet the needs identified in Section 2. The treatment processes will experience excess wear due to inadequate screening; the County will continue the inefficient dewatering operations and BCWS will be unable to accept additional flows due to inadequate treatment capacity. This will result in shifting the wastewater treatment in the service area from centralized wastewater treatment to privately owned septic systems and wastewater treatment package systems.

The EPA estimates that between 10% and 70% of all septic systems in the United States are failing and are a common source of water contamination (EPA, 2013). An increased use of private systems may lead to a decline in water quality and contamination of the local waterways. This alternative does not address the long-term growth needs in the service area. Therefore, this alternative is not a viable option and will not be considered further.

3.2 Alternative 2: Regionalization

BCWS owns and operates three WWTPs in their wastewater service area: the CBWWTP, the Upper Berkeley WWTP (UBWWTP), and the Lower Berkeley WWTP (LBWWTP). The LBWWTP has a design capacity of 22.5 mgd, and the UBWWTP has a design capacity of 0.90 mgd. The LBWWTP is located 17 miles and the UBWWTP is located 23 miles from the CBWWTP. Conveying wastewater from the CBWWTP service area to either the LBWWTP or the UBWWTP would incur significant cost due to the long distance and additional conveyance infrastructure needed. BCWS has implemented wastewater treatment regionalization to the extent practical considering the service area size and population served. Further regionalization is not feasible for the County. Therefore, this alternative is not a viable option and will not be considered further.

3.3 Alternative 3: Plant Expansion

Alternative 3 includes the CBWWTP upgrade and expansion from 6 mgd to 9 mgd. Section 5 of this PER details the CBWWTP expansion plan with the addition of a new parallel treatment train. The existing CBWWTP was commissioned in 2009 with a rated capacity of 3 mgd and was expanded to 6 mgd in

2020. Expansion to 9 mgd includes a third oxidation ditch and a third secondary clarifier to meet the current permitted effluent ultimate oxygen demand (UOD) at the expanded flow. In addition to the new facilities. The 9-mgd expansion includes rehabilitation of the existing screens and replacement of the current RFP with centrifuge dewatering.

4. Cost and Effectiveness Analysis of Alternatives

A cost and effectiveness analysis was performed for each viable alternative. The analysis uses a planning period of 20 years and a real discount rate of 2.0%, taken from Appendix C of OMB circular A-94. The capital, operation and maintenance, and salvage values were used to determine the net present cost of each viable alternative.

The opinion of probable construction cost for the expansion of the CBWWTP to 9 mgd was prepared in accordance with the guidelines of the Association for the Advancement of Cost Engineering (AACE) International for a Class 4 level of estimation based on information developed during conceptual design. The expected accuracy range for a Class 4 level of estimation is +50% to -30%. **Table 4-1** summarizes the opinion of probable construction cost in 2023 dollars. The Cost and Effectiveness Certification (DHEC 3152) form is provided in Appendix A.

Table 4-1: Alternatives Cost and Effectiveness Summary

	Alternative No. 1	Alternative No. 2	Alternative No. 3
Capital Cost¹	\$ 0 ³	\$63,440,000	\$40,490,000
Year-1 O&M Cost²	\$1,060,000	\$1,569,000	\$1,403,000
Salvage Value³	\$3,320,000	\$9,660,000	\$7,370,000
Planning Period	20 years		
Real Discount Rate	2.0%		
PV Capital Cost	\$0	\$63,440,000	\$40,490,000
PV 20-Yr O&M⁴	\$22,760,000	\$31,700,000	\$29,440,000
PV Salvage Value	\$2,970,000	\$7,320,000	\$5,750,000
Net Present Cost	\$19,790,000	\$87,820,000	\$64,180,000

¹Capital cost accounts for all construction cost including SRF allowed contingency for construction and excludes engineering services.

²O&M costs are based on a average daily flow of 6 mgd for Alternative 1 and 9 mgd for Alternatives 2 & 3 for a fair comparison.

³Salvage value equals 10% of the capital cost.

⁴The salvage value for all alternatives includes an estimated salvage value for the escalated original 3 mgd and expanded 6 mgd facility capital costs (\$15M in 2009 escalated to \$23.4M in 2023; \$9.6M in 2020 escalated to \$9.9 in 2023 dollars).

5. Selected Alternative and Design Criteria

The selected alternative, Alternative 3, includes expanding the plant to treat 9 mgd of wastewater. The following section describes each process in detail.

5.1 Influent Wastewater Characteristics

Hazen summarized and evaluated the reported daily operational data from January 1, 2020, through August 31, 2023, to establish the wastewater characteristics for the influent flows and loads.

5.1.1 Influent Flow

Figure 5-1 displays the influent flow, and **Table 5-1** summarizes the influent annual average (AA), maximum month (MM), and peak day (PD) flows and peaking factors (PF). Flow was diverted from the LBWWTP to CBWWTP in July 2020 and December 2022 causing a permanent increase in influent flow and load.

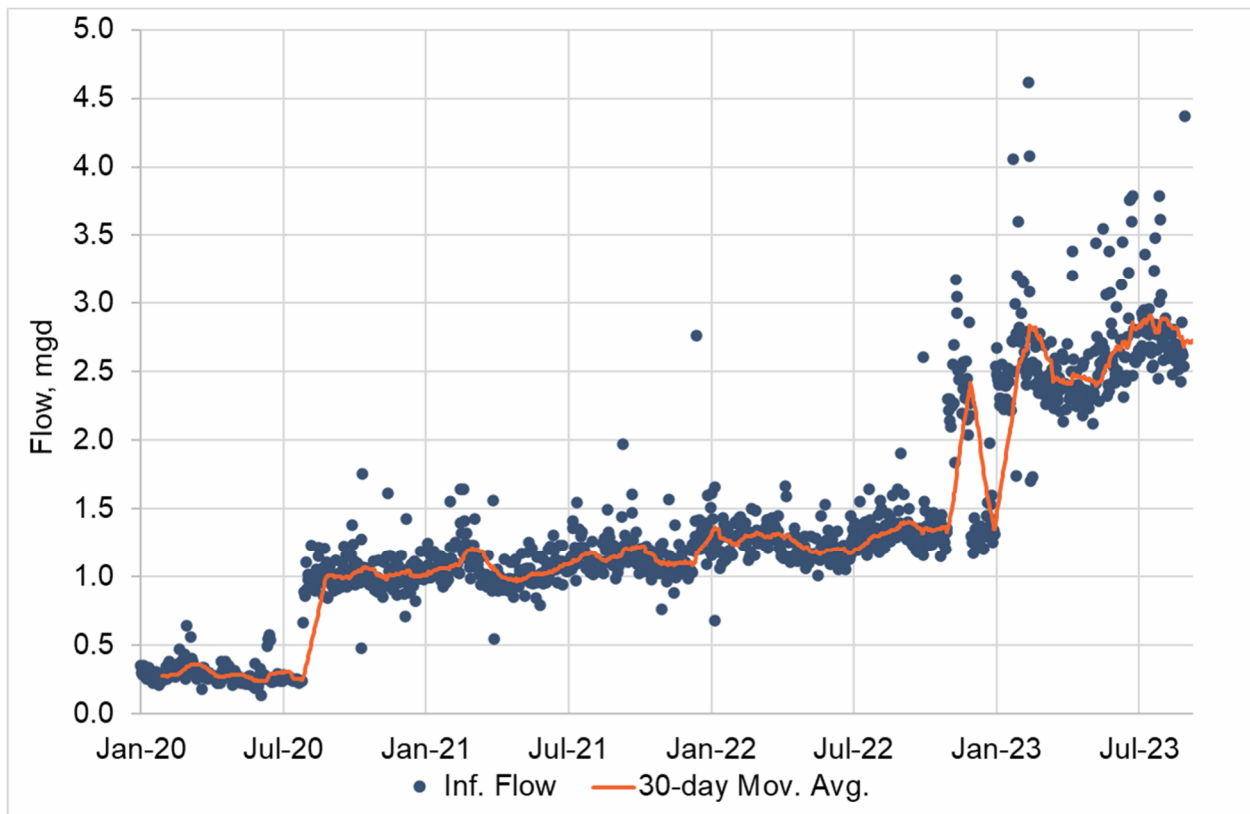


Figure 5-1: Daily and 30-day Moving Average Influent Flow

Table 5-1: Influent Flows and Peaking Factors

Year	AA	MM		PD	
	mgd	mgd	PF	mgd	PF
2020	0.60	1.1	1.8	1.8	2.9
2021	1.1	1.3	1.2	2.8	2.5
2022	1.4	2.4	1.8	3.2	2.3
2023 ¹	2.7	2.9	1.1	4.6	1.7
Average	1.3	1.9	1.5	3.1	2.4

¹Through August 2023

5.1.2 Influent Concentrations and Loads

Tables 5-2, 5-3, and 5-4 summarize annual reported influent five-day biochemical oxygen demand (BOD₅), total suspended solids (TSS), and ammonia (NH₃-N), respectively, concentrations and loads. Influent data for 2020 is not included since it is not expected to be representative of current conditions. Influent sampling was reduced from weekly to monthly starting in 2023; therefore, maximum month loads and peaking factors are not provided for the 2023 data.

Table 5-2: Influent BOD₅ Concentrations and Loads

Parameter	2021	2022	2023 ¹
Annual Average Flow, mgd	1.12	1.38	2.65
Annual Average Concentration, mg/L	302	264	320
Annual Average Load, lb/day	2,720	2,800	6,540
Maximum Month Load, lb/day	3,930	3,980	-
Maximum Month PF	1.45	1.42	-
Max Day PF	2.06	1.69	1.77

¹Through August 2023

Table 5-3: Influent TSS Concentrations and Loads

Parameter	2021	2022	2023 ¹
Annual Average Flow, mgd	1.12	1.38	2.65
Annual Average Concentration, mg/L	288	219	338
Annual Average Load, lb/day	2,620	2,570	6,930
Maximum Month Load, lb/day	4,190	4,140	-
Maximum Month PF	1.60	1.61	-
Max Day PF	2.02	2.16	1.78

¹Through August 2023

Table 5-4: Influent NH₃-N Concentrations and Loads

Parameter	2021	2022	2023 ¹
Annual Average Flow, mgd	1.12	1.38	2.65
Annual Average Concentration, mg/L	43	41	37
Annual Average Load, lb/day	390	480	760
Maximum Month Load, lb/day	470	650	-
Maximum Month PF	1.19	1.39	-
Max Day PF	1.99	2.01	1.21

¹Through August 2023

The Berkeley County Landfill discharges leachate to the CBWWTP. The leachate contributes substantial total Kjeldahl nitrogen (TKN), NH₃-N, and BOD₅ loads to the CBWWTP. Berkeley County submitted Significant Industrial User (SIU) Wastewater Discharge Permit No. 007-2023-B (June 2023), which established more stringent effluent limits for the Berkeley County Landfill leachate discharge. **Table 5-5** summarizes allowable leachate BOD₅, TSS, TKN, and NH₃-N loads to the CBWWTP. Leachate flow to the CBWWTP is limited to a monthly average of 150,000 gallons per day (gpd).

Table 5-5: Allowable Leachate Loads to the CBWWTP

Parameter	Monthly Average Concentration (mg/L)	Monthly Average Load (lb/d)	Daily Maximum Concentration (mg/L)	Daily Maximum Load (lb/d)
BOD ₅	M & R ¹	500	M & R ¹	500
TSS	M & R ¹	M & R ¹	1,000	M & R ¹
TKN	M & R ¹	M & R ¹	M & R ¹	M & R ¹
NH ₃ -N	M & R ¹	600	M & R ¹	600

¹Monitor and Report

Table 5-6 summarizes leachate load contributions to the CBWWTP between April 2022 and July 2023. **Table 5-7** presents reported leachate concentrations. Current leachate TSS concentrations and BOD₅ loads exceed the allowable limits in the SIU permit. Average and maximum ammonia loads are 38% and 71%, respectively, of the allowable limits.

Table 5-6: Leachate Loads to the CBWWTP

Parameter	Number of Samples	Average Load	Maximum Load
Flow, gpd	Daily	22,900	49,500
BOD ₅ , lb/d	20	1,010	9,633
TSS, lb/d	19	1,193	22,195
TKN, lb/d	9	472	1,759
NH ₃ -N, lb/d	17	228	428

Table 5-7: Leachate Concentrations

Parameter	Number of Samples	Average Concentration	Maximum Concentration
BOD ₅ , mg/L	20	1,197	5,100
TSS, mg/L	19	3,186	59,140
TKN, mg/L	9	1,406	5,860
NH ₃ -N, mg/L	17	714	1,548

Table 5-8 compares the average leachate loads to the 2023 CBWWTP influent loads. Leachate is estimated to make up 30% of the NH₃-N and 15% of the BOD₅ loads to the CBWWTP although it contributes to less than 1% of the flow.

Table 5-8: Leachate Contribution to the CBWWTP

Parameter	Average Leachate Load ¹	2023 Average CBWWTP Influent Load	% Leachate Contribution
BOD ₅ , lb/d	1,010	6,540	15%
TSS, lb/d	1,193	6,930	17%
NH ₃ -N, lb/d	228	760	30%

1. Average leachate loads are based on historical data of approximately 9 to 20 samples total, depending on the parameter, taken over a one-year period. Leachate flow is reported daily. These loads match those shown in Table 5-6.

Table 5-9 estimates 2023 domestic wastewater loads to the CBWWTP and resulting domestic concentrations based on leachate and total influent loads to the CBWWTP presented above. The domestic contribution to the CBWWTP is representative of medium-strength domestic wastewater and similar to the initial CBWWTP influent design concentrations, which did not account for impacts of leachate.

Table 5-9: Domestic Contribution to the CBWWTP

Parameter	2023 Domestic Loads (lb/d)	2023 Domestic Concentration (mg/L)	3.0-mgd Design Influent Wastewater Characteristics (mg/L)
BOD ₅	5,530	252	250
TSS	5,740	262	250
NH ₃ -N	530	24	25

5.1.3 Influent Temperature

Table 5-10 displays reported influent temperature data. The minimum seven-day temperature of approximately 16°C was used for secondary treatment process design, and the maximum month temperature of 29°C was used for the evaluation of aeration capacity.

Table 5-10: Reported Influent Temperature

Parameter	Temperature, °C
Minimum Day	15
Minimum 7-Day	16
Minimum Month	17
Average Annual	23
Maximum Month	29

5.1.4 Design Criteria

Table 5-11 presents the design influent flows, and **Table 5-12** summarizes the design domestic influent concentrations and loads for the expansion to 9 mgd. A TKN concentration of 40 mg/L was selected and reflects medium-strength wastewater and a typical domestic NH₃-N:TKN ratio of 0.63. Maximum month loads are based on a 1.3 peaking factor applied to the average load, which is in the typical range (1.2 to 1.3) observed at WWTPs similar in capacity to the CBWWTP. A load peaking factor of 2 was applied to the average loads for BOD₅, NH₃-N, and TKN to calculate maximum day aeration requirements.

Table 5-11: Influent Flow Design Criteria for 9-mgd Expansion

Parameter	Flow, mgd	Peaking Factors
Average Design Flow (ADF)	9	--
Peak Hour Flow (PHF)	22.5	2.5

Table 5-12: Domestic Influent Design Concentrations and Loads for 9-mgd Expansion

Scenario	BOD ₅	TSS	NH ₃ -N	TKN
Average Concentration at 9 mgd, mg/L	250	250	25	40
Average Design Load, lb/d	18,800	18,800	1,900	3,000
Maximum Month Design Load, lb/d	24,400	24,400	2,400	3,900
Maximum Month Concentration at 9 mgd, mg/L	325	325	32.5	52
Maximum Day Design Loads, lb/d	37,600	-	3,800	6,000

The maximum allowable leachate loads were added to the design domestic loads (**Table 5-13**) to calculate combined loads to the CBWWTP based on the following approach:

- The maximum allowable leachate BOD₅ load of 500 lb/day was added to the domestic average, maximum month, and maximum day BOD₅ loads
- The maximum allowable leachate NH₃-N load of 600 lb/day was added to the domestic average, maximum month, and maximum day loads NH₃-N loads
- A leachate TKN load of 1,200 lb/d was added to the domestic average, maximum month, and maximum day TKN loads based on the observed leachate NH₃-N/TKN ratio of 0.5

- A leachate TSS load of 1,250 lb/d was added to the domestic average and maximum month TSS loads based on the daily maximum leachate TSS concentration of 1,000 mg/L at the 150,000 gpd maximum monthly leachate flow

Table 5-13: Combined Influent Design Concentrations and Loads for 9-mgd Expansion

Scenario	BOD ₅	TSS	NH ₃ -N	TKN
Average Design Load, lb/d	19,300	20,050	2,500	4,200
Average Concentration at 9 mgd, mg/L	257	267	33	56
Maximum Month Design Load, lb/d	24,900	25,650	3,000	5,100
Maximum Month Concentration at 9 mgd, mg/L	332	342	40	68
Maximum Day Design Loads, lb/d	38,100	-	4,400	7,200

5.2 Liquid Train Treatment Facilities

5.2.1 Influent Force Main and Flow Meters

Two existing 24-inch influent lines, each with their own existing flow meters, deliver influent to the CBWWTP. These lines combine into one common 30-inch line entering the headworks facility. The 9-mgd expansion does not include upgrades or alterations to the CBWWTP raw influent infrastructure.

5.2.2 Preliminary Treatment Facility (PTF)

The expansion includes upgrades to the existing preliminary treatment facility (PTF) constructed downstream of the influent flow meters. The PTF will feature rehabilitation of and upgrades to the multi-rake bar screen.

5.2.2.1 Screening

The CBWWTP has two bar screens and one manually cleaned bar rack located in a bypass channel. Screenings discharge into a hopper and convey to a dumpster for offsite disposal.

The mechanical screen installed in the 2009 original plant construction operates well, has sufficient capacity, and will continue to be operated until its end of useful life. The multi-rake screen installed in the 6-mgd expansion has larger bar spacing, ½-inch, which permits rags and other large materials to pass through the screen. This large debris degrades and collects in the downstream treatment processes. The 9-mgd expansion project proposes replacement of the internals of the ½-inch multi-rake screen to a ¼-inch multi-rake screen in the existing structure.

Each screen requires a peak flow capacity of 15 mgd to accommodate the 30-mgd peak flow at the future plant build-out capacity of 12-mgd ADF. The existing screening channels require hydraulic modification to increase the capacity of the existing screens to 15 mgd each. **Table 5-14** summarizes the 9-mgd screening design criteria.

Table 5-14: Screening Design Criteria

Criteria	Existing Screen 1	Existing Screen 2	Modified ¹ Screen 2
Screen Type	Mechanical	Multi-Rake	
Number of Units	1	1	
Materials of Construction	316 SS	316 SS	
Manufacturer	Parkson	Duperon	
Model	Aqua Guard	FlexRake	
Bar Opening, in	¼	½	¼
Peak Flow/screen, mgd	15		
Total Screening Capacity, mgd	30		

¹ Multi-rake bar screens will not be replaced but shall be rehabilitated to accommodate peak flows and ¼" bar spacing.

5.2.2.2 Grit Removal

Grit removal reduces excess deposition of grit in downstream processes. The existing vortex grit removal units remove grit from the influent, which is pumped to an existing grit classifier. Grit is then discharged via conveyer into a dumpster at grade for collection and off-site disposal. The existing grit removal equipment has a combined capacity of 10-mgd ADF and 24-mgd peak flow. Therefore, the 9-mgd expansion does not require additional grit removal. **Table 5-15** summarizes the existing grit removal design criteria.

Table 5-15: Grit Removal Design Criteria

Criteria	Existing
Type	Vortex
Number of Units	2
Average flow per Unit, mgd	5.0
Peak flow per Unit, mgd	12
Total Grit Capacity, mgd	24
Grit Removal	Pumping
Grit Classifier	Cyclone

5.2.3 Oxidation Ditches

The facility currently has two 2.61-million-gallon (MG) Ovivo Carousel oxidation ditches to provide biological treatment. The oxidation ditches perform nitrification and denitrification to reduce BOD₅ and total nitrogen (TN) in the secondary effluent. A return gate, kept at a constant position, diverts flow into the anoxic zone. Each anoxic zone includes two mixers. A third Ovivo Carousel oxidation ditch similar to the existing will be constructed during the 9-mgd expansion. **Table 5-16** summarizes the existing and proposed oxidation ditch design criteria.

Table 5-16: Oxidation Ditch Design Criteria

Oxidation Ditches	Existing Oxidation Ditches No. 1 and No. 2	Proposed Oxidation Ditch No. 3
Number of Oxidation Ditches	2	1
Oxidation Ditch Sidewater Depth, ft	18	18
Anoxic Cells per Oxidation Ditch	1	1
Anoxic Volume per Oxidation Ditch, MG	0.43	0.43
Carrousel Volume per Oxidation Ditch, MG	2.18	2.18
Total Volume per Oxidation Ditch, MG	2.61	2.61
Total Anoxic Volume, MG	1.29	
Total Carrousel Volume, MG	6.54	
Total Oxidation Ditch Volume, MG	7.83	
Anoxic HRT at 9-mgd ADF, hr	3.44	
Aerobic HRT at 9-mgd ADF, hr	17.4	
Total HRT at 9-mgd ADF, hr	20.9	
Minimum Wastewater Temperature, °C	16	
Maximum Wastewater Temperature, °C	29	
Aerobic Solids Retention Time (aSRT), days	12	
MLSS Concentration, mg/L	4,000	
Average DO Concentration, mg/L	2	
Peak Day DO Concentration, mg/L	1	
Average Actual Oxygen Requirement, lb O ₂ /day	31,000	
Peak Day Actual Oxygen Requirement, lb O ₂ /day	60,000	
Alpha	0.9	
Average Standard Oxygen Requirement, lb O ₂ /day	47,000	
Peak Day Standard Oxygen Requirement, lb O ₂ /day	77,000	
Standard Oxygen Transfer Rate (SOTR), lb O ₂ /hp-hr	3.0	
Average Aerator Power Required, HP	650	
Peak Day Aerator Power Required, HP	1,070	
Number of Aerators per Oxidation Ditch	2	2
Aerator Power (each), HP	200	200
Total Aerator Power per Oxidation Ditch, HP	400	400
Total Aerator Power, HP	1,200	
Aerator Output Control	Variable Speed	Variable Speed

5.2.4 Secondary Clarifiers

A secondary clarifier splitter box receives the oxidation ditch effluent. The splitter box distributes flow to the two existing secondary clarifiers and one future secondary clarifier from a common influent box.

The proposed expansion includes the addition of one new secondary clarifier to increase secondary treatment capacity to 9 mgd. The CBWWTP has two peripheral-feed style secondary clarifiers by Envirex, now Evoqua. Only a peripheral feed style secondary clarifiers will be considered for the new clarifier during the detailed design phase. **Table 5-17** presents the secondary clarifier design criteria, and **Table 5-18** summarizes the solids loading rate (SLR) and surface overflow rate (SOR) at the 9-mgd expansion.

Table 5-17: Secondary Clarifier Dimensional Criteria

Secondary Clarifier	Existing Secondary Clarifiers No. 1 & No. 2	Proposed Secondary Clarifier No. 3
Number	2	1
Manufacturer	Envirex Rim-Flo	Evoqua Rim-Flo or Equal
Diameter, ft	100	100
Surface Area (each), sf	7,854	7,854
Surface Area (total), sf	15,708	7,854
Side Water Depth, ft	15	15

Table 5-18: Secondary Clarifier Loading Rates

Secondary Clarifier	
Average Design Flow, mgd	9
Peak Hour Flow, mgd	22.5
Design RAS Flow, mgd	9
Design MLSS, mg/L	4,000
No. of Clarifiers in Service	3
Total Clarifier Area, sf	23,560
SOR at Average Design Flow, gpd/sf	382
SLR at Average Design Flow, lb/sf-day	25
SOR at Peak Hour Flow, gpd/sf	955
SLR at Peak Hour Flow, lb/sf-day	44

5.2.5 Return Activated Sludge Pumping

The existing Return Activated Solids (RAS) Pump Station returns settled solids from the secondary to the effluent box of the headworks, where it combines with raw screened and de-gritted influent upstream of distribution to the oxidation ditches. The RAS Pump Station has three (two duty, one standby) dry pit submersible centrifugal pumps. One additional pump will be included in the 9-mgd expansion project to allow for one dedicated RAS pump per secondary clarifier with one common stand-by pump. **Table 5-19** summarizes the RAS Pump Station design criteria.

The existing pump provides capacity beyond a 100% return rate. At current influent flows, the pumps operate outside of the acceptable operating range (AOR). These current limitations in RAS pump operation combined with the higher head conditions in the discharge force main at expanded capacities

intensify the issue. The existing RAS pumps should be replaced to match the new RAS pump to improve operational efficiency.

For the 9-mgd expansion one new RAS pump is recommended. **Table 5-19** shows the RAS pump station design criteria.

Table 5-19: RAS Pump Station Design Criteria

RAS Pump Station	Existing Pump Conditions	Proposed Pump Conditions
Number of Pumps	3 (2 duty, 1 standby)	1 new duty
Manufacturer	Flygt	Pentair or Equal
Model	NT3202 LT 614	5436L WD
Best Efficiency Point Flow, gpm ¹	4,400	1,800
Best Efficiency Point Head, ft ¹	44.0	68
Design Flow		
Firm Capacity, gpm ²	4,167	6,350
Total Capacity, gpm	6,350	8,333
Design Flow TDH, ft	43.4	60.6
Motor, hp	60	50
Percent of BEP ³	60%	117%
Operating Efficiency ³	62%	80%
Resulting Brake Horsepower, hp ³	27.7	39.8
Minimum Design Flow		
Minimum Design Flow, gpm	521	521
Minimum Design Flow TDH, ft	26.5	26.5
Motor, hp	60	50
Percent of BEP ³	18%	52%
Operating Efficiency ³	35%	65%
Resulting Brake Horsepower, hp ³	9.9	6.7

¹ BEP for one pump at full speed. Existing pumps operate below the BEP to meet the current operating conditions.

² Firm and Total Capacity of existing RAS pumps is based on a 33% turndown to meet the 100% design return rate. Firm and total capacity for the proposed pump conditions is based on one new duty pump and two existing duty pumps operating at design flow.

³ Percent of BEP, Operating efficiency, and brake horsepower are based on a single pump at 3mgd for the existing and proposed pumps.

5.2.6 Disinfection

The CBWWTP disinfects final effluent with an open-channel ultraviolet (UV) disinfection system. The existing two-channel Trojan UV 3000Plus system provides six total UV banks and has a rated capacity of 9-mgd average flow and 22.5-mgd peak flow with all banks online. Per SCDHEC *Regulation R.61-67*

Standards for Wastewater Facility Construction, and as a reliability classification III facility, the disinfection facility must “have a sufficient number of units such that with the largest flow capacity unit out of service, the remaining units shall have a design flow capacity of fifty (50) percent of the total design average flow to the unit operation.” Therefore, the existing facility meets the minimum regulatory requirements for reliability. **Table 5-20** summarizes the UV Disinfection Facility design criteria.

Table 5-20: UV Disinfection Design Criteria

Disinfection	Existing Conditions
No. of Banks	6
Number of channels	2
Design Flow, mgd	9
Design Peak Flow, mgd	22.5
Minimum UVT, % at 253.7nm	60
Sleeve Fouling Factor	0.95
Maximum TSS Concentration, mg/L	30 based on a 30-day average
Dose Type	4.0" NWRI Mean MS2 V2.1A Greenway
Minimum UV dose at peak flow, mW·s/cm ²	34.78
Fecal Coliform Limit, cfu/100mL	≤200 30-day geometric mean ≤400 daily maximum
Redundancy Class III Reliability Requirement	50% ADF redundancy (50% of the average design flow can be accommodated by the remaining units with the largest unit out of service) or 4.5 mgd
Class III Reliability System Flow provided, mgd	7.5

5.2.7 Effluent Pump Station

The existing Effluent Pump Station has four (three duty and one standby) 7.5-mgd vertical turbine pumps. The effluent pump station receives flow from the disinfection facility and discharges the treated effluent via more than 17,000 linear feet of 30-inch HDPE pipe into the Cooper River. The existing pumps provide a firm capacity of 22.5 mgd and a total capacity of 30 mgd. **Table 5-21** presents the effluent pump station design criteria.

Table 5-21: Effluent Pump Station Design Criteria

Transfer Pumps	Existing Conditions
Type of Pump	Vertical Turbine
Number of Units	4 (3 duty, 1 standby)
Duty Point	5,200 gpm, 71.5 ft
Size, hp	125
Firm Pumping Capacity, mgd	22.5
Total Pumping Capacity, mgd	30

5.3 Solids Train Treatment Facilities

The existing CBWWTP solids handling facilities include sludge thickening, sludge holding, pumping, dewatering and off-site disposal. An electronically actuated control valve modulates waste activated sludge (WAS) flow from the RAS discharge pipe to the two aerobic digesters. Manually operated telescoping valves decant sludge in each digester to thicken WAS. Rotary lobe pumps send thickened WAS (TWAS) from the sludge digesters to the dewatering building for polymer conditioning and dewatering via a RFP. The dewatered cake conveys to trucks in the sludge truck loading bay for off-site disposal at the Berkeley County Landfill.

5.3.1 Solids Loading Rates

The design plant influent BOD₅ and TSS characteristics including impacts from combined influent, presented in **Section 5.1.4** and **Table 5-13**, were used to determine the solids production rates. **Table 5-22** presents the projected solids production rates for the CBWWTP. Mass loading peaking factors, developed from historical data analysis, determine maximum month (MM) loading conditions.

Table 5-22: Sludge Production Rates at 9-mgd Plant Capacity

	AA	MM
Sludge Production Rate, lb TS/MG-Average Design Flow	1,800	2,340
Sludge Production, lb/day	16,200	21,100

5.3.2 Sludge Holding Tank

BCWS plans to continue landfill disposal of solids for the foreseeable future. The landfill will accept unclassified wastewater biosolids that meet the EPA paint filter test and do not contain free water. With no economic or operational drivers to transition away from landfilling of biosolids, it is recommended that the CBWWTP maintain production of unclassified biosolids product per the Environmental Protection Agency (EPA) 40 CFR 503 standards. Unclassified solids do not have a hydraulic retention time (HRT) requirement for aerobic digestion. Therefore, the CBWWTP aerobic digestion tanks are not required to store solids for a specific duration. As these tanks are not required to fully aerobically digest sludge, these tanks will herein be referred to Sludge Holding Tanks to avoid confusion.

Table 5-23 presents the existing CBWWTP Sludge Holding Tank design criteria, including HRT at the projected sludge production rates for the 9-mgd expansion. The estimated HRT in the Sludge Holding Tanks was determined using an assumed typical WAS concentration. Historical WAS concentration data was limited and variable, so an assumed value of 0.75%TS was used to determine HRT at projected plant flows. The CBWWTP utilizes telescoping valves in each Sludge Holding Tank to decant WAS prior to dewatering. The 9-mgd expansion project does not include additional Sludge Holding Tanks or ancillary equipment.

Table 5-23: Sludge Holding Tank Design Criteria

	Existing Conditions
Number of Sludge Holding Tanks	2
Diameter, ft	80
Volume, MG/tank	0.7
Aeration Type	coarse bubble aeration pipes in a halo configuration
Mixing Type	vertical turbine mechanical mixer
Assumed Incoming WAS Solids Concentration from RAS Pump Station, %TS	0.75%
Decanted WAS Solids Concentration to Dewatering ¹ , %TS	1.8%
9-mgd Expansion MM HRT, days	2.1 (1 tank) 4.2 (2 tanks)
9-mgd Expansion AA HRT, days	2.7 (1 tank) 5.4 (2 tanks)

¹ Average of historical data provided by BCWS from January 2020 to October 2023.

5.3.3 Dewatering Equipment

Dewatering upgrades for the 9-mgd expansion are planned to be retrofit into the existing dewatering building. The CBWWTP currently has one RFP located in this facility with original plans for a second future unit. BCWS has experienced issues with low dewatered cake solids concentration and long operating hours with the existing RFP.

The 9-mgd expansion project includes replacing the RFP with dewatering centrifuges. The change to centrifuges enables the plant to operate at higher solids throughput, designed for this plant expansion to 9 mgd and future buildout capacity of 12 mgd. For mechanical redundancy, Hazen recommends one duty dewatering unit to handle projected buildout sludge production and one standby dewatering unit and ancillary equipment.

A 500 to 550 mm bowl size centrifuge unit, with a capacity of 2,250 lb(dry)/hr or 225 gpm, is the largest centrifuge size that reasonably fits within the existing building footprint and provides sufficient space for equipment maintenance and service. Andritz and Centrisys offer units in the 500 to 550 mm bowl size range that will work for this application.

Table 5-24 presents the existing and proposed dewatering equipment design considerations. Related ancillary equipment shall be sized to support the capacity of the 225 gpm units.

Table 5-24: Dewatering Equipment Design Consideration

Parameter	Existing Conditions	Proposed Conditions
Type	Rotary Fan Press	Centrifuge
Number of units	1	2
Feed Concentration, %TS	1.8%	1.8%
Solids Loading Rate per unit, lb(dry)/hr	85-100	2,250
Hydraulic Loading Rate per unit, gpm	---	225
Bowl Diameter, mm	--	500—550
Horsepower per unit, HP	20	Main drive: 100 Back drive: 20
Vendor	Fournier	Andritz, Centrisys

At an anticipated feed concentration of 1.8%TS, based on historical average decanted WAS solids concentrations, both proposed centrifuge sizes would operate in hydraulic loading rate (HLR)-limited mode or at the above listed HLR. To maximize operation of the centrifuges, at feed solids concentrations greater than 2.0%TS, the proposed centrifuges would operate in solids loading rate (SLR)-limited mode.

Estimated operating hours with the anticipated sludge production for this expansion to 9 mgd are shown in **Table 5-25**.

Table 5-25: Anticipated Dewatering Hours of Operation at 9-mgd Plant Capacity

Operating Scenario	Number of Centrifuges in Service	Hours of Operation at AA Loading, hr/day	Hours of Operation at MM Loading, hr/day
5 days/wk	2	5.3	6.9
5 days/wk	1	10.6	13.8
7 days/wk	2	3.8	4.9
7 days/wk	1	7.6	9.9

Dewatered cake will continue as unclassified and disposed of at the offsite county landfill using two trailers owned by the County. With one truck loading lane under the existing distribution conveyor, one trailer may be evenly loaded at a time. Additional detail about dewatered cake conveyance may be found in **Section 5.3.6**.

5.3.3.1 *Centrate Equalization*

Centrate from the centrifuges will be discharged below each centrifuge and flow by gravity through a new centrate drain pipe to the head of the plant. Additionally, slops generated on centrifuge start-up will be directed to drain with the knife gate under each cake chute. Spray water will be programmed to run in the centrate chute during operation and the cake chute during start-up / slops management.

5.3.4 Dewatering Feed Pumps

Two existing Vogelsang rotary lobe pumps, in duty-standby configuration, located in the dewatering building transfer WAS from the digesters to the existing RFP. Two new larger rotary lobe pumps are recommended to feed the proposed centrifuges due to increased capacity of the proposed centrifuges. A variable speed drive is recommended for the feed pumps to allow full loading of the centrifuges with fluctuating solids feed. Positive displacement pumps are preferred for feeding dewatering equipment as the pump curve is relatively flat across a range of discharge pressures. Rotary lobe pumps are recommended for feeding the new centrifuges due to ease of maintenance and a compact footprint. **Table 5-26** lists the preliminary dewatering feed pump design criteria.

Table 5-26: Dewatering Feed Pumps Design Consideration

Parameter	Existing Conditions	Proposed Conditions
Type	Rotary lobe	Rotary lobe
Number	2	2
Maximum Flow, gpm	Unknown	250
Solids Concentration, %TS	1.3% - 1.8%TS	0.75% - 2.0%TS
Horsepower, HP	7.5-hp	≤15-hp
Vendor	Vogelsang	Boerger, LobePro, Netzsch, Vogelsang

The feed pump design will match the maximum dewatering centrifuge hydraulic rate to ensure feed pumping does not constrain dewatering operations. Each pump will be sized to feed one centrifuge. Piping, valving, and equipment sizing will be arranged during detailed design to provide process redundancy.

The existing dewatering process has grinders located ahead of the sludge feed pumps. Grinders are necessary to protect dewatering equipment from grit or larger material that could come from the sludge holding tanks. If grit gets into the bowl of a centrifuge, the equipment will wear faster and the balancing of the bowl and scroll rotating assembly may be impacted. The existing grinders will be replaced with larger units sized to accommodate the increased flow required for the new dewatering technology. **Table 5-27** lists the preliminary grinder design criteria.

Table 5-27: Grinder Design Consideration

Parameter	Existing Conditions	Proposed Conditions
Number	2	2
Maximum Flow, gpm	65	250
Solids Concentration, %TS	1.3% - 1.8% TS	0.75% - 2.0% TS
Vendor	Vogelsang	"Muffin Monster" by JWC

5.3.5 Polymer Storage and Makeup Units

Polymer solution will be fed to the dewatering feed stream to improve capture and dewatered cake solids. Two neat liquid polymer preparation and feed systems with direct feed from the polymer make-up units (PMU) to the dewatering centrifuges are recommended.

Each polymer preparation and feed system will be designed to deliver up to 15 or 20 gallons of neat polymer per hour for the smaller and larger centrifuge sizes, respectively. From sludge sampling, the centrifuge vendors under consideration returned polymer dosing recommendations of 13 to 30 lbs active polymer solution per dT solids feed. A typical dilution ratio of 200:1 is recommended. Polymer dilution water requirements will be a maximum of 67 gpm per PMU during dewatering operation. The polymer preparation systems provided will be piped with appropriate manual valves to provide process redundancy and flexibility between the PMUs and centrifuges.

Table 5-28 shows the polymer system design criteria.

Table 5-28: Polymer System Design Criteria

Parameter	Value
Number of PMUs	2
Neat Polymer Dose	15 or 20 gph
Dilution Ratio	200:1
Manufacturers	Cleanwater1 (UGSI), ProMinent, Velodyne

BCWS has expressed interest in bulk polymer storage tanks to replace the current system of polymer tote deliveries to improve operations. At an estimated typical polymer dose of 25 lb (APS)/dT solids, the CBWWTP would consume approximately 13.1 gallons of neat polymer solution per hour under average solids production at this 9-mgd expansion. Bulk tank configurations will be explored during detailed design with a target of six weeks of polymer storage at buildout demand for annual average conditions. Ideally, two bulk polymer storage tanks may be sized to fit in the existing polymer area with modifications to the containment area. A fiberglass reinforced plastic tank may be custom sized.

The existing screw conveyor system was designed and provided by the RFP vendor, Fournier, to match the rotary fan press capacity. With the future dewatering centrifuges proposed for the 9-mgd expansion, it is anticipated that the screw conveyance system will need to be upsized to accommodate the maximum throughput of the new dewatering technology. The updated conveyance system will still incorporate an inclined shaftless conveyor to transfer cake from the dewatering unit level to the multi-point discharge conveyor for truck loadout.

With the assumed feedstock and operating capacity discussed earlier, the centrifuges will run in HLR-limited mode. Under those feed conditions, the recommended smaller 225 gpm capacity centrifuge processes 2,030 lb(dry)/hr. From sludge testing results of the CBWWTP’s WAS-only sludge, 18% TS is a reasonable assumption for the dewatered cake solids. Assuming a 40,000 wet pound capacity on each trailer, it would take approximately 3.5 hours to fill a trailer with one centrifuge in service. If two centrifuges were in service, it would take approximately 1.8 hours to fill a trailer.

Table 5-29 provides the dewatered cake conveyance design criteria.

Table 5-29: Solids Conveyance Preliminary Design Criteria

Parameter	Value	
Conveyor	Inclined, Individual per centrifuge	Truck Loadout
Number of Conveyors	2	1
Wet Cake Mass Loading	13,000 lb/hr/conveyor	23,000 lb/hr/conveyor
Wet Cake Bulk Density	40 - 50 lb/cu ft	40 - 50 lb/cu ft
Volumetric Capacity	280 cu ft/hr/conveyor	600 cu ft/hr/conveyor
Incline	35°	0°
Direction	Reversing	Mono
Design Bed Depth	<30%	<30%
Conveyor Diameter	12 in	14 in
Maximum Rotating Speed	25 rpm	25 rpm
Drive Type	Constant Speed	Constant Speed
No. of Inlets per Conveyor	1	1
No. of Outlets per Conveyor	1	3

The screw conveyor sizing will be finalized during detailed design.

5.3.5.1 Slops Management

The proposed centrifuge design includes an electrically actuated knife gate under the cake chute for slops management. As the centrifuge dewateres solids, cake continually drops from each centrifuge through an opening at the bottom of the unit. Each opening aligns over a knife gate which opens to convey solids to the common conveyor leading to truck loadout.

Centrifuges produce a slops product during startup and shutdown because the bowl does not rotate at target speed. While the centrifuges are not operating at target speed, the associated knife gate closes to move slops to the plant drain. Once the centrifuge achieves the torque setpoint and forms cake, the knife gate re-opens. During the centrifuge clean in place cycle, the knife gate automatically closes to send all washwater to the centrate drain.

5.3.6 Disposal

The CBWWTP currently produces an unclassified biosolids cake product that is trucked approximately 1.5 miles to the Berkeley County Landfill. With the County owning both the wastewater facility and the landfill, the CBWWTP is protected from rising tipping fees seen elsewhere in the Lowcountry area and is able to maintain a reliable long-term outlet for their unclassified product. Since there are no anticipated changes to the Berkeley County Landfill’s acceptance of unclassified solids, it is recommended that the CBWWTP continue to send biosolids to the Berkeley County Landfill for ultimate disposal.

Trucking of dewatered solids is typically conducted on a five-day per week schedule according to the landfill’s acceptance hours (M-F 8:00am-5:00pm). In addition to the current dewatering equipment

operational issues, delayed removal of biosolids hauling trailers in the mornings has been impacting dewatering hours, regularly keeping operations staff onsite after typical hours so the CBWWTP may meet their target solids processing goals. To alleviate the issue of not being able to dewater when the exiting trucks are full and waiting to be taken to the landfill, the County could purchase a third truck or hire a contract driver to transfer the full trucks as needed.

5.4 Standby-by Power and Electrical Building

Hazen will evaluate the electrical distribution capacity of the existing plant electrical distribution system, including the standby generator, for process improvements in existing facilities. Early calculations indicate that the existing electrical distribution system can handle new loads added to existing facilities.

A new electrical distribution system including electric utility supply and a standby generator will power the proposed 9-mgd and 12-mgd process facilities. There will not be an interconnection with the existing plant electrical distribution system. The new electrical distribution equipment will be located in a new electrical building. The building and the electrical distribution equipment ratings will be sized for both the 9-mgd and 12-mgd expansions. Electrical distribution equipment located in the building will include, but is not limited to, switchgear, a motor control center (MCC), panelboards, variable frequency drives (VFDs), and HVAC equipment.

The switchgear will be arranged in a main-tie-main configuration, which provides a level of redundancy. On a site visit in December 2023, plant staff indicated a desire for a closed transition between the utility and generator. This means that when utility power is restored after an outage, the plant will transfer from generator power back to utility power without cycling plant power. This will be coordinated with the electric utility during detailed design.

6. Cost Estimate of Selected Alternative

The total estimated construction cost for expansion of the Central Berkeley WWTP from 6 to 9 mgd is \$40.49 million as summarized in **Table 6-1**. Total project cost is provided in **Table 6-2**. Costs are estimated based upon vendor quotes for equipment and recent construction bid costs of similarly sized facilities. Total project cost includes a construction contingency of 10% on the first \$10,000,000 and 5% construction costs greater than \$10,000,000. It also includes contractor overhead and profit (OH&P) of 20% and subcontractor OH&P of 25%.

Table 6-1: Construction Cost Estimate

Item	Alternative No. 3 Cost
9 MGD Plant Expansion	\$26,260,000
<i>Site / Structural</i>	\$9,010,000
<i>Equipment</i>	\$9,190,000
<i>Electrical</i>	\$4,840,000
<i>Instrumentation and Controls</i>	\$3,220,000
Construction Subtotal	\$26,260,000
Contractor OH&P	\$5,260,000
Subcontractor OH&P	\$6,570,000
Construction Cost	\$38,090,000
SRF Construction Contingency	\$2,400,000
Total Capital Cost	\$40,490,000

Table 6-2: Total Project Cost Estimate

Item	Alternative No. 3 Cost
Engineering – Planning and Design	\$1,274,200
Land	N/A
Legal and Appraisal	N/A
Construction	\$38,090,000
Contingency for Construction	\$2,400,000
Equipment	N/A
Materials	N/A
Contingency for Materials	N/A
Construction Inspection / Engineering	\$680,800
Loan Closing Fee	\$95,000
Total Project Cost	\$42,540,000

7. Location Map

All work associated with the CBWWTP 9-mgd expansion project will occur on the existing CBWWTP property within the existing fence line. **Figure 7-1** illustrates the location of the CBWWTP expansion project, and **Figure 7-2** shows the existing and proposed treatment trains at the CBWWTP.

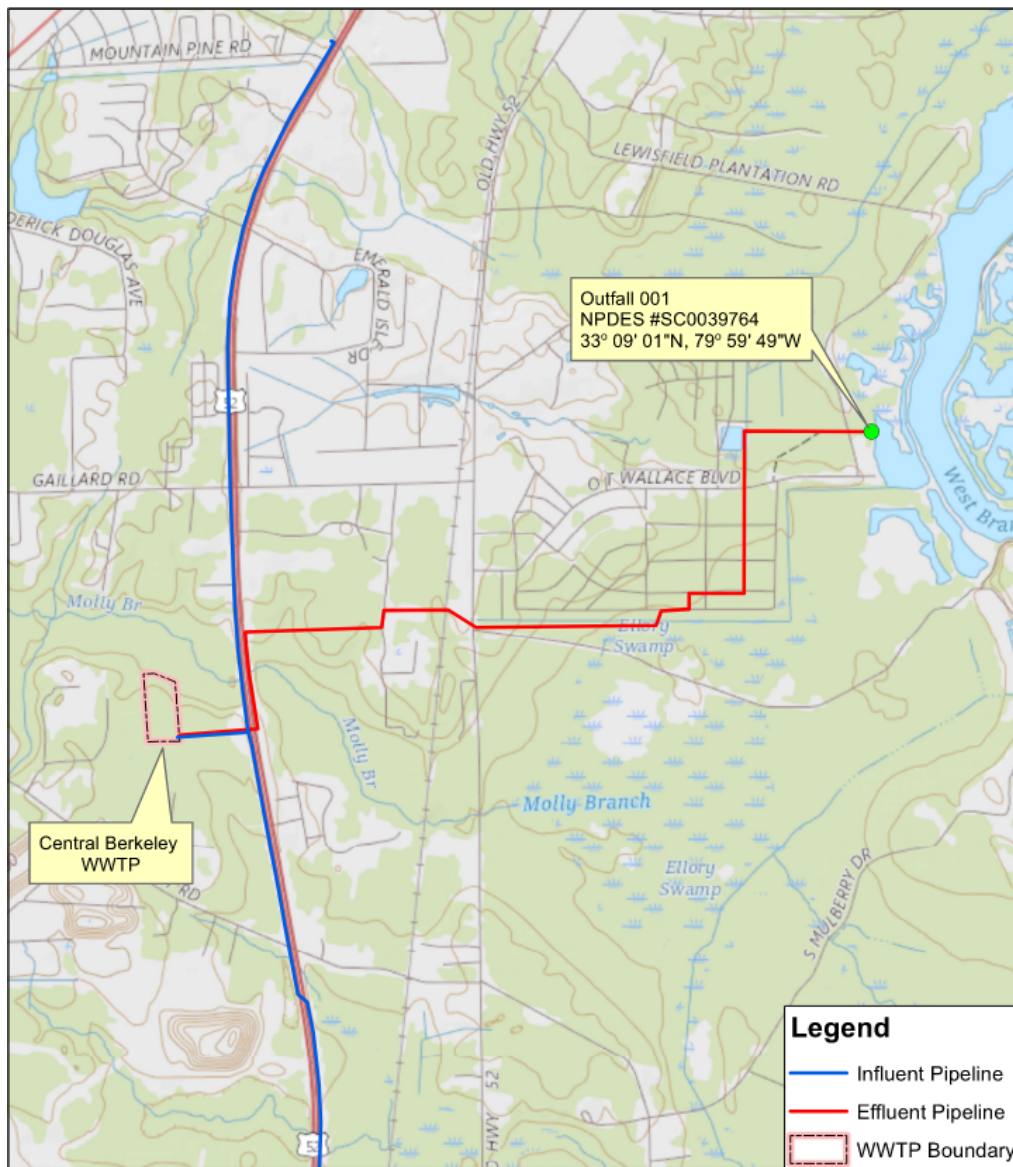


Figure 7-1: Location Map

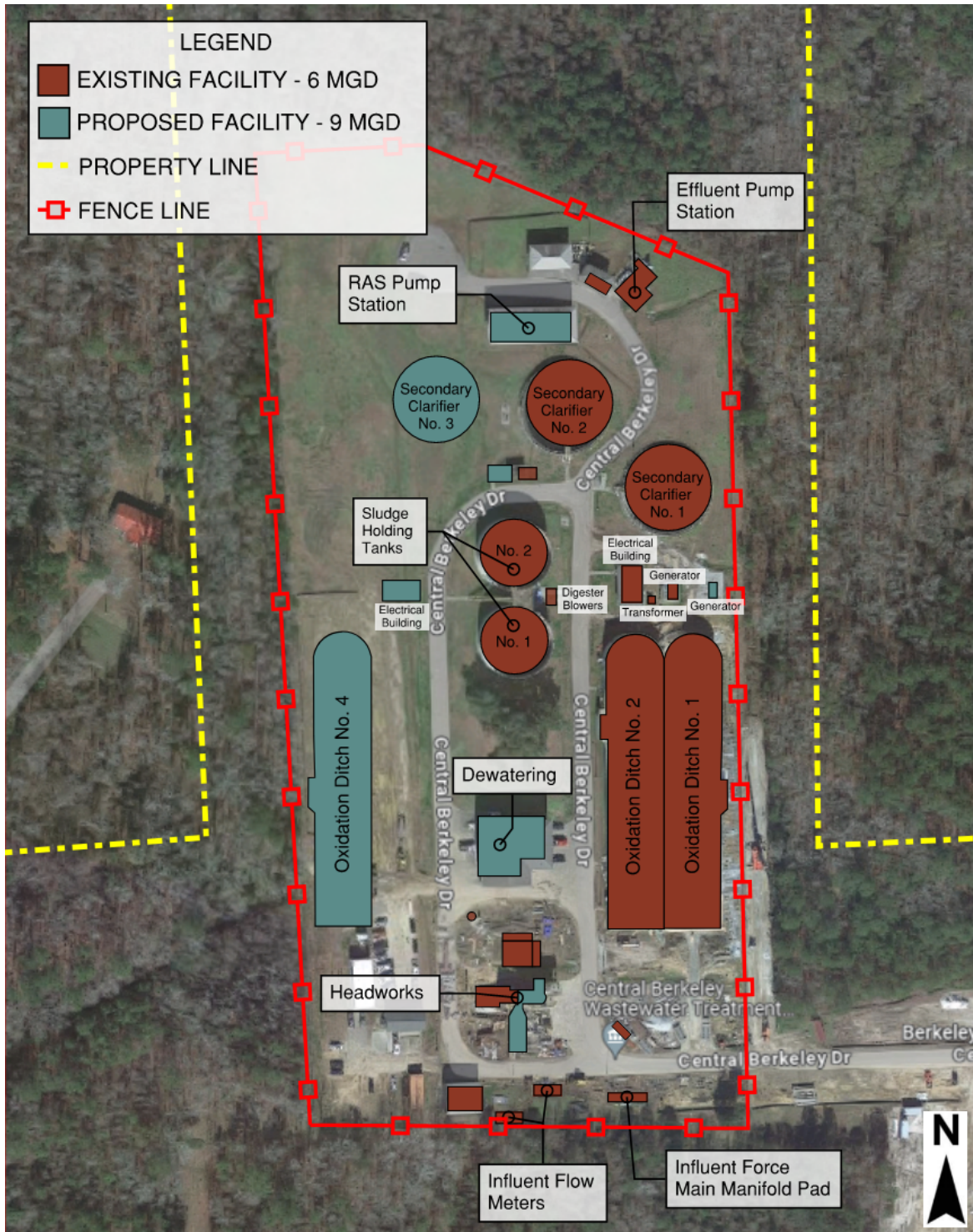


Figure 7-2: Site Map

8. Planning Area Map

Figure 8-1 identifies the CBWWTP service area.

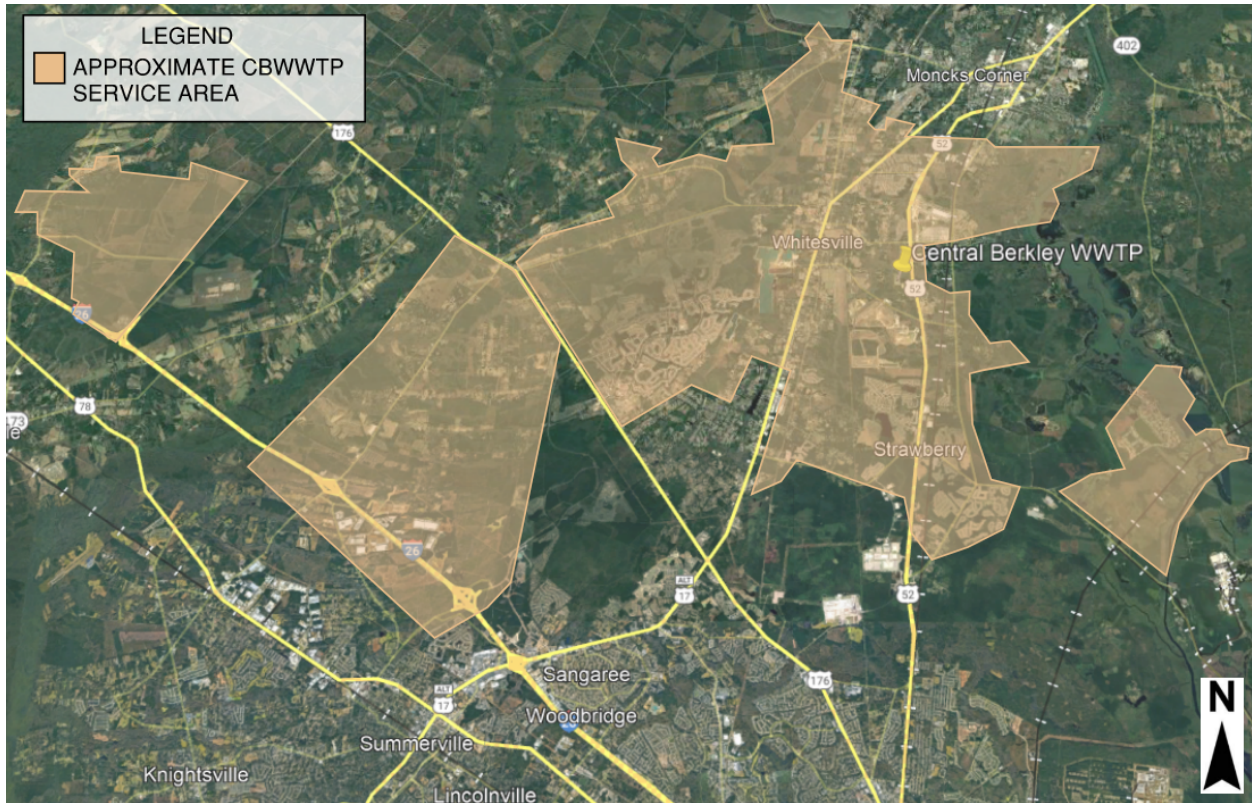


Figure 8-1: CBWWTP Service Area

9. Other DHEC Sections

CBWWTP has a Reliability Classification III by DHEC, which provides protection for waters of the State by requiring backup components and auxiliary power. The backup power source shall provide enough power to operate the screening facilities, one aerator per oxidation ditch, the secondary clarifier mechanisms, RAS pumps, and the main wastewater pumps during peak wastewater flow condition with critical lighting and ventilation, at a minimum. The proposed design for CBWWTP expansion will meet all Reliability Classification III requirements.

Section R.61-67.200 does not require any additional information related to this project.

10. Environmental Evaluation and Public Participation

DHEC determined that the CBWWTP 9-mgd expansion project does not qualify for a categorical exclusion and was issued a Finding of No Significant Impact (FNSI). Therefore an environmental evaluation must be completed, and a public meeting conducted. All documentation from the environmental evaluation is provided in Appendix B and Appendix C includes documentation of the public meeting conducted by BCWS.

11. Federal Flood Risk

SRF funding requires evaluating the floodplain impact from new construction and proposed improvements. The Federal Emergency Management Agency (FEMA) issued a Flood Insurance Rate Map (FIRM) for the area encompassing the project site dated December 7, 2018. The conceptual design analysis includes reviewing the flood elevations.

All portions of the CBWWTP 9-mgd expansion project fall outside of the 100-year floodplain. The area bordering CBWWTP has a FEMA flood elevation of 27 feet. Any structures placed inside the floodplain will have a finished floor or top of wall elevation set to a minimum of 2 feet above the FEMA flood elevation, or elevation 29 feet. See **Figure 11-1** for the FEMA Flood Map of the CBWWTP.

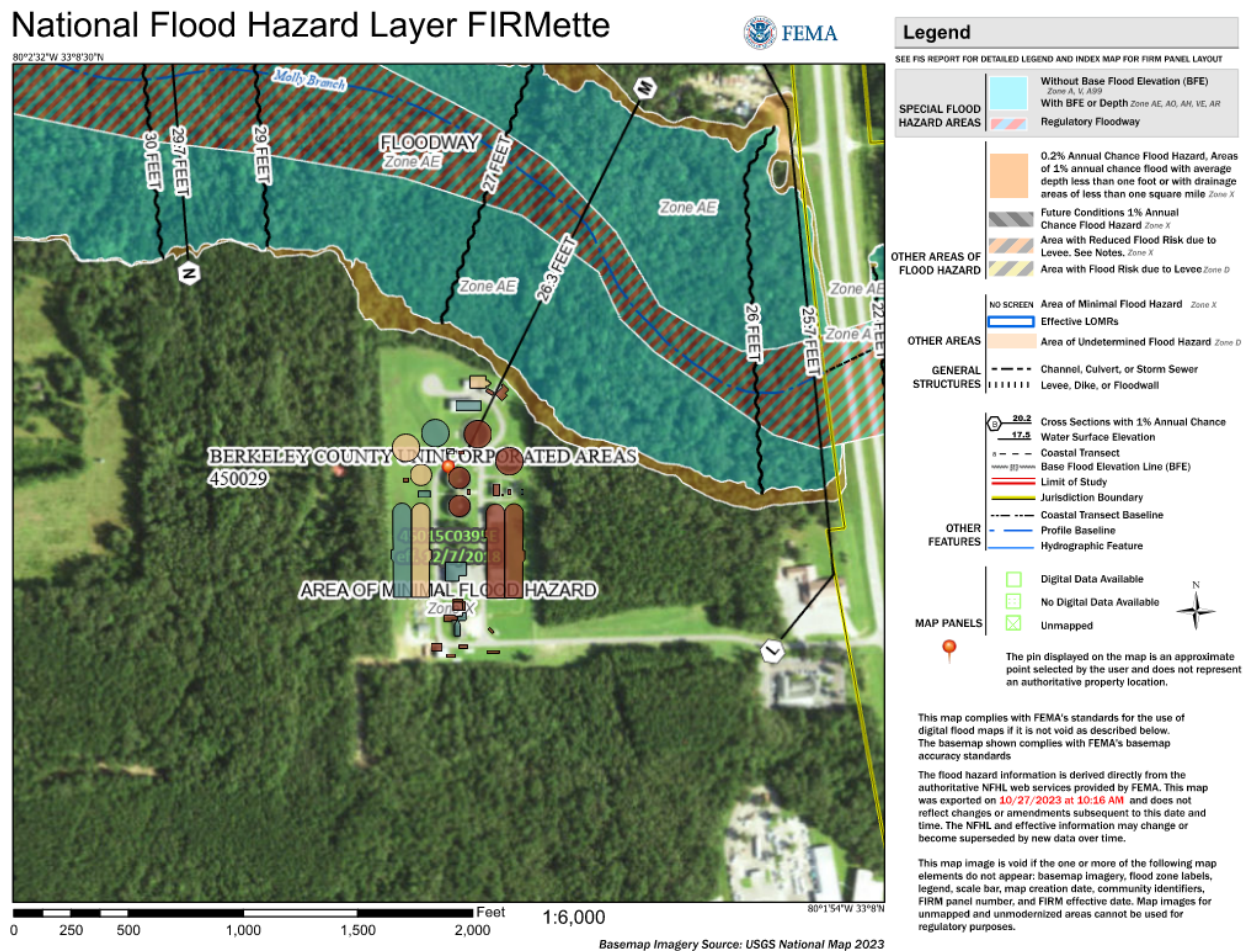


Figure 11-1: CBWWTP Area Flood Map

Appendix A: Cost and Effectiveness



Cost and Effectiveness Certification



SRF Project Number 496-32

Project Name Central Berkeley WWTP Upgrade to 9 MGD

Project Sponsor Berkeley County Water and Sanitation

Section 602(b)(13) of the Federal Water Pollution Control Act (FWPCA) requires a recipient of a loan to certify that the recipient:

- 1) has studied and evaluated the cost and effectiveness of the processes, materials, techniques, and technologies for carrying out the proposed project or activity for which assistance is sought under the Clean Water State Revolving Fund Loan Program; and
- 2) has selected, to the maximum extent practicable, a project or activity that maximizes the potential for efficient water use, reuse, recapture, and conservation, and energy conservation, taking into account –
 - (i) the cost of constructing the project or activity;
 - (ii) the cost of operating and maintaining the project or activity over the life of the project or activity; and
 - (iii) the cost of replacing the project or activity.

Pursuant to Section 602(b)(13) of the FWPCA, all Project Sponsors will evaluate and certify that cost and effectiveness has been addressed as part of the Preliminary Engineering Report.

Certification

Pursuant to Section 602(B)(13), we certify that the requirements of Section 602(B)(13), as set forth in items (1) and (2) above, have been completed.

Emma Martin

Digitally signed by Emma Martin
DN: C=US, E=emartin@hazenandsawyer.com, O=Hazen and Sawyer, CN=Emma Martin
Date: 2024.02.29 13:51:10-05'00'

Signature of Project Engineer

Emma S. Martin

Printed Name of Project Engineer

Ryan Gatlin

Digitally signed by Ryan Gatlin
Date: 2024.02.29 13:40:52-05'00'

Signature of Project Sponsor's Representative

Ryan Gatlin

Printed Name of Project Sponsor's Representative

Submit by email to DHEC project manager or by mail to:
SRF Section - Water Facilities Permitting Division, S.C. DHEC, 2600 Bull Street, Columbia, SC 29201

Appendix B: Environmental Evaluation Records



March 27, 2024

Dr. Wenonah Haire
Catawba Indian Nation
1536 Tom Steven Rd
Rock Hill, SC 29730

RE: Request for Environmental Consultation
SRF Project Central Berkeley WWTP 9-MGD Expansion
SRF Project # 496-32
Berkeley County

Dear Dr. Haire,

Berkeley County Water & Sanitation (BCWS) is pursuing a State Revolving Fund (SRF) loan for this project. Since this project will be funded with SRF federal monies, we are making an official request to your office for environmental review and comments. The included location map(s) shows the area for project activities. The Department has also included other information we used in our environmental review. The Department did not find any significant concerns and proposes that a Finding of No Significant Impact decision be issued for this project.

If your Agency has any concerns, please provide us with detailed comments. The Department requests a response be received within the 30 calendar days of the date on this correspondence. If we do not receive a response, or a request for additional review time within 30 calendar days, the Department may move forward with the project.

Should you have questions or need additional information, please contact me at (803) 898-4151 or leathegn@dhec.sc.gov.

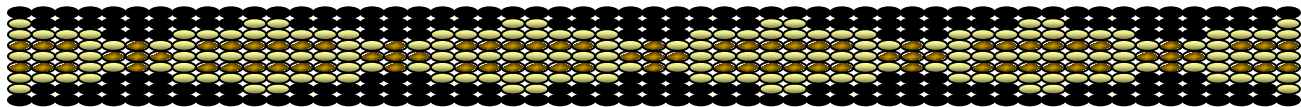
Sincerely,

A handwritten signature in blue ink that reads 'Gracie Leatherman'. The signature is fluid and cursive, with the first name 'Gracie' being more prominent.

Gracie Leatherman
State Revolving Fund Division
SCDHEC Bureau of Water

Catawba Indian Nation
Tribal Historic Preservation Office
1536 Tom Steven Road
Rock Hill, South Carolina 29730

Office 803-328-2427



April 24, 2024

Attention: Gracie Leatherman
DHEC
2600 Bull Street
Columbia, SC 29201

Re. THPO #	TCNS #	Project Description
2024-231-8		SRF Project Central Berkeley WWTP 9-MGD Expansion – SRF Project # 496-32

Dear Ms. Leatherman,

The Catawba have no immediate concerns with regard to traditional cultural properties, sacred sites or Native American archaeological sites within the boundaries of the proposed project areas. **However, the Catawba are to be notified if Native American artifacts and / or human remains are located during the ground disturbance phase of this project.**

If you have questions, please contact Caitlin Rogers at 803-328-2427 ext. 226, or e-mail Caitlin.Rogers@catawba.com.

Sincerely,

Wenonah G. Haire
Tribal Historic Preservation Officer



March 27, 2024

Maggie Jamison
SC Dept. of Natural Resources
5 Geology Road
Columbia, SC 29212

RE: Request for Environmental Consultation
SRF Project Central Berkeley WWTP 9-MGD Expansion
SRF Project # 496-32
Berkeley County

Dear Ms. Jamison,

Berkeley County Water & Sanitation (BCWS) is pursuing a State Revolving Fund (SRF) loan for this project. Since this project will be funded with SRF federal monies, we are making an official request to your office for environmental review and comments. The included location map(s) shows the area for project activities. The Department has also included other information we used in our environmental review. The Department did not find any significant concerns and proposes that a Finding of No Significant Impact decision be issued for this project.

If your Agency has any concerns, please provide us with detailed comments. The Department requests a response be received within the 30 calendar days of the date on this correspondence. If we do not receive a response, or a request for additional review time within 30 calendar days, the Department may move forward with the project.

Should you have questions or need additional information, please contact me at (803) 898-4151 or leathegn@dhec.sc.gov.

Sincerely,

A handwritten signature in blue ink that reads "Gracie Leatherman".


Gracie Leatherman
State Revolving Fund Division
SCDHEC Bureau of Water

RE: Request for Consultation: Central Berkeley WWTP 9-mgd Expansion SRF #496-32

Greg Mixon <MixonG@dnr.sc.gov>

Wed 4/24/2024 10:03 AM

To:Leatherman, Gracie N. <LeatheGN@dhec.sc.gov>

 3 attachments (13 MB)

496-32 CBWWTP 9mgd expansion maps.pdf; SRF PER - CBWWTP 9-mgd Expansion ..pdf; Request Cover Letter.pdf;

***** Caution. This is an EXTERNAL email. DO NOT open attachments or click links from unknown senders or unexpected email. *****

Good morning Gracie,

Personnel with the South Carolina Department of Natural Resources (SCDNR) have reviewed the information provided regarding the proposed project and find that the project will not result in negative impacts to the environment, and we offer no objections to the proposed work.

Thank you for the opportunity to review this project and provide comments. Should you have any questions or need more information, please do not hesitate to contact me by email at [MixonG@dnr.sc.gov%20]MixonG@dnr.sc.gov or by phone at 803.734.3282.

Greg Mixon

Office of Environmental Programs

South Carolina Department of Natural Resources

217 Fort Johnson Road, Charleston, SC 29412

P.O. Box 12559, Charleston, SC 29422-2559

Office: 803-734-3282

Mobile: 803-600-7543

MixonG@dnr.sc.govwww.dnr.sc.gov/environmental

From: Leatherman, Gracie N. <LeatheGN@dhec.sc.gov>**Sent:** Wednesday, March 27, 2024 10:42 AM**To:** environmental <environmental@dnr.sc.gov>**Cc:** Peterson, Raymond F. <PetersRF@dhec.sc.gov>**Subject:** Request for Consultation: Central Berkeley WWTP 9-mgd Expansion SRF #496-32

Good Morning,

The SRF Division is reaching out to request any comments or concerns you may have regarding this project. I'm attaching several maps I used in my review, including project maps

and some information from SC Heritage. Additionally, the Preliminary Engineering Report (PER) is attached. Please let me know if you have trouble accessing that.

The proposed project includes the CBWWTP upgrade and expansion from 6- to 9-mgd. The existing CBWWTP was commissioned in 2009 with a rated capacity of 3-mgd and was expanded to 6-mgd in 2020. Expansion includes a third oxidation ditch and a third secondary clarifier to meet the current permitted effluent ultimate oxygen demand at the expanded flow. The project also includes rehabilitation of the existing screens and replacement of the current rotary fan press with centrifuge dewatering; new rotary lobe feed pumps, and polymer system upgrades, along with one new RAS pump. A new internal electrical distribution system and standby generator will be provided. All work will be within the CBWWTP property on previously disturbed land.

If you have any questions or need more information, please let me know. Thank you!

Gracie Leatherman

Environmental Coordinator/Project Manager

State Revolving Fund - Bureau of Water

S.C. Dept. of Health & Environmental Control

Office: (803) 898-4151

Connect: www.scdhec.gov

EXTERNAL EMAIL: Do not click any links or open any attachments unless you trust the sender and know the content is safe.



March 27, 2024

Region IV
Federal Emergency Management Agency
3003 Chamblee Tucker Road
Atlanta, GA 30341

RE: Request for Environmental Consultation
SRF Project Central Berkeley WWTP 9-MGD Expansion
SRF Project # 496-32
Berkeley County

To Whom It May Concern,

Berkeley County Water & Sanitation (BCWS) is pursuing a State Revolving Fund (SRF) loan for this project. Since this project will be funded with SRF federal monies, we are making an official request to your office for environmental review and comments. The included location map(s) shows the area for project activities. The Department has also included other information we used in our environmental review. The Department did not find any significant concerns and proposes that a Finding of No Significant Impact decision be issued for this project.

If your Agency has any concerns, please provide us with detailed comments. The Department requests a response be received within the 30 calendar days of the date on this correspondence. If we do not receive a response, or a request for additional review time within 30 calendar days, the Department may move forward with the project.

Should you have questions or need additional information, please contact me at (803) 898-4151 or leathegn@dhec.sc.gov.

Sincerely,

A handwritten signature in blue ink that reads "Gracie Leatherman".

Gracie Leatherman
State Revolving Fund Division
SCDHEC Bureau of Water



March 27, 2024

Christopher Stout
Ocean & Coastal Resource Management
1362 McMillan Ave., Suite 400
Charleston, SC 29405

RE: Request for Environmental Consultation
SRF Project Central Berkeley WWTP 9-MGD Expansion
SRF Project # 496-32
Berkeley County

Dear Mr. Stout,

Berkeley County Water & Sanitation (BCWS) is pursuing a State Revolving Fund (SRF) loan for this project. Since this project will be funded with SRF federal monies, we are making an official request to your office for environmental review and comments. The included location map(s) shows the area for project activities. The Department has also included other information we used in our environmental review. The Department did not find any significant concerns and proposes that a Finding of No Significant Impact decision be issued for this project.

If your Agency has any concerns, please provide us with detailed comments. The Department requests a response be received within the 30 calendar days of the date on this correspondence. If we do not receive a response, or a request for additional review time within 30 calendar days, the Department may move forward with the project.

Should you have questions or need additional information, please contact me at (803) 898-4151 or leathegn@dhec.sc.gov.

Sincerely,

Gracie Leatherman
State Revolving Fund Division
SCDHEC Bureau of Water



Coastal Zone Consistency Comments

To: Gracie Leatherman, BOW Water Facilities Permitting

From: Benjamin Thepaut, OCRM Coastal Zone Consistency Section *BT*

Project Name: Central Berkeley WWTP 9-mgd Expansion SRF #496-32

Site Location: 158 Central Berkeley Drive, Moncks Corner, South Carolina

Date: April 23, 2024

The staff of the Office of Ocean and Coastal Resource Management (OCRM) was contacted to provide comments pertaining to the above requested project. In detail, Berkeley County owns and operates the Central Berkeley Wastewater Treatment Plant (CBWWTP) and seeks upgrade and expansion. The preferred alternative includes the CBWWTP upgrade and expansion from 6 mgd to 9 mgd. The existing CBWWTP was commissioned in 2009 with a rated capacity of 3 mgd and was expanded to 6 mgd in 2020. Expansion to 9 mgd includes a third oxidation ditch and a third secondary clarifier to meet the current permitted effluent ultimate oxygen demand (UOD) at the expanded flow. In addition to the new facilities. The 9-mgd expansion includes rehabilitation of the existing screens and replacement of the current RFP with centrifuge dewatering.

Performing a cursory review of the proposed project area based upon the information provided, the proposed expansion will be entirely within uplands at the existing WWTP property. The project site is bounded by the floodplain and wetlands of Molly Branch. The expansion efforts should be designed to remain on high ground and avoid these floodplain and wetland areas. This project is considered as less than ½ mile to the receiving water body. Previous archaeological coordination with the State Historic Preservation Office indicated late-discovery conditions apply to work in and around the site.

This type of project would need to be reviewed for consistency with Guidelines for Evaluation of All Projects as well as the Public Services and Facilities, and Stormwater Management policies contained in the S.C. Coastal Zone Management Program.

This memo should not be considered a final determination on the project and a review for Coastal Zone Consistency Determination will still be required upon submittal of the appropriate State and Federal permit applications.



March 27, 2024

John Sylvest
State Historic Preservation Office
SC Dept. of Archives & History
8301 Parklane Road
Columbia, SC 29223

RE: Request for Environmental Consultation
SRF Project Central Berkeley WWTP 9-MGD Expansion
SRF Project # 496-32
Berkeley County

Dear Mr. Sylvest,

Berkeley County Water & Sanitation (BCWS) is pursuing a State Revolving Fund (SRF) loan for this project. Since this project will be funded with SRF federal monies, we are making an official request to your office for environmental review and comments. The included location map(s) shows the area for project activities. The Department has also included other information we used in our environmental review. The Department did not find any significant concerns and proposes that a Finding of No Significant Impact decision be issued for this project.

If your Agency has any concerns, please provide us with detailed comments. The Department requests a response be received within the 30 calendar days of the date on this correspondence. If we do not receive a response, or a request for additional review time within 30 calendar days, the Department may move forward with the project.

Should you have questions or need additional information, please contact me at (803) 898-4151 or leathegn@dhec.sc.gov.

Sincerely,

Gracie Leatherman
State Revolving Fund Division
SCDHEC Bureau of Water



April 19, 2024

Gracie Leatherman
State Revolving Fund Division
SC Department of Health and Environmental Control
leathegn@dhec.sc.gov

Re: Central Berkeley WWTP 9-MGD Expansion
Moncks Corner, Berkeley County, South Carolina
SHPO Project No. 24-JS0160

Dear Gracie Leatherman:

Thank you for your March 27, 2024 letter and project review submittal, which we received on April 1, 2024, regarding the above referenced proposed undertaking. We also received a Section 106 Project Review Form, site aerials, and maps as supporting documentation for this undertaking. The State Historic Preservation Office is providing comments to the US Environmental Protection Agency (EPA) and the SCDHEC State Revolving Fund Division pursuant to Section 106 of the National Historic Preservation Act and its implementing regulations, 36 CFR 800. Consultation with the SHPO is not a substitution for consultation with Tribal Historic Preservation Offices, other Native American tribes including those with state recognition, local governments, or the public.

Based on the description of the undertaking's Area of Potential Effect (APE) and the identification of no historic properties within the APE, our office concurs with the assessment that no properties listed in or eligible for listing in the National Register of Historic Places will be affected by this project. The APE includes archaeology site 38BK1671, which does not meet the criteria for listing in the National Register.

If archaeological materials are encountered during construction, the procedures codified at 36 CFR 800.13(b) will apply. Archaeological materials consist of any items, fifty years old or older, which were made or used by man. These items include, but are not limited to, stone projectile points (arrowheads), ceramic sherds, bricks, worked wood, bone and stone, metal and glass objects, and human skeletal materials. The federal agency or the applicant receiving federal assistance should contact our office immediately.

Please refer to SHPO Project No. 24-JS0160 in any future correspondence regarding this project. If you have any questions, please contact me at (803) 896-6129 or JSylvest@scdah.sc.gov.

Sincerely,

John D. Sylvest

John D. Sylvest
Supervisor of Survey and Review & Compliance
State Historic Preservation Office

cc: Tracy Williams, williams.trychacio@epa.gov



March 27, 2024

Tom McCoy
US Dept. of the Interior
Fish and Wildlife Services
176 Croghan Spur Rd., Suite 200
Charleston, SC 29407

RE: Request for Environmental Consultation
SRF Project Central Berkeley WWTP 9-MGD Expansion
SRF Project # 496-32
Berkeley County

Dear Mr. McCoy,

Berkeley County Water & Sanitation (BCWS) is pursuing a State Revolving Fund (SRF) loan for this project. Since this project will be funded with SRF federal monies, we are making an official request to your office for environmental review and comments. The included location map(s) shows the area for project activities. The Department has also included other information we used in our environmental review. The Department did not find any significant concerns and proposes that a Finding of No Significant Impact decision be issued for this project.

If your Agency has any concerns, please provide us with detailed comments. The Department requests a response be received within the 30 calendar days of the date on this correspondence. If we do not receive a response, or a request for additional review time within 30 calendar days, the Department may move forward with the project.

Should you have questions or need additional information, please contact me at (803) 898-4151 or leathegn@dhecs.sc.gov.

Sincerely,

A handwritten signature in blue ink that reads "Gracie Leatherman". The signature is fluid and cursive, written in a professional style.

Gracie Leatherman
State Revolving Fund Division
SCDHEC Bureau of Water



United States Department of the Interior



FISH AND WILDLIFE SERVICE
South Carolina Ecological Services
176 Croghan Spur Road, Suite 200
Charleston, SC 29407-7558
Phone: (843) 727-4707 Fax: (843) 727-4218

In Reply Refer To:

03/21/2024 19:26:04 UTC

Project code: 2024-0066376

Project Name: 496-32 Central Berkeley WWTP Upgrade to 9 MGD

Federal Nexus: no

Federal Action Agency (if applicable): South Carolina Department of Health and Environmental Control

Subject: Technical assistance for '496-32 Central Berkeley WWTP Upgrade to 9 MGD'

Dear Gracie Leatherman:

This letter records your determination using the Information for Planning and Consultation (IPaC) system provided to the U.S. Fish and Wildlife Service (Service) on March 21, 2024, for '496-32 Central Berkeley WWTP Upgrade to 9 MGD' (here forward, Project). This project has been assigned Project Code 2024-0066376 and all future correspondence should clearly reference this number. **Please carefully review this letter. Your Endangered Species Act (Act) requirements are not complete.**

Ensuring Accurate Determinations When Using IPaC

The Service developed the IPaC system and associated species' determination keys in accordance with the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and based on a standing analysis. All information submitted by the Project proponent into IPaC must accurately represent the full scope and details of the Project.

Failure to accurately represent or implement the Project as detailed in IPaC or the Northern Long-eared Bat Rangewide Determination Key (Dkey), invalidates this letter. ***Answers to certain questions in the DKey commit the project proponent to implementation of conservation measures that must be followed for the ESA determination to remain valid.***

Determination for the Northern Long-Eared Bat

Based upon your IPaC submission and a standing analysis, your project is not reasonably certain to cause incidental take of the northern long-eared bat. Unless the Service advises you within 15 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that the Action is not likely to result in unauthorized take of the northern long-eared bat.

Other Species and Critical Habitat that May be Present in the Action Area

The IPaC-assisted determination for the northern long-eared bat does not apply to the following ESA-protected species and/or critical habitat that also may occur in your Action area:

- American Chaffseed *Schwalbea americana* Endangered
- Canby's Dropwort *Oxypolis canbyi* Endangered
- Monarch Butterfly *Danaus plexippus* Candidate
- Pondberry *Lindera melissifolia* Endangered
- Red-cockaded Woodpecker *Picoides borealis* Endangered
- Tricolored Bat *Perimyotis subflavus* Proposed Endangered

You may coordinate with our Office to determine whether the Action may cause prohibited take of the animal species and/or critical habitat listed above. Note that if a new species is listed that may be affected by the identified action before it is complete, additional review is recommended to ensure compliance with the Endangered Species Act.

Next Steps

Coordination with the Service is complete. This letter serves as technical assistance. All conservation measures should be implemented as proposed. Thank you for considering federally listed species during your project planning.

We are uncertain where the northern long-eared bat occurs on the landscape outside of known locations. Because of the steep declines in the species and vast amount of available and suitable forest habitat, the presence of suitable forest habitat alone is a far less reliable predictor of their presence. Based on the best available information, most suitable habitat is now expected to be unoccupied. During the interim period, while we are working on potential methods to address this uncertainty, we conclude take is not reasonably certain to occur in areas of suitable habitat where presence has not been documented.

If no changes occur with the Project or there are no updates on listed species, no further consultation/coordination for this project is required for the northern long-eared bat. However, the Service recommends that project proponents re-evaluate the Project in IPaC if: 1) the scope, timing, duration, or location of the Project changes (includes any project changes or amendments); 2) new information reveals the Project may impact (positively or negatively) federally listed species or designated critical habitat; or 3) a new species is listed, or critical habitat designated. If any of the above conditions occurs, additional coordination with the Service should take place before project implements any changes which are final or commits additional resources.

If you have any questions regarding this letter or need further assistance, please contact the South Carolina Ecological Services and reference Project Code 2024-0066376 associated with this Project.

Action Description

You provided to IPaC the following name and description for the subject Action.

1. Name

496-32 Central Berkeley WWTP Upgrade to 9 MGD

2. Description

The following description was provided for the project '496-32 Central Berkeley WWTP Upgrade to 9 MGD':

This project proposes upgrading the Central Berkeley WWTP and expansion from 6 mgd to 9 mgd with the addition of a new parallel treatment train. Expansion to 9 mgd includes a third oxidation ditch and a third secondary clarifier to meet the current permitted effluent ultimate oxygen demand at the expanded flow.

Additionally, the expansion includes rehabilitation of the existing screens and replacement of the current RFP with centrifuge dewatering.

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@33.13711455,-80.0373982945223,14z>



DETERMINATION KEY RESULT

Based on the answers provided, the proposed Action is consistent with a determination of “may affect, but not likely to adversely affect” for the Endangered northern long-eared bat (*Myotis septentrionalis*).

QUALIFICATION INTERVIEW

1. Does the proposed project include, or is it reasonably certain to cause, intentional take of the northern long-eared bat or any other listed species?

Note: Intentional take is defined as take that is the intended result of a project. Intentional take could refer to research, direct species management, surveys, and/or studies that include intentional handling/encountering, harassment, collection, or capturing of any individual of a federally listed threatened, endangered or proposed species?

No

2. Your project overlaps with an area where northern long-eared bats may be present year-round. Time-of-year restrictions may not be appropriate for your project due to bats being active all year.

Do you understand that your project may impact bats at any time during the year and time-of-year restrictions may not apply to your project?

Yes

3. The action area does not overlap with an area for which U.S. Fish and Wildlife Service currently has data to support the presumption that the northern long-eared bat is present. Are you aware of other data that indicates that northern long-eared bats (NLEB) are likely to be present in the action area?

Bat occurrence data may include identification of NLEBs in hibernacula, capture of NLEBs, tracking of NLEBs to roost trees, or confirmed NLEB acoustic detections. Data on captures, roost tree use, and acoustic detections should post-date the year when white-nose syndrome was detected in the relevant state. With this question, we are looking for data that, for some reason, may have not yet been made available to U.S. Fish and Wildlife Service.

No

4. Does any component of the action involve construction or operation of wind turbines?

Note: For federal actions, answer ‘yes’ if the construction or operation of wind power facilities is either (1) part of the federal action or (2) would not occur but for a federal agency action (federal permit, funding, etc.).

No

5. Is the proposed action authorized, permitted, licensed, funded, or being carried out by a Federal agency in whole or in part?

No

PROJECT QUESTIONNAIRE

IPAC USER CONTACT INFORMATION

Agency: South Carolina Department of Health and Environmental Control

Name: Gracie Leatherman

Address: 2600 Bull St

City: Columbia

State: SC

Zip: 29201

Email: leathegn@dhec.sc.gov

Phone: 8038984151



United States Department of the Interior



FISH AND WILDLIFE SERVICE
South Carolina Ecological Services
176 Croghan Spur Road, Suite 200
Charleston, SC 29407-7558
Phone: (843) 727-4707 Fax: (843) 727-4218

In Reply Refer To:

03/22/2024 14:41:00 UTC

Project code: 2024-0066376

Project Name: 496-32 Central Berkeley WWTP Upgrade to 9 MGD

Subject: Consistency letter for '496-32 Central Berkeley WWTP Upgrade to 9 MGD' for specified federally threatened and endangered species and designated critical habitat that may occur in your proposed project area consistent with the South Carolina Ecological Services Field Office (ESFO) Determination Key (DKey) for project review and guidance for federally listed species.

Gracie Leatherman:

The U.S. Fish and Wildlife Service (Service) received on **March 22, 2024** your effect determination(s) for the '496-32 Central Berkeley WWTP Upgrade to 9 MGD' (the Action) using the South Carolina ESFO DKey for project review and guidance for federally-listed species within the Information for Planning and Consultation (IPaC) application. The Service developed this application in accordance with the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

Based on your answers and the assistance of the Service's South Carolina ESFO DKey, you made the following effect determination(s) for the proposed Action:

Species	Listing Status	Determination
American Chaffseed (<i>Schwalbea americana</i>)	Endangered	No effect
Canby's Dropwort (<i>Oxypolis canbyi</i>)	Endangered	NLAA
Pondberry (<i>Lindera melissifolia</i>)	Endangered	No effect
Red-cockaded Woodpecker (<i>Picoides borealis</i>)	Endangered	No effect

Coordination with the Service is complete Thank you for considering federally listed species during your project planning.

The following species and/or critical habitats may also occur in your project area and **are not** covered by this conclusion:

- Monarch Butterfly *Danaus plexippus* Candidate
- Northern Long-eared Bat *Myotis septentrionalis* Endangered

- Tricolored Bat *Perimyotis subflavus* Proposed Endangered

Please note that due to obligations under the ESA, potential impacts of this project must be reconsidered if: (1) new information reveals impacts of this identified action may affect any listed species or critical habitat in a manner not previously considered; (2) this action is subsequently modified in a manner which was not considered in this assessment; or (3) a new species is listed or critical habitat is designated that may be affected by the identified action. If any of the above conditions occurs, additional consultation with the South Carolina ESFO should take place before project changes are final or resources committed.

Bald and Golden Eagle Protection Act (BGEPA): Bald and golden eagles are not included in this section 7(a)(2) consultation and this information does not constitute a determination of effects by the Service. The Service developed the [National Bald Eagle Management Guidelines](#) to advise landowners, land managers, and others who share public and private lands with bald eagles when and under what circumstances the protective provisions of the BGEPA may apply to their activities. The guidelines should be consulted prior to conducting new or intermittent activity near an eagle nest.

If the Federal Action may impact bald or golden eagles, additional coordination with the Service under the Bald and Golden Eagle Protection Act (BGEPA) (54 Stat. 250, as amended, 16 U.S.C. 668a-d) may be required. Please contact Ulgonda Kirkpatrick (phone: 321/972-9089, e-mail: ulgonda_kirkpatrick@fws.gov) with any questions regarding potential impacts to bald or golden eagles.

Action Description

You provided to IPaC the following name and description for the subject Action.

1. Name

496-32 Central Berkeley WWTP Upgrade to 9 MGD

2. Description

The following description was provided for the project '496-32 Central Berkeley WWTP Upgrade to 9 MGD':

This project proposes upgrading the Central Berkeley WWTP and expansion from 6 mgd to 9 mgd with the addition of a new parallel treatment train. Expansion to 9 mgd includes a third oxidation ditch and a third secondary clarifier to meet the current permitted effluent ultimate oxygen demand at the expanded flow.

Additionally, the expansion includes rehabilitation of the existing screens and replacement of the current RFP with centrifuge dewatering.

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@33.13711455,-80.0373982945223,14z>



QUALIFICATION INTERVIEW

1. Does the proposed project involve research or other actions that include the collection, capture, handling, or harassment of any individual federally listed threatened, endangered or proposed species?

No

2. Is the action authorized, funded, or being carried out by a Federal agency?

No

3. Is the project an existing structure that requires maintenance, repair, or replacement?

No

4. Does the project intersect the red-cockaded woodpecker AOI?

Automatically answered

Yes

5. Is the action area located within suitable Red-cockaded woodpecker [foraging habitat](#) (pine or pine/hardwood stands in which 50% or more of the dominant trees are pines and the dominant pine trees are 30 years of age or older or >10-inches diameter breast height (dbh) and the midstory height does not exceed 12 feet)?

No

6. Does the project intersect the pondberry AOI?

Automatically answered

Yes

7. Is there suitable pondberry habitat (e.g., pond margins, swampy depressions, sandy sinks, and seasonally flooded wetlands) for pondberry located within the project area?

No

8. Does the project intersect the American chaffseed AOI?

Automatically answered

Yes

9. Is there suitable habitat for American chaffseed located within the project area?

Note: American Chaffseed occurs in sandy (sandy peat, sandy loam), acidic, seasonally moist to dry soils. It is generally found in early successional habitats described as open, moist pine flatwoods, fire-maintained savannas, ecotonal areas between peaty wetlands and xeric (dry) sandy soils, bog borders, and other open grass-sedge systems. American Chaffseed is dependent on factors such as fire and mowing to maintain the open to partly open conditions that it requires. They can be found in habitat that is managed for the red-cockaded woodpecker. The species appears to be shade intolerant. American Chaffseed occurs in species-rich plant communities where grasses, sedges, and savanna dicots are numerous. For more information see: American Chaffseed (Schwalbea americana) Recovery Plan. ECOS: https://ecos.fws.gov/docs/recovery_plan/950929c.pdf

No

10. Does the project intersect the Canby's dropwort AOI?

Automatically answered

Yes

11. Is there suitable habitat for Canby's dropwort located within the project area?

Note: Canby's Dropwort can be found in a variety of coastal plain habitats, including natural ponds dominated by pond cypress, grass-sedge-dominated Carolina bays, wet pine savannas, shallow pineland ponds and cypress-pine swamps or sloughs. The largest and most vigorous populations have been found in open bays or ponds that are wet throughout most of the year, but which have little or no canopy cover. Soils are sandy loams or acidic peat mucks underlain by clay layers which, along with the slight gradient of the areas, result in the retention of water.

Yes

12. Will the project impact suitable Canby's dropwort habitat (e.g., changes to the groundwater table, introduced shading, habitat loss/conversion, herbicide/pesticide application, dredge and fill activities)?

No

13. This determination key does not cover the Northern long-eared bat. Have you or will you complete the Determination Key for the Northern long-eared bat?

Yes

IPAC USER CONTACT INFORMATION

Agency: South Carolina Department of Health and Environmental Control

Name: Gracie Leatherman

Address: 2600 Bull St

City: Columbia

State: SC

Zip: 29201

Email: leathegn@dhec.sc.gov

Phone: 8038984151

Appendix C: Public Meeting Documentation

The Post and Courier

148 Williman Street - Charleston, SC 29403

Classified Ad to publish in		Post and Courier, Post & Courier Web			
		* One affidavit of publication will be provided for Legal Ads. Additional affidavits will have a charge of \$20.00 per affidavit. (Effective July 20, 2023) FOR ALL LEGAL AFFIDAVIT INQUIRIES, CONTACT affidavits@postandcourier.com			
Customer Name		Berkeley County Water & Sanitation			
Order	2069980	Class	955	Lines	75.0
Account	358436	Start Date	05/17/2024	Payments	\$0.00
Name	JIMMY CREPEAU	Stop Date	05/17/2024	Total Price	\$166.50
Phone	(843) 719-2370	Insertions	2	Ad Rep	P&C Legals

**PUBLIC HEARING DATE:
June 24, 2024**

State Revolving Fund (SRF) Loan Program: Berkeley County Water & Sanitation, Berkeley County, Central Berkeley Wastewater Treatment Plant 9-MGD Expansion Project; SRF Project #496-32. To all interested parties: this is notification that Berkeley County is required, as condition of the loan program to conduct a public meeting and/or hearing for this project. In lieu of a special meeting, this meeting and/or hearing may be conducted as an approved agenda item during a regular scheduled and noticed Berkeley County Council meeting, to discuss this project, which is open to the public. The project includes expanding the rated treatment capacity from 6-mgd to 9-mgd average design flow by installing new screening equipment, one oxidation ditch, one secondary clarifier, one return sludge pump, and replacing the existing dewatering equipment with an expanded, more compact technology in the existing building. The estimated cost is \$40,500,000. This project is needed to improve process efficiency, enhance dewatering, and service area growth. Berkeley County will finance a portion of the project with a loan from the SRF Loan Program with remaining costs, paid for with a combination of a South Carolina Infrastructure Investment Program (SCIIP) Grant and local funds. There are minimal environmental impacts expected as part of this project since work will take place entirely within the fenced property of the existing wastewater treatment plant site. The documentation supporting this project is posted and available for public review at the Berkeley County Water & Sanitation office in Moncks Corner, SC. Any questions regarding this Notice should be directed to Richard Marchand, Director of BCWS, at (843) 761-8817 or richard.marchand@berkeleycountysc.gov.
AD# 2069980

Legal (843) 958-7392 Fax: (843) 937-5473
www.postandcourier.com

BERKELEY COUNTY GOVERNMENT
COUNTY COUNCIL PUBLIC HEARING MINUTES

June 24, 2024

County Administration Building

6:40 PM

1003 Hwy 52, Moncks Corner, SC 29461

ROLL CALL

Name	Attendance
Steve Davis	Absent
Tommy Newell	Present
Phillip Obie	Present
Dan Owens	Present
Caldwell Pinckney	Present
Amy Stern	Present
Marshall West	Present
Josh Whitley	Present

Roll Call Notes:

r. John O. Williams, II, County Attorney, was also present.

1. Call to Order

Electronic Participation Authorized

During periods of discussion and/or presentations, minutes are condensed and paraphrased.

Chairman Johnny Cribb called the meeting to order at 6:40 p.m.

In accordance with the Freedom of Information Act, the electronic and print media were duly notified.

2. Public Hearings

- a. BILL NO. 24-16, AN ORDINANCE TO AMEND ARTICLE 6, RURAL ZONING DISTRICTS, ARTICLE 4, USE TABLE, AND OTHER AMENDMENTS RELATED THERETO, THE BERKELEY COUNTY ZONING AND DEVELOPMENT STANDARDS ORDINANCE, AS AMENDED, PROVIDE AN ALTERNATIVE APPROACH TO SUBDIVISION DEVELOPMENT WITHIN THE RURAL AREAS OF THE COUNTY, MEET THE RURAL CHARACTER AND NATURAL RESOURCES PROTECTION OBJECTIVES OF THE COMPREHENSIVE

PLAN, MAXIMIZE OPEN SPACE CONSERVATION, AND MINIMIZE DEVELOPMENT IMPACTS WITHIN ENVIRONMENTALLY, CULTURALLY, AND/OR HISTORICALLY SIGNIFICANT AREAS.

Bill No. 24-16 was postponed in Committee and will not receive Third Reading on June 24, 2024.

DETAILS:

Chairman Cribb stated that Bill No. 24-16 has been postponed and will not receive Third Reading this evening.

b. BILL NO. 24-17, AN ORDINANCE AUTHORIZING THE EXECUTION AND DELIVERY OF A FIRST AMENDMENT TO AN EXISTING FEE-IN-LIEU OF TAX AND INCENTIVE AGREEMENT BY AND BETWEEN BERKELEY COUNTY AND DCB CAMP HALL, LLC (AS SUCCESSOR IN INTEREST TO DC BLOX INC.), TO EFFECT CERTAIN MODIFICATIONS THERETO WITH RESPECT TO CERTAIN PROPERTY NOW OR TO BE HEREAFTER LOCATED IN THE COUNTY; AND OTHER MATTERS RELATING THERETO.

DETAILS:

Chairman Cribb inquired as to if there were any public comments. There being none, he proceeded to the next Public Hearing.

c. BILL NO. 24-18, AN ORDINANCE TO MODIFY THE OFFICIAL ZONING AND DEVELOPMENT STANDARDS MAPS OF BERKELEY COUNTY, SOUTH CAROLINA, IN REGARD TO SILAS AND JOHN SMITH FOR TMS NOS. 248-00-03-012, 248-00-03-108 AND 248-00-03-099 (± 4.38 TOTAL ACRES); LOCATED ON CHARITY CHURCH ROAD IN THE HUGER COMMUNITY, FROM THE MANUFACTURED RESIDENTIAL (R-2) DISTRICT TO THE AGRICULTURAL (FLEX-1) DISTRICT, IN COUNCIL DISTRICT 8.

DETAILS:

Chairman Cribb inquired as to if there were any public comments. There being none, he proceeded to the next Public Hearing.

d. BILL NO. 24-20, AN ORDINANCE PROVIDING APPROPRIATIONS FOR THE FISCAL YEAR 2024-2025 BEGINNING JULY 1, 2024 AND ENDING JUNE 30, 2025 FOR BERKELEY COUNTY; TO PROVIDE FOR LEVY OF TAXES ON ALL TAXABLE PROPERTY IN BERKELEY COUNTY FOR ALL COUNTY PURPOSES; TO PROVIDE FOR THE EXPENDITURES OF SAID TAXES AND OTHER REVENUES COMING INTO THE COUNTY FOR THE FISCAL YEAR.

DETAILS:

Chairman Cribb inquired as to if there were any public comments. There being none, he proceeded to the next Public Hearing.

e. BILL NO. 24-21, AN ORDINANCE PROVIDING FOR THE ADOPTION OF FISCAL YEAR 2024-2025 (BEGINNING JULY 1, 2024 AND ENDING JUNE 30, 2025) BUDGETS FOR BERKELEY COUNTY WATER AND SANITATION SEWER AND WATER AND SOLID WASTE FUND; ESTABLISHING OPERATIONAL, DEBT SERVICE, AND CAPITAL IMPROVEMENT BUDGETS FOR WATER AND SEWER AND SOLID WASTE DIVISIONS; AND TO PROVIDE FOR THE EXPENDITURES OF REVENUES COMING INTO BERKELEY COUNTY WATER AND SANITATION SEWER AND WATER AND SOLID WASTE DIVISIONS DURING THE FISCAL YEAR, AND TO AMEND THE CODE OF ORDINANCES, BERKELEY COUNTY,

SOUTH CAROLINA, SETTING RATES, CHARGES AND PENALTIES FOR WATER AND SEWER AND SOLID WASTE SERVICE BY BERKELEY COUNTY WATER AND SANITATION.

DETAILS:

Chairman Cribb inquired as to if there were any public comments. There being none, he proceeded to the next Public Hearing.

f. BILL NO. 24-22, AN ORDINANCE PROVIDING FOR THE FISCAL YEAR BEGINNING JULY 1, 2024, AND ENDING JUNE 30, 2025, FOR THE DEVON FOREST SPECIAL TAX DISTRICT OPERATIONAL BUDGET; AND TO PROVIDE FOR THE EXPENDITURES OF THE REVENUES RECEIVED BY THE DEVON FOREST SPECIAL TAX DISTRICT DURING THE FISCAL YEAR.

DETAILS:

Chairman Cribb inquired as to if there were any public comments. There being none, he proceeded to the next Public Hearing.

g. BILL NO. 24-23, AN ORDINANCE PROVIDING FOR THE FISCAL YEAR BEGINNING JULY 1, 2024 AND ENDING JUNE 30, 2025 FOR THE PIMLICO SPECIAL TAX DISTRICT OPERATIONAL BUDGET; AND TO PROVIDE FOR THE EXPENDITURES OF THE REVENUES RECEIVED BY THE PIMLICO SPECIAL TAX DISTRICT DURING THE FISCAL YEAR.

DETAILS:

Chairman Cribb inquired as to if there were any public comments. There being none, he proceeded to the next Public Hearing.

h. BILL NO. 24-24, AN ORDINANCE PROVIDING FOR THE FISCAL YEAR BEGINNING JULY 1, 2024, AND ENDING JUNE 30, 2025 FOR THE SANGAREE SPECIAL TAX DISTRICT OPERATIONAL BUDGET; AND TO PROVIDE FOR THE EXPENDITURES OF THE REVENUES RECEIVED BY THE SANGAREE SPECIAL TAX DISTRICT DURING THE FISCAL YEAR.

DETAILS:

Chairman Cribb inquired as to if there were any public comments. There being none, he proceeded to the next Public Hearing.

i. BILL NO. 24-25, AN ORDINANCE PROVIDING FOR THE FISCAL YEAR BEGINNING JULY 1, 2024, AND ENDING JUNE 30, 2025, FOR THE OPERATIONAL BUDGET OF THE BERKELEY COUNTY SPECIAL FIRE TAX DISTRICT WITHIN THE UNINCORPORATED PORTIONS OF BERKELEY COUNTY; AND TO PROVIDE FOR THE EXPENDITURES OF THE REVENUES RECEIVED BY THE SPECIAL FIRE TAX DISTRICT DURING THE FISCAL YEAR.

DETAILS:

Chairman Cribb inquired as to if there were any public comments. There being none, he proceeded to the next Public Hearing.

j. BILL NO. 24-26, AN ORDINANCE PROVIDING FOR THE FISCAL YEAR BEGINNING JULY 1, 2024, AND ENDING JUNE 30, 2025, FOR THE TALL PINES SPECIAL TAX DISTRICT OPERATIONAL BUDGET; AND TO PROVIDE FOR THE EXPENDITURES OF THE

REVENUES RECEIVED BY THE TALL PINES SPECIAL TAX DISTRICT DURING THE FISCAL YEAR.

DETAILS:

Chairman Cribb inquired as to if there were any public comments. There being none, he proceeded to the next Public Hearing.

k. BILL NO. 24-27, AN ORDINANCE TO AMEND THE EXISTING FIRE PROTECTION AND PREVENTION ORDINANCE NO. 23-08-57 TO UPDATE THE MITIGATION RATES FOR FIRE DEPARTMENT AND HAZARDOUS MATERIAL TEAMS.

DETAILS:

Chairman Cribb inquired as to if there were any public comments. There being none, he proceeded to the next Public Hearing.

l. State Revolving Fund (SRF) Loan Program: Berkeley County Water & Sanitation, Berkeley County, Central Berkeley Wastewater Treatment Plant 9-MGD Expansion Project

To all interested parties: this is notification that Berkeley County is required, as condition of the loan program to conduct a public meeting and/or hearing for this project. In lieu of a special meeting, this meeting and/or hearing may be conducted as an approved agenda item during a regular scheduled and noticed Berkeley County Council meeting, to discuss this project, which is open to the public. The project includes expanding the rated treatment capacity from 6-mgd to 9-mgd average design flow by installing new screening equipment, one oxidation ditch, one secondary clarifier, one return sludge pump, and replacing the existing dewatering equipment with an expanded, more compact technology in the existing building. The estimated cost is \$40,500,000. This project is needed to improve process efficiency, enhance dewatering, and service area growth. Berkeley County will finance a portion of the project with a loan from the SRF Loan Program with remaining costs, paid for with a combination of a South Carolina Infrastructure Investment Program (SCIIP) Grant and local funds. There are minimal environmental impacts expected as part of this project since work will take place entirely within the fenced property of the existing wastewater treatment plant site. The documentation supporting this project is posted and available for public review at the Berkeley County Water & Sanitation office in Moncks Corner, SC. Any questions regarding this Notice should be directed to Richard Marchand, Director of BCWS, at (843) 761-8817 or richard.marchand@berkeleycountysc.gov.

DETAILS:

Chairman Cribb inquired as to if there were any public comments. There being none, he proceeded to the next Public Hearing.

m. State Revolving Fund (SRF) Loan Program: Berkeley County Water & Sanitation, Berkeley County, Sandy Run Water Main

To all interested parties: this is notification that Berkeley County is required, as condition of the loan program to conduct a public meeting and/or hearing for this project. In lieu of a special meeting, this meeting and/or hearing may be conducted as an approved agenda item during a regular scheduled and noticed Berkeley County Council meeting, to discuss this project, which is open to the public. The project includes extending a new public 6” distribution water main approximately 5,250 linear feet along Sandy Run Circle from the existing 14-inch water main along Jedburg Road. The installation of the 6” water main, fire hydrants, valves, and subsequent fittings will be conducted within the public road right-of-way. This project is needed to achieve compliance with fed-

eral and state drinking water regulations and standards. Berkeley County will finance this project through a Principal Forgiveness Loan from the SRF Loan Program. The documentation supporting this project is posted and available for public review at the Berkeley County Water & Sanitation office in Moncks Corner, SC. Any questions regarding this Notice should be directed to Richard Marchand, Director of BCWS, at (843) 761-8817 or richard.marchand@berkeleycountysc.gov.

DETAILS:

Chairman Cribb inquired as to if there were any public comments. There being none, he proceeded to adjourn the Public Hearings.

3. Adjournment

The Public Hearings adjourned at 6:49p.m.

DRAFT