STATE OF TENNESSEE

Office of the Attorney General

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December 27, 2023

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Electronically Filed in TPUC Docket Room
on December 27, 2023 at 9:14 a.m.

Re: Tennessee Public Utility Commission ("TPUC" or the "Commission"), Docket No. 23-00077, *Joint Application of Limestone Water Utility Operating Company, LLC and Cumberland Basin Wastewater Systems, LLC for Approval of the Acquisition of and to Operate the Wastewater System of Cumberland Basin Wastewater Systems, LLC, and to Issue a Certificate of Public Convenience and Necessity*

Dear Mr. Malone & Ms. Barnes:

The Consumer Advocate has reviewed the *Joint Application* filed by Limestone Water Utility Operating Company, LLC ("Limestone") and Cumberland Basin Wastewater Systems, LLC ("Cumberland Basin") (together, "Joint Applicants") in the above-referenced acquisition Docket.

The Joint Application requests, in the alternative, that the Commission grant Limestone a Certificate of Convenience and Necessity ("CCN"). Accordingly, the Consumer Advocate has reviewed Limestone's compliance with the minimum filing requirements set forth in TPUC Rule 1220-04-13-.17 regarding new CCNs in addition to its review of Limestone's compliance with the minimum filing requirements for an acquisition, which are set forth in TPUC Rule 1220-04-14-.08.

The Consumer Advocate appreciates the time and effort that the Joint Applicants put into compiling the *Joint Application*, as well as the Joint Applicants' attention to the Commission's minimum filing requirements. However, the Consumer Advocate could not locate, and thus seeks clarification on, the items set forth in "Attachment A" hereto, relating to compliance with TPUC

Rule 1220-04-13-.17, and "Attachment B" hereto, relating to compliance with TPUC Rule 1220-04-13-.08. Please note that this is not a discovery request by the Consumer Advocate, but a review of Limestone's compliance with TPUC's minimum filing requirements.

The Consumer Advocate would like to thank the Joint Applicants in advance for their attention to the Consumer Advocate's requests. If you have questions regarding this request, please contact me at (615) 741-2357.

Respectfully,

Shilina B. Brown
Assistant Attorney General

cc: Kelly Cashman-Grams, TPUC
Tim Huddleston, Cumberland Basin

Rule 1220-04-13-.17(a) General Information

1. *Rule 1220-04-13-.17(a)(5)*. The rule requires the petition to include a corporate organization chart showing all affiliate relationships. However, there are errors on the corporate organizational chart filed as Exhibit 5 to the *Joint Petition.* Specifically, (1) US Water, LLC should read as US Water Systems, LLC and (2) Central States Water Resources, Inc. should be shown as linked directly to CSWR, LLC and not linked to US Water, LLC. Josiah Cox provided such corrections in his testimony in a hearing before the Kentucky Public Service Commission.[1]

2. *Rule 1220-04-13-.17(a)(5)*. The rule requires a copy of the applicant's articles of incorporation, partnership agreement, and/or by-laws. The required documents were filed with the *Joint Petition*; however, the Consumer Advocate noticed that the principal address for Limestone on both the Operating Agreement and the articles of incorporation are not the same principal address stated on page 4 of the *Joint Petition*. Please explain why they differ and clarify.

3. *Rule 1220-04-13-.17(a)(7)(i)*. This rule requires the location of the wastewater system, i.e., treatment plant, pre-application treatment facilities, collection infrastructure, building(s) for equipment, drip fields, disposal fields and/or wetland cells.

    - The Genesis Village map shows only the wastewater treatment facility ("WWTF") and lift station location without the required details. According to SOP-08040, the system is described as a system with septic tanks, an effluent collection system, two Aquapoint BioClere fixed film reactors, and fenced drip irrigation field.[2] The Consumer Advocate reviewed the Tennessee Department of Environment and Conservation ("TDEC") Water Resources Dataviewer ("WR Dataviewer") and Enforcement Dataviewer. As a result of this review, the Consumer Advocate located a TDEC administrative order,[3] which required Cumberland Basin Water Systems, Inc. ("CBWSI") to file updated engineering plans[4] of the system.

    - The Bluffs map only shows the WWFT location. According to SOP-07008, the system is described as a system with septic tanks, an effluent collection system, a recirculating media filer, a UV disinfection, and a 6.0-acre drip irrigation field.[5] The Consumer Advocate reviewed TDEC WR and

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[1] Josiah Cox Testimony on Cross Examination, video at 2:40:53/8:08:04, KYPSC Case No. 2022-00432 (Sept. 19, 2023). The videos of the two-day hearing can be accessed at https://psc.ky.gov/Case/ViewCaseFilings/2022-00432/Hearings.

[2] *Joint Petition* at Exhibit 16, SOP-08040.

[3] *Consent Order and Assessment*, WPC16-0026 (Nov. 4, 2016). A copy of this order is attached as CAD MFR Exhibit A-1.

[4] A copy of the updated engineering plans is attached as CAD MFR Exhibit A-2. TDEC employees inspected the system and informed CBWSI that the submitted plans complied with the requirements of the administrative order. Copies of the TDEC site visit and TDEC email are attached as CAD MFR Exhibit A-3.

[5] *Joint Petition* at Exhibit 16, SOP-07008.

Enforcement Dataviewers, but we did not locate engineering plans or administrative orders regarding this system in the dataviewers.

Please file updated maps in this docket that clearly provide the required detail as set out in this rule.

4. *Rule 1220-04-13-.17(a)(7)(iii)*. This rule requires a map to show access roads and names of access roads and the other utilities necessary to provide wastewater service. The updated engineering plans for SOP-08040 appear to delineate an access road to the WWTF. The maps provided in the *Joint Petition* do not show access roads or other utilities necessary to provide services. Please file updated maps in this docket that shows the access roads and other utilities pursuant to this rule requirement.

Rule 1220-04-13-.17(c) Managerial Ability

1. *Rule 1220-04-13-.17(c)(3)*. This rule requires copies of all contracts related to any pending merger or acquisition of the applicant, corporate parent or affiliate. All TPUC docket numbers were provided in response to this rule with a statement of this rule being overly burdensome[6] to Limestone. Recently, the Commission issued an order that granted Limestone's motion for waiver of this rule.[7] The Consumer Advocate did not locate a motion for wavier of this rule for the current Docket. Please clarify if a waiver of this rule has been obtained.

Rule 1220-04-13-.17(d) Technical Ability

1. *Rule 1220-04-13-.17(d)(2)*. This rule requires a copy of the State Operator Certificate for the wastewater system operator of record. If the operator is a contract employee of the utility, provide a copy of the employment contract. The certificate filed with the *Joint Petition* reflects the current operator is the current Cumberland Basin employee. Limestone stated that they will not retain any of the current Cumberland Basin employees. Please update this docket by filing Limestone's operator certificate or the contract with the operator who will be Limestone's contract employee.

2. *Rule 1220-04-13-.17(2)(d)(4)*. This rule asks for a list of complaint(s), notices of violation or administrative action filed with or issued by a regulatory agency and to identify the nature of the complaint notices of violation or administrative action, which agency is involved, and how the issue was or is being resolved. In reviewing the *Joint Petition* and the TDEC Water Resources Dataviewer, the Consumer Advocate notes the following regarding Limestone's existing wastewater and water utilities:

    a. Grasslands Wastewater System, TN0027278.

        i. Consent Order. The *Joint Petition* states that Limestone entered into a Consent Order with TDEC on February 3, 2023, resolving

[6] *Joint Petition*, Appendix A at pp. 3-4, FN8.

[7] *Order Approving Petition to Amend Certificate of Convenience and Necessity and Waive Commission Rule*, pp. 5-6, TPUC Docket No. 22-00059 (Dec. 19, 2023).

issues at Grasslands sewage treatment plant. Please update this docket with an explanation detailing the status of the corrective action set out in the consent decree.

ii. Ongoing Issues. The Grasslands System has had 4 incidents of washouts;[8] a sanitary sewer overflow at a manhole;[9] a failure of lift station resulting in the release of 250,000 gallons of untreated wastewater;[10] and the overflow from a sludge holding tank.[11] In response to inquiries by TPUC Staff and the Consumer Advocate in TPUC Docket No. 23-00026, TDEC provided an overview of the conditions and issues of concern of adding additional waste load to the Grasslands System.[12]

b. Aqua Drinking Water System, DWS ID#0000948. TDEC recently issued a Notice of Deficiency regarding Limestone's failure to provide documentation of participant notice activities as required under TDEC's rules and regulations. A copy of the Notice of Deficiency is attached as CA MFR Exhibit A-9. Please provide an explanation and update to this Notice of Deficiency.

c. Hideaway Wastewater System, SOP-07090. By letter dated July 10, 2023, TDEC issued a Compliance Evaluation Inspection and Notice of Violation detailing numerous issues of concern and 7 "Action Items and Recommendations." A copy of the Notice of Violation is attached as CA MFR Exhibit A-10. Limestone responded, in writing, to the Notice of Violation on 3 different dates: August 9th, September 12th, and November 7th.[13] In 2012, TDEC conducted a site visit at this system and filed a Filed Activity Report dated May 8, 2012.[14] Please provide an explanation and update regarding any outstanding issues of concern raised by TDEC.

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[8] Limestone provided the required notice to TDEC about washouts on March 3 and 23, 2023; April 6, 2023, and July 10, 2023. Copies of Limestone's notices to TDEC of the washouts are attached as CA MFR Exhibit A-4. Washouts are prohibited by TDEC's permit, and each day of a washout is a separate violation. TDEC permit, p. 23, Part 2, § 2.3.6.

[9] Limestone provided the required notice to TDEC of the sanitary sewer overflow on April 7, 2023. A copy of this notice is attached as CA MFR Exhibit A-5.

[10] Limestone provided the required notice to TDEC of the lift station failure on April 10, 2023. A copy of this notice is attached as CA MFR Exhibit A-6.

[11] Limestone provided the required notice to TDEC of the overflow from a sludge holding tank on June 20, 2023. A copy of this notice is attached as CA MFR Exhibit A-7.

[12] A copy of this summary is attached as CA MFR Exhibit A-8. Please note that the attached referenced image that was attached in the email are the first three notices of washouts that are provided as part of CA MFR Exhibit A-4.

[13] Copies of Limestone's responses are attached, in chronological order, as CA MFR Exhibits A-1 – 14.

[14] A copy of the Field Activity Report is attached as CA MFR Exhibit A-12.

Rule 1220-04-13-.17(e) Sworn Testimony

1. *Rule 1220-04-13-.17(2)(e)(6)*. This rule requires a signed affidavit stating that all information submitted concerning the wastewater CCN application is true and correct to the best of the witness' knowledge and belief. The Direct Testimony of Josiah Cox filed with the *Joint Petition* contains an affidavit, but it fails to satisfy the rule here. Please file a correct affidavit in this docket to comply with this rule.

Rule 1220-04-14-.08(2) Acquisitions

1. *Rule 1220-04-14-.08(2)(b)*. The *Joint Petition* stated in "Appendix A" that only CSWR/Limestone's financials were provided. The rule requires the financial statements "of the selling utility's three most recently completed fiscal years or reporting periods at the time the application for acquisition is filed." Please update the Docket and provide Cumberland Basin's financial statements.

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION

IN THE MATTER OF:	)	
	)	
GENESIS VILLAGE ESTATES TOWNHOMES, LLC and GARY EMERY,	)	**DIVISION OF WATER RESOURCES**
	)	
RESPONDENTS.	)	**CASE NUMBER WPC16-0026**
	)	

CONSENT ORDER AND ASSESSMENT

This CONSENT ORDER AND ASSESSMENT is entered into between the Tennessee Department of Environment and Conservation and Genesis Village Estates Townhomes, LLC and Gary Emery for the purpose of resolving the issues set forth herein. The parties stipulate and agree as follows:

PARTIES

I.

Tisha Calabrese Benton is the duly appointed Director of the Tennessee Division of Water Resources by the Commissioner of the Tennessee Department of Environment and Conservation (hereinafter the "Division" and the "Department" respectively).

II.

Genesis Village Estates Townhomes, LLC (hereinafter "Respondent GVE"), is the owner of Genesis Village Estates (hereinafter the "Site"), a residential subdivision located at 4955 Genesis Road, Crossville, Cumberland County, Tennessee. Service of process may be made on Respondent GVE through Mr. David L. Bryan, Registered Agent, at 10531 McMinnville Highway, Morrison, TN 37357-3415. Mr. Gary Emery ("Respondent Emery") is the developer and manager of Genesis Village Estates. Service of process may be made on Respondent Emery at 4955 Genesis Road, Crossville, TN 38571.

JURISDICTION

III.

Whenever the Commissioner has reason to believe that a violation of Tennessee Code Annotated ("Tenn. Code Ann.") § 69-3-101 *et seq.*, the Water Quality Control Act (the "Act"), has occurred, or is about to occur, the Commissioner may issue a complaint to the violator and the Commissioner may order corrective action be taken pursuant to Tenn. Code Ann. § 69-3-109(a). Further, the Commissioner has authority to assess civil penalties against any violator of the Act, pursuant to Tenn. Code Ann. § 69-3-115; and has authority to assess damages incurred by the state resulting from the violation, pursuant to Tenn. Code Ann. § 69-3-116. Pursuant to Tenn. Code Ann. § 69-3-107(13), the Commissioner may delegate to the Director any of the powers, duties, and responsibilities of the Commissioner under the Act. The Commissioner has delegated these powers, duties, and responsibilities to Tisha Calabrese Benton, Director, Division of Water Resources (the "Director").

IV.

The Respondents are "persons" as defined by Tenn. Code Ann. § 69-3-103(26) and, as herein described, have violated the Act.

V.

Tennessee Code Annotated § 69-3-108(b)(2) & (c) require any person operating any part of a treatment works or a sewerage system to obtain a permit. A person proposing to operate a sewerage system may obtain the required state operating permit ("SOP") by submitting an application, all required plans, and the application fee to the Division for its review. A person proposing to operate a public sewerage system that is not owned and operated by a municipality or public utility district must also obtain a Certificate of Public Convenience and Necessity ("CCN") from the Tennessee Regulatory Authority ("TRA").

FACTS

VI.

On May 22, 2008, the Division received a SOP application from Integrated Resource Management, Inc. ("IRM Utility"). IRM Utility applied to serve as the operator of a proposed wastewater collection system with recirculating sand filter plant with drip irrigation disposal (collectively, the "System") to serve one hundred (100) homes at the Site. Ownership was to be transferred from Respondent GVE to IRM Utility when the System was built per the contract with the owner/developer, Respondent GVE. IRM Utility petitioned TRA for a CCN for the Site.

VII.

On August 29, 2008, the Division issued a permit to IRM Utility for the operation of the System with tracking number, SOP-08040, and an expiration date of August 30, 2013.

VIII.

On October 6, 2008, the Division approved construction plans and specifications for the System to be operated by IRM Utilities.

IX.

On March 20, 2009, IRM Utilities requested that the permit be modified to include a bioclere system instead of a sand filter for the drip field area. On May 5, 2009, SOP 08-040 was modified accordingly.

X.

On August 31, 2010, Division personnel conducted a site visit, noting that installation of the System had begun but was not completed.

XI.

In a letter dated June 20, 2011, IRM Utility informed Respondent GVE a home may be improperly occupied and hooked up to a partial collection system without the required CCN from the TRA. IRM Utility noted that Respondent GVE was still required to complete construction of the System.

XII.

On April 18, 2012, Respondent GVE transmitted a Letter of Intent to the TRA in support of IRM Utility's CCN petition. The Letter of Intent states that Respondent GVE will guarantee to IRM Utility that a third-party will install the System in accordance to IRM Utility's Rules and Regulations as required by the TRA. Respondent GVE provided IRM Utility with an irrevocable letter of credit in the amount of $250,000 with IRM Utility as the beneficiary for acceptable guarantee of the construction of the System. Respondent GVE acknowledged the LOC was an estimated amount provided by IRM Utility and may increase or decrease due to contingencies typical with construction.

XIII.

On June 18, 2012, Division personnel conducted a site visit, noting that the System had still not been built.

XIV.

On December 4, 2012, the TRA granted IRM Utilities the right to provide wastewater services at the Site through an Order issued under TRA Docket 11-00081.

XV.

On September 30, 2013, the Division issued a warning letter to IRM Utility for failing to submit a new application 180 days before the existing permit expired.

XVI.

On October 8, 2013, the Division received notice from an attorney representing Respondent GVE explaining that Respondent GVE was in the process of obtaining an agreement with another public utility to serve the project and that utility would apply for a new permit. This letter was copied to the TRA.

XVII.

On October 15, 2013, the Division received an application from IRM Utility for reissuance of SOP-08040. IRM Utility explained that Respondent GVE had not built the proposed treatment system and was not discharging. The letter also explained that Respondent GVE was operating a pump and haul operation without IRM Utility's approval. A subsequent file review found that Respondent GVE did not have a permit to dispose of septage by pump and haul.

XVIII.

On October 25, 2013, Division personnel inspected the Site and confirmed that Respondent GVE was operating a collection system and a pump and haul operation serving several homes. Division staff noted a bioclere unit was on site, but not operational. Division staff also noted the drip line for land application had not been installed.

XIX.

On October 29, 2013, the Division responded to GVE's October 8, 2016, letter, advising Respondent GVE of the requirements for obtaining an agreement with a public utility other than IRM Utility to operation the sewerage system at the Site. The letter indicated that IRM Utility had applied to renew the existing permit, and that Respondent GVE would be made an interested party to that permit. The letter noted that a portion of the System has been constructed

and that state law prohibits the operation of the sewerage system except in accordance with the terms of a valid permit.

XX.

On November 22, 2013, the Division received a letter from the attorney representing Respondent GVE indicating that his client intended to contract with Cumberland Basin Wastewater System, LLC ("CBWS") for the operation of the wastewater disposal system at Genesis Village Estates.

XXI.

On January 13, 2014, the Division sent a letter to Respondent GVE and IRM Utility in response to the permit application, site inspection, and correspondence. In this letter, the Division notified Respondent GVE that the pump and haul activity documented during the October 25, 2013, inspection was a violation of the state Water Quality Control Act. The Division requested a corrective action plan from Respondent GVE, detailing the critical factors necessary to comply with the statutory requirement that operation of the sewer system be in accordance with a valid permit and provide the estimated maximum time frames for each of the critical factors. The Division requested the Respondent to provide:

- Construction plans and specifications for the proposed system.
- A current schedule for completion of the construction of the drip irrigation system.
- The name and business address of the entity that will operate the sewerage system.
- Clarification whether the entity will own the sewage system and its appurtenances or have access to it via perpetual easement.

XXII.

On April 15, 2014, IRM Utility responded to the Division's request for a corrective action plan from January 13, 2014. IRM Utility referenced a visit to the Site in June 2011. IRM Utility reiterated that it gave a warning in June 2011 that Respondent GVE should not use the System until the System was completed, inspected, operable and approved by IRM Utility. The letter indicated that the collection system was complete within one year of approval by the Division of the original construction plans and that the bioclere filter was installed early in 2009 before Respondent GVE put a hold on construction.

XXIII.

On April 16, 2014, the Division received an SOP application from Respondent Emery requesting permit coverage to pump and haul wastewater. In the application, Mr. Emery identified himself as the proposed permittee and as the developer and manager of the Site. CBWS was listed as the operator who would take ownership of the System upon completion of construction. Respondent GVE identified nine (9) homes generating wastewater, including three (3) occupied full-time and six (6) occupied part-time. The application states that the reason the system cannot be served by a public sewer is the "[p]rivate utility system construction not complete." The application indicated the facility has a 9,000 gallon holding tank and an 8,000 gallon pump station.

XXIV.

On August 20, 2014, the Division informed Respondent GVE that its request to reissue SOP-08040 as a pump and haul permit was not justified because:

- Respondents are not a public sewer provider as required by Tenn. Comp. R. & Regs. 0400-40-16-.02(8);
- The Site had been subdivided on the basis of public utility service availability; and

- IRM Utilities is the public sewer provider of record.

The letter further notified Respondents of the Division's intent to reissue SOP-08040 to IRM Utilities.

XXV.

On October 1, 2014, the Division reissued SOP-08040 to IRM Utility.

XXVI.

On September 29, 2015, IRM Utility requested the SOP be transferred or terminated. IRM Utility informed the Division that the contract between IRM Utility and Respondent GVE had been cancelled, the letter of credit assuring the construction of the System had been cancelled, and the construction of the System had not been completed.

XXVII.

On March 8, 2016, the Division notified the Mayor of Cumberland County that the Site has no public sewer system. The letter requested that Cumberland County "take necessary action to ensure that the inspector(s) implementing building codes in Cumberland County do not authorize new construction" at the Site. The letter indicated that the 13 townhomes that had been constructed at the Site are served by an illegal sewerage system.

XXVIII.

On June 7, 2016, IRM Utility and CBWS jointly petitioned the TRA to transfer the CCN for Genesis Village Estates to CBWS.

XXIX.

On or about June 15, 2016, Division staff visited the Site with Respondent Emery. Respondent Emery confirmed that the System had not been completed. Due to the twelve (12)

houses that had been connected to the collection system, the System had to be pumped periodically.

XXX.

On July 18, 2016, the Division's Chief Engineer emailed a requirements matrix to the Respondents outlining the specific action items to be completed.

XXXI.

On August 4, 2016, a show cause meeting was held with Respondent Emery, CBWS, Michael Hines, an engineer for GVE, and the Division.

XXXII.

On August 29, 2016, Respondent Emery emailed a new plan for the Site and a court order from the Chancery Court of Warren County, Tennessee regarding the resolution of litigation between it and IRM Utilities.

XXXIII.

On September 12, 2016, the Division received a permit application for the Site from CBWS. On September 26, 2016, the Division sent a response letter, indicating that the application did not include all required plan details and that public notice of a draft permit would be contingent on TRA advising TDEC that it has received a complete application to transfer the CCN.

XXXIV.

On October 10, 2016, the TRA granted the joint petition to transfer the CCN to CBWS.

XXXV.

During the course of investigation the Division incurred DAMAGES in the amount of SIXTY DOLLARS AND NINETY-THREE CENTS ($60.93).

VIOLATIONS

XXXVI.

By operating a sewerage system without coverage under an SOP, Respondents have violated Tenn. Code Ann. §§ 69-3-108(b), -108(c),and -114(b), which state in part:

§ 69-3-108(b):

> It is unlawful for any person…to carry out any of the following activities, except in accordance with the conditions of a valid permit:
> …
> (2) The construction, installation, modification, or operation of any treatment works, or part thereof, or any extension or addition thereto.

§ 69-3-108(c):

> Any person operating or planning to operate a sewerage system shall file an application with the commissioner for a permit or, when necessary, for modification of such person's existing permit. Unless a person holds a valid permit, it is unlawful to operate a sewerage system.

§ 69-3-114(b):

> In addition, it is unlawful for any person to act in a manner or degree which is violative of any provision of this part or of any rule, regulation, or standard of water quality promulgated by the board or of any permits or orders issued pursuant to the provisions of this part; or fail or refuse to file an application for a permit as required in § 69-3-108; or to refuse to furnish, or to falsify any records, information, plans, specifications, or other data required by the board or the Commissioner under this part.

ORDER AND ASSESSMENT

XXXVII.

WHEREFORE, pursuant to the authority vested by Tenn. Code Ann. §§ 69-3-109, 69-3-115 and 69-3-116, I, Tisha Calabrese Benton, order, and the Respondents agree, as follows:

1) The Respondents shall maintain pump and haul activity for the current residents of Genesis Village Estates during permitting and construction of the wastewater treatment system. All

pump and haul activities shall be complete on or before April 30, 2017. The Respondents shall provide pump and haul records of the previous month's activities to the Division by the 15th of each month. All requested records including but not limited to pump and haul records shall be sent to the manager of the Enforcement and Compliance Section at the Tennessee Department of Environment and Conservation, Division of Water Resources, William R. Snodgrass Tower, 312 Rosa L. Parks Avenue, 11th Floor, Nashville, Tennessee, 37243. All correspondence related to this Order shall identify case number WPC16-0026.

2) On or before the thirty-first (31st) day after receipt of this Order, the Respondents shall submit a list of existing connections and a list of legally obligated commitments or valid building permits in effect as of September 30, 2016.

3) Effective immediately, the Respondents shall make no further connections or allow increased flows to the sewage collection system beyond the existing and obligated connections identified in response to item 2. This moratorium requirement shall remain in effect until items 4 through 7 are completed, the Division has issued an SOP to CBWS, and the Division has inspected and approved the as-built sewerage system.

4) Within thirty (30) days after execution of this Order, the Respondents shall submit a complete permit application, plans, specifications, engineering report, and fees to the Division;

5) No later than seventy-five (75) days after Division approval of construction plans and specifications, the Respondents shall provide evidence to the Division that construction of the sewerage system including the drip field is substantially complete.

6) No later than January 31, 2017, the Respondent shall submit a valid plat to the Division.

7) On or before the thirty-first (31st) day after receipt of this ORDER and ASSESSMENT, the Respondents shall pay a CIVIL PENALTY of TWENTY-FIVE THOUSAND, SEVEN HUNDRED SEVENTY-TWO DOLLARS ($25,772.00) to the Division, hereby ASSESSED to be paid as follows:

   a. **The Respondents shall pay a CIVIL PENALTY in the amount of FIVE THOUSAND, ONE HUNDRED FIFTY-FOUR DOLLARS ($5,154.00).**

   b. If the Respondents fail to comply with item 1, the Respondents shall pay a CIVIL PENALTY in the amount of ONE THOUSAND DOLLARS ($1,000.00), payable on or before the thirty-first (31st) day after default.

   c. If the Respondents fail to comply with item 2 above in a timely manner, the Respondents shall pay a CIVIL PENALTY in the amount of ONE THOUSAND, NINETY DOLLARS ($1,000.00), payable on or before the thirty-first (31st) day after default.

   d. If the Respondents fail to comply with item 3 above in a timely manner, the Respondents shall pay a CIVIL PENALTY in the amount EIGHT THOUSAND, DOLLARS ($8,000.00), payable on or before the thirty-first (31st) day after default.

   e. If the Respondents fail to comply with item 4 above in a timely manner, the Respondents shall pay a CIVIL PENALTY in the amount TWO THOUSAND DOLLARS ($2,000.00), payable on or before the thirty-first (31st) day after default.

   f. If the Respondents fail to comply with item 5, by connecting another condominium unit prior to the conditions of item 5 above being met, the Respondents shall pay a CIVIL PENALTY in the amount of SEVEN THOUSAND DOLLARS ($7,000.00), payable on or before the thirty-first (31st) day after default.

g. If the Respondents fail to comply with item 6, the Respondents shall pay a CIVIL PENALTY in the amount of ONE THOUSAND, SIX HUNDRED EIGHTEEN DOLLARS ($1,618.00), payable on or before the thirty-first (31st) day after default.

8) On or before the thirty-first (31st) day after receipt of this ORDER and ASSESSMENT, the Respondent shall pay DAMAGES to the Division in the amount of SIXTY DOLLARS AND NINETY-THREE CENTS ($60.93).

The Director of the Division may, for good cause shown, extend the compliance dates contained within this Consent Order and Assessment. In order to be eligible for this time extension, the Respondent shall submit a written request to be received in advance of the compliance date. The written request must include sufficient detail to justify such an extension and include at a minimum the anticipated length of the delay, the precise cause or causes of the delay, and all preventive measures taken to minimize the delay. Any such extension by the Division will be in writing. Should the Respondent fail to meet the requirement by the extended date, any associated Civil Penalty shall become due on or before the 31st day thereafter.

The Respondent shall otherwise conduct its business in accordance with the Act and rules promulgated pursuant to the Act. Further, the Respondent is advised that the foregoing Consent Order and Assessment is in no way to be construed as a waiver, expressed or implied, of any provision of the law or regulations. However, compliance with the Consent Order and Assessment will be one factor considered in any decision whether to take enforcement action against the Respondent in the future. Failure to comply with any of the requirements of this order could lead to further enforcement actions which may include additional civil penalties, assessment of damages and/or recovery of costs.

WAIVER OF RIGHT TO APPEAL

The Respondents understand that they have the right to appeal this Consent Order and Agreement pursuant to Tenn. Code Ann. §§ 69-3-105(i), 69-3-109, and 69-3-116. By signing below, the Respondent knowingly and voluntarily waive any right they may have to appeal this Consent Order and Assessment.

Issued by the Director of the Division of Water Resources and agreed to by Genesis Village Estates Townhomes, LLC and Gary Emery on this 4 day of November, 2016.

Tisha Calabrese Benton, Director
Division of Water Resources
Tennessee Department of Environment and Conservation

David Bryan, Managing Partner
Genesis Village Estates Townhomes, LLC

Gary Emery

Reviewed by:

Stephanie A. Durman
BPR Number 027783
Office of General Counsel
William R. Snodgrass TN Tower, 2nd Floor
312 Rosa L. Parks Avenue
Nashville, Tennessee 37243-1548
Telephone: (615) 532-3020

C E DESIGNERS, Inc.
108 EAST COMMERCIAL AVENUE
MONTEREY, TENNESSEE 38574

Phone: (931) 839-2350
Fax: (931) 839-6380

May 17, 2017

Mr. George C. Garden, P.E. BCEE/ Chief Engineer
Division of Water Resources
11th Floor, William R. Snodgrass TN Tower
312 Rosa L. Parks Avenue
Nashville, TN 37243-1102

RE: Genesis Village Waste Water System
Cumberland County, Tennessee
CED Job No. D-159

Dear Mr. Garden:

I appreciate your visit to my office on May 12, 2017 with your two associates. It is also helpful that you shared your half sized set of Plans marked with your concerns and shared verbally your mark-ups..

We have completed our revisions to the Plans based on the above comments. Please find attached two copies of the latest revision of these Plans 24"x36". I understand why you were having a problem with reading the half sized set. As I told you, we only work with 24"x36" sized sheets which have a readable sized notes and details. We make a commitment that any client who pays for a job will receive a sufficient number of copies of the full sized plans to operate the project. In the future the client can also request replacement sets of Plans.

These revised as-builts have the signature of Tim Huddleston as the operator and contractor verifying the correctness as provided to **C E DESIGNERS, INC.**

On Sheet 2 of the Plans, revisions have been made to reflect actual construction and to add clarity for the reader. Your notes were very helpful.

On Sheet 3 of the Plans, flow directional arrows were added to the Bioclere Section view for clarity.

Responding to your comments on Sheet 4 of the Plans required that we make a physical visit to the site to verify the orientation of the inside section views and of the Plan view.

I hope that having these sets will allow you to complete your as-built review and will give you a level of comfort with our work.

Yours,

Mike Callahan, P.E.
Chief Executive Officer

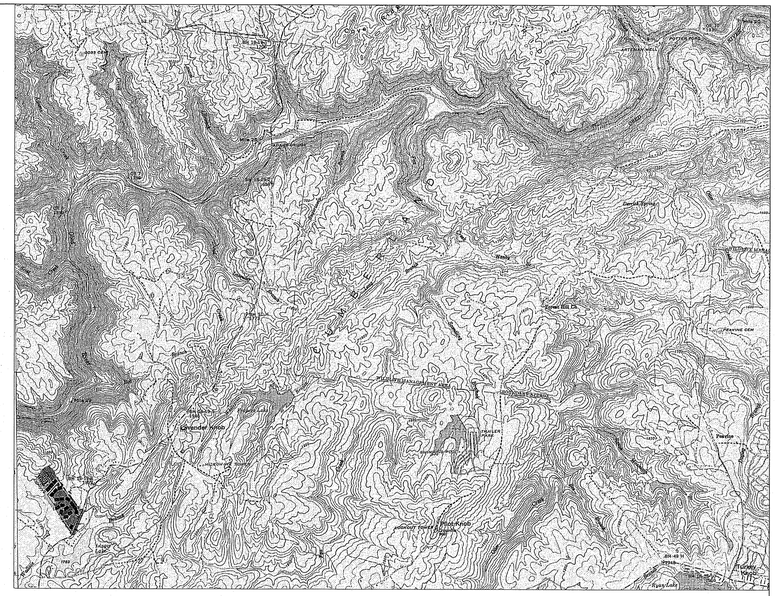
MC:sc

Attachments:
Mike Hines, P.E.
Tim Huddleston
Gary Emery
C E File

SEWAGE WORKS

FOR

GENESIS VILLAGE ESTATES CUMBERLAND COUNTY, TENNESSEE



SCALE: 1"=2000'

LOCATION MAP

RECORD DRAWINGS:
THESE DRAWING WERE PREPARED IN ACCORDANCE WITH OUR CONSTRUCTION RECORDS. THEY SHOW THE PROJECT "AS-CONSTRUCTED" TO THE BEST OF OUR KNOWLEDGE BUT ARE NOT GUARANTEED TO BE CORRECT IN EACH AND EVERY DETAIL. THIS INFORMATION IS PROVIDED BY THE CONTRACTOR.
DATE: 05 MAY 2017

CONTRACT I- WASTE WATER TREATMENT PLANT
JOB NUMBER D-159
DATE: OCTOBER 07, 2016
REVISED - OCTOBER 21,2016
REVISED - NOVEMBER 04,2016
REVISED - NOVEMBER 30,2016
RECORD DRAWING - MAY 03, 2017

INDEX:

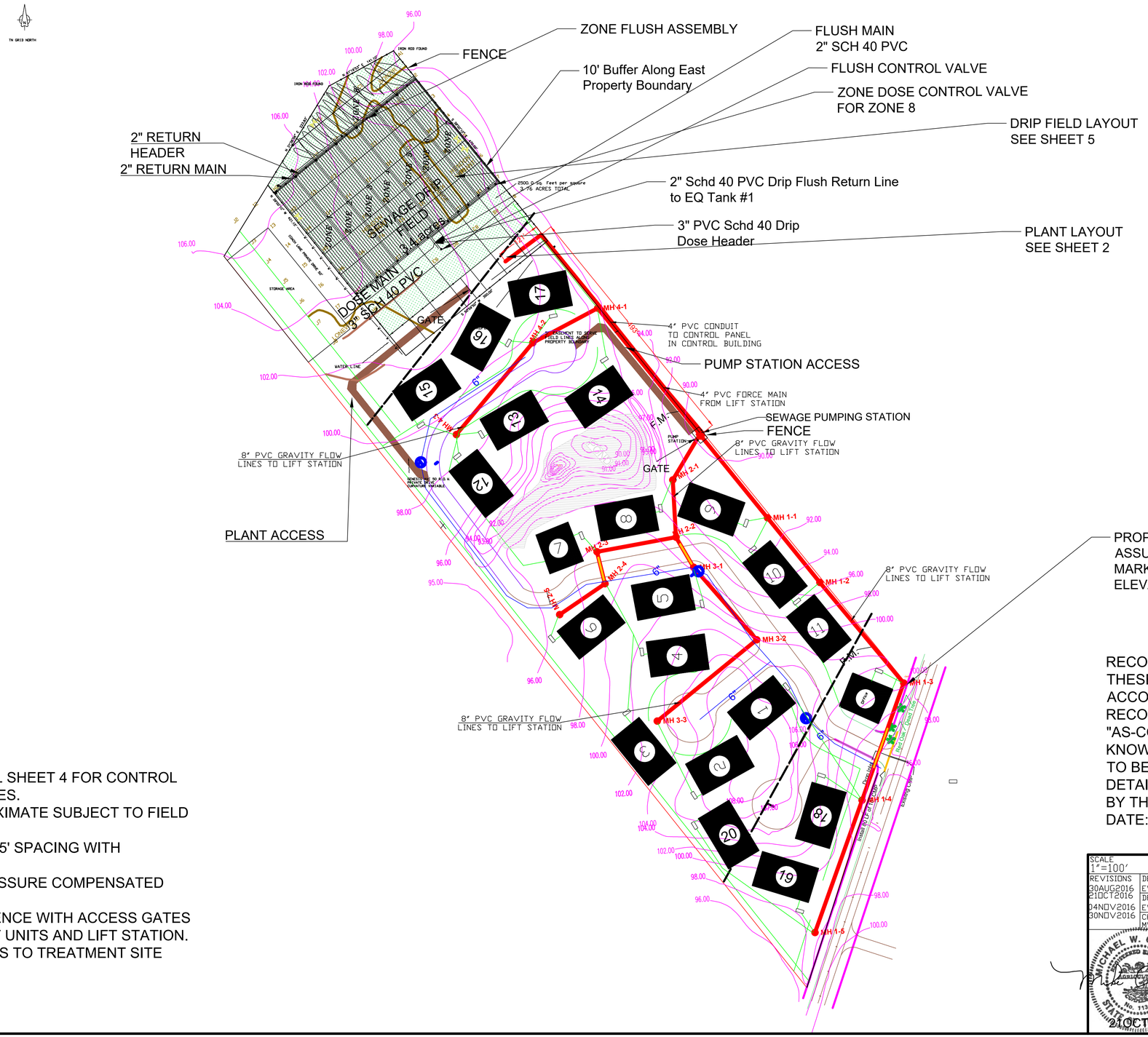
CE ***DESIGNERS, Inc.***
108 East Commercial Avenue
Monterey, Tennessee 38574

MICHAEL W. CALLAHAN — REGISTERED ENGINEER — No. 113119 — STATE OF TENNESSEE

APPROVED
BY: _____
CUMBERLAND BASIN WASTEWATER SYSTEMS, LLC.

SET NO. _____

EFFLUENT DRIP DISPERSAL ZONES



DRIP CONSTRUCTION NOTES:

1. SEE TYPICAL DRIP ZONE DETAIL SHEET 4 FOR CONTROL VALVE LOCATIONS WITHIN ZONES.
2. CAV VALVE LOCATIONS APPROXIMATE SUBJECT TO FIELD LOCATION.
3. DRIP LINES TO BE ON NOMINAL 5' SPACING WITH ORIFICES ON 1' SPACING.
4. DRIP TUBE TO BE NETAFIM PRESSURE COMPENSATED UNIRAM 0.820" ID, 0.61 GPH.
5. 5' CHAIN LINK OR BARB WIRE FENCE WITH ACCESS GATES AROUND DRIP AND TREATMENT UNITS AND LIFT STATION.
6. 8' WIDE GRAVEL ACCESS DRIVES TO TREATMENT SITE AND LIFT STATION.

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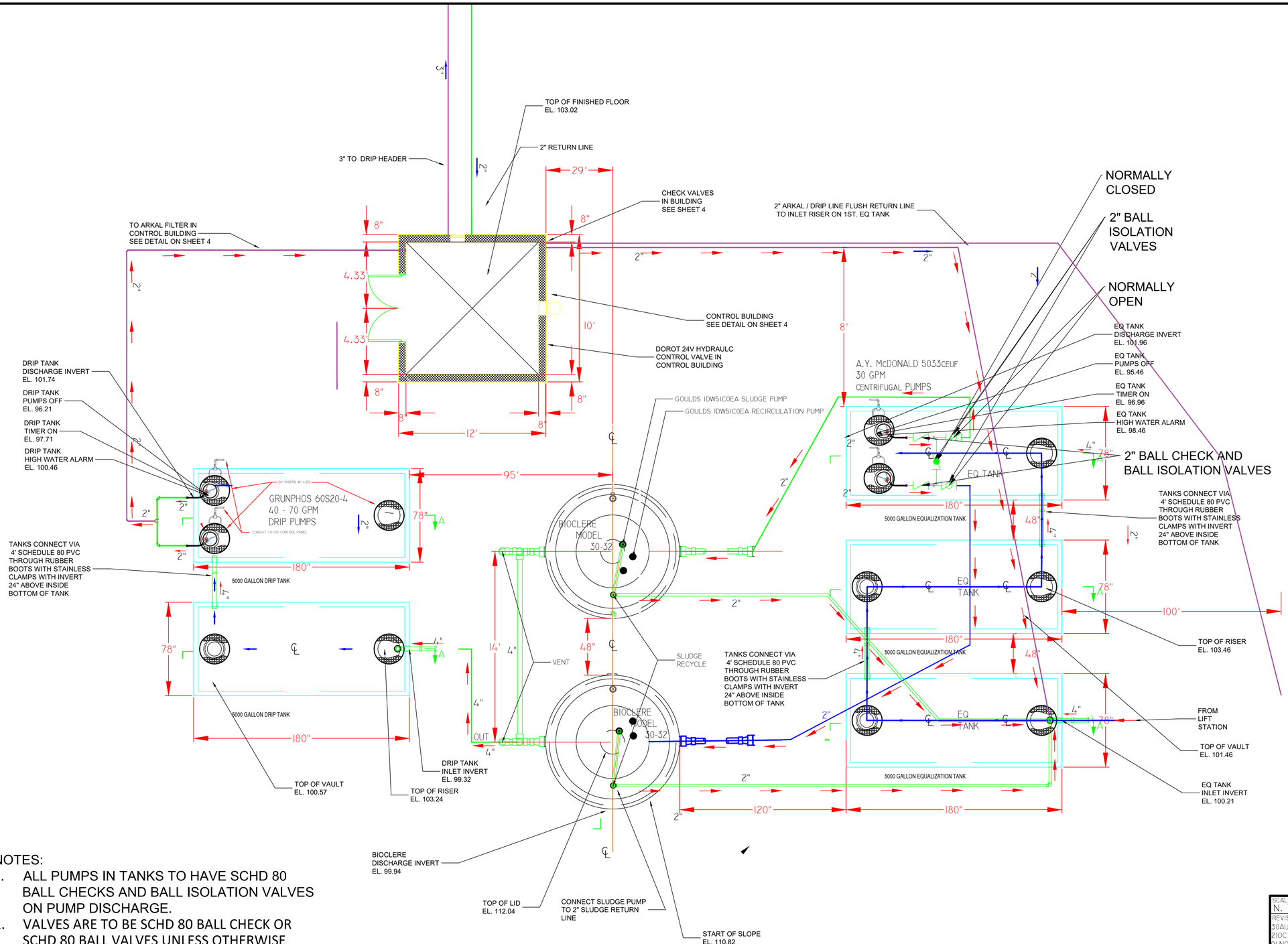
DATE: 05 MAY 2017

SCALE 1"=100'	SEWAGE WORKS
REVISIONS / DESIGNED: EWC	
30AUG2016 / 21OCT2016 / 04NOV2016 / 30NOV2016	SITE LAYOUT
DRAWN: EWC	
CHECKED: MWC	
	FOR GENESIS VILLAGE ESTATES CUMBERLAND COUNTY, TN
	DATE 21 OCT 2016
	JOB NO. D-159
	SHEET 1

MICHAEL W. CALLAHAN — REGISTERED ENGINEER — No. 17319 — STATE OF TENNESSEE
21OCT16

CE DESIGNERS, Inc.
108 EAST COMMERCIAL AVENUE
MONTEREY, TENNESSEE 38574



BIOCLERE
30-32

Description	Elevation
BM =	100.00
Top of Lift Station	93.00
Lift pumps OFF	82.00
Lift lead pump ON	83.00
Lag pump ON	86.00
High water alarm	87.00
Top of EQ tanks	101.46
Top of EQ risers	103.46
EQ inlet invert	100.21
EQ discharge invert	101.96
EQ pumps OFF	95.46
EQ timer ON	96.96
EQ high water alarm	98.46
Top of Bioclere	112.04
Bioclere inlet invert	100.02
Bioclere discharge invert	99.94
Drip tank top	100.57
Drip tank inlet invert	99.32
Drip discharge invert	101.74
Drip pump OFF	96.21
Drip timer ON	97.71
Drip high water	100.46
Control bldg floor	103.02

NOTES:
1. ALL PUMPS IN TANKS TO HAVE SCHD 80 BALL CHECKS AND BALL ISOLATION VALVES ON PUMP DISCHARGE.
2. VALVES ARE TO BE SCHD 80 BALL CHECK OR SCHD 80 BALL VALVES UNLESS OTHERWISE INDICATED.
3. TANKS ARE 5,000 GALLON BARGER DUPLEX PUMP TANKS.
4. ALL PIPING SOLVENT WELDED JOINT SCHD 40 PVC UNLESS OTHERWISE INDICATED.

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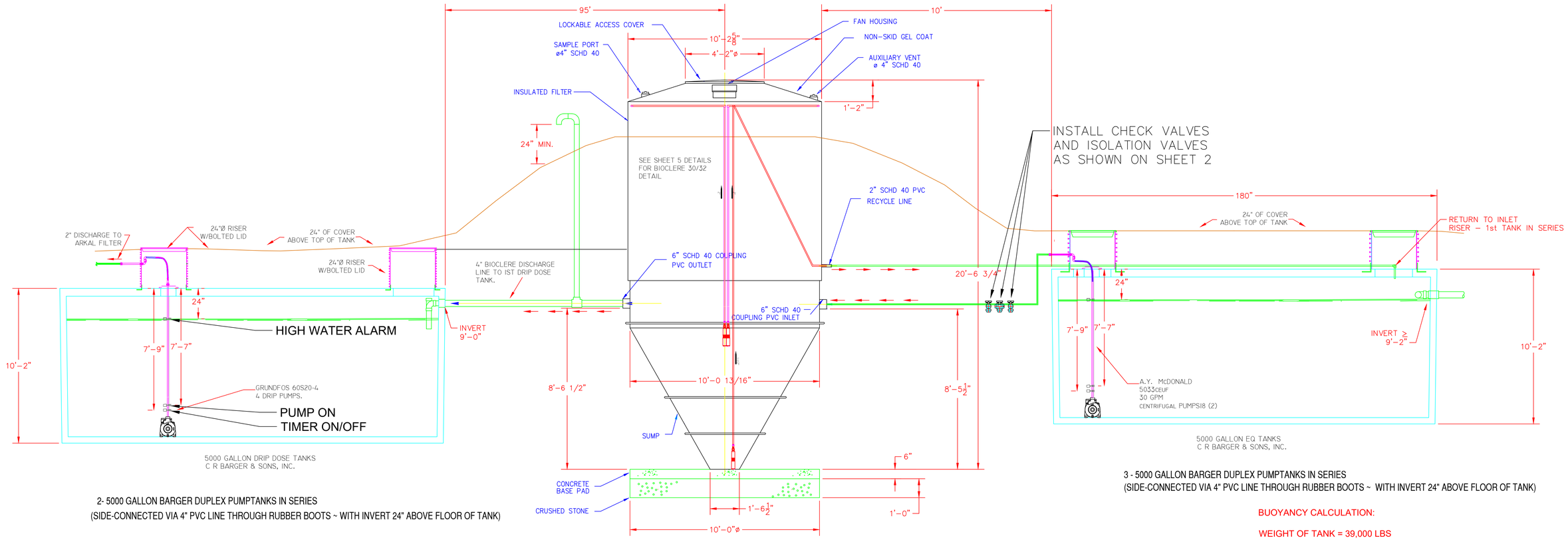
DATE: 05 MAY 2017

SCALE N. T. S.		SEWAGE WORKS
REVISIONS	DESIGNED	
30AUG2016	EWC	
21OCT2016	DRAWN	TREATMENT PLANT - AERIAL VIEW
04NOV2016	EWC	
30NOV2016	CHECKED	
	MWC	
		FOR GENESIS VILLAGE ESTATES CUMBERLAND COUNTY, TN
MICHAEL W. CALLAWAY LICENSED PROFESSIONAL ENGINEER AGRICULTURE NO. 113319 STATE OF TENNESSEE 21 OCT 16	CE DESIGNERS, Inc. 108 EAST COMMERCIAL AVENUE MONTEREY, TENNESSEE 38574	DATE 21 OCT 2016
		JOB NO. D-159
		SHEET 2



2- 5000 GALLON BARGER DUPLEX PUMPTANKS IN SERIES
(SIDE-CONNECTED VIA 4" PVC LINE THROUGH RUBBER BOOTS ~ WITH INVERT 24" ABOVE FLOOR OF TANK)

3 - 5000 GALLON BARGER DUPLEX PUMPTANKS IN SERIES
(SIDE-CONNECTED VIA 4" PVC LINE THROUGH RUBBER BOOTS ~ WITH INVERT 24" ABOVE FLOOR OF TANK)

BUOYANCY CALCULATION:

WEIGHT OF TANK = 39,000 LBS
WEIGHT OF 24" OF COVER:
180"X78"X24"/1728 CU.IN./CU.FT.X80 LBS/CU.FT. = 15,600 LBS
WEIGHT OF MINIMUM 2" OF WATER IN TANK:
24"X170"X68"/1728 CU.IN./CU.FT.X62.4 LBS/CU.FT. = 10,019 LBS.
TOTAL WEIGHT = 64,619 LBS.

BUOYANCY:
180"X78"X122"/1728 CU.IN./CU.FT.X62.4 LBS/CU.FT. = 61,854 LBS.
NET BUOYANCY FORCE = 61,854 LBS - 64,619 LBS = -2,765 LBS.

ADDITIONAL ANTIBUOYANCY FORCES OF WEIGHT OF INTERNAL PUMPS AND APPURTENANCES AND FRICTION OF SOIL AGAINST TANK SIDES WOULD ADD ADDITIONAL ANTIFLOTATION PROTECTION. TANKS WILL NOT FLOAT.

NOTES:
1. TWO IDENTICAL BIOCLERE 30-32 UNITS IN PARALLEL.
2. EQ TANK PUMPS PIPED AND VALVED SO EACH PUMP CAN DOSE EITHER BIOCLERE OR BE ISOLATED FOR REPLACEMENT.
3. ALL PIPING CONNECTIONS TO TANKS, 4" SCHD 80 PVC, THROUGH RUBBER BOOTS WITH STAINLESS STEEL HOSE CLAMPS, INVERT TO BE 24" ABOVE FLOOR OF TANK.
4. PUMP CONTROL FLOATS TO BE SET WITH "TIMER ON" 7'9" BELOW TOP OF TANK, "PUMP ON" 2" ABOVE TIMER FLOAT, AND "HIGH WATER ALARM" 2' BELOW TOP OF TANK.
5. CUSTOM TELEMETRY CONTROL PANEL FROM JNM TECHNOLOGIES TO BE INSTALLED PER CBWS REQUIREMENTS.
6. ALL PIPING TO BE SCHD 40 PVC WITH SOLVENT WELDED JOINTS UNLESS OTHERWISE SPECIFIED.
7. ALL PUMPS TO HAVE SCHD 80 PVC BALL AND BALL CHECK VALVES ON DISCHARGE LINE.

Description	Elevation
BM =	100.00
Top of Lift Station	93.00
Lift pumps OFF	82.00
Lift lead pump ON	83.00
Lag pump ON	86.00
High water alarm	87.00
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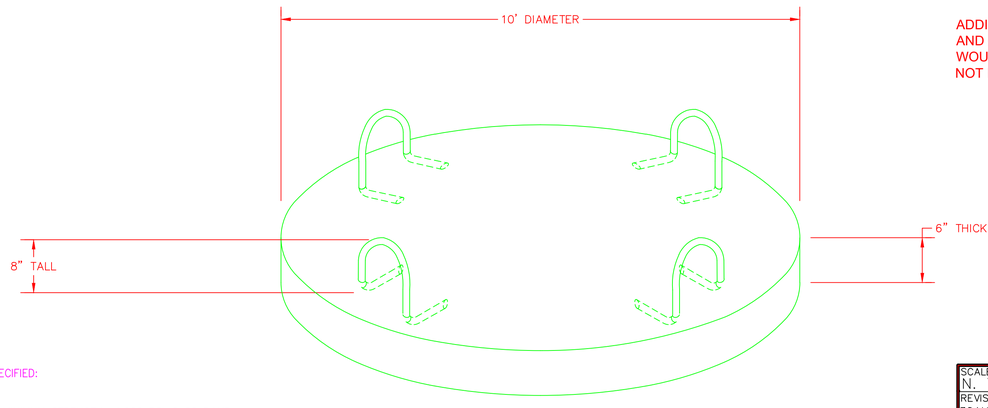
Drip discharge invert	101.74
Drip pump OFF	96.21
Drip timer ON	97.71
Drip high water	100.46
Control bldg floor	103.02

MODEL 30-32
With 2700 GALLON CLARIFIER

NOT TO SCALE



NOTES: UNLESS OTHERWISE SPECIFIED:

1. CONCRETE MINIMUM STRENGTH: 4,000 PSI @ 28 DAYS.
2. STEEL REINFORCEMENT: 6 X 6 10 GAUGE STEEL WIRE MESH.
3. EYES: (4): 1/2" DIAMETER RE-BAR CAST IN PLACE AS SHOWN 6" FROM O.D., EQUALLY SPACED.
4. PAD TO BE SUPPLIED AND INSTALLED BY CONTRACTOR

BIOCLERE TIE-DOWN PAD

NOT TO SCALE

RECORD DRAWINGS:
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DATE: 05 MAY 2017

SCALE
N. T. S.

REVISIONS	DESIGNED
30AUG2016	EWC
21OCT2016	DRAWN
04NOV2016	EWC
30NOV2016	CHECKED
	MWC

SEWAGE WORKS

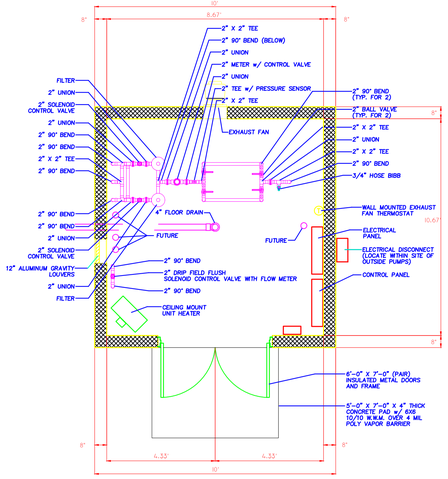
TREATMENT PLANT – Side View

FOR
GENESIS VILLAGE ESTATES
CUMBERLAND COUNTY, TN

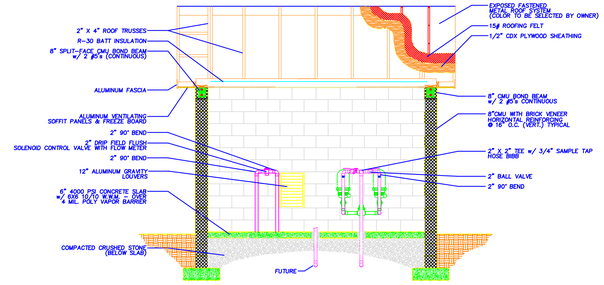
MICHAEL W. CALLAHAN
REGISTERED ENGINEER
No. 113519
STATE OF TENNESSEE
31 OCT 16

CE DESIGNERS, Inc.
108 EAST COMMERCIAL AVENUE
MONTEREY, TENNESSEE 38574

DATE
21 OCT 2016
JOB NO.
D-159
SHEET 3

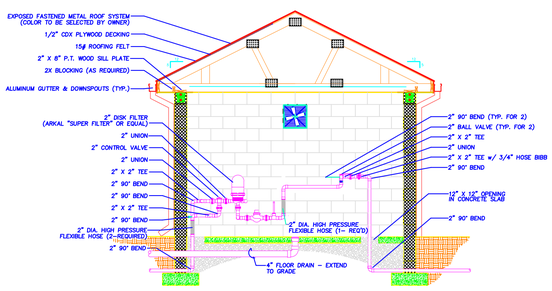


PLAN VIEW

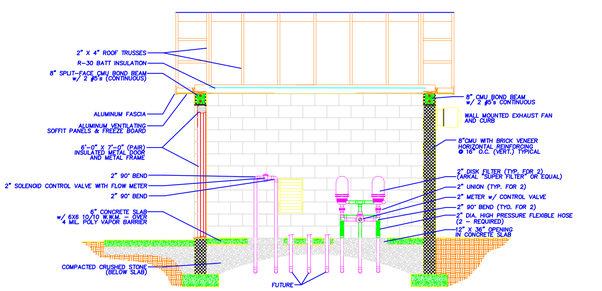


NOTE:
ALL BUILDING PIPING AND VALVES TO BE SCHEDULE 80 PVC

FACING SOUTH EAST

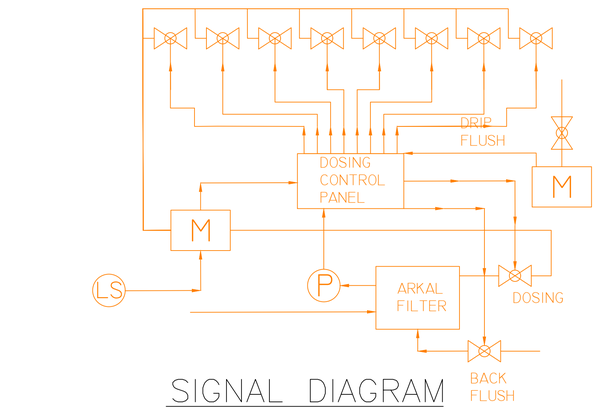


FACING NORTH EAST



FACING NORTH WEST

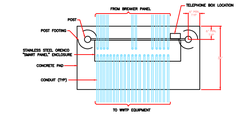
CONTROL BUILDING
N.T.S.



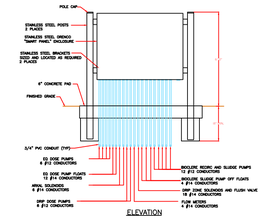
SIGNAL DIAGRAM
N.T.S.

ELECTRICAL NOTES:

1. ELECTRICAL CONDUIT AND ASSOCIATED FITTINGS TO BE PVC SUITABLE FOR UNDERGROUND SERVICE.
2. CONDUIT TO BE BURIED A MINIMUM OF 24" BELOW FINISHED GRADE. BACKFILL SHALL BE FREE OF STONES AND FOREIGN DEBRIS FOR A MINIMUM OF 12" FROM CONDUIT.
3. CONDUCTORS, EXCEPT SUBMERSIBLE TYPE, SHALL BE COPPER WITH THWN INSULATION. SUBMERSIBLE TYPE SHALL BE SUPPLIED PUMP MANUFACTURER AND INSTALLED BY A ELECTRICAL CONTRACTOR. MINIMUM WIRE SIZE TO BE #12 FOR CONDUCTORS AND #14 FOR CONTROL WIRES.
4. ALL ELECTRICAL WORK TO BE IN ACCORDANCE WITH ALL APPLICABLE CODES AND INSPECTED BY THE AUTHORITY HAVING JURISDICTION.
5. POLE WORK TO CONFORM TO WITH R.E.A. FORM 604 AND BULLETIN 50-3, AND AS REQUIRED BY THE ELECTRICAL UTILITY COMPANY.
6. INSTALLATION SHALL BE LEFT IN NEAT AND WORKING CONDITION GUARANTEED FOR ONE YEAR INVOLVING FAULTY WORKMANSHIP OR MATERIALS.
7. SERVICE PANEL SHALL BE RATED AT 200 AMPS AND TO BE APPROVED FOR USE BY THE AUTHORITY HAVING JURISDICTION
8. TELEMETRY TO BE VIA WIRELESS CELLULAR DATA TRANSMISSION BUILT INTO PANEL BY SUPPLIER.

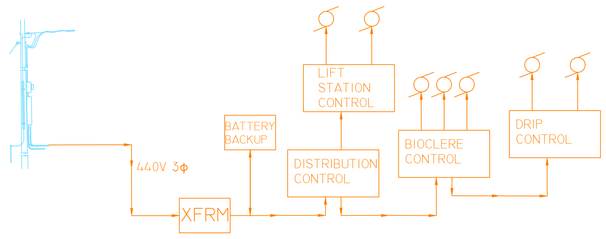


PLAN

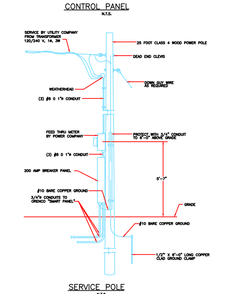


ELEVATION

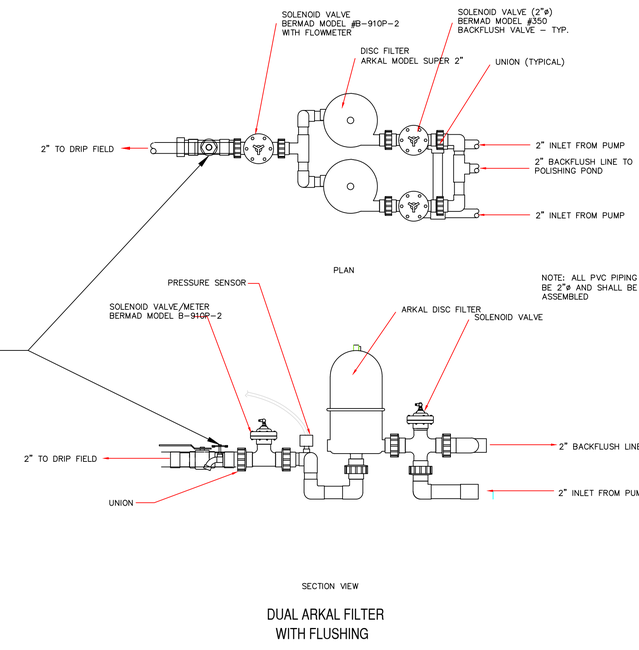
CONTROL PANEL
N.T.S.



POWER LINE DIAGRAM
N.T.S.



SERVICE POLE
N.T.S.



DUAL ARKAL FILTER WITH FLUSHING

RECORD DRAWINGS:
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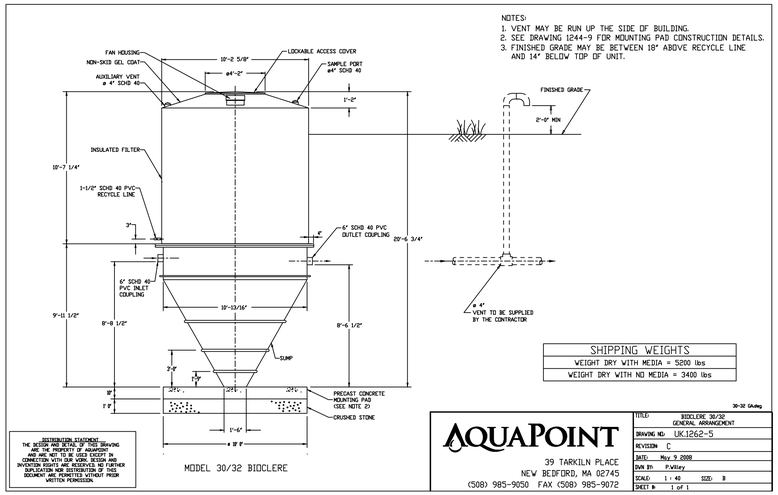
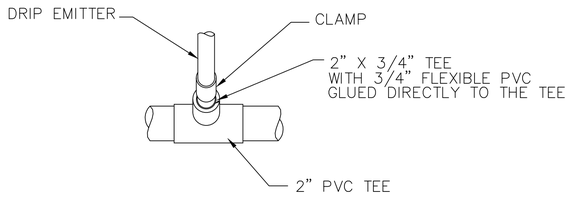
DATE: 05 MAY 2017

SCALE: N.T.S.		SEWAGE WORKS
REVISIONS	DESIGNED	
30AUG2016	EWC	
21OCT2016	DRAWN	DETAILS
04NOV2016	EWC	
30NOV2016	CHECKED	
	MWC	
		FOR GENESIS VILLAGE ESTATES CUMBERLAND COUNTY, TN
		DATE 21 OCT 2016
		JOB NO. D-159
		SHEET 4

MICHAEL W. CALL — REGISTERED ENGINEER — No. 113219 — STATE OF TENNESSEE — 21OCT2016

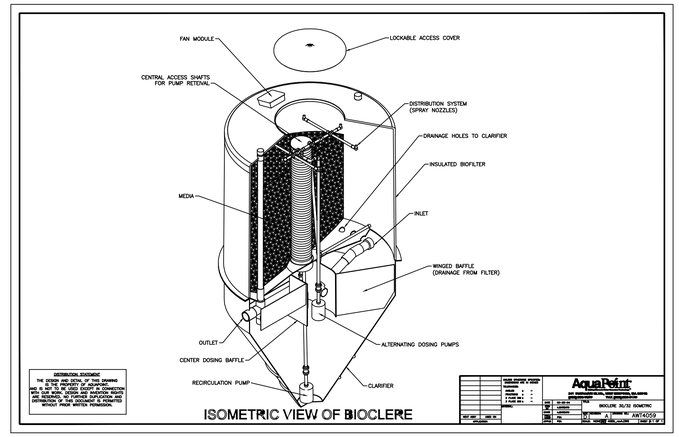
CE DESIGNERS, Inc.
108 EAST COMMERCIAL AVENUE
MONTEREY, TENNESSEE 38574



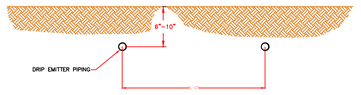


MANIFOLD TAP

N.T.S.



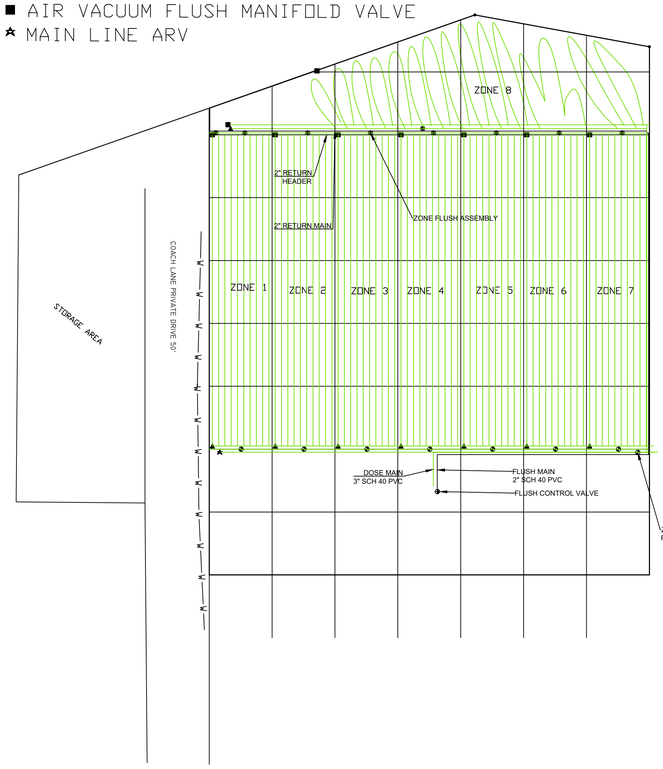
ISOMETRIC VIEW OF BIOCLERE

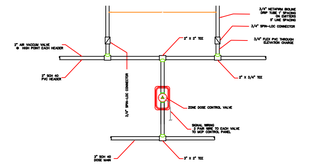


DRIP EMITTER PIPING

N.T.S.

- ◕ ZONE DOSE CONTROL VALVE
- ◉ ZONE FLUSH ASSEMBLY
- ◑ FLUSH CONTROL VALVE
- ▲ AIR VACUUM DOSE MANIFOLD VALVE
- ■ AIR VACUUM FLUSH MANIFOLD VALVE
- ⛢ MAIN LINE ARV





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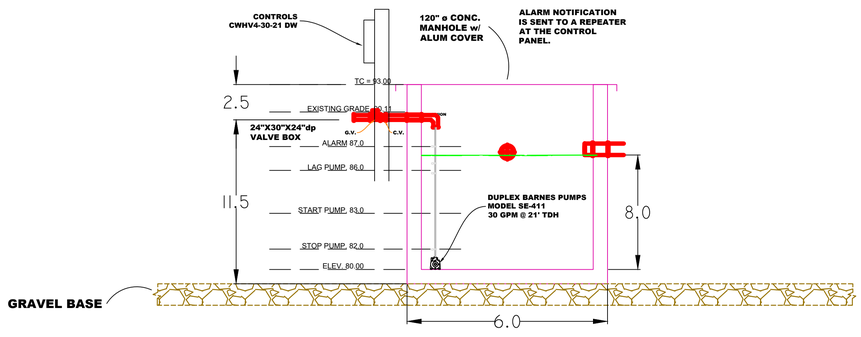

SEWAGE PUMPING STATION

(PS1)

SCALE: N.T.S.

SCALE	N.T.S.
REVISIONS	
30AUG2016	
21OCT2016	
04NOV2016	
30NOV2016	
DESIGNED	EWC
DRAWN	EWC
CHECKED	MWC

SEWAGE WORKS

DETAILS

FOR
GENESIS VILLAGE ESTATES
CUMBERLAND COUNTY, TN

MICHAEL W. CALLAHAN — REGISTERED ENGINEER — AGRICULTURE — COLORADO — No. 71319 — STATE OF TENNESSEE
21OCT2016

CE DESIGNERS, Inc.
108 EAST COMMERCIAL AVENUE
MONTEREY, TENNESSEE 38574

DATE: 21 OCT 2016
JOB NO.: D-159
SHEET 5

Follow-up Inspection Report (Land-based Systems)

DATE: **May 19, 2017 (3 – 4 pm Local time)**
Facility: **Genesis Village Townhouses**
Address: **4955 Genesis Road, Crossville TN**
County: **Cumberland**
SOP: **08040 (C&E: WPC16-0026;)**
Purpose of Visit: **Follow-up to Start-up Inspection; Commissioning Site Visit**
Responsible Management Entity: **Cumberland Basin Wastewater Systems**
Present at Inspection: **Gary Emery, Owner, Genesis Village Townhomes**
Representatives of W&O Construction/Cumberland Basin WW Systems
George Garden, P.E. BCEE, Division of Water Resources
Certified Operator

Type of System

		Latitude	Longitude
Coventional- Septic Tank	X	36deg01' 05.51"N	084deg59' 36.95W
Oxidation lagoon			
Wisconsin Mound			
Low Pressure pipe System			
Recirculating Sand Filter			
BioClere (2 units)	X	36deg01' 05.15"N	084deg59' 37.29"W
Advantex Bio-Media Filter			
Recirculating Biological Contractor			
STEG collection system via conventional gravity sewer to conventional duplex Sewer Lift Station to Bioclere treatment units via force main	X	36deg01' 01.58"N	084deg59' 32.19"W

Dispersal Application

		Latitude	Longitude
Conventional - Disperal			
Lpp_ Laterals			
Drip Spacing (5 ft)	X	36deg01'06"N	084deg59'39"W
Spray			

Waste Stream Characterization Domestic ~~Commercial/Industrial~~
Disinfection: **None**
Photos Taken: **None**
Fencing: **In Progress**
Signs: **None**
Inhibited Access: **Locks on Bioclere units and Control Room**
Contour: **Dispersal field virtually flat; hose on contour**
Dispersal Field **Netafim 5' spacing with Arkal prefilter**

Lagoon Discharging **NA**
Water Level Monitoring **Floats signal to control panel for treatment and dispersal**
Design Capacity: **99 Condo units → 30,000 gpd**
Water Source: **City of Crossville**

Site Conditions

		Latitude	Longitude
Ponding	NA		
Overflow	NA		
Broken-exposed Pipes	NA		
Stuck solenoids valves	NA		
Springs	NA		
Private Water Wells	NA		
Non Community Water	NA		
Well head protection area	NA		
Surface Water Intakes	NA		
Kasrt Features	NA		
Sinkhole/closed Depression	NA		

Comments:

1. **System operating under low flow wastewater conditions; expect sewer lift station and the dispersal pump system to pump no more than 1 time per day and the Bioclere to operate primarily on the dosing cycle.**
2. **Record drawings have been corrected. Engineering report supplemented except for data on dispersal field and filter control diagrams.**
3. **Biocleres were unlocked and the fan enclosures and electrical junction boxes open to the weather. The conduit run from the control building and the fan enclosures must be dried out.**
4. **Netafim dosing hose installed and certified by JNM representative; computer monitor and control system in operation.**
5. **Site work remaining: only cosmetic landscaping and drip dispersal area fencing remain to be completed.**
6. **Commissioning deemed complete.**

Inspected By: George Garden, P.E. BCEE **Date: May 20, 2017**

Karen H. Stachowski

From: George Garden
Sent: Wednesday, May 31, 2017 11:53 AM
To: Will Ward
Cc: Stephanie Durman
Subject: WPC 16-0026 Genesis Village - Record Dwgs
Attachments: D-159 GENESIS VILLAGE ESTATES RECORD DRAWINGS.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

The attached has been reviewed and approved and meets the requirements of the Consent Order including Appendix 1 to the Order.

TN Department of Environment & Conservation
George C. Garden, P.E. BCEE| Chief Engineer
Division of Water Resources
11th Floor, William R. Snodgrass TN Tower
312 Rosa L. Parks Avenue
Nashville TN 37243-1102
p. 615-253-9934 c. 615-416-0164
george.garden@tn.gov

From: Dana Douglas
To: Daniel Pleasant
Cc: Brad Thibault; Chris Carroll; Terry Merritt; Joe Stoops; Josh Martin
Subject: [EXTERNAL] Grasslands Washout
Date: Wednesday, July 19, 2023 5:22:21 PM

Daniel,

The Grasslands facility became hydraulically overloaded today due to heavy rains and began washing out due to I&I in the collection system.

Please reach out if you have any questions.

Thank you,
Dana Douglas
CWS TN State Manager
615-603-6812

From: Dana Douglas
To: Daniel Pleasant; Joe Stoops; Josh Martin
Cc: Chris Carroll
Subject: [EXTERNAL] SSO
Date: Friday, April 7, 2023 6:46:53 AM

Daniel,

In addition to the email sent yesterday concerning the plane washing out, the WWTP discharge manhole, immediately past the tertiary treatment was/is overflowing. This is also due to the 2 inches of rain received overnight Wednesday into Thursday. Combined with the Harpeth River being flooded, this has caused the WWTP discharge line to be hydraulically maxed out causing the SSO.

Please reach out if you have any questions or concerns.

Thank you,
Dana Douglas
CWS TN Area Supervisor
615-603-6812

From: Dana Douglas
To: Daniel Pleasant
Cc: Josh Martin; Chris Carroll; Joe Stoops; Kevin Parham
Subject: [EXTERNAL] Sanitary Sewer Release
Date: Monday, April 10, 2023 5:08:39 PM

Daniel,

I was notified yesterday afternoon by the weekend operator that the primary lift station to the treatment facility was not pumping. I contacted Bouchard and Sons immediately to do what was necessary to get the station up and operational. They were unable to find a sufficient vac truck yesterday and returned this morning to make the necessary repairs.

Due to the lift station being O/S, manhole number 001 has been overflowing, releasing approximately 250k gallons. Again, this is due to lift station failure.

If you have any questions or concerns, please reach out.

Thank you,
Dana Douglas
CWS TN Area Supervisor
615-603-6812

From: Dana Douglas
To: Daniel Pleasant
Cc: Chris Carroll; Joe Stoops; Josh Martin
Subject: [EXTERNAL] Sludge Overflow
Date: Tuesday, June 20, 2023 6:20:28 PM

Daniel,

Upon arrival at the Grasslands facility this morning, the operator noticed the sludge holding container was overflowing. The airlift pump had been turned off over night to allow the sludge to thicken for wasting today. We just had a blower motor replaced and the main electrical panel repaired, the operator(s) fired up the third blower to increase aeration and aid in NH3 removal. We assume the increased pressures somehow activated the airlift pump sometime overnight, causing the spill. We have Onsite Environmental cleaning up the spill. When I am able to get an estimate on the amount of spillage, I will let you know.

If you have any questions, please reach-out.

Thank you,
Dana Douglas
CWS TN State Manager
615-603-6812

From: Wade Murphy
To: Cole McCormick
Cc: Daniel Pleasant; MichaelP Murphy; Michael Lancaster; Karen H. Stachowski; Timothy Hill; Angela Jones
Subject: RE: Commission Docket No. 23-00036 (Limestone - Nash Ridge)
Date: Friday, June 23, 2023 4:27:40 PM
Attachments: image001.png
Washout_Combined Email Notifications to TDEC.pdf

Cole, thanks for contacting TDEC via the email below and your phone call to me also on June 21, 2023. I have researched your concern in coordination with some colleagues. I understand your concern to be what permitting and/or enforcement actions are relevant to Limestone's proposal to expand its service area of the Grasslands STP to encompass a new 39 lot subdivision called Nash Ridge. My three thoughts pertain to addition of service area on the basis of a collection system only, Limestone's responsibility under their permit, and Limestone's stated future plans.

Regarding the collection system, TDEC can view it within TPUC's jurisdiction to expand this utility's service area, to encompass the Nash Ridge Subdivision, on the basis of a new low pressure sewer system connected to Limestone's existing sewer system (collection system and treatment plant). TDEC looks positively at low pressure sewer systems as the type of design that has the least potential for allowing extraneous water into the sewer system.

Limestone is already violating its NPDES permit. Limestone's permit prohibits "washouts" which is where more than 30% of the active bacteria providing the treatment gets washed out of the treatment reactor. These are particularly bad because it can take days following the washout for the operators to adjust the treatment plant back into good operation. That increases potential to discharge pollutants in excess of permit limits. Washouts also have the potential to result in partially treated sewage being discharged to the river directly. Limestone's current discharge permit places the burden on Limestone to take all reasonable steps to minimize any adverse impact to the waters of Tennessee resulting from noncompliance with their permit. As you are aware, they currently have a consent order with TDEC to address problems with the sewer system. Consent Order WPC22-0086 required submission of a Corrective Action Plan. Limestone submitted that plan timely in May, 2023. Record available to me indicates that the Division of Water Resources found it omits elements required in an engineering report developed per good engineering practices. We may not have communicated that back to Limestone yet. It's possible that this corrective action plan is a potential mechanism for them to explain how they will address and fix treatment plant problems in time to meet demand of the 39 additional lots without worsening the existing problems. I have attached three recent notifications to DWR of washouts.

Limestone's future plans may not be easily "permittable". Numbered Page 5 of the document at the docket link you provide below says that Limestone is in the process of applying for and obtaining a modification to its existing Grasslands WWTP permit with TDEC to modify and expand the existing system. Limestone plans on building a new, expanded, treatment plant. To my knowledge, the Division of Water Resources is not working on engineering plans or a permit modification for replacement or expand the existing system. An NPDES permit modification will not likely be an issue if Limestone only proposes to replace its 0.25 MGD treatment plant with another 0.25 MGD treatment plant. The Division of Water Resources will not be in a position to propose any increase in discharge pollutant loads from an expanded treatment plant without an acceptable antidegradation

justification from Limestone including water quality modeling to demonstrate an increased discharge will not cause or contribute to a condition of pollution. All of that may be expensive and time-consuming to produce. Limestone and its consultants need to determine whether the existing treatment plant can accommodate sewage from the new development without causing or contributing to overflows in the collection system and washouts at the treatment plant.

The Consumer Affairs Division of the AG's office reached out to our office to see what we know about this situation. I'm copying that agency's representative on this email as a courtesy as well as staff in our field office and Compliance and Enforcement and Engineering Services Units.

I know this is a lot of information. Feel free to call or respond with questions.

Respectfully,

TN Department of Environment & Conservation

Wade D. Murphy | E.I.
Division of Water Resources, Water-Based Systems Unit
William R. Snodgrass TN Tower, 11th Fl
312 Rosa L. Parks Ave 37243
p. 615-532-0666
wade.murphy@tn.gov
tn.gov/environment

From: Cole McCormick <Cole.McCormick@tn.gov>
Sent: Wednesday, June 21, 2023 11:45 AM
To: Wade Murphy <Wade.Murphy@tn.gov>
Subject: Commission Docket No. 23-00036 (Limestone - Nash Ridge)

Hello Wade,

Here is the link to Commission Docket No. 23-00036 which is Limestone's proposed expansion to their Grasslands CCN for the Nash Ridge Subdivision: Tennessee Public Utility Commission Electronic Docket Number 2300036

Here is some information pulled from the Petition (I tried to pull some of the main points but there is more in the Petition itself):

Page 12 of the (05/23/2023) Petition filing, PDFp.13 says: "Wastewater services to Nash Ridge will be

provided through a to-be constructed wastewater system and an existing wastewater system. The to-be constructed system will utilize precast concrete septic tanks for each home with E1 grinder pumps and controls and PVC pipe collection force mains. The wastewater will be transported to an existing manhole in the existing Grasslands WWTP collection system and ultimately make its way to the Grasslands WW Treatment Plant, which is an extended aeration treatment facility followed by clarification and chlorination and owned and operated by Limestone under its current CCN."

Design Capacity = 0.25 MGD or 250,000 GPD. Because this is an NPDES Permit, there are specific limits of various bacterial and elemental deposits allowed according to Exhibit 14 PDFp.87

PDFp.16 explains: "Limestone currently holds discharge permit TN0027278 for the Grasslands system that will serve Nash Ridge. Limestone is in the process of requesting a modification of that permit from TDEC to expand their system to serve the Nash Ridge subdivision.

Limestone did receive a notice of violation on its grasslands system in 2022 from TDEC. See Case no. WPC22-0086

PDFp.16 says: Limestone entered into a Consent Order and Assessment (“Consent Order”) with TDEC on February 13, 2023. The Consent Order resolved violations that had occurred at the Grasslands facility and set forth a corrective action plan. A copy of the Consent Order is attached as Exhibit 21. No complaints or notices of violation are pending with TDEC.

Sincerely,
Cole

Cole McCormick
Tennessee Public Utility Commission
Utilities Consultant/Utilities Division
Office Phone: 615-770-6871
Cell Phone: 931-787-3174

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER RESOURCES
William R. Snodgrass - Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, Tennessee 37243-1102

November 30, 2023

Aqua Utilities
Michael Dick, Contact
1650 Des Peres Rd.
Des Peres, MO 63131

CERTIFIED MAIL
RETURN RECEIPT REQUESTED:

9414 7266 9904 2120 5247 68

Re: **Lead and Copper Rule – Participating Consumer Notification Documents**
PWSID: TN0000948
County: Hardin

Dear Contact Dick:

The Division of Water Resources (DWR) appreciates your dedicated efforts to delivering safe drinking water. According to our records, the Aqua Utilities sucessfully completed the monitoring of lead and copper at consumer taps during the compliance period of June 1, - September 30, 2023.

We have received the sample results; however, we have not received the required documentation of the participant notice activities as outlined in Tenn. Comp. R. & Regs. ("Rule[s]") Chapter § 0400-45-01-.33(6)(e). Each sampled location must receive a Consumer Notification letter within 30 days of the results being received from the laboratory. Examples of these documents are included for reference.

If you believe the violation listed above has been identified incorrectly, submit copies of the documents validating that the requirements were timely completed via email to DWRWater.Compliance@tn.gov within 10 days of receipt of this notice.

After 10 days, the violation will be submitted to the EPA and additional reporting will be required in order to return to compliance with the Lead and Copper Rule:

(I) Public Notice - Missing the Lead and Copper sampling event deadlines constitutes a Tier 3 Violation and requires issuance of a public notice within 12 months. This public notice must contain content and language specified in Tenn. Comp. R. & Regs. ("Rule[s]") Chapter § 0400-45-01-.19(5). Submit a copy of the public notice to the Division within 10 days of publication.

If you should need assistance or have any questions please contact the Jackson Environmental Field Office at (731) 512-1300 or Christopher Allen in the Nashville Central Office at (615) 948-0716 and via email at Christopher.Daniel.Allen@tn.gov.

Sincerely,

Jessica Murphy
Manager, Compliance and Enforcement Unit, Division of Water Resources

EJM:CDA

Cc: Tom Moss, NCO-C&E Unit, Tom.Moss@tn.gov
Anna Sartors, NCO-DW Unit, Anna.R.Sartors@tn.gov
Christopher Allen, NCO-C&E Unit, Christopher.Daniel.Allen@tn.gov
Conner Franklin, JEFO-DW Unit, Conner.Franklin@tn.gov
Noah Reid, JEFO-DW Unit, Noah.Reid@tn.gov
Clark Culver, Certified Operator-Aqua Utilities, wcc_clark@yahoo.com
Lynn Starrett, Project Manager-Aqua Utilities, lynn.starrett@clearwatersol.com

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER RESOURCES
William R. Snodgrass Tower, 312 Rosa L. Parks Avenue, 11th Floor
Nashville, Tennessee 37243

Lead and Copper Results Consumer Notice Certification Form

PWS_ID#: TN_____ Phone:_____

Distribution System Name: _____

Date(s) of results receipt from laboratory _____

The water system named above hereby certifies that its lead consumer notice has been provided to each person it serves at the specific sampling site from which the sample was tested. The water system also certifies that these results and the following information were provided to such persons within 30 days of receiving the test results from the laboratory:

☐ Individual tap results from lead tap water monitoring carried out under the requirements of 40 CFR 141.86.
☐ An explanation of the health effects of lead.
☐ Steps that consumers can take to reduce exposure to lead in drinking water.
☐ Contact information for our water utility.
☐ The maximum contaminant level goals and action levels for lead, and the definitions of these two terms from 40 CFR 141.153(c).

This information was distributed to consumers at sampling locations within the required timeframe – Select all that apply:

☐ within 30 days to all sites with results below the Lead Action Level
☐ within 72 hours to ____ (#) sites with Lead results above Action Level on _____(date)
☐ within 72 hours to all sampled sites if 90th percentile exceeded Action Level, Public Notice was also conducted on_____(date) include documentation of actions and copy of Public Notice.

Method of Distribution - Select all that apply:

☐ Notice was distributed by mail or other direct delivery.
☐ electronic mail.
☐ posting the notice in public places (attach a list of locations).
☐ delivery of multiple copies to single bill addresses serving several persons such as: apartments, businesses, and large private employers.
☐ other methods. Specify other methods: _____

_____

_____

This form must be completed and returned to the Division along with a completed copy of the distributed Participant Notification.

Distributor print name:_____

Distributor signature:_____Date:_____

Email address: _____

Return form to: Drinking Water Compliance, Tennessee Tower 11th Floor, 312 Rosa L. Parks Ave., Nashville, TN 37243 or vial email DWRWater.Compliance@tn.gov

Location:_____ Date:_____

_____

_____

Notification of Results

Thank you for participating in the monitoring of tap water.

The results at the sampled tap are:

Lead _____mg/L Copper _____mg/L

Contaminant level requiring follow-up action:
Lead __0.015__mg/L Copper__1.3__mg/L

ppm or mg/L = Parts per million or milligrams per liter, explained in terms of money as one penny in $10,000.

ppb or micrograms/L = Parts per billion or micrograms per liter, explained in terms of money as one penny in $10,000,000.

The MCLG, or maximum contaminant level goal for lead is zero mg/L. This is the level of a contaminant in drinking water where there is no known or expected health risk. MCLGs allow for a margin of safety. The action level for lead is 0.015 mg/L and the action level for copper is 1.3 mg/L. An action level is the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

Lead is a common metal found in the environment. Although most lead exposure occurs when people eat paint chips and inhale dust, or from contaminated soil, the EPA estimates that 10 to 20 percent of human exposure to lead may come from lead in drinking water. Lead is rarely found in source water but enters tap water through corrosion of plumbing materials. Homes built before 1988 are more likely to have lead pipes, fixtures, and solder. However, new homes are also at risk: even legally designated "Lead-Free" plumbing may contain up to 8 percent lead. The most common source is brass and chrome-plated brass faucets and fixtures, which can leach significant amount of lead into water, especially hot water.

Exposure to lead in drinking water can cause serious health effects in all age groups. Infants and children can have decreases in IQ and attention span. Lead exposure can lead to new learning and behavior problems or exacerbate existing learning and behavior problems. The children of women who are exposed to lead before or during pregnancy can have increased risk of these adverse health effects. Adults can have increased risks of heart disease, high blood pressure, kidney, or nervous system problems.

Copper is a reddish metal that occurs naturally in rock, soil, water, sediment, and air. It is commonly found in coins, electrical wiring, and pipes. It is an essential element for living organisms, including humans. However, too much copper can cause adverse health effects, including vomiting, diarrhea, stomach cramps, and nausea. It has also been associated with liver damage and kidney disease.

The human body has a natural mechanism for maintaining the proper level of copper; however, children under one year old have not yet developed this mechanism and, as a result, are more vulnerable to the toxic effects of copper. People with Wilson's disease also have a problem with maintaining the proper balance and should exercise particular care in limiting exposure to copper.

Consumers can reduce their exposure to lead in drinking water by the following:

(I) Run your water to flush out lead. If the water has not been used for several hours, run water for 15-30 seconds, or until it becomes cold, or until it reaches a steady temperature before using it for drinking or cooking. Flushing removes water containing lead from the plumbing lines.

(II) Do not cook with or drink water from the hot water tap. Lead dissolves more easily into heated water. Do not use hot water for preparing baby formula. Boiling water does not reduce lead.

(III) Look for alternative sources or treatment of water if you are concerned about contaminants. You may want to consider purchasing a water filter or bottled water. Read the packaging to ensure the filter is approved to reduce lead or contact NSF International at 800-NSF-2010 or www.nsf.org for more information on performance standards for water filters.

(IV) Get your child tested. Visit the Tennessee Department of Health to learn more about children and lead, or contact your healthcare provider to find out how you can get your child tested for lead if you concerned about lead exposure. https://www.tn.gov/health/health-program-areas/mch-lead.html

(V) The following is a list of some Department approved laboratories in your area that you can call to have your water tested for lead (Insert names and phones numbers of at least two laboratories).

(VI) Identify your plumbing fixtures containing lead. New brass faucets, fittings, and valves, even those advertised as "Lead-Free" may contribute lead to drinking water. Tennessee law currently restricts the sale of plumbing fixtures not considered "lead-free."

For more information on reducing lead exposure around your home/building and the health effects of lead, visit EPA's Web site at www.epa.gov/lead, call the EPA Safe Drinking Water Hotline at 800-426-4791, contact your health care provider, or reach out to the State of Tennessee Department of Environment and Conservation by mailing:

Lead and Copper in Drinking Water
Tennessee Tower, 11th Floor
312 Rosa L. Parks Ave.,
Nashville, TN 37243

Your participation in this program is a valuable contribution to the community's safety.

For more information contact please contact_____

with your local water utility at (_____)_____

PWS_ID#: TN000_____

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
Division of Water Resources
Nashville Environmental Field Office
711 R.S. Gass Blvd.
Nashville, Tennessee 37216
Phone 615-687-7000 Statewide 1-888-891-8332 Fax 615-687-7078

July 10, 2023

Mr. Josiah Cox, President
Ecopy: jcox@CSWRgroup.com
Central States Water Resources (CSWR)
1630 Des Peres Rd., Suite 140
Des Peres, MO 63131

Re: **Compliance Evaluation Inspection and Notice of Violation**
Limestone Water Utility Operating Company, LLC
Hideaway Wastewater Treatment Facility
SOP# 07090
Williamson County

Dear Mr. Cox,

On Tuesday, June 13, 2023, Mrs. Christina Wingett performed a Compliance Evaluation Inspection on the Limestone Water Utility Operating Company, LLC Hideaway Wastewater Treatment Facility for compliance with State Permit SOP-07090, which became effective on April 1, 2023, and expires on March 31, 2028, and the previous permit which was effective June 1, 2021 to January 31, 2023. The inspection covered the time period from June 2018 to June 2023. She met with Mr. Dana Douglas and Mr. Kevin Parham during the inspection. The Division of Water Resources (Division) would like to thank Mr. Douglas and Mr. Parham for their time and courtesy shown while on site.

Permit and Records Review

Records are not maintained per the permit requirements and could not be produced in a timely manner. The listed certified operator in charge was not correct and a Certified Operator in Charge designation letter was provided electronically by Mr. Douglas on June 29, 2023. Copies of Quarterly Operation Reports and *E. coli* laboratory data were provided via e-mail on June 29, 2023. Copies of contract laboratory data were provided via e-mail on June 21, 2023. The Standard Operating Procedure for *E. coli* was provided in the electronic documentation and did include the

required method number and reference to the *23rd Edition of the Standard Methods*. In reviewing the *E. coli* bench sheets several issues were found:

1. Numbers should not be scribbled out or written over, a clean strike through with initials and date is sufficient.
2. Incorrect dates were provided with results given for December 20, **2023** and December 29, **2023**.
3. The bench sheet well count section was blank for March 2, 2023 but data was reported on the Quarterly Operating Report.
4. Insufficient significant figures are given for the incubator temperature, the tenths place must be included in the reported number.
5. The well count "dateplates counted" is incorrect for May 25, 2023, with the sample collection date and date counted as the same but a twenty-four hour incubation period is necessary.

When Ms. Wingett inquired if the *E. coli* bench sheets provided to her were the original copy of record or a secondary transcription on Wednesday July 5, 2023 via email, Mr. Douglas replied in part on July 10, 2023, "*The transcribed data is the data that was recorded on the day of sample collection (location, date, etc.), the MPN is based upon the Iddexx colony chart which does not change. Most instances, the data was recorded in phone notes. After collection, the sample was delivered to the Grasslands facility for analysis. With that being said, I guess there aren't any official-original copies of record from that day to provide*." This is not acceptable laboratory record-keeping practice. Bench sheets at minimum must include:

a. The exact place, date, and time of sampling;
b. The exact person(s) collecting samples;
c. The dates and times the analyses were performed;
d. The person(s) or laboratory who performed the analyses;
e. The analytical techniques or methods used, and;
f. The results of all required analyses.

The aforementioned discrepancies and issues with the bench sheets lead the Division to question the veracity of the documentation. This phenomenon is repeated in the 2022 data for multiple different analyses where numbers are reported on the Monthly Operating report, but no bench sheets or laboratory data could be produced to support their validity.

No contract laboratory data could be provided before July 2022 due to the change in ownership according to Mr. Lundgren and Mr. Douglas. However, even after the transition, not all data was collected or maintained with no *E. coli* bench sheet data provided before January 2023. *E. coli* analysis is conducted at a sister facility with a laboratory by the operators. All documentation for the permit must be maintained for the required minimum of three years. Required sampling frequencies are not met with samples taken quarterly rather than monthly.

- June 2021- Did not meet required sampling frequency for Ammonia, *E. coli*, Total Suspended Solids (TSS), or Nitrite plus Nitrate.

- July 2021- No samples reported. Did not meet required sampling frequency for Biochemical Oxygen Demand (BOD), Ammonia, *E. coli*, TSS, or Nitrite plus Nitrate.
- August 2021- No samples reported. Did not meet required sampling frequency for BOD, Ammonia, *E. coli*, TSS, or Nitrite plus Nitrate.
- September 2021- Did not meet required sampling frequency for Ammonia, *E. coli*, or Nitrite plus Nitrate.
- October 2021- Late report. No samples reported. Did not meet required sampling frequency for BOD, Ammonia, *E. coli*, TSS, or Nitrite plus Nitrate.
- November 2021- Late report. No samples reported. Did not meet required sampling frequency for BOD, Ammonia, *E. coli*, TSS, or Nitrite plus Nitrate.
- December 2021- Late report. Did not meet required sampling frequency for Ammonia, *E. coli*, or Nitrite plus Nitrate. *E. coli* value written over on report submitted to Division.
- January 2022- Late report. No samples reported. Did not meet required sampling frequency for BOD, Ammonia, *E. coli*, TSS, or Nitrite plus Nitrate. Date not listed on Quarterly Operating Report, had to deductively estimate by signature dates.
- February 2022- Late report. Did not meet required sampling frequency for Ammonia, *E. coli*, or Nitrite plus Nitrate. Date not listed on Quarterly Operating Report, had to deductively estimate by signature dates. *E. coli* sample results not listed for correct date of collection according to attached analytical report.
- March 2022- Late report. No samples reported. Did not meet required sampling frequency for BOD, Ammonia, *E. coli*, TSS, or Nitrite plus Nitrate. Date not listed on Quarterly Operating Report, had to deductively estimate by signature dates.
- April 2022- No Quarterly Operating Report provided and no report on file at the Division office.
- May 2022- No Quarterly Operating Report provided and no report on file at the Division office.
- June 2022- No Quarterly Operating Report provided and no report on file at the Division office.
- July 2022- No samples reported. Did not meet required sampling frequency for BOD, Ammonia, *E. coli*, TSS, or Nitrite plus Nitrate. Values for BOD, TSS, Ammonia, and Nitrite plus Nitrate present on contract laboratory report but were not transferred to Quarterly Operating Report.
- August 2022- No Quarterly Operating Report provided and no report on file at the Division office.
- September 2022- No samples reported. Did not meet required sampling frequency for BOD, Ammonia, *E. coli*, TSS, or Nitrite plus Nitrate.
- October 2022- TSS was reported on the incorrect date. *E. coli* value was reported on the operating report, but a corresponding bench sheet was not provided. *E. coli*, Ammonia, and Nitrite plus Nitrate did not meet required sampling frequency.
- November 2022- No samples reported. Did not meet required sampling frequency for BOD, Ammonia, *E. coli*, TSS, or Nitrite plus Nitrate.
- December 2022- *E. coli* values on the bench sheets, 4.2 and 1.0, do not match what was reported to the Division on the Quarterly Operating Report 151.5. Did not meet required sampling frequency for BOD, Ammonia, *E. coli*, TSS, or Nitrite plus Nitrate.

- January 2023- Values from the contract laboratory analytical report are not transcribed to the correct date on the Quarterly Operating Report. *E. coli* did not meet required sampling frequency. BOD exceedance violation.
- February 2023- *E. coli* value reported on Quarterly Operating Report is <1 for 2/2/2023, *E. coli* value reported on bench sheet is 25.9. *E. coli* value reported on bench sheet for 2/16/2023 is 1 but no *E. coli* value is reported on Quarterly Operating Report for that date. *E. coli* value reported on Quarterly Operating Report is <1, no *E. coli* value reported on bench sheet. Did not meet required sampling frequency for BOD, Ammonia, TSS, or Nitrite plus Nitrate.
- March 2023- *E. coli* value reported on Quarterly Operating Report is <1 for 3/2/2023, no *E. coli* value reported on bench sheet. Values for Ammonia and Nitrite plus Nitrate are reported on the Quarterly Operating Report for 3/16/2023 but no corresponding analytical report was provided. *E. coli* value reported on bench sheet for 3/16/2023 is 1 but no *E. coli* value is reported on Quarterly Operating Report for that date. *E. coli* value reported on Quarterly Operating Report for 3/23/2023 is <1, but no *E. coli* value reported on bench sheet.

Site Review

The collections system is comprised of individual E-One grinder pump units for a subdivision, followed by bar screening, into a Sheaffer system deep cell lagoon and storage cell, into a Baswood Trickling Filter/Attached Growth system with a 75/25 recirculation rate, clarification, disc filtration, and ultraviolet disinfection and expanded drip irrigation fields. Active acreage amongst both drip fields is 13.7 acres, reserve drip field acreage is 18.2 acres according to Mr. Douglas.

The system described does not meet the design submitted to the Division on March 4, 2019. According to the discussions during the inspection, the solids handling area is not in operation, no polymer is used, and solids are not removed from the system according to the information provided by Mr. Parham. Due to the presence of media in the treatment lagoon, an incorrectly placed pipe may be allowing solids from the Cambrian system to flow back to the lagoon rather than where a sludge de-waterer should be according to the submitted plans. Dye testing could be a useful tool to investigate unexpected flows.

The bar screenings fall into a trash can that Mr. Parham indicated takes months to fill. However, documentation was not provided that this waste was hauled off appropriately as the correct classification of waste with records maintained for a minimum of five years.

The lagoon is in three cells with baffles present to prevent short circuiting. The wastewater flows between anoxic and aerated zones to help with nutrient removal. Mr. Douglas was unsure of the depth of solids in the lagoon or the lagoon depth overall. There is a short-term storage pond or finishing pond that has wastewater in it rather than the designed finished water due to a leak in the lining of the lagoon in 2017. Wastewater was diverted to the finishing pond to repair the liner of the lagoon. According to an email correspondence with Mr. John Newberry by Mr. Bruce Meyer on November 15, 2017, the wastewater was all returned to the main lagoon, but this is not the case as wastewater was present in the finishing pond at the time of inspection. This finishing pond is

not made to contain solids or untreated waste because there is not a pipe to return this wastewater to the main lagoon. A blanket of solids was visible just below the waterline. This wastewater is aerated to prevent it from becoming septic. An equalization pond is in the process of being constructed.

The trickling filter system is comprised of three large above-ground tanks. Due to low flow, one of the three tanks is not in operation. Media from the attached growth system was observed in the lagoon. This should not be possible.

Solids within the system are concerning. Mr. Douglas indicated the clarifier sludge blanket is zero and the solid's handling basin is not operational. Mr. Douglas said no solids have been removed from the system. In the event solids are removed, ensure proper protocols are in place by a licensed contractor to remove the waste with all manifests and what landfill receives the waste maintained for the required five years.

One of the ultraviolet disinfection units was not working correctly, potentially due to low flow according to Mr. Douglas. Spare UV bulbs are present on site and are of the mercury containing variety therefore documentation of proper disposal must be maintained.

No process control analyses are occurring. Preventative maintenance is occurring at the site. Mr. Douglas indicated the facility is visited three times per week, which exceeds the required frequency of observation. However, required inspections are not occurring that meet the requirements outlined in your permit under A. General Requirements:

> *The site shall be inspected by the certified operator or his/her designee, at a minimum, once per fourteen days . . .*
- *the condition of the treatment facility security controls (doors, fencing, gates, etc.),*
- *the condition of the drip area security controls (doors, fencing, gates, etc.),*
- *the condition of the site signage,*
- *the operational status of the mechanical parts of the treatment system (pumps, filters, telemetry equipment, etc.)*
- *the condition of the UV bulbs (if applicable)*
- *the condition of the land application area including the location of any ponding*
- *the name of the inspector*
- *the description of any corrective actions*

No instances of ponding water were viewed in the drip field adjacent to the treatment facility. This field was not fenced but did include signage along each perimeter. The second drip field down the road is reserve with drip installed and is fenced. Mr. Douglas and Mr. Parham were also advised of the added permit requirement of:

> *"Instances of surface saturation, ponding or pooling within the land application area as a result of system operation are prohibited. Instances of surface saturation, ponding or pooling. . . shall be promptly investigated and noted on the Monthly Operations Report. . . Any instances of surface saturation, ponding or pooling not associated with a major*

precipitation event not corrected within three days of discovery shall be reported to the local Environmental Field Office at that time for investigation. Surface saturation, ponding or pooling resulting in the discharge of treated wastewater into Waters of the State or to locations where it is likely to move to Waters of the State shall be immediately reported to the local Environmental Field Office"

There has been a release from the collection system that was not reported to the Division. Releases and overflows must be reported as outlined in the permit section C. Noncompliance. 2. Reporting of Noncompliance.

Conclusions

Compliance with your permit requirements helps ensure the protection of human health and the environment. Inadequate sampling, failure to provide reports in a timely manner, inaccurate data handling and reporting, improper operation and maintenance of the facility, lack of self-monitoring on Quarterly Operating Reports, unsupported data reported to the Division, and exceedance of permitted effluent limits are hazards to human health and the environment and a violation of the permit. This letter hereby serves as a **Notice of Violation**.

Action Items and Recommendations

Steps must be taken to protect data integrity and transcription. Provide a written response addressing the following items within **30 days** of the receipt of this letter or by August 13, 2023, whichever occurs first:

1. Immediately begin conducting all required monthly, quarterly, and annual monitoring.
2. Report all releases to the Division according to the permit requirements. Provide a written overflow/release report for the incident that occurred that was not reported to the Division.
3. Continually update the Division on the Certified Operator in Charge of the facility through signed letters designating their position as soon as you are aware the change will occur.
4. Records must be maintained in accordance with the permit for a minimum of three years for all operations reports and a minimum of five years for all sludge and solids. *These documents must be available at the time of inspection.*
5. *E. coli* documentation is not sufficient. Scribbles should not be used; greater care must be taken to ensure correct transcription from bench sheet to Quarterly Operating Report. All data reported to the Division must have a documented trail to support is creation and validity. Original laboratory documentation must be maintained in accordance with the *40 Code of Federal Regulations Part 136*. Update all bench sheets to include the required information.
6. Immediately begin conducting all permit required inspections and document details.
7. Provide written process control procedures and analyses as required in the permit for Proper Operation and Maintenance.

Provide a written response addressing the following items within **60 days** of the receipt of this letter or by September 13, 2023, whichever occurs first:

8. Remove the wastewater from the finishing pond as was indicated in the correspondence to the Division in 2017.
9. Provide as-built specifications for what systems are “in the ground” at the facility.
10. Investigate solids in the system and provide an explanation of the solids handling process.

Due to the state of recordkeeping and sampling this letter serves as notification of a formal referral to the Compliance and Enforcement Unit for potential further enforcement. You are required to attend a Compliance Review Meeting to outline what is being done to correct and prevent the violations from continuing and to show why the Division should not pursue further enforcement action. The Compliance Review Meeting will be held at the Nashville Environmental Field Office, address is provided at the top of this letter, on **August 2, 2023, at 1:00 PM.** You should be prepared to discuss all the violations outlined in this letter and any other items related to the operation of the wastewater treatment facility at your site.

The Division would like to thank Mr. Douglas and Mr. Parham again for their courtesy and cooperation shown during these inspections. If you have any questions or concerns, please contact your inspector Christina Wingett at 615-961-3875 or christina.wingett@tn.gov.

Sincerely,

Michael Murphy
Program Coordinator
Division of Water Resources

e-copy: Dana Douglas, Supervisor, dana.douglas@clearwatersol.com
Kevin Parham, Grade III Operator, kevin.parham@clearwatersol.com
Josh Martin, Regulatory Compliance Officer, josh.martin@clearwatersol.com
Mandy Sappington, EHS Compliance Manager, msappington@cswrgroup.com
Sara Elias, TDEC Compliance and Enforcement, sarah.elias@tn.gov
Brad Harris, TDEC, brad.harris@tn.gov
Timmy Jennette, Field Office Manager, tim.jennette@tn.gov

From: Justin Lundgren
To: Christina Wingett
Cc: Brad Thibault; Dana Douglas; Josh Martin
Subject: [EXTERNAL] Hideaway SOP07090 Action Items follow up
Date: Tuesday, August 29, 2023 2:09:47 PM
Attachments: image001.png
Hideaway OMP, SOP, QA manual and Ack page.zip
IMG_0893.JPG

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

Good afternoon,

Please find in the attached zip file the following: Operations Management Plan, Standard Operating Procedure, Quality Assurance Manual and Laboratory QA Acknowledgement page to satisfy item number seven under Action Items on the Compliance Evaluation Inspection report. We had originally asked for an extension for this item but were able to gather all the information quicker than expected.

I have also attached a picture of the Bi-Weekly Inspection form showing that the operators have been consistently using it since 6-15-23.

As of this date (8/29) the finishing lagoon has been pumped down approximately 15 feet. Air is turned off to the finishing lagoon for 24 hours beforehand to let any solids settle and then the water is pumped off the top so that minimal solids are transferred to main lagoon. Once the water level is down as much as possible a plan will be developed for removing the solids from the polishing lagoon.

Limestone UOC will follow up with a written response to TDEC Division of Water Resources by September 13th to summarize progress made and address any Action Items not yet satisfied.

If you have any questions or concerns, please feel free to contact me anytime.

Thank you,

Justin Lundgren
EHS Compliance Coordinator
Email: Jlundgren@cswrgroup.com
O: (314) 492-8425 ext. 138
1630 Des Peres Rd., Ste. 140, Des Peres, MO 63131
www.centralstateswaterresources.com

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by:	**Hideaway, TN WWTP**	SOP No:	Liq Strm Samp
Approval:	Brad Thibault	Revision No:	1.1
	Director of Asset Management	Effective Date:	1/1/2023

SUBJECT: Liquid Stream Sampling

1.0 SCOPE

This document applies to the Project Manager and operations personnel.

2.0 PURPOSE

Multiple liquid streams require routine and non-routine sampling at the Grassland Wastewater Treatment Plant. The sampling protocols for collecting samples to analyze the liquid streams within the project are similar. All samples can be collected using this SOP. This SOP aims to establish consistent protocols that will assure representative sampling and consistent quality assurance.

Grab Sample – is a sample in which all of the liquid is collected as a single aliquot or a number of aliquots collected over a time period of fewer than 15 minutes.

Composite Sample – is a sample composed of discrete aliquots of equal volume collected over a period of time and combined based on time proportioned (equal aliquots collected at equal time intervals) or flow proportioned (the volume of aliquots collected at equal time intervals based on the flow at the time each aliquot was collected.)

This SOP may be used for the collection of both Grab and Composite samples. Grab samples collected using this SOP will utilize the SOP for collecting the required volume of samples needed within a 15-minute period. Composite samples will require repeating this SOP multiple times over a specified time period. Composite samples must be composed of a minimum of four (4) aliquots. If composite samples are required, the sample collector is responsible for establishing the compositing criteria before the sampling is begun. In addition, compositing criteria should be recorded on the Chain-of-Custody forms in the comments section.

Sample Points:

Sample points will not be detailed in this SOP; refer to the Master Sampling Schedule or the sampling schedule provided by the Project Manager.

3.0 TRIGGER

This SOP may be used for the collection of liquid samples from any liquid stream within the project, whether the analysis is to be used for process control or compliance.

4.0 RESPONSIBILITIES

All operations personnel have the responsibility for carrying out the procedures outlined herein. If the operations staff is not available to conduct the procedures, the Plant Manager will carry out the procedures herein.

5.0 REFERENCES AND FORMS

Operations, Maintenance, and Management Services Agreement

EPA Ecological Assessment Standard Operating Procedures and Quality Assurance Manual, January 2002.

EPA, Standard Operating Procedure for Monitoring Well Sampling, March 2003.

Representative Sampling of Ground Water for Hazardous Substances, Guidance Manual for Ground Water Investigations, July 1995, California EPA, Department of Toxic Substances Control.

6.0 EQUIPMENT AND SUPPLIES

No special sampling equipment is needed to collect liquid stream samples if the samples are collected directly in the sample containers. The sample collector may wish to collect the sample in a large container and then return it to the in-house laboratory to pour it into the various containers sent to the commercial laboratory. If a large container is to be used, it should be of a material compatible with all the container requirements for all the analyses that will be run on the sample. Typically, plastic sample collection bottles of 1 liter are used.

Sample Containers:

Certified Clean Sample containers will be provided by the contract commercial laboratory for all samples to be sent to the commercial laboratory for analysis. In-house analysis for process control will reuse sample containers. The reused sample container must be decontaminated per the Equipment Decontamination process listed herein. The attached table provides the approved sample container material for performing the analysis. The sample collector is responsible for using the appropriate sample container material when collecting samples.

Not all samples can be collected in a single container at the sample site and then poured into the sample containers in the laboratory. Samples of E Coli are required to grab samples and must be collected in the Sample Container that will be sent to the commercial laboratory for analysis.

Equipment Decontamination:

All sampling equipment and intermediate sample containers must be decontaminated immediately before sampling and again immediately following sampling (except for those Certified Clean Sample containers provided by the contract commercial laboratory). The following is the basic decontamination protocol that should be implemented.

Decontamination Protocol:
(1) thorough washing with a laboratory-grade detergent,
(2) thorough rinsing with tap water;
(3) at least three distilled water rinses.
(4) Allow equipment to air dry. Do not use a towel or paper towel to dry the equipment.

Sample Preservation:

Sample containers provided by the contract laboratory will be provided with the appropriate preservative in the container for the analysis to be performed. The sample collector is responsible for using the appropriate containers with the appropriate preservatives for the analysis. Samples to be analyzed in-house for process control do not require chemical preservation because these samples are intended to be analyzed the same day the sample is collected. The attached table provides the preservation specifications of the analysis to be performed. Suppose a single large container is used to collect the sample at the sample site. In that case, the preservative will not be added until the sample is poured into the containers that will be sent to the laboratory. See the attached table for preservation requirements.

Sample Volume:

Sample volume is the minimum volume of a sample that will be required to perform the intended analysis. The attached table provides the minimum sample volumes for each of the analyses that will be performed. Some containers will hold a sufficient volume of sample that several analytes can be tested from the same sample container, providing the container material and sample preservation are appropriate for all analytes. The sample collector is responsible for preparing the appropriate sample containers to hold the minimum sample volume. In some cases, the samples must be placed in more than one container for analysis. The sample collector should gather all the containers used to collect the sample before collecting the sample.

7.0 SAFETY

All required and recommended safety equipment and Personal Protective Equipment, and any SDSs that may be applicable.

8.0 PROCEDURE

Note: Most samples will be collected from collection jugs specially prepared for the collection of the samples or from streamflow directly in the sample containers. Suppose a variance to this protocol is required to collect a specific sample. In that case, the sample collector should notify the Project Manager and assist in making the appropriate modifications to this SOP.

A. If a single large container (intermediate container) will be used to collect the sample before pouring it to the sample containers, the large intermediate container must be decontaminated prior to use and immediately following use. Decontamination should follow the decontamination protocol provided above in this SOP.

B. Slowly place the collection container in the stream to be sampled. No special sampling equipment is needed to collect samples. All samples will be collected directly in the sample container or the intermediate container.

C. Slowly fill the container to prevent volatilization and splashing. Once the desired sample volume has been collected, the container should be capped to prevent contamination of the sample while in transit to the laboratory.

D. The sample should be delivered to the laboratory by the sample collector immediately upon collecting the desired samples.

E. The individual sample containers that will be preserved and sent to the commercial laboratory should be prepared with the caps on immediately after the sample is collected. The container should not be shaken to avoid adding dissolved oxygen to the sample or other potential contamination. The sample should be immediately poured into the appropriate sample containers (if not using commercial laboratory-supplied containers). If funnels are needed to pour the samples, the same funnel may be used for making all pours since the sample is from the same source and the same grab sample.

It is important that the laboratory area where the samples will be poured should be decontaminated before setting up the sample containers and should be free of any clutter and litter. The pour area should be decontaminated immediately upon labeling and transferring the sample containers to coolers for transport to the commercial laboratory.

In most cases, the sample containers should not be filled completely, but a small space should be provided for the expansion of the sample when it is cooled to 4^{o}C.

F. Sample Custody Control

(1) Labels are not required on the intermediate sample containers unless several sample sites will be sampled and delivered to the laboratory for pouring. In this case, the intermediate sample containers will need to be appropriately labeled to prevent mixing up the samples.

(2) Labels shall be placed on each sample container sent to the laboratory, containing the Sample Id, date, time, sample collector, preservation, and analysis to be performed.

(3) Chain-of-Custody: The sample in the intermediate sample container is considered under the sample collector's custody and remains under his custody until the sample is poured into the individual sample containers and a chain-of-custody has been prepared and custody relinquished to an authorized custodian. The sample collector is responsible for initiating and completing the Sample Chain-of-Custody. Refer to the Chain-of-Custody SOP for detailed instructions on completing the form.

(3) Custody Control: The sample collector must retain custody of the sample until he relinquishes custody to another individual or the sample is placed in an access-controlled location. For the sample to be relinquished from the control of the sampler, he must sign and date the appropriate release on the Chain-of-Custody and custody accepted by an authorized person or signed into secure storage.

G. Equipment Decontamination

Once the sample has been transferred to the appropriate sample containers, the remaining sample must be returned to the Plant influent for treatment. Do not dispose of the remaining sample by any other method. Any sampling equipment, funnels, or other equipment used or taken to the sample site must be assumed to be contaminated and decontaminated. Use the same decontamination protocol as provided above in this SOP.

Quality Control:

As a sample collector, it is important that you collect a representative sample, which means that you must make every effort

- that the sample is not cross-contaminated by commingling sampling equipment or improper

decontamination;
- that the sample is appropriately identified and
- that sample custody is maintained.

Calculations: No calculations are required

Reagents: No reagents are required

9.0 TRAINING FOR EMPLOYEES

This SOP and any revision shall be communicated in the following manner:

Employee Group Affected:	Communication Method
Operations and Maintenance	Meeting

10.0 REVIEW AND APPROVAL

Reviewer / Title	Revision No.	Review Date
Brad Thibault / Director of Asset Management	1.0	12/14/2022

Approved by:	
Title:	
Date:	

11.0 CHANGE HISTORY

Revision Number	Summary of Changes	Issue Date	Effective Date
1.0	Initial issue	12/29/2022	1/1/2023

TRAINING AND ACKNOWLEDGEMENT

Employees acknowledge receipt and understanding of this Standard Operating Procedure by signing below.

Procedure Name: Liquid Stream Sampling

Revision No. 1.0

Effective Date: 1/1/2023

NAME (Print)	NAME (Signature)	DATE

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by:	**Hideaway, TN WWTP**	SOP No:	PLT-006
Approval:	Brad Thibault	Revision No:	1.0
	Director OF Asset Management	Effective Date:	January 1, 2023

SUBJECT: Data Entry and Validation

1.0 SCOPE

This procedure pertains to anyone entering data into Utility Cloud or SAMS Water & Wastewater databases. This may include but is not limited to OMTs, O&M Supervisors, Managers, and administrative personnel.

2.0 PURPOSE

This SOP aims to ensure that all data, whether a permit required, or process control based, is entered correctly into Utility Cloud or SAMS database program. Central States Water Resources have adopted the Utility Cloud and SAMS databases'. They are used in all projects universally for the maintenance, organization, and generation of process control and regulatory data.

3.0 TRIGGER

Daily data entry process and procedures

4.0 RESPONSIBILITIES

The O&M Supervisors and Managers are responsible for ensuring that this policy is followed by all personnel who enter daily data into SAMS or UC at the Hideaway WWTP Project.

5.0 REFERENCES AND FORMS

1. UC and SAMS database help menu
2. Process Control Management Strategies

6.0 EQUIPMENT AND SUPPLIES

Desktop or laptop computer along with treatment plant raw data entry sheets

.

7.0 SAFETY REQUIREMENTS

There are no significant safety concerns for the completion of the work assignment.

8.0 PROCEDURE

1. Data is collected and hand-entered onto the Data Entry Form (s)
2. Data is checked for accuracy and applicability for the processes within the facility against design or current operational criteria.

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by:	**Hideaway, TN WWTP**	SOP No:	PLT-006
Approval:	Brad Thibault	Revision No:	1.0
	Director OF Asset Management	Effective Date:	January 1, 2023

SUBJECT: Data Entry and Validation

3. Data is entered into UC or SAMS using the Data Entry format located within the Data Manager/Custom Data Entry/Operations daily entry
4. Once data entry is complete, the person entering the data he/she will enter her personal ID criteria in the box beside the title Data Entry Person. Safe the data before leaving by hitting the calculation button on the top right side of your data entry form.
5. Once the entries have been entered and saved, notify another OMT that the data is ready to be validated.
6. The second employee will compare the raw data to what was entered into UC or SAMS database.
7. Make necessary corrections and then enter your employee ID number into the box next to the line that signifies that the data entered for that day has been validated.
8. Be sure to calculate and/or save your changes before leaving UC or SAMS database.
9. Notify key Operations personnel so they can review the data during the weekly process control meetings or if unusual conditions are being experienced.

.

9.0 Quality Control

Computer Data Entry Validation:

- Data Validation should be performed by someone other than the person entering the data. If this is not possible, the data validation should be done after several hours from the time of entry to the validation. This will force the person to make the validation to look more closely at the data and will increase their ability to identify errors.
- Data entered and validated on the weekends will be reviewed and validated the following Monday again.

10.0. TRAINING TO EMPLOYEES

This SOP and any revision shall be communicated in the following manner:

Employee Group Affected:	Communication Method
Operations and Maintenance Staff	During weekly meeting

11.0 REVIEW AND APPROVAL

Reviewer / Title	Revision No.	Review Date

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by:	**Hideaway, TN WWTP**	SOP No:	PLT-006
Approval:	Brad Thibault	Revision No:	1.0
	Director OF Asset Management	Effective Date:	January 1, 2023

SUBJECT: Data Entry and Validation

Name, Title	Revision reviewed	Date or review
Name, Title	Revision reviewed	Date or review
Name, Title	Revision reviewed	Date or review
Name, Title	**Revision reviewed**	**Date or review**

Approved by:	Brad Thibault
Title:	Director of Asset Management
Date:	1.1.23

12.0 CHANGE HISTORY

Revision Number	Summary of Changes	Issue Date	Effective Date
1.0	Initial issue	28 Dec 2022	01 Jan 2023

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by:	**Hideaway, TN WWTP**	SOP No:	PLT-006
Approval:	Brad Thibault	Revision No:	1.0
	Director OF Asset Management	Effective Date:	January 1, 2023

SUBJECT: Data Entry and Validation

Appendix A

Appendices may be included to provide other information, such as guidance or reference information.

Appendices may include forms, but keeping forms separate from procedure documents is best. This allows the form to be separately controlled and managed.

Appendices have no specific format requirements but should include the same document header and footer.

Other Document Format Requirements:

The text font is Arial 10 point. The main headings are bold and in all caps.

The numbering of subsections is appropriate if desired to break up longer sections.

All right margins should be ragged for ease of reading.

Graphics, fonts, and formats in the header and footer should not be changed from what is shown in this formatted document.

Since a document is likely to be used all effective and issue dates should be formatted as “dd Mon yyyy.” Example “04 Jul 2011”.

Excessive use of hyperlinks should be avoided as they can change and become outdated. It might be more appropriate to say, for example:

Footer Requirements:

The footer should always include the page number and total pages.

For all documents, state: “Controlled document. Uncontrolled copies may not be up-to-date. Information contained herein is company confidential and for internal use only.”

TRAINING AND ACKNOWLEDGEMENT

Employees acknowledge receipt and understanding of this Standard Operating Procedure by signing below.

Procedure Name: Data Validation

Revision No. 1.0

Effective Date: January 2, 2023

NAME (Print)	NAME (Signature)	DATE

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by:	**Hideaway, TN WWTP**	SOP No:	1
Approval:	Brad W. Thibault	Revision No:	1.0
	Director of Asset Management	Effective Date:	January 1, 2023

SUBJECT: Flow Meter Check

1.0 SCOPE

This document applies to the Project Manager and operations personnel.

2.0 PURPOSE

This must be performed at least once per month.

3.0 TRIGGER

Preventive maintenance.

4.0 RESPONSIBILITIES

All operations personnel have the responsibility for carrying out the procedures outlined herein. If the operations staff is not available to conduct the procedures, the Plant Manager will carry out the procedures herein.

5.0 REFERENCES AND FORMS

O&M Manuals

6.0 EQUIPMENT AND SUPPLIES

Cell phones or two-way radios

7.0 SAFETY REQUIREMENTS

Normal PPE steel-toed boots, hard hats, hearing protection, and safety glasses.

8.0 PROCEDURE

1. Chose a time when the flow is relatively constant.
2. One operator should be stationed at the staff gauge, and the other should be inside the Ops Building Electrical room, looking at the Effluent Flow Meter.
3. Observe the level on the staff gauge for about 30 seconds.
4. The staff gauge is measured using a plunger on a cable. The reading is taken where the south end of the butt connector hits the yardstick. The plunger should touch the surface of the water.
5. The outside operator should radio six staff gauge readings to the inside operator about 3 minutes apart. The inside operator will take corresponding readings from the Effluent Flow Meter and record all readings on the Flow Meter Calibration Log.
6. Consult the Effluent Weir Chart and record staff gauge MGD readings in the Flow Meter Calibration Log

column.

7. Subtract the actual staff gauge MGD from the meter MGD and calculate the percent deviation. This should be less than 10%. If it is greater than 10, notify the plant supervisor, who will confirm the readings.
8. The staff gauge has been checked against the Flow Meter. Now the Flowmeter readings should be checked against the Control Room readings. This is done with one operator in the Control Room and one in the Ops Building Electrical Room.
9. The Ops Building Operator should radio six readings to the operator in the Control Room. A delay might be found here, but the numbers should match within a few seconds. If no matches are found here, taking into consideration the delay, the plant supervisor should be notified.

Calculations:

$$\frac{\text{Meter Reading} - \text{Staff Gauge Reading}}{\text{Staff Gauge Reading}} \times 100 = \% \text{ difference}$$

9.0 TRAINING FOR EMPLOYEES

Describe who must be trained in this policy and procedure and what level of knowledge they should have. Indicate how they are to be trained. A separate procedure may be referenced.

10.0 REVIEW AND APPROVAL

Reviewer / Title	Revision No.	Review Date
Name, Title	Revision reviewed	Date or review
Name, Title	Revision reviewed	Date or review
Name, Title	Revision reviewed	Date or review

Approved by:	Brad Thibault
Title:	Director of Asset Management
Date:	1.1.23

11.0 CHANGE HISTORY

Revision Number	Summary of Changes	Issue Date	Effective Date
1.0	Initial issue	Date of the first issue	Effective Date of the first issue.

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by:	**Hideaway, TN WWTP**	SOP No:	1
Approval:	Brad W. Thibault	Revision No:	1.0
	Director of Asset Management	Effective Date:	January 1, 2023

SUBJECT: Flow Meter Check

1.1, 2.0 etc.	Briefly describe what was changed from the earlier issue. List each revision as a separate line item on this table.	Date of issue of revision	Effective Date of revision

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by:	**Hideaway, TN WWTP**	SOP No:	1
Approval:	Brad W. Thibault	Revision No:	1.0
	Director of Asset Management	Effective Date:	January 1, 2023

SUBJECT: Flow Meter Check

Appendix A

Appendices may be included to provide other information, such as guidance or reference information.

Appendices may include forms, but keeping forms separate from procedure documents is best. This allows the form to be separately controlled and managed.

Appendices have no specific format requirements but should include the same document header and footer.

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The numbering of subsections is appropriate if desired to break up longer sections.

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Graphics, fonts, and formats in the header and footer should not be changed from what is shown in this formatted document.

Since a document is likely to be used, all effective and issue dates should be formatted as “dd Mon yyyy”. Example “04 Jul 2011”.

Excessive use of hyperlinks should be avoided as they can change and become outdated. It might be more appropriate to say, for example

Footer Requirements:

The footer should always include the page number and total pages.

For all documents, state: “Controlled document. Uncontrolled copies may not be up-to-date. Information contained herein is company confidential and for internal use only. Issued by Central States Water Resources”.

TRAINING AND ACKNOWLEDGEMENT

Employees acknowledge receipt and understanding of this Standard Operating Procedure by signing below.

Procedure Name: Flow Meter Check

Revision No. 1.0

Effective Date: January 1, 2023

NAME (Print)	NAME (Signature)	DATE

LABORATORY QUALITY ASSURANCE PROGRAM MANUAL ACKNOWLEDGEMENT

Project Name: Hideaway

I acknowledge receiving a copy of the CSWR Laboratory Quality Assurance Program Manual.

I understand this program must be adhered to. The site-specific portion of the program must be maintained and periodically reviewed and revised to ensure all documentation is current and facility-specific.

_____	_____
Project Manager (Print Name)	Telephone
_____	_____
Project Manager (Signature)	Date

Where applicable:

_____	_____
Laboratory Manager (Print Name)	Telephone
_____	_____
Laboratory Manager (Signature)	Telephone

_____
Date Received

Within fifteen business days of receipt of the Laboratory Quality Assurance Program Manual, please complete the above information, scan it, and email it to Mandy Sappington, CSWR Compliance Group. Email: msappinton@cswrgroup.com

Should you have any questions, please call Mandy at **(314) 464-3976**.

I appreciate your cooperation.

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by:	**Hideaway, TN WWTP**	SOP No:	LAB-SSV
Approval:	Brad Thibault	Revision No:	1.0
	Director of Asset Management	Effective Date:	January 1, 2023

SUBJECT: Settled Sludge Volume (Settlometer)

1.0 SCOPE

The settled sludge volume or Settlometer test is useful in observing biological processes. Activated sludge can be observed in the Settlometer at different minutes throughout a 60 minute test and/ or as identified in the Process Control Management Plan, which is used to determine the returned-sludge flow rate and wasting schedule. The 30-minute sludge volume is also to determine the sludge volume index (Method 2710D)

The settled sludge volume method is inappropriate for dilute sludge because the small volume of settled material is usually present. In such cases, use the volumetric test for settleable solids using the Imhoff cone (Method 2540F). It is important to note that the results obtained from Method 2540F are not comparable with those obtained with this procedure.

2.0 PURPOSE

This document is to describe the proper steps and procedures to collect, test, and read the volume of sludge settled in the Settlometer.

3.0 TRIGGER

Daily, to properly maintain a solids balance in relation to influent BOD, inventoried MLSS, aeration DO, wasting (sludge age), and secondary clarifier sludge blanket level.

4.0 RESPONSIBILITIES

This document applies to all personnel responsible for properly collecting the sample, accurately testing, and reading the settled sludge volume.

5.0 REFERENCES AND FORMS

Standard Methods for the Examination of Water and Wastewater, AWWA, APHA, and WEF

Process Control Management Plan, Unit Process Management Strategy for Activated Sludge

6.0 EQUIPMENT AND SUPPLIES

a) Settlometer: A Nalgene Settlometer Kit can be used for this determination and is EPA approved. The kit contains a 2-liter transparent polycarbonate Settlometer, cover, and paddle for manual mixing.
    a. The paddle permits agitation without scratching the jar
b) Timer or stopwatch
c) Thermometer

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by:	**Hideaway, TN WWTP**	SOP No:	LAB-SSV
Approval:	Brad Thibault	Revision No:	1.0
	Director of Asset Management	Effective Date:	January 1, 2023

SUBJECT: Settled Sludge Volume (Settlometer)

7.0 SAFETY REQUIREMENTS

- Steel-toed safety shoes
- Rubber gloves
- Safety Glasses with side shields
- Lab coat/ uniform

8.0 PROCEDURE

- Collect a single grab sample of activated sludge in a clean plastic or glass bottle; no preservation is needed
    - If necessary, a larger container could be used to obtain enough sample and poured up into the sample bottle
    - Test the temperature of the sample and record
    - Analyze the sample immediately
        - Storing samples is not permitted
- Fill the Settlometer from the collected 2-liter sample
    - Distribute the solids by mixing manually with a mixing paddle
    - If possible, maintain the temperature of the sample to the temperature recorded at the basin
- Remove the paddle and let the suspension settle
    - Set the timer to the appropriate time
        - 5, 10, 15, 20, 25, 30, 40, 45, 50, 55, and 60 minutes
    - Determine the volume occupied by reading the graduated Settlometer at each time and record these volumes
        - Times are identified in Process Control Management Plan and could be reduced or increased according to the season, weather, or treatment issues
- Variations in temperature, solids concentration, sludge age, and the time between collection and the start of the test will significantly affect the results

9.0 TRAINING FOR EMPLOYEES

All employees are to be trained in this procedure. The training may be performed in a classroom setting or at on-site locations.

10.0 REVIEW AND APPROVAL

Reviewer / Title	Revision No.	Review Date
Brad Thibault, Director of Asset Management	Original	January 2023
Name, Title	Revision reviewed	Date or review

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by:	**Hideaway, TN WWTP**	SOP No:	LAB-SSV
Approval:	Brad Thibault	Revision No:	1.0
	Director of Asset Management	Effective Date:	January 1, 2023

SUBJECT: Settled Sludge Volume (Settlometer)

Name, Title	Revision reviewed	Date or review

Approved by:	Brad Thibault
Title:	Director of Asset Management
Date:	1.1.23

11.0 CHANGE HISTORY

Revision Number	Summary of Changes	Issue Date	Effective Date
1.0	Initial issue	December 20, 2022	January 1, 2023
1.1, 2.0, etc.	Briefly describe what was changed from the earlier issue. List each revision as a separate line item on this table.	Date of issue of revision	Effective Date of revision

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by: **Hideaway, TN WWTP**
Approval: Brad Thibault
Director of Asset Management

SOP No: LAB-SSV
Revision No: 1.0
Effective Date: January 1, 2023

SUBJECT: Settled Sludge Volume (Settlometer)

TRAINING AND ACKNOWLEDGEMENT

Employees acknowledge receipt and understanding of this Standard Operating Procedure by signing below.

Procedure Name: Settled Sludge Volume (Settlometer)

Revision No. 1.0

Effective Date: January 1, 2023

NAME (Print)	NAME (Signature)	DATE

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by:	**Hideaway, TN WWTP**	SOP No:	LAB-SSV
Approval:	Brad Thibault	Revision No:	1.0
	Director of Asset Management	Effective Date:	January 1, 2023

SUBJECT: Settled Sludge Volume (Settlometer)

Hideaway **WWTP**

Daily Operations Log

Date: _____

Outdoor Conditions

Temp	
Precip	
Cloud	

Time	Sample	PH	Tmp	D.O.	Alk.	CL	SSV	NH3	TRC	Oper.
	Raw		°F							
	Eff		°F							
	Raw		°F							
	Eff		°F							
	Up strm		°F							
	Dwn strm		°F							
				Level	5 Sett.	30 Sett.	60 Sett.	D.O.	NH3	
	AB		°C							
	AB		°C							

SHT	Level
in	

SV30ml/L(1000)

MLSS mg/L

SHT Trar	to							
start	in.							
end	in.							
	Total							

Decant			Slg Box			Slg Box		
start	in.		start	in.		start	in.	
end	in.		end	in.		end	in.	
	Total			Total			Total	

LG	MLSS		VSS=		Slg Box	TSS=
CB	MLSS		VSS=			Cake=
SHT	MLSS		VSS=			

Elec Meter	Influent	Effluent	Lagoon	OG&E	CB

UV 1	UV 2	Filter 1	Filter 2		

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by: **Hideaway, TN WWTP**
Approval: Brad W. Thibault
Director of Asset Management

SOP No: ASS-01
Revision No: 1.0
Effective Date: January 2023

SUBJECT: Activated Sludge Seeding & Start-up

1.0 SCOPE

This document applies to the Project Manager and operations personnel.

2.0 PURPOSE

The primary objective of the start-up is to develop a proper microbial floc (activated sludge) as quickly as possible. This development will result in an increase in the reduction of biochemical oxygen demand (BOD5) and a reduced load on the receiving waters as the activated sludge floc is settled and removed in the sedimentation tanks. A portion of this settled floc (activated sludge) is returned to the aeration tanks until a desirable concentration of organisms, expressed as mixed liquor-suspended solids (MLSS), has been established. Once this concentration is established, excess settled floc (activated sludge) is wasted to maintain the proper concentration of MLSS in the process.

3.0 TRIGGER

Loss of biomass due to toxicity dump and or overfeeding of iron metal, for example, has inhibited all biomass activity and/or assists with starting up a new facility.

4.0 RESPONSIBILITIES

All operations personnel have the responsibility for carrying out the procedures outlined herein. If the operations staff is not available to conduct the procedures, the Plant Manager will carry out the procedures herein.

5.0 REFERENCES AND FORMS

EPA MO-8
"Operation of Wastewater Treatment Plants," Environmental Protection Agency, Technical Training Grant No. 5TT1-WP-16-03, Chapter 7.
WPCF Manual of Practice No. 11, "Operation of Wastewater Treatment Plants," 1966, pages 108-122.
Wastewater Engineering, Metcalf and Eddy, McGraw-Hill Book Company, Inc., New York, 1972, pages 482-533.
McKinney, Ross E., Microbiology for Sanitary Engineers, McGraw Hill Book Company, Inc., New York, 1962 pages 213-237.
Standard Methods for the Examination of Water and Wastewater, 20th Edition, APHA, AWWA, WPCF, 1971

6.0 EQUIPMENT AND SUPPLIES

Various

7.0 SAFETY REQUIREMENTS

Normal PPE steel-toed boots, hard hats, hearing protection, and safety glasses.

SUBJECT: Activated Sludge Seeding & Start-up

8.0 PROCEDURE

The activated sludge process has various modifications that provide different approaches to biological waste treatment depending on the characteristics of the wastewater to be treated. Table 1 illustrates some of the differences in these process modifications. (Note the differences in MLSS concentration.)

It is essential that laboratory analysis and control schedules be provided and followed during start-up. Although the following procedures should apply to starting up any of the process modifications of the activated sludge process, the supervisor should take advantage of all the information available to him. The person(s) responsible for a start-up should obtain the process design criteria such as influent flow, BOD5 loading, sludge age, detention time, temperature, and mixed liquor suspended solids (MLSS) concentration. The use of these parameters as control parameters should be discussed with the design engineer for his comment and for any corrections he feels should be made. Once the correct information has been obtained, the desired Start-Up MLSS concentration can be estimated. Using the design flow and design MLSS concentration and by measuring the actual flow and calculating the BOD5 loading entering the basin, the desired Start-Up MLSS concentration in a single aeration basin can be determined.

$$\text{Design MLSS concentration for aeration basin to be started} \times \frac{\text{Actual Flow to the Basin}}{\text{Design Flow to the Basin}} \times \frac{\text{Actual BOD Concentration}}{\text{Design BOD Concentration}} = \text{Actual “minimum” Start-Up MLSS Concentration for a Single Basin}$$

The above equation is for a single aeration basin. If there is more than one basin in the plant, the design MLSS will have to be varied accordingly to obtain the "minimum" Start-Up MLSS concentration for anyone aeration basin. This proportioning to the basins is necessary in order to maintain the proper food-to-microorganism ratio (F/M) and sludge age. By starting only one or two basins, the other basins can be started using the activated sludge from the others as seed sludge, and the start-up of these basins should be accomplished more quickly and efficiently. (See Examples 1 and 2.)

The "minimum" Start-Up MLSS concentration is the concentration that should be built up before wasting any activated sludge during start-up. (If the flow into the plant is stepped in increments during start-up, then the Start-Up MLSS concentration will also have to be incremented accordingly.) It should not be necessary to change the value for the MLSS concentration obtained due to any temperature fluctuations or minor changes in flow, but by maintaining the "minimum" MLSS concentration value within plus or minus 10%, a manageable start-up with good efficiency should be possible. The optimum value for MLSS concentration will have to be determined by adjusting the return sludge rate and wasting rate, which changes the MLSS concentration in the basin, and by comparing the BOD5 removal efficiency through the secondary process. The optimum value for MLSS concentration will be when the BOD5 in the final clarifier effluent is minimized.

Ferric chloride or polymers can help develop the MLSS concentration by concentrating the solids used for recirculation while minimizing final effluent BOD5 loading on the receiving waters. The quantity of chemicals or polymer to be added to the settling tank can be determined in the laboratory by jar tests. Caution should be

exercised when adding chemicals in order that toxic cation levels are not allowed to develop. Adding chemicals as coagulant aids may give erroneous values for MLSS concentration because some of the suspended solids may be chemical floes and not biological floes. It will be necessary to test for mixed liquor volatile suspended solids (MLVSS) concentration, which would indicate the amount of biological suspended solids present and remove the chemical floc error.

Inspection and Pretesting

Before putting the preceding paragraph's information into effect, a responsible person should inspect and pretest the activated sludge facilities to ensure that:

1. All debris is removed from the basins and piping systems.
2. All gates and valves are opened and closed and checked for smoothness of operation and seating in the closed position. The effluent weirs are checked for level.
3. The effluent weirs are checked for level.
4. All nozzle heads of the froth control system are open and on securely.
5. The inspection of the air system includes:
   - Checking the air filter and condensation trap.
   - Checking the airlines for leaks.
   - Checking valves for proper and smooth operation.
   - Inspect the blower for proper lubrication, clearances, and safety guards.
   - Inspect the coupling from the motor for proper alignment.
   - Inspect the mounting of the motor and blower for tightness.
   - Inspecting air gauges for proper operation and calibration.
6. The air headers are raised and lowered, and checked for smooth operation.
7. The diffusers are inspected to ensure the air can freely go through.

If mechanical aerators are used, they should be 'rotated first by hand to ensure proper alignment and smoothness of operation. The mounting of the unit should be carefully inspected to ensure it is fastened securely. The motor should be lubricated properly and the lubricant type recorded and properly filed. All electrical motors should be jogged to see that the· wiring is connected correctly and that the motors are turning in the correct direction. After inspecting the facilities for installation, operation, and calibration in accordance with the manufacturer's instructions, the facilities are ready for testing. The facilities should be "wetted down," preferably with domestic water, and

1. The piping system should be inspected for leaks of either air or water.
2. The gates and valves should again be checked for seating.

3. The froth control system should be checked to see that the nozzles are spraying the correct pattern and in the proper area.
4. The air system and its safety devices should be inspected for proper operation. (The air pressure and amperage readings should be recorded and filed.)
5. The motors should be inspected for vibration, noise, and overheating, and an amperage reading taken and recorded.

After inspecting the air system for proper operation, run the system for three to four hours, inspecting periodically for any problems.

Start-Up Procedure

Prior to start-up, a composite sample of the raw sewage to be treated should be obtained, and a settleable solids test run. From this test, very carefully remove the filtrate and determine the BOD5 and the Chemical Oxygen Demand (COD). The filtrate is used to approximate the primary clarifier effluent characteristics. The BOD5 and COD tests should be performed on several samples in order to obtain a BOD5 to COD relationship. This relationship allows the COD test to be used for process control in lieu of the much longer BOD5 test during start-up. This test will enable a quick measure of the efficiency through the activated sludge treatment process and a quick means of estimating the ratio of organics (BOD5) to the microbial population (MLSS), usually referred to as the food-to-microorganisms ratio (F/M). A normally operating plant typically has an F/M ratio of 0.2 to 0.5, except for extended aeration, which operates at a lower F/M of 0.1 and less.

The BOD5 to COD relationship should be used with discretion because there may be a change in the ratio of the two parameters, possibly caused by an increase in the non-biodegradable organics or due to solids carryover, which could prohibit or invalidate such a relationship. To reduce the error between the COD/BOD5 ratio, it may be useful to obtain another COD/BOD5 ratio by testing the liquid portion of a Suspended Solids test for BOD5 and COD (referred to as the Dissolved BOD5 and Dissolved COD). The Dissolved COD/BOD5 relationship will probably be more consistent than the other COD/BOD5 ratio, but it will take longer to obtain. Keep in mind that the Dissolved COD/BOD5 ratio may not be the same for all areas of the plant; therefore, depending on the circumstances of start-up,-the COD/BOD5 ratio may have to be determined at· a number of locations in the plant for start-up control. (Both the COD and BOD5 tests should continue to be run during start-up to confirm the COD/BOD 5 relationship.) Once the process becomes operational, the COD test should be run as a useful process control tool, although the BOD5 is the standard quality control parameter required by most regulatory agencies.

On the second and third days after the effluent from the primary clarifiers begins entering the aeration basin, the BOD5, COD, MLSS, and sludge volume index (SVI) should be determined on samples from the

aeration basin and the final clarifier. (The relationship between COD and BOD5 of the influent may not be the same a8 'that of the effluent; therefore, BOD5 should be run daily.) The SVI is indicative of the settling characteristic of the floc in the final clarifier and will indicate the possibility of sludge bulking. Generally, an-

SVI in the range of 50-150 indicates a good settling sludge. Visual observation of the settleable solids test is also beneficial in obtaining information on the settling characteristics of the activated sludge in the final clarifier.

The following are examples of the preceding procedures:

EXAMPLE 1: MLSS Determination: Single Basin Conventional Treatment Single Aeration Basin
Design Conditions - Flow = 1.0 MGD BOD5 Loading = 37lb. BOD5/day/1000 ft3 of basin -Temperature 70° F* MLSS = 1500 mg/l - BOD5 Concentration 150 mg/l.
Actual Conditions Flow = .75 MGD BOD5 Loading = 28lb. BOD5/day/1000 ft3 of basin Temperature = 65° F* BOD5 Concentration ~ 150 mg/l
*Obtained from analysis of raw sewage, from analysis of clarifier effluent, or from BOD5/COD relationship.
“Minimum” MLSS concentration = 1500 x .75 MGD x 150 mg/l / 150 mg/l/ = 1120 mg/l.

EXAMPLE 2: MLSS Determination: Multiple Basins Conventional Treatment Ten (10) Aeration Basins with 54,000 ft3/basin (Three to be started)
Design Conditions Flow = 16 MGD BOD5 Loading = 37 lb/day/1000 ft3 of basin Temperature = 70°F. MLSS = 1500 mg/l Total Volume of Basins = 54,000 ft3 x 10 540,000 ft3 BOD5 Concentration 150 mg/l
Actual Conditions Flow = 4MGD BOD5 Loading = 31lb/day/1000 ft3 of basin Temperature = 65° F. BOD5 Concentration = 150 mg/1
"Minimum" MLSS =

Flow to the basin(s) to be started/number or volume of basins
Design flow to the basin(s)/total number or volume of basins

x BOD5 Concentration to Basins x Design MLSS =
Design BOD5 Concentration

4 MGD/3 Basins
16 MGD/10 Basins x 150 mg/l x 1500 mg/l = 1250 mg/l

The number of basins required to be started under field conditions is determined by the flow. The design flow for Example 2 is 16 MGD to ten basins, or 1.6 MGD/basin if all basins are equal in volume. Therefore,

SUBJECT: Activated Sludge Seeding & Start-up

4 MGD would require 2.5 basins (4 MGD divided by 1.6 MGD/basin). Since it doesn't equal an even number of basins, use the next higher number.

(in this example, three basins). Therefore, starting· up three (3) basins will have a better food-to-microorganisms (F /M) ratio than if all ten (10) basins were used or only one basin, and thus will have a more effective start-up.

The start-up of the activated sludge process can be accomplished by using seed sludge or raw wastewater to develop a suitable microorganism population expressed as mixed liquor suspended solids (MLSS).

1. The use of a seed-activated sludge will provide the most reliable means of a start-up. When available, enough seed sludge should be placed into the aeration basin to provide at least 500 mg/l of MLSS in order to handle the plant flow. Maximum aeration should be used during start-up to provide a minimum Dissolved Oxygen content of 2 mg/l and to aid mixing. With the seed sludge aerated, flow into the aeration basin should be introduced at approximately 10 percent of plant flow if possible and increased in daily increments of 10 percent if there is no indication of the process deteriorating. This will enable the treatment process to produce a quality effluent as the MLSS concentration is increasing.

2. If raw sewage is used, begin the start-up of the activated sludge process by filling the aeration basin. With the raw sewage, bypassing the primary clarifier will provide the greatest number of available seed organisms without seed sludge. The aerators should be operating · before raw sewage is let into the basin to keep the diffusers from clogging and to provide mixing, and should be operated at a rate to maintain a minimum Dissolved Oxygen (DO) residual of 2 mg/l. If possible, the aeration basins should then be bypassed for approximately eight hours, during which the raw sewage is aerated. After approximately seven hours, the aerators should be turned off. The mixture in the basin is allowed to settle for thirty to sixty minutes, after which additional raw sewage should be allowed to enter and displace the basin supernatant. The mixture should then be aerated and allowed to settle as before. This practice should be continued until the MLSS is at least 500 mg/l, at which time the aeration basins should be placed on continuous flow and the MLSS allowed to build up to the "minimum" MLSS calculated. As the MLSS continues to increase, the aeration rate may be reduced if the DO is greater than 2 mg/l. The DO test should be run frequently during this period, usually every two hours during start-up, to ensure that the oxygen requirements of the organisms are met.

Regardless of which of the above methods is used, no return sludge should be wasted during start-up; the sludge return pumps should be returning at a rate such that no sludge blanket will develop in the settling tanks. This procedure will ensure the maximum number of available organisms, as activated sludge will be returned to the aeration basin. When the proper MLSS concentration is reached for full flow, the return-

activated sludge pumping rate should be adjusted. The estimated return sludge pumping rate can be determined from the analysis of the settleable solids:

% MLSS in the 60-minute settleable solids test expressed as the decimal equivalent
x (Influent flow rate plus the return sludge flow rate) = Return Activated Sludge Pumping Rate

EXAMPLE 3: Adjusted Return Sludge Pumping Rate Determination
Flow to Aeration Basin = 4 MGD
Return Sludge Flow = 2 MGD
The volume of MLSS in 60-minute settling test = 400 ml in
2 liters = 20% = .20

Therefore
Adjusted Return Sludge Rate = .20 x (4+2) MGD = 1.2 MGD
Adjusted Return Sludge Rate = 1.2 MGD x 695 GPM/MGD = 835 gallons/minute

Therefore, the return-activated sludge pumping will have to be reduced from 2 MGD to 1.2 MGD or 835 gallons/minute. This rate may have to be adjusted to maintain the proper MLSS in the aeration basin. When the return sludge pumping rate has been established, sludge should begin to form a blanket in the settling tank. After the sludge blanket accumulates to approximately 1 foot above the tank bottom, the excess waste-activated sludge pumping rate can be determined. The waste-activated sludge pumping rate will also change the return sludge pumping rate.

EXAMPLE 4: Waste Activated Sludge Pumping Rate Determination This can be determined in one of two ways:

1. Activated Sludge Plant with all basins operating. Assume these values were obtained from laboratory analysis: MLSS = 2800 mg/l. (Used in Step (1)) Return Sludge, Suspended Solids 5600 mg/l (Used in Step (6)) Influent, Suspended Solids (Used in Step (2)) 60 mg/l Average Daily Flow = 4 MGD (Used in Step (2)) ‘ Volume of Aeration Basin = 0.55 MG (Used in Step (1)) ' Design Sludge Age = Mean Cell Residence Time = 5 days (Used in Step (4)) ‘ Return Sludge Pumping Rate = 835 GPM

Determine: Step (1): lbs of Solids in Aeration-Basin = MLSS (mg/l) x Volume of Aeration Basin (MG) x 8.34 lbs/MG mg/l

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= 2800 mg/l x 0.55 MG X 8.34 mg/l = 12,700 lbs. of Solids in the Aeration Basin dlbs Solids Added by Primary Clarifier Effluent= ay Influent Suspended Solids (mg/l) x Avg. Daily Flow (MGD) 8 34 lbs/MG x • mg/l = 60 mg/l x 4.0 MGD x 8.34 lbs/MG mg/1 2,000 lbs/day Added by Primary Clarifier Effluent Step (3): Sludge Age (days)= MLSS in Aeration Basin (lbs) Solids Added by Primary Clarifier Effluent (lbs/day) 12,700 lbs = 2,000 lbs/day = 6.4 days

Step (4): If the Sludge Age was less than the design value of five days, no wasting should be done. Under normal conditions, the sludge age will indicate when to reduce or increase the waste rate. The design sludge age = 5 days; therefore, rearranging the equation in (3),

lbs. MLSS to be maintained = Sludge Age x Solids added by Primary Effluent = 5 days x 2,000 lbs/day = 10,000 lbs.
Step (5): The proper amount of MLSS to be wasted = 12,700 lbs. -10,000 lbs. = 2,700 lbs.
Step (6): Waste-activated sludge pumping rate = Amount of solids to be wasted (lbs) in a 24-hour period / Return sludge concentration (mg/l) x 8.34 lbs/MG = 2,700 lbs/day / 5,600 mg/l X 8.34 lbs/MG/mg/l = 0.058 MGD
0.58 MGD x 695 GPM/MGD = 40.5 GPM

This waste-activated sludge pumping rate will change the return sludge pumping rate from 835 GPM to 794.5 GPM (835 - 40.5 GPM).

The waste-activated sludge pumping rate is set for 24 hours to eliminate any rapid changes to the sensitive biological cultures.

2. Another means of estimating the wasting rate is to use the desired MLSS concentration obtained earlier in the start-up proceedings.

Assume these results were obtained from the laboratory tests:

MLSS = 2800 mg/l Return Sludge, Suspended Solids 5600 mg/l Primary Effluent, Suspended Solids = 60 mg/l Average Daily Flow = 4 MGD Volume of Aeration Basin = 0.55 MG and also Desired MLSS = 2720 mg/l plus or minus 10%.

Step (1): Amount of Solids to be wasted lbs/day =
(Laboratory MLSS-desired MLSS) x Average Daily Flow x 8.34 =
(2800-~720 mg/l) X 4 MGD X 8.34 = 2670 lbs/day
Step (2): Waste-activated sludge pumping rate =

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2670 lbs/day
5600 mg/l X 8.34 lbs/MG/ mg/l = 0.571MGD = 39.6 GPM

Therefore, the return sludge pumping rate will be 795.4 GPM (835 - 39.6 GPM). The waste-activated sludge pumping rate and the return sludge pumping rate may have to be adjusted if the characteristics of the wastewater change, thus changing the desired MLSS concentration. The waste-activated sludge pumping rate will have to be increased or decreased to maintain an optimum value for MLSS in the aeration basin to provide the best possible treatment of the wastewater.

When the plant has stabilized, a good activated sludge should settle rapidly, leaving a clear, odorless, and stable supernatant. The floc should appear granular with sharply defined edges, be golden brown, and have a musty odor. However, there are some conditions that may occur during start-up that will indicate a poorly operating process. The operator should not expect immediate results from any of the presented control procedures. An experienced operator will be of the greatest value when these problems arise in the wastewater treatment process. An unstable effluent will probably result during start-up due to inadequate biological treatment. Chlorination is often used to reduce health hazards in the receiving water. State and Federal regulatory agencies should be contacted to ensure that no harm will come to the wildlife or fish present in the receiving waters as a result of heavily chlorinating the plant effluent. The use of alum, ferric chloride, and polymers as an aid to settling in final settling tanks will help reduce the BOD5 loading on the receiving waters. The coagulants should be thoroughly mixed with the aeration basin contents before being released into the final settling tank.

During start-up, when the MLSS is low, the aeration basins may experience severe foaming. Foaming is believed to occur because of synthetic detergents and other surfactants in conjunction with high aeration and low aeration MLSS. The foam contains sludge solids, grease, and bacteria and should be brought under control as quickly as possible. Water nozzles using screened sewage or domestic water have been used successfully to control foaming. Defoaming agents are also used or possibly used in conjunction with water nozzles to help control the foaming. The operator may be able to reduce the aeration rate while maintaining his DO and building up his MLSS to aid in the control of foaming. The foaming should decrease as the MLSS continues to increase in the aeration basin and the process approaches stability. Sludge bulking may occur during start-up due to overloading the basin. Sludge bulking is indicated by poorly settling sludge and poor sludge compaction. The sludge blanket in the final clarifier becomes deeper and rises to overflow the weirs. The sludge settleability decreases, as indicated by a significant rise in the SVI, and the sludge appears light and fluffy. Sludge bulking is associated with the growth of filamentous organisms that attach themselves from one floc to another and prevent compaction of the sludge particles and poor settling results. Another cause of sludge bulking is bound to water in which the bacteria composing

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the floc swell because of the addition of water and thereby decrease in density. When sludge bulking occurs, it is usually associated with low pH, low DO, low nitrogen concentration, high F/M, industrial waste, or septic sewage. The primary purpose of control is to increase the sludge age or decrease the F /M ratio. Low DO - The DO should be checked initially to see that at least 2 mg/1 of DO exists in the aeration basin; if not, inspect the aerating equipment to see that it is functioning correctly and increase the aeration rate. If the aerators or blowers are operating at capacity, then additional aerators, diffusers, or blowers may have to be added. The design of the aeration rate should be investigated if aerators have to be added. Low pH -Lime is usually added, often with flocculant aids, to raise the pH and control bulking by improving the sludge's settling characteristics while corrective action is being taken—high F/M (Low Sludge Age). To reduce the F/M, the organic load (F) on the basin is decreased by reducing the influent flow to the basin, or the MLSS (M) is increased by increasing the return sludge rate and decreasing the wasting rate. Both of these actions should increase the sludge age.

The plant records should be reviewed to determine what caused the problem and that future operations take measures to prevent the same conditions from occurring again. Rising sludge should not be confused with sludge bulking. In a rising sludge, the settling characteristics and compaction are good. Rising sludge occurs as a result of too long a detention time in the clarifier. The sludge rises in chunks from the size of a pea to as large as a basketball, usually forming a brown, fine scum or froth on the surface of the settling tank. The sludge undergoes denitrification with the release of nitrogen gas that becomes entrapped in the sludge, causing it to rise to the surface. By increasing the rate of return of activated sludge pumping or increasing the sludge wasting rate and decreasing the sludge age, the problem of rising sludge should be corrected. If the start-up of the activated sludge process is in winter, it will take longer to build up the mixed liquor suspended solids, which may strain other plant operations. In winter, the loading and air rates change. The sewage will require less air and more solids to bring about efficient treatment. Usually, the ambient temperature is not significant unless it raises or lowers the temperature of the liquor by more than 10° F. The operator should use caution when changing the mode of operation of this process or any other. An extreme change or allowing the process to go too far the other way can be just as detrimental to treatment efficiency as the existing problem. Therefore, make any changes gradually and in an orderly step-by-step fashion.

Activated Sludge Checklist*

To supplement the preceding recommendations for starting up an activated sludge process, the following checklist should be reviewed:

I. Literature Review

A. Manufacturer's Literature

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B. Facility's Operation and Maintenance Manual

*It is assumed that the previous sections' recommendations concerning Preparation for Start-Up and Start-Up of the Pretreatment, Primary Treatment, and Chlorination Facilities have been followed, and an outline of start-up procedures has been made.

II. Preparation for Start-Up

A. Meet with consulting engineers and start-up experts.

1. Obtain design parameter values.
    a. Flow into the aeration basin
    b. BOD5 loading and concentration
    c. Temperature
    d. The volume of the basin(s) (total and individual)
    e. MLSS
    f. Sludge pump capability (return and wasting pumps)
2. Determine COD to BOD5 relationship.
    a. Run BOD5 and COD tests for at least a week prior to start-up.
    b. Calculate COD to BOD5 ratio.

B. Estimate actual start-up conditions.

1. Flow into aeration basin(s) being started
2. BOD5 loading and concentration 3. Temperature
3. Temperature
4. Volume of the basin(s) to be started

C. Calculate "minimum" MLSS concentration for a start-up.

III. Start-Up Procedure

A With seed sludge

1. Turn aerators on and maintain a minimum DO residual of 2 mg/l.
2. Fill the aeration basin(s) with raw sewage or water.
3. Add seed sludge to bring MLSS of the basin(s) being started to at least 500 mg/l.
4. Let flow into aeration basin(s) at approximately 10% of the design and increment at 10% a
5. Return all activated sludge from the final settling tank.

B. Without seed sludge

1. Turn aerators on and maintain a ·minimum DO residual of 2 mg/l.
2: Fill-basin(s) with raw sewage.

3. Let flow into the aeration basin.
4. Bypass flow for eight hours and aerate mixture in the basin for seven hours.
5. Turn off aerators and allow the mixture to settle for thirty to sixty minutes.
6. Again, let flow into the aeration basin, bypass flow for eight hours, reaerate mixture, and allow it to settle; continue until the MLSS is at least 500 mg/l.
7. Let the basin accept continuous flow.
8. Return all activated sludge from the final settling tank.

IV. Process Monitoring During Start-Up

A. Measure operational control and standard effluent parameters to include:

1. MLSS in the aeration basins
2. DO in the aeration basins
3. Influent and effluent BOD5 and COD
4. SS in the secondary clarifier
5. SVI in the secondary clarifier
6. Calculate F /M

B. Calculate return activated sludge pumping rate when aeration basin MLSS concentration reaches "minimum" MLSS concentration.

C. Permit sludge blanket to form in a final settling tank to approximately one foot of depth.

D. Calculate activated sludge wasting rate and begin wasting activated sludge.

V. Normal Operation

A. Continue monitoring process by measuring the operational control and standard effluent parameters to include:

1. Influent and effluent BOD5 concentration
2. MLSS in the aeration basin
3. SS in the secondary clarifier
4. SVI in the secondary clarifier
5. DO in the aeration basin
6. Calculate F /M.

B. Adjust process

1. Return sludge rate
2. Wasting Rate
3. Air Supply

SUBJECT: Activated Sludge Seeding & Start-up

9.0 TRAINING FOR EMPLOYEES

This SOP and any revision shall be communicated in the following manner:

Employee Group Affected:	Communication Method
Operations and Maintenance of personal	Meeting

10.0 REVIEW AND APPROVAL

Reviewer / Title	Revision No.	Review Date
Brad Thibault, Director of Asset Management	1.0	1/29/2023
Name, Title	Revision reviewed	Date or review
Name, Title	Revision reviewed	Date or review

Approved by:	Brad W. Thibault
Title:	Director of Asset Management
Date:	1/29/2023

11.0 CHANGE HISTORY

Revision Number	Summary of Changes	Issue Date	Effective Date
1.0	Initial issue	1/29/2023	1/29/2023

TRAINING AND ACKNOWLEDGEMENT

Employees acknowledge receipt and understanding of this Standard Operating Procedure by signing below.

Procedure Name: WWT Activated Sludge Seeding-Start-up
Revision No. 1.0

Effective Date: 1/29/2023

NAME (Print)	NAME (Signature)	DATE

Central States Water Resources

Standard Operating Procedure (SOP)

Issued by: **Hideaway, TN WWTP**
Approval: Brad Thibault
Director of Asset Management

SOP No: 01
Revision No: 001
Effective Date: 1/23/2023

SUBJECT: ASPC Samples

1.0 SCOPE

This document applies to Project Name, State, Project Manager, and operations personnel.

2.0 PURPOSE

Activated sludge samples must be taken to adhere to site-specific intervals from each train at the designated sample location area. The samples are to be analyzed for TSS, DO, pH, Temp, 10 and 30 settleability's. The hand-held meter(s) should be used until such time that online meters are installed.

3.0 TRIGGER

Testing should be done per the following frequency and parameters on effluent: five times per week for DO, pH, settable solids, and TRC. three times per week for TSS, E. Coli, NH3, CBOD; daily for flow.

Testing should be done per the following frequency and parameters for influent: three times per week for TSS and CBOD; daily for flow.

4.0 RESPONSIBILITIES

All operations personnel have the responsibility for carrying out the procedures outlined herein. If the operations staff is not available to conduct the procedures, the Project Manager will carry out the procedures herein.

5.0 REFERENCES AND FORMS

Laboratory SOP, this SOP is meant only to supplement the laboratory SOP.

6.0 EQUIPMENT AND SUPPLIES

pH meter
If online meters are unavailable, the hand-held meter should be used.
Filters
Drying oven and muffle furnace
Vacuum pump and manifold
Scales

7.0 SAFETY REQUIREMENTS

PPE should be worn at all times.

8.0 PROCEDURE

Take 2 liters of activated sludge from the sample point location of the aeration basin. Return to the lab with the sample and analyze for TSS and settleability.

SUBJECT: ASPC Samples

Quality Control:
The laboratory pH and DO meters and colorimeter are calibrated daily before each use.

Calculations:
These can be found in the laboratory TSS bench books

9.0 TRAINING TO EMPLOYEES

Project Manager and operations staff. Basic understanding of how to perform the procedure on a routine basis.

10.0 REVIEW AND APPROVAL

Reviewer / Title	Revision No.	Review Date
Project Manager	Revision reviewed	Date or review
Name, Title	Revision reviewed	Date or review
Name, Title	Revision reviewed	Date or review

Approved by:	Brad Thibault
Title:	Director of Asset Management
Date:	1/23/2023

11.0 CHANGE HISTORY

Revision Number	Summary of Changes	Issue Date	Effective Date
1.0	Initial issue	Date of the first issue	Effective Date of the first issue.
1.1, 2.0 etc.	Testing parameters and frequencies were updated to match permit.	Date of issue of revision	Effective Date of revision

SUBJECT: ASPC Samples

Appendix A

Appendices may be included to provide other information such as guidance or reference information.

Appendices may include forms but it is best to keep forms separate from procedure documents. This allows the form to be separately controlled and managed.

Appendices have no specific format requirements but should include the same document header and footer.

Other Document Format Requirements:

The text font is Arial 10 point. The main headings are bold and all caps.

The numbering of subsections is appropriate if desired to break up longer sections.

All right margins should be ragged for ease of reading.

Graphics, fonts, and formats in the header and footer should not be changed from what is shown in this document.

Since a document is likely to be used, all effective and issue dates should be formatted as “dd Mon yyyy”. Example “04 Jul 2011”.

Excessive use of hyperlinks should be avoided as they can change and become outdated. It might be more appropriate to say for example: “Form No. MS 101-3 is available on the Management Systems Site”, rather than insert a hyperlink in a document.

Footer Requirements:

The footer should always include the page number and the total number of pages.

For all documents state: “Controlled document. Uncontrolled copies may not be up-to-date. Information contained herein is company confidential and for internal use only.

Central States Water Resources

Standard Operating Procedure (SOP)

Issued by: **Hideaway, TN WWTP**
Approval: Brad Thibault
Director of Asset Management

SOP No: 01
Revision No: 001
Effective Date: 1/23/2023

SUBJECT: ASPC Samples

TRAINING AND ACKNOWLEDGEMENT

By signing below, employees acknowledge receipt and understanding of this Standard Operating Procedure

Procedure Name: ASPC Samples

Revision No. 1.0

Effective Date: 2/27/2023

NAME (Print)	NAME (Signature)	DATE

Central States Water Resources

Standard Operating Procedure (SOP)

Issued by: **Hideaway, TN WWTP**
Approval: Brad Thibault
Director of Asset Management

SOP No: 01
Revision No: 001
Effective Date: 1/23/2023

SUBJECT: ASPC Samples

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by: **Hideaway, TN WWTP**
Approval: Brad Thibault
Director of Asset Management

SOP No: Power Fail
Revision No: Original
Effective Date: February 1, 2023

SUBJECT: Electrical Power Failure

1.0 SCOPE

This document applies to all personnel working at the wastewater facility Hideaway. The facility is a single electricity source. Source electricity enters the facility from the outside transformers into the pump building power distribution panels. An Automatic Transfer Switch directs electricity from either a normal or emergency source. The source of electricity is considered Normal power. The generator electricity is considered Emergency power. The electricity is considered low voltage, 480 VAC three phase. Single phase, 120 VAC, and 220 VAC transformed at building lighting transformers as needed. During a source electricity failure, the generator will automatically start and go online at the switchgear. The generator has enough capacity to power the complete facility.

2.0 PURPOSE

This document describes the steps and procedures to detect and correct the cause of internal power failures. During the loss of source electricity, the generator will run until the source electricity is restored.

3.0 TRIGGER

Electricity loss from a single source

4.0 RESPONSIBILITIES

The plant on-duty operator checks the generator for proper operation during a source electricity failure. The on-duty operator is responsible for identifying the electricity failure and locate and isolate the source of the failure. The plant on-duty operator is responsible for notifying the electric provider of the power failure. The Plant Manager is responsible for securing repair parts to correct the power failure source.

5.0 REFERENCES AND FORMS

Electrical Safety Policy E-101
Arc Flash Safety

6.0 EQUIPMENT AND SUPPLIES

VOM meter
Electrical Safety Gloves
Arc Flash electrical safety PPE
Electrically safe tools

7.0 SAFETY REQUIREMENTS

Uniform
Gloves
Steel toed boots

SUBJECT: Electrical Power Failure

8.0 PROCEDURE

8.1 Types of Electrical Power Failures

8.1.1 Source Electricity failure (most common)
a. Electricity loss somewhere out in the electrical grid
b. Complete loss of source electricity
c. Generator automatically starts and supplies electricity to the entire WWTP
d. Generator automatically shuts off when source electricity is restored

8.1.2 Source Electricity single phasing (very uncommon)
a. Lights in the building may or may not work
b. 3-Phase pumps trying to start to give the symptoms of single phasing (not pumping and hum)
c. 3-Phase motors will hum, run slow and get hot
d. Identified by (Only electrically qualified person) testing any 3-phase electric source for electricity on all phases. IF 480 VAC is not discovered on all three legs, trip the main breaker to start the generator
e. Call the electricity provider to report a problem
f. Notify the Plant Manager of the findings

8.2 Breaker Resetting Procedures

8.2.1 Main Panel, Incoming Source Electricity Breaker, 2400 amps (to reset)
a. Contact indicator will indicate “Open”
b. Flip the charging handle out by prying with a finger on the right side end of the handle. The spring-loaded handle will flip outward
c. Lift the handle upward and release several times until the unit indicator states “CHARGED.”
d. Standing to the side of the main breaker, press the “CLOSE” button
e. The breaker will make a loud bang when contacts close
f. Verify that electrical power is restored to WWTP and that all units are functional

8.2.2 Component Circuit Breaker
a. Verify which breaker has tripped
b. Push the breaker handle to the fully down position
c. Standing to either side of the breaker, pull/push the handle up; a loud bang will indicate contacts are closed
d. Verify component is energized, and that electrical loads are operating

9.0 TRAINING FOR EMPLOYEES

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by: **Hideaway, TN WWTP**
Approval: Brad Thibault
Director of Asset Management

SOP No: Power Fail
Revision No: Original
Effective Date: February 1, 2023

SUBJECT: Electrical Power Failure

All employees are to be trained on this procedure. The training may be performed in a classroom setting or at on-site locations.

10.0 REVIEW AND APPROVAL

Reviewer / Title	Revision No.	Review Date
	Original	2/1/2023

Approved by:	Brad Thibault
Title:	Director of Asset Management
Date:	2-1-23

11.0 CHANGE HISTORY

Revision Number	Summary of Changes	Issue Date	Effective Date

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by: **Hideaway, TN WWTP**
Approval: Brad Thibault
Director of Asset Management

SOP No: Power Fail
Revision No: Original
Effective Date: February 1, 2023

SUBJECT: Electrical Power Failure

TRAINING AND ACKNOWLEDGEMENT

Employees acknowledge receipt and understanding of this Standard Operating Procedure by signing below.

Procedure Name: Electrical Power Failure

Revision No. Original

Effective Date: 2-1-23

NAME (Print)	NAME (Signature)	DATE

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by: **Hideaway, TN WWTP**
Approval: Brad Thibault
Director of Asset Management

SOP No: 01
Revision No: Of this revision
Effective Date: 1/29/2023

SUBJECT: Toxic Dump

1.0 SCOPE

This document applies to the Plant Manager and operations personnel.

2.0 PURPOSE

To identify toxic material, such as heavy metals, acids, caustics, chlorine, or pesticides, that may inhibit biological activity, cause poor settleability, or kill the organisms in activated sludge.

3.0 TRIGGER

Low SOUR or respiration rate
A high number of flagellates
High metal concentrations

4.0 RESPONSIBILITIES

All operations personnel has the responsibility for carrying out the procedures outlined herein. If the operations staff is not available to conduct the procedures, the Project Manager will carry out the procedures herein.

6.0 EQUIPMENT AND SUPPLIES

The tools required are as follows:

Various

Standard PPE is required for working on plant grounds, control panels, and pumps.

7.0 SAFETY REQUIREMENTS

There is no specific precaution for this procedure. PPE required is as follows:

Safety glasses
Steel Toe Boots
Protective gloves

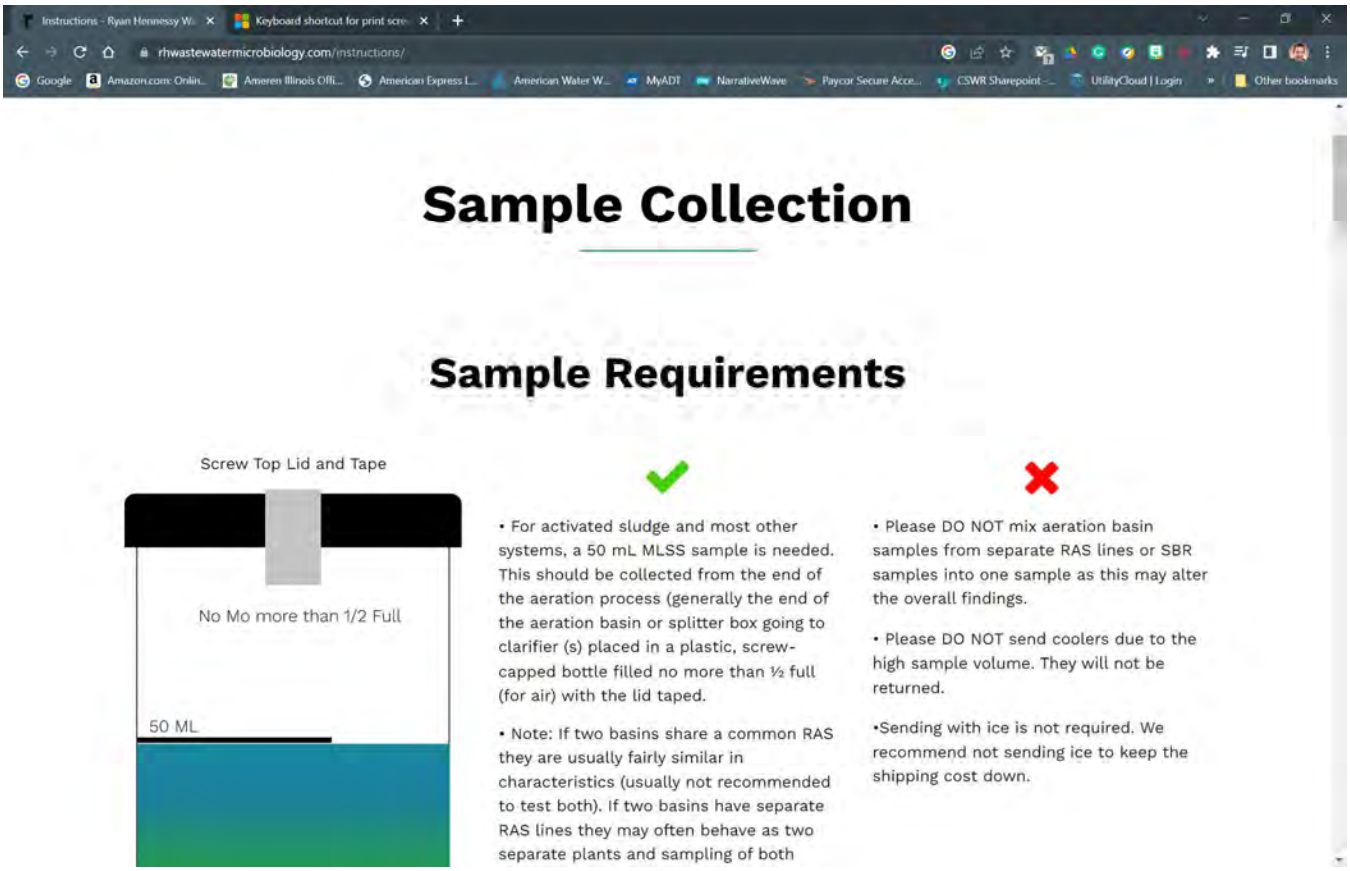
8.0 PROCEDURE

If observations suggest that a toxic condition is present in the system, the following approach should be, followed:

Sample influent, mixed liquor, and RAS sludge for heavy metals. If heavy metal concentrations are within

SUBJECT: Toxic Dump

reasonable levels, proceed to step two.
Evaluate toxic organics using GC-mass spectrometry techniques. Contact Ryan Hennessy with Ryan Hennessy Wastewater Microbiology @ 920-573-2820; ryan@rhwastewatermicrobiology.com; see sample collection instructions:



Use the custody form for shipping samples to the laboratory.

PDF
Microbiology Examination Custody

Quality Control:

Logbooks and records regarding toxicity dumps will be located in the PM's office at the WWTP.

SUBJECT: Toxic Dump

9.0 TRAINING FOR EMPLOYEES

Plant Manager and operations staff. Basic understanding of how to perform the procedure on a routine basis.

10.0 REVIEW AND APPROVAL

Reviewer / Title	Revision No.	Review Date
Name, Title	Revision reviewed	Date or review
Name, Title	Revision reviewed	Date or review
Name, Title	Revision reviewed	Date or review

Approved by:	Brad Thibault
Title:	Director of Asset Management
Date:	1.29.23

11.0 CHANGE HISTORY

Revision Number	Summary of Changes	Issue Date	Effective Date
1.0	Initial issue	Date of the first issue	Effective Date of the first issue.
1.1, 2.0 etc.	Briefly describe what was changed from the earlier issue. List each revision as a separate line item on this table.	Date of issue of revision	Effective Date of revision

SUBJECT: Toxic Dump

Appendix A

Appendices may be included to provide other information such as guidance or reference information.

Appendices may include forms but it is best to keep forms separate from procedure document. This allows the form to be separately controlled and managed.

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For all documents state: “Controlled document. Uncontrolled copies may not be up-to-date. Information contained herein is company confidential and for internal use only. Issued by Central States Water Resources”.

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by: **Hideaway, TN WWTP**
Approval: Brad Thibault
Director of Asset Management

SOP No: 01
Revision No: Of this revision
Effective Date: 1/29/2023

SUBJECT: Toxic Dump

TRAINING AND ACKNOWLEDGEMENT

Employees acknowledge receipt and understanding of this Standard Operating Procedure by signing below.

Procedure Name:_____

Revision No._____

Effective Date:_____

NAME (Print)	NAME (Signature)	DATE

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by: **Hideaway, TN WWTP**
Approval: Brad Thibault
Director of Asset Management

SOP No: 01
Revision No: Of this revision
Effective Date: 1/29/2023

SUBJECT: Toxic Dump

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by:	**Hideaway, TN WWTP**	SOP No:	1
Approval:	Brad W. Thibault	Revision No:	1.1
	Director of Asset Management	Effective Date:	January 1, 2023

SUBJECT: YSI Dissolved Oxygen Calibration

1.0 SCOPE

This document applies to the Project Manager and operations personnel.

2.0 PURPOSE

The following calibration protocols guide plant operators to calibrate the probe to ensure accurate data properly.

The calibration procedures will result in an instrument offset or gain correction and may be performed if required by regulatory agencies. Air calibration is the most accurate method. The calibration by comparison method is the least accurate and is therefore not preferred. Both calibration methods are provided in this SOP to provide flexibility for the operator depending on the current circumstances triggering the calibration and the available materials.

3.0 TRIGGER

DO probe calibration is to be performed daily and/or every shift when the accuracy of the DO reading is questionable.

Routine Maintenance Requirements

4.0 RESPONSIBILITIES

All operations personnel have the responsibility for carrying out the procedures outlined herein. If the operations staff is not available to conduct the procedures, the Plant Manager will carry out the procedures herein.

5.0 REFERENCES AND FORMS

YSI Operation and Maintenance Manual

6.0 EQUIPMENT AND SUPPLIES

YSI model 50B dissolved oxygen meter with a YSI 5739 probe
100 ml BOD bottle.
Mercury Barometer or computer to log on to the internet for the weather bureau.

7.0 SAFETY REQUIREMENTS

Normal PPE steel-toed boots, hard hats, hearing protection, and safety glasses.

8.0 PROCEDURE

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by:	**Anywhere USA Project**	SOP No:	1
Approval:	Brad W. Thibault	Revision No:	1.1
	Director of Asset Management	Effective Date:	January 1, 2023

SUBJECT: YSI Dissolved Oxygen Calibration

Calibrate the D.O. meter prior to checking the sample in the effluent or basins. Turn the D.O. meter on and set the function switch to C. (there should be 15 minutes warm-up times from when the meter is turned on to stabilize).

Place the D.O. probe in the BOD bottle with about one inch of fresh water and read the temperature on display after about 15 minutes. Look up the DO Saturation Values sheet temperature to get the D.O Saturation.

Log onto the internet to the weather and get the Barometric Pressure. Look at the Table of Ambient Barometric Pressure Correction Factors to get the Barometric Pressure correction factor.

Look on the Table of Altitude Correction Factors sheet to get the Altitude correction for 1000 ft. (0.966)

Calculations:

Altitude Correction X Barometric Pressure X D.O. mg/l Saturation = D.O. mg/l Calibration

0.966 X 1.004 X 8.61 = 8.351 mg/l

Example of calibration Log Sheet:

Altitude Correction 1000 ft.	Barometric Pressure	Barometric Pressure Correction	Sample Temp. C	D.O Saturation	D.O. mg/l before Calibr.	D.O. Calibr.	D.O. After Calibr.	% Calibr.	Time
0.966	30.05	1.004	22.6 C	8.6 1mg/l	8.10 mg/l	8.351 mg/l	8.61 mg/l	100%	8:30 am

Once you get the above information, you are ready to calibrate the DO Meter.

Turn the function switch to mg/l and log the results in the before calibration column.

Turn the function switch to mg/l Cal, go to the display keys, put the DO calibration calculation in, and press the Cal button.

Turn the function key to the % Cal, and it should read 100% and log the # on the log sheet.

Then turn the function key to mg/l, read the DO mg/l after calibration, and log the # on the log sheet. (should be about the same as the mg/l saturation).

The meter is now ready to take out and take the DO readings around the plant area basins.
DO Meter Maintenance:

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by: **Anywhere USA Project**
Approval: Brad W. Thibault
Director of Asset Management

SOP No: 1
Revision No: 1.1
Effective Date: January 1, 2023

SUBJECT: YSI Dissolved Oxygen Calibration

Change the probe membrane every two weeks or if you get unstable readings, if this does not work, change the probe.
Change the batteries when the low battery shows on display.

9.0 TRAINING FOR EMPLOYEES

This SOP and any revision shall be communicated in the following manner:

Employee Group Affected:	Communication Method
Operations and Maintenance of personal	Meeting

10.0 REVIEW AND APPROVAL

Reviewer / Title	Revision No.	Review Date
Brad Thibault, Director of Asset Management	1.0	12/23/2022
Name, Title	Revision reviewed	Date or review
Name, Title	Revision reviewed	Date or review

Approved by:	Brad W. Thibault
Title:	Director of Asset Management
Date:	12/16/2022

11.0 CHANGE HISTORY

Revision Number	Summary of Changes	Issue Date	Effective Date
1.0	Initial issue	12/28/2022	1/1/2023

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by: **Anywhere USA Project**
Approval: Brad W. Thibault
Director of Asset Management

SOP No: 1
Revision No: 1.1
Effective Date: January 1, 2023

SUBJECT: YSI Dissolved Oxygen Calibration

TRAINING AND ACKNOWLEDGEMENT

Employees acknowledge receipt and understanding of this Standard Operating Procedure by signing below.

Procedure Name: Dissolved Oxygen Sensor Calibration

Revision No. 1.0

Effective Date: January 1, 2023

NAME (Print)	NAME (Signature)	DATE

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by: **Anywhere USA Project**
Approval: Brad W. Thibault
Director of Asset Management

SOP No: 1
Revision No: 1.1
Effective Date: January 1, 2023

SUBJECT: YSI Dissolved Oxygen Calibration

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by:	**Hideaway, TN WWTP**	SOP No:	001-HS&S
Approval:	Brad Thibault	Revision No:	1.0
	Director of Asset Management	Effective Date:	1 January 2023

SUBJECT: Transporting Samples to Laboratory

1.0 SCOPE

Various samples are collected daily, and proper handling of them is essential. The sample analyses' results are used to comply with the plant's operating permit and optimize process control and treatment efficiency.

2.0 PURPOSE

Provides a protocol for documenting, handling, and delivering samples to the contract lab. These samples are required by The TDEC permit and the contract lab and **MUST** be delivered each day at the proper temperature using ice.

3.0 TRIGGER

Routine daily sampling

4.0 RESPONSIBILITIES

O&M company is responsible for the packaging and delivery of samples to the contract lab. The Operations Department is responsible for preparing and placing the samples in the designated areas for the guards to retrieve.

5.0 REFERENCES AND FORMS

Liquid Stream Sampling SOP – located in the operations office.

6.0 EQUIPMENT AND SUPPLIES

Sample bottles provided by Waypoint
Ice and cooler
Chain of Custody with a **black pen**

7.0 SAFETY REQUIREMENTS

Follow Corporate Health and Safety Manual and Site-Specific Safety Procedures.

Caution – Wear proper Personal Protective Equipment (PPE).

8.0 PROCEDURE

First:

- Verify that the number of samples picked up from the designated areas matches those listed on the chain of custody sheets. If there is a discrepancy, radio the operator on duty and tell him/her that you need assistance and wait for them in the lab. The number of bottles may vary, and ensuring all the samples are delivered to the CONTRACT Lab is important.

Second:

- **All samples indicated on the custody sheet must be stored on ice once removed from the refrigerator**; the chain requires this of custody and DNR requirement for sample preservation (0 ^{0}C to 6 ^{0}C). If no ice is available, the shift supervisor must be notified immediately. The samples will not be removed from the refrigerator or delivered without ice.
- The security guard will sign the chain of custody in the appropriate areas, and all entries and signatures must be in **black ink.**

Note – These are permanent legal records.

Third:

Pack samples carefully in the shipping cooler to prevent bottle breakage, sample degradation, and container leakage. Be aware that samples may vary in size and weight, and packaging must take this into consideration.

- Check that the bottle caps are securely fastened with gloves.
- Do not use broken or leaky coolers; the cooler lids must be able to be fully closed.
- Do not just dump ice on top of the samples; the samples must be individually placed into the ice and arranged to prevent them from hitting other sample bottles and causing damage.
- Ice will be arranged around the samples by hand.

Once the samples have been verified and are ready for transport, the security guard must communicate with the on-duty operator to confirm that the samples are on ice and ready for transportation. The coolers must be secured in the back of the truck to prevent damage and moving around while driving.

*If there are questions or concerns at any point, contact the on-duty operator immediately.

The samples will be delivered to the CONTRACT lab by 7:00 am daily.

9.0 TRAINING FOR EMPLOYEES

This SOP and any revision shall be communicated in the following manner:

Employee Group Affected:	Communication Method
Operations	Meeting

10.0 REVIEW AND APPROVAL

Reviewer / Title	Revision No.	Review Date
Brad Thibault	1.0	12/31/2022

Approved by:	Brad Thibault
Title:	Director Asset Management
Date:	12/31/2022

11.0 CHANGE HISTORY

Revision Number	Summary of Changes	Issue Date	Effective Date

1.0	Initial issue	12/13/2022	1/1/2023

TRAINING AND ACKNOWLEDGEMENT

Employees acknowledge receipt and understanding of this Standard Operating Procedure by signing below.

Procedure Name: Transporting Samples

Revision No. 1.0

Effective Date: January 1, 2023

NAME (Print)	NAME (Signature)	DATE

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by: **Hideaway, TN WWTP**
Approval: Brad Thibault
Director of Asset Management

SOP No: 07090
Revision No: Original
Effective Date: 7/1/2023

SUBJECT: Activated Sludge Wasting Procedures

1.0 SCOPE

This procedure applies to all personnel at the Hideaway Wastewater Treatment Facility.

2.0 PURPOSE

Wasting is the process by which excess microorganisms are removed from the system. The process aims to create a stable biomass to treat the wastewater entering the system effectively. Wasting is dependent upon the space available in the waste tank. Effective cooperation between plant and solids handling operations is necessary for mixed liquor control.

3.0 TRIGGER

Wasting is done as needed at the Wastewater Treatment Facility. Currently, the influent load to the facility combined with a 3-stage lagoon and Cambrian process solids generation is minimal, and wasting is unnecessary.

4.0 RESPONSIBILITIES

Project Manager – Responsible for implementing and monitoring activities associated with this policy and procedure.

Lead Operator – Responsible and accountable for ensuring compliance with this policy and procedure within their areas of responsibility.

Employees – All site employees are responsible and accountable for complying with this policy and procedure.

5.0 REFERENCES AND FORMS

Wasting Formulas and Worksheet Excel File
SCADA Interface

6.0 EQUIPMENT AND SUPPLIES

None

7.0 SAFETY

Safety glasses
Steel-toed boots

8.0 PROCEDURE

8.1 Standard Wasting Procedure

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by: **Hideaway, TN WWTP**
Approval: Brad Thibault
Director of Asset Management

SOP No: 07090
Revision No: Original
Effective Date: 7/1/2023

SUBJECT: Activated Sludge Wasting Procedures

When facility operations are normal, and the influent wastewater entering the system is of normal characteristics, the following procedure will be followed.

8.1.1 Sampling and Analysis

To predict the amount of wasting needed, the following information is needed:

- Depth of Blanket in the clarifier
- Level of sludge in the sludge holding tank

8.1.2 Calculations

Laboratory variables needed:

Gallons to Waste = (Lbs. to Waste / (8.34 lbs/gal x RAS conc.)) x 1,000,000

Minutes to Waste = Gallons to Waste / Waster valve flow rate (GPM)

Number of Waster Cycles to achieve waste volume = 1440 minutes per day/minutes to waste

8.1.3 Wasting Rate

- Based upon section 8.1.1
- Return the waste valve control panel “Local/Off/Remote” switch to auto when finished wasting.

9.0 TRAINING FOR EMPLOYEES

All Facility Personnel must be trained in this procedure. Initial training will occur through actual hands-on training and a review of SOP. This document and referenced documents will be reviewed during the annual training.

10.0 REVIEW AND APPROVAL

Reviewer / Title	Revision No.	Review Date
	Original	

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by: **Hideaway, TN WWTP**
Approval: Brad Thibault
Director of Asset Management

SOP No: 07090
Revision No: Original
Effective Date: 7/1/2023

SUBJECT: Activated Sludge Wasting Procedures

Approved by:	Brad Thibault
Title:	Director of Asset Management
Date:	2/3/23

11.0 CHANGE HISTORY

Revision Number	Summary of Changes	Issue Date	Effective Date
1.0	Initial issue	2/3/2023	2/3/2023

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by: **Hideaway, TN WWTP**
Approval: Brad Thibault
Director of Asset Management

SOP No: 07090
Revision No: Original
Effective Date: 7/1/2023

SUBJECT: Activated Sludge Wasting Procedures

TRAINING AND ACKNOWLEDGEMENT

Employees acknowledge receipt and understanding of this Standard Operating Procedure by signing below.

Procedure Name: Activated Sludge Wasting

Revision No. Original

Effective Date: February 3, 2023

NAME (Print)	NAME (Signature)	DATE

Hideaway WWTP

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CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by:	**Hideaway, TN WWTP**	SOP No:	LAB DATA-01
Approval:	Brad Thibault	Revision No:	1.0
	Director of Asset Management	Effective Date:	July 1, 2023

SUBJECT: Reviewing and Validating Monthly Discharge Monitoring Reports

1.0 SCOPE

This document applies to the Hideaway WWTP Project Manager, Compliance Manager, Operations Supervisor, and/or Lab Manager.

2.0 PURPOSE

Central States Water Resources utilizes contract laboratories and Utility Cloud or SAMS data management software to generate a monthly water quality report called a Discharge Monitoring Report (DMR). The DMR is then submitted to the TDEC for review and approval. The DMR is a product of data manually entered into the SAMS software and a TDEC-approved spreadsheet. The DMR also contains calculations (e.g., monthly averages, pounds formula); thus, these reports can potentially contain errors either during the data transfer process or within the various calculations programmed within the software. This Standard Operating Procedure (SOP) was created to establish an internal system to review and validate the data and calculations contained within the software to ensure that these reports are accurate before being submitted.

3.0 TRIGGER

A DMR is due once per quarter. These reports are generated using software that may contain glitches. Therefore, once a month, the Operations Supervisor will evaluate the data entered into UC or SAMS in search of errors.

4.0 RESPONSIBILITIES

The Operations Supervisor and Manager are responsible for carrying out the procedures outlined herein. The Project Manager will fill in for the Operations Supervisor or Manager should they be available.

Once the Operations Supervisor feels that the data entry is error-free, they will validate it and send it to the Compliance Manager for further evaluation and validation. Finally, when the Compliance Manager feels the data entry is error-free, they will validate the data for submission.

5.0 REFERENCES AND FORMS

SOP# PLT-006 – CSWR Data Validation SOP

6.0 EQUIPMENT AND SUPPLIES

A printed version of the TDEC report.
A printed copy of the DMR produced by the operator.
Computer with Utility Cloud or SAMS software to access the data for editing (if needed).

7.0 SAFETY REQUIREMENTS

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by:	**Hideaway, TN WWTP**	SOP No:	LAB DATA-01
Approval:	Brad Thibault	Revision No:	1.0
	Director of Asset Management	Effective Date:	July 1, 2023

SUBJECT: Reviewing and Validating Monthly Discharge Monitoring Reports

This procedure is time-intensive, so make sure that you're sitting in a comfortable position.

8.0 PROCEDURE

8.1 Discharge Monitoring Report Generation

Following the validation of the SAMS or UC data entry (see SOP: "Evaluating and Validating Lab Data Entry into SAMS or UC"), the DMR is ready to be generated and signed by the operator of record. The Operations Supervisor will review and validate the DMR.

8.2 Discharge Monitoring Report Review and Validation By Operations Supervisor

The Operations Supervisor will compare the data in SAMS or UC and the data transferred into the DMR. This process establishes that all data had been transferred successfully and accurately.

One should take notice of reviewing numeric digits, dates, and units. Ensure the correct and appropriate number of sample analyses has been conducted (cross-reference with a permit and/or sampling schedule). Ensure all values are within permit limitations. If values are not within permit limitations, ensure proper internal and external notifications are conducted.

They will then review all calculations within the DMR to ensure they are set up properly and generate accurate values. One should not only pay close attention to the calculations and their outputs but the dates and units as well. These values should match the units that the lab generated.

Once the Operations Supervisor feels that the data in the DMR are accurate, they will validate and submit the DMR to the Compliance Manager for further review.

8.3 Discharge Monitoring Report Review and Validation By Compliance Manager

The Compliance Manager will follow the steps outlined in 8.2 above.

Once the Compliance Manager feels the DMR is error-free, they will validate the report and conclude this procedure.

9.0 TRAINING FOR EMPLOYEES

The PM, Compliance Manager, Operations Supervisor, and Lab Manager must be trained on this SOP annually.

10.0 REVIEW AND APPROVAL

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by: **Hideaway, TN WWTP**
Approval: Brad Thibault
Director of Asset Management

SOP No: LAB DATA-01
Revision No: 1.0
Effective Date: July 1, 2023

SUBJECT: Reviewing and Validating Monthly Discharge Monitoring Reports

Reviewer / Title	Revision No.	Review Date
Name, Title	Revision reviewed	Date or review
Name, Title	Revision reviewed	Date or review
Name, Title	Revision reviewed	Date or review

Approved by:	Dana Douglas
Title:	Plant Manager
Date:	8.14.23

11.0 CHANGE HISTORY

Revision Number	Summary of Changes	Issue Date	Effective Date
1.0	Initial issue	XXXX	XXXX

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by: **Hideaway, TN WWTP**
Approval: Brad Thibault
Director of Asset Management

SOP No: LAB DATA-01
Revision No: 1.0
Effective Date: July 1, 2023

SUBJECT: Reviewing and Validating Monthly Discharge Monitoring Reports

TRAINING AND ACKNOWLEDGEMENT

Employees acknowledge receipt and understanding of this Standard Operating Procedure by signing below.

Procedure Name: Reviewing and Validating DMRs

Revision No. 1.0

Effective Date: January 1, 2023

NAME (Print)	NAME (Signature)	DATE

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by: **Hideaway, TN WWTP**
Approval: Brad Thibault
Director of Asset Management

SOP No: LAB DATA-01
Revision No: 1.0
Effective Date: July 1, 2023

SUBJECT: Reviewing and Validating Monthly Discharge Monitoring Reports

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by:	**Hideaway, TN WWTP**	SOP No:	Lab-001
Approval:	Brad W. Thibault	Revision No:	1.0
	Director of Asset Management	Effective Date:	July 1, 2023

SUBJECT: pH Analysis

1.0 SCOPE

This SOP applies to any O&M employee performing pH analysis.

2.0 PURPOSE

This SOP aims to ensure a standardized method of calibrating the pH meter and analyzing the pH of samples.

3.0 TRIGGER

It is necessary to follow the procedures of this SOP whenever pH meters are calibrated, and samples are analyzed for pH.

4.0 RESPONSIBILITIES

Any CSWR or O&M company employee performing pH meter calibration and sample analysis is responsible for following this SOP. Maintaining fresh pH solutions which are not expired is critical to accurate and repeatable results.

5.0 REFERENCES AND FORMS

Standard Methods for the Examination of Water and Wastewater
18th Edition, Method 4500 H+ B, pages 4-65.

Standard Methods for the Examination of Water and Wastewater
20th Edition, Method 4500-H+ B, pages 4-87.

6.0 EQUIPMENT AND SUPPLIES

- pH meter and probe combination (with Automatic temperature compensation) - Accumet AB 15
- beakers
- magnetic stir bars
- stir plate
- pH buffer – 4 (red)
- pH buffer – 7 (yellow)
- pH buffer – 10 (blue)

7.0 SAFETY REQUIREMENTS

Safety glasses

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by:	**Hideaway, TN WWTP**	SOP No:	Lab-001
Approval:	Brad W. Thibault	Revision No:	1.0
	Director of Asset Management	Effective Date:	July 1, 2023

SUBJECT: pH Analysis

Rubber or vinyl gloves
Clean work area

8.0 PROCEDURE

8.1 Calibration

8.1.1 Fill clean beakers with fresh pH 4 (red), pH 7 (yellow), and pH 10 (blue) buffers.
8.1.2 Press “Setup” on pH meter.
8.1.3 Press ‘Setup’ on the pH meter a second time.
8.1.4 Press ‘Enter’ to clear previous calibrations.
8.1.5 Place the beaker with pH 4 buffer on the stir plate. Add a clean stir bar. Turn the stir plate on to stir gently.
8.1.6 Place the pH probe and temperature sensor probe in the beaker on a stir plate, not letting the stir bar touch the probe. The pH probe is glass and can be easily broken. Take care not to let anything bump it.
8.1.7 Press ‘Standard’ and wait for a stable reading (identified when ‘Standard’ is no longer blinking).
8.1.8 Press ‘Standard’ and record the pH reading, temperature reading, and known value in the Daily Maintenance Logbook.
8.1.9 Take the probes out of the pH 4 buffer and rinse them with MilliQ water into the plastic waste beaker.
8.1.10 Touch or blot probes dry with a Kim wipe. Do not wipe.
8.1.11 Take the pH 4 beaker off the stir plate and repeat 8.1.5 through 8.1.10 using pH 7 buffer.
8.1.12 Take the pH 7 beaker off the stir plate and repeat 8.1.5 through 8.1.10 using pH 10 buffer.
8.1.13 Press Standard and record the slope value that flashes on the screen under the pH slope.
8.1.14 Record the pH, temperature, and known value in the Daily Maintenance Log Book.

8.2 Standard Analysis

8.2.1 Remove the probe from the pH 10 buffer and rinse with MilliQ water into the plastic waste beaker.
8.2.2 Touch probes dry with a Kim wipe™.
8.2.3 Take the pH 10 beaker off the stir plate and place the pH 8 buffer on the stir plate. Add a clean stir bar. Turn the stir plate on to stir gently.
8.2.4 Place the pH probe and temperature sensor probe in the beaker on the stir plate, again taking care not to allow anything to bump the probe.
8.2.5 Allow the reading (under measurement) to stabilize. You are not calibrating this sample; just checking the reading. It should be within ± 0.5 pH units. If not, recalibrate and check for problems.

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by:	**Hideaway, TN WWTP**	SOP No:	Lab-001
Approval:	Brad W. Thibault	Revision No:	1.0
	Director of Asset Management	Effective Date:	July 1, 2023

SUBJECT: pH Analysis

8.2.6 Record the pH value in the pH Standard Book. Record the pH reading and the temperature in the pH Standard Book.

8.3 Quality Control

8.3.1 Initial Demonstration of Capability
- a. Each analyst must run a pH blind sample at least 4 times.
- b. Results must fall within an acceptable range.
- c. If Results are not acceptable, the analyst will be retrained prior to rerunning blind samples.

8.2.1 Method Detection Limit – not applicable

8.2.2 Laboratory Reagent Blank (commonly referred to as method blank) – not applicable

8.2.3 Laboratory Fortified Blank (commonly referred to as spiked blank) – not applicable

8.2.4 Matrix Spike and Matrix Spike Duplicate – not required

8.2.5 Internal Standards – not required

8.2.6 Calibration
- 8.2.6.1 Calibrate pH meter daily.
- 8.2.6.2 Check pH meter with standard every 4 hours. If the reading has deviated ±0.02 SU, recalibrate the meter.

8.2.7 Control Charts
- 8.2.7.1 Enter data into the QA/QC database daily for duplicate samples.
- 8.2.7.2 Enter data into the QA/QC database daily for standard results.
- 8.2.7.3 Check for acceptable results.
- 8.2.7.4 If anything other than acceptable is received.
  - 8.2.7.4.1 Stop the analysis
  - 8.2.7.4.2 Review technique
  - 8.2.7.4.3 Determine possible sources of error
  - 8.2.7.4.4 Implement corrective action

8.2.8 Corrective Action
- 8.2.8.1 Determine necessary corrective action based on a review of the method and technique.
- 8.2.8.2 Implement corrective action to prevent a recurrence.

8.2.9 QC Acceptance Criteria
- 8.2.9.1 Standard (Accuracy)
  - 8.2.9.1.1 Warning limits = ±0.05
  - 8.2.9.1.2 Alarm limits = ±0.1 SU
- 8.2.9.2 Duplicate (precision) must be within ±0.02 SU.

8.2.10 Definitions of Preparation and Analytical Batches – not required

8.2.11 Minimum Frequency for Conducting all QC Elements
- 8.2.11.1 Standards are to be analyzed daily and every four hours.
- 8.2.11.2 Duplicates are to be analyzed daily.

8.2.12 Quality Control Sample
- 8.2.12.1 ERA or comparable unknown samples will be run twice annually.
- 8.2.12.2 If any unknown sample does not receive acceptable results:

8.2.12.2.1 The procedure shall be evaluated to determine the source of error
8.2.12.2.2
8.2.12.2.3 Corrective actions will be taken
8.2.12.2.4 A new unknown sample will be run
8.2.12.2.5 The process will be repeated until acceptable results are obtained.
8.2.12.2.6

8.3 Analysis

8.3.1 Take the probe out of the storage solution and rinse the probe with DI water into the plastic waste beaker.

8.3.2 Touch probes dry with a Kim wipe.

8.3.3 Take the storage solution off the stir plate and place the sample on the stir plate. Add a clean stir bar. Turn the stir plate on to stir gently.

8.3.4 Place the pH probe and temperature sensor probe in the beaker on the stir plate, again taking care not to allow anything to bump the probe.

8.3.5 Allow the reading (under measurement) to stabilize.

8.3.6 Record the pH value and temperature in the pH Bound Laboratory Book.

8.3.7 At least once per day, collect a second sample and perform a duplicate analysis following items 8.3.1 – 8.3.6 above. The duplicate sample must be within ±0.02 SU of the original sample.

8.4 Miscellaneous information

8.4.1 Always rinse the probe with DI water before and after use.

8.4.2 Blot probe dry, do not rub.

8.4.3 Check the liquid level in the probe and refill as needed.

8.4.4 Keep probe in storage solution between uses.

8.4.5 If the reading deviates from the original by more than 0.10, recalibrate the meter.

8.4.6 If the meter says, “bad electrode, clear the calibrations and recalibrate, making sure all buffers are fresh and in clean beakers.

8.4.7 Always use fresh standards within the range of the test procedure.

8.4.8 Make sure the mixing bar provides a well-mixed sample.

9.0 TRAINING TO EMPLOYEES

Describe who must be trained in this policy and procedure and what level of knowledge they should have. Indicate how they are to be trained. A separate procedure may be referenced.

10.0 REVIEW AND APPROVAL

Reviewer / Title	Revision No.	Review Date
Name, Title	Revision reviewed	Date or review

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by: **Hideaway, TN WWTP**
Approval: Brad W. Thibault
Director of Asset Management

SOP No: Lab-001
Revision No: 1.0
Effective Date: July 1, 2023

SUBJECT: pH Analysis

Name, Title	Revision reviewed	Date or review
Name, Title	Revision reviewed	Date or review

Approved by:	Brad Thibault
Title:	Director of Asset Management
Date:	7.1.23

11.0 CHANGE HISTORY

Revision Number	Summary of Changes	Issue Date	Effective Date
1.0	Initial issue	Date of the first issue	Effective Date of the first issue.

TRAINING AND ACKNOWLEDGEMENT

Employees acknowledge receipt and understanding of this Standard Operating Procedure by signing below.

Procedure Name: pH

Revision No. 1.0

Effective Date: January 1, 2023

NAME (Print)	NAME (Signature)	DATE

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by: **Hideaway, WWTP**
Approval: Brad Thibault
Director of Asset Management

SOP No: 01
Revision No: Of this revision
Effective Date: 7/1/2023

SUBJECT: Alkalinity-pH Control

1.0 SCOPE

This document applies to the Project Manager and operations personnel.

2.0 PURPOSE

The pH is extremely important in biological wastewater treatment because the microorganisms remain sufficiently active only within a narrow range between pH 6.5 and 8.0. Outside this range, pH can inhibit or completely stop the biological activity. Nitrification reactions are especially pH sensitive. Biological activity declines to near zero at a pH below 6.0 in un-acclimated systems.

3.0 TRIGGER

Lagoon or Cambrian pH less than 6.5 S.U
Raw wastewater pH less than 6.5 S.U
Septic conditions of raw wastewater
Sulfide odors in raw wastewater

4.0 RESPONSIBILITIES

All operations personnel has the responsibility for carrying out the procedures outlined herein. If the operations staff is not available to conduct the procedures, the Project Manager will carry out the procedures herein.

5.0 REFERENCES AND FORMS

O&M Manual for WWTP
Activated Sludge MOP OM-9
Operation of WWTP Volume I – California State University, Sacramento

6.0 EQUIPMENT AND SUPPLIES

The tools required are as follows:

Various

Standard PPE is required for working in the facility laboratory and on plant grounds.

7.0 SAFETY REQUIREMENTS

There are no specific precautions for this procedure. PPE required is as follows:

Safety glasses
Steel Toe Boots
Protective gloves

SUBJECT: Alkalinity-pH Control

Rubber gloves approved for electrical work.

8.0 PROCEDURE

If the pH in the aeration basin is less than 6.5 or is widely varying, raise the Lagoon or Cambrian unit pH by adding sodium bicarbonate (NaHCO3), caustic soda (NaOH), or lime (Ca (OH 2) at the head of the first lagoon and or the Cambrian Anoxic Tank. If nitrification is required, the pH should be kept above 7.0 and held as constant as possible to encourage an acceptable nitrification rate. BE SURE THE SYSTEM IS NOT SHOCKED BY HIGH PH LEVELS OR OVERDOSED TO pH LEVELS ABOVE 9.0.

When determining the chemical needed for pH adjustment, obtain and weigh (or measure) a small amount (about 1 to 2 grams) of the chemical to be used in the treatment process. While a measured sample is stirring, add small increments of the chemical until the pH is about 7.2. Then weigh (or measure) the portion not used to determine the amount used in the titration. The weight of the chemical required is calculated according to the procedures given below in the calculations section.

Quality Control:

Logbooks and Alkalinity / pH control records will be located in the operations office at the WWTP.

Calculations:

Caustic Soda (NaOH)

Step 1. Calculate the pure NaOH needed to raise the pH to about 7.2.

$$\text{NaOH needed, } = \frac{(\text{ml of NaOH used per liter sample vol})(\text{N of NaOH})(\text{Equiv Weight of 1.0 N})}{1000\ \text{ML/L}}$$

Step 2. Calculate the weight of pure NaOH needed to adjust the pH.

NaOH needed, lb/day= (NaOH needed, mg/l)(Q,mgd)(8.34 lb/gal)

Step 3. Calculate the weight of the commercial caustic soda solution needed to furnish the lb/day of pure NaOH needed if using a commercial grade solution with a 25% Concentration.

$$\text{NaOH needed, lb/day} = \frac{(\text{Pure NaOH needed, lb/day})(100\%)}{\text{Solution concentration, \%}}$$

SUBJECT: Alkalinity-pH Control

9.0 TRAINING FOR EMPLOYEES

Project Manager and operations staff. Basic understanding of how to perform the procedure on a routine basis.

10.0 REVIEW AND APPROVAL

Reviewer / Title	Revision No.	Review Date
Name, Title	Revision reviewed	Date or review
Name, Title	Revision reviewed	Date or review
Name, Title	Revision reviewed	Date or review

Approved by:	Brad Thibault
Title:	Director of Asset Management
Date:	6.1.23

11.0 CHANGE HISTORY

Revision Number	Summary of Changes	Issue Date	Effective Date
1.0	Initial issue	Date of the first issue	Effective Date of the first issue.
1.1, 2.0 etc.	Briefly describe what was changed from the earlier issue. List each revision as a separate line item on this table.	Date of issue of revision	Effective Date of revision

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by: **Hideaway, WWTP**
Approval: Brad Thibault
Director of Asset Management

SOP No: 01
Revision No: Of this revision
Effective Date: 7/1/2023

SUBJECT: Alkalinity-pH Control

TRAINING AND ACKNOWLEDGEMENT

Employees acknowledge receipt and understanding of this Standard Operating Procedure by signing below.

Procedure Name:_____

Revision No._____

Effective Date:_____

NAME (Print)	NAME (Signature)	DATE

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by: **Hideaway, WWTP**
Approval: Brad Thibault
Director of Asset Management

SOP No: 01
Revision No: Of this revision
Effective Date: 7/1/2023

SUBJECT: Alkalinity-pH Control

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by: **Hideaway, TN WWTP**
Approval: Brad Thibault
Director of Asset Management

SOP No: 01
Revision No: Of this revision
Effective Date: 7/1/2023

SUBJECT: Blower-Aerator Failure

1.0 SCOPE

This document applies to the Project Manager and operations personnel.

2.0 PURPOSE

Dead spots and non-uniform mixing patterns will generally indicate a clogged diffuser or that the diffuser header valves need adjustment to balance the air distribution in the tank.

Aerobic systems require molecular oxygen to maximize the conversion of organic matter through a complex series of Biochemical Oxidation and Reduction Reactions.

Oxygen needed by the microorganisms is transferred to the mixed liquor by aeration. The fine bubble aeration system takes compressed atmospheric air and passes it through the diffuser element. Diffusion makes the oxygen in the compressed air accessible to microorganisms.

3.0 TRIGGER

Minimal or excessively large, centralized plume visible across the aeration basin
Reduced blower output (SCFMS)
Biological growths of slime
Oils and greases in the wastewater
Fibrous material adhering to the edges of the diffuser units
Dust and dirt from unfiltered or inadequately filtered air
Rust and scale from air main corrosion

4.0 RESPONSIBILITIES

All operations personnel have the responsibility for carrying out the procedures outlined herein. If the operations staff is not available to conduct the procedures, the Project Manager will carry out the procedures herein.

5.0 REFERENCES AND FORMS

Activated Sludge – MOP OM-9
Operation of WWTP Volume III – California State University, Sacramento
Operation of Municipal WWTP – MOP 11
Volume 16 of O&M Manual – Aeration System

6.0 EQUIPMENT AND SUPPLIES

The tools required are as follows:

Various

SUBJECT: Blower-Aerator Failure

Standard PPE is required for working on plant grounds, control panels, and pumps.

7.0 SAFETY REQUIREMENTS

There is no specific precaution for this procedure. PPE required is as follows:

Safety glasses
Steel Toe Boots
Protective gloves
Rubber gloves approved for electrical work

8.0 PROCEDURE

If observations suggest aeration or blower failure conditions, the following approach should be, followed:

1. Check air rates across the lagoon cells and/or Cambrian Tank 2 or 3 for proper operation; proceed to step two if rates appear abnormal.
2. Check to verify if valves need adjustment to balance the air distribution; if air adjustment does not resolve the problem, proceed to step three.
3. If air masses are rising over the diffuser, the diffusers could need cleaning or replacement; if the diffusers do not need cleaning or replacement, proceed to step four.
4. Check the blower preventive maintenance requirements, service record, design capacity, and present output. The blower may need repair.

Quality Control:

Logbooks and records regarding blower/aeration failure will be located in the office at the WWTP.

9.0 TRAINING FOR EMPLOYEES

Project Manager and operations staff. Basic understanding of how to perform the procedure on a routine basis.

10.0 REVIEW AND APPROVAL

Reviewer / Title	Revision No.	Review Date
Name, Title	Revision reviewed	Date or review
Name, Title	Revision reviewed	Date or review
Name, Title	Revision reviewed	Date or review

Approved by:	Brad Thibault

SUBJECT: Blower-Aerator Failure

Title:	Director of Asset Management
Date:	2/3/2023

11.0 CHANGE HISTORY

Revision Number	Summary of Changes	Issue Date	Effective Date
1.0	Initial issue	Date of the first issue	Effective Date of the first issue.
1.1, 2.0 etc.	Briefly describe what was changed from the earlier issue. List each revision as a separate line item on this table.	Date of issue of revision	Effective Date of revision

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by: **Hideaway, TN WWTP**
Approval: Brad Thibault
Director of Asset Management

SOP No: 01
Revision No: Of this revision
Effective Date: 7/1/2023

SUBJECT: Blower-Aerator Failure

TRAINING AND ACKNOWLEDGEMENT

Employees acknowledge receipt and understanding of this Standard Operating Procedure by signing below.

Procedure Name:_____

Revision No._____

Effective Date:_____

NAME (Print)	NAME (Signature)	DATE

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by: **Hideaway, TN WWTP**
Approval: Brad Thibault
Director of Asset Management

SOP No: 01
Revision No: Of this revision
Effective Date: 7/1/2023

SUBJECT: Blower-Aerator Failure

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by: **Hideaway, TN WWTP**
Approval: Brad Thibault
Director of Asset Management

SOP No: e-coli testing
Revision No: 1.0
Effective Date: 7-1-2023

SUBJECT: e-Coli Testing

1.0 SCOPE

The Hideaway Wastewater Plant is required to have disinfection. The effluent shall be disinfected continuously so that violations of the applicable bacteriological limitations (fecal coliform or e-coli) do not occur.

2.0 PURPOSE

This SOP's purpose is to serve as a procedure to complete the E-coli testing needed to stay in compliance. There are currently 4 approved methods in (TN): Coliscan MF Method, EPA Method 1603 Modified M-TEC agar, mColi Blue-24, and Colilert MPN Method or Colilert-18 MPN Method, for the State of Tennessee. The Hideaway Wastewater Plant currently uses the Colilert MPN method. This SOP explains that method.

3.0 TRIGGER

Disinfection

4.0 RESPONSIBILITIES

The operators are responsible for this test.

5.0 EQUIPMENT AND SUPPLIES

a) Incubator b) bacteriological sampling bottles c) Colilert reagent d) Quanti-Tray e) Quanti-Tray sealer

6.0 SAFETY REQUIREMENTS

Follow O&M Health and Safety Manual and Site-Specific Safety Procedures. Standard PPE is required for working in a laboratory.

Caution – Wear proper Personal Protective Equipment (PPE).

7.0 PROCEDURE

1. Set the incubator to 35 degrees C.
2. Collect samples taking care not to touch the interior of the cap or the bottle rim.
3. Add reagent to sample bottle and gently invert until reagent has dissolved.
4. Pour the sample into Quanti-Tray
5. Seal Quanti-Tray using Quanti-Tray sealer
6. Place Quanti-Tray in the incubator noting the following: Date, Time in, incubator temp.

8.0 Additional Important Information

9.0 TRAINING FOR EMPLOYEES

This SOP and any revision shall be communicated in the following manner:

Employee Group Affected:	Communication Method
Operations	Meeting

10.0 REVIEW AND APPROVAL

Reviewer / Title	Revision No.	Review Date
	1.0	2-1-2023

Approved by:	Brad Thibault
Title:	Director of Asset Management
Date:	2.1.23

11.0 CHANGE HISTORY

Revision Number	Summary of Changes	Issue Date	Effective Date

TRAINING AND ACKNOWLEDGEMENT

By signing below, employees acknowledge receipt and understanding of this Standard Operating Procedure

Procedure Name:_____

Revision No._____

Effective Date:_____

NAME (Print)	NAME (Signature)	DATE

Central States Water Resources

Standard Operating Procedure (SOP)

Issued by:	**Hideaway, TN WWTP**	SOP No:	01
Approval:	Brad Thibault	Revision No:	1.0
	Director of Asset Management	Effective Date:	7/1/2023

SUBJECT: Logbook

1.0 SCOPE

This document applies to Hideaway Project Manager and operations personnel.

2.0 PURPOSE

Minimum of One Official Operator's Logbook per Plant. There must be one official operator's logbook for each plant. This logbook should be regarded as a legal document, which may be reviewed by regulatory agencies or clients and could even be brought into a court of law as evidence. Missing logbooks or missing pages from logbooks should be reported to the plant manager immediately. At some larger plants, two official logbooks may be used (e.g., wet end and solids end). However, both logbooks must meet all standard Plant Logbook policies and procedures.

3.0 TRIGGER

Daily responsibility.

4.0 RESPONSIBILITIES

All operations personnel have the responsibility for carrying out the procedures outlined herein. If the operations staff is not available to conduct the procedures, the Project Manager will carry out the procedures herein.

5.0 REFERENCES AND FORMS

N/A

6.0 EQUIPMENT AND SUPPLIES

Official Operator's Logbook

7.0 SAFETY REQUIREMENTS

N/A

8.0 PROCEDURE

A. General Criteria for Logbooks.
1. The logbook must be hardbound with consecutively numbered or dated pages. The annual diary-type logbook is much preferred, as it is easier to locate information and can be kept more orderly.
2. All entries in the logbook must be made in non-erasable ink. The use of whiteout or completely blacking our entries is NOT permitted. Any corrections should be made by drawing a single line through

SUBJECT: Logbook

the incorrect entry, rewriting the corrected entry, and initialing the changes.
3. The operator in charge of each shift, respective unit process, or treatment plant is responsible for reviewing all entries made in the logbook as well as reading the previous shift's log entries. Entries must be made throughout each shift and as close to the event or completion of the task as practical.
4. The minimum required logbook information (listed in Section 11) should be entered into the official logbook(s) regardless of whether it is also contained on log sheets or secondary logbooks.
5. Where security is a problem or conditions warrant, pages from the official logbook(s) should be duplicated using photocopies, carbon paper, or special books with carbonless duplicate pages. The copies of the logbook pages must be removed from the normal logbook area each day, or if photocopying is used, the logbook pages should be photocopied on a weekly basis. Copies should be stored securely (preferably away from the plant site). Copies of the logbook pages may be discarded once the logbook has been completed and stored.
6. The Plant Manager oversees the logbook policy and ensures that the proper information is being entered promptly. Entries should be regularly reviewed to ensure they meet these requirements and do not contain inappropriate information. Furthermore, the Operations Supervisor or other designee, as well as the Plant Manager, should review at least once per month the previous pages of the logbook. Any entries or missing page alterations should be reported to the Plant Manager immediately. The logbooks will be evaluated during the annual process control audits.
7. When completed, the logbooks should be kept in a secure place for at least four years following completion.

Policy Regarding Entries:
Generally, logbook entries should consist only of observable facts and occurrences. Personal speculation may be appropriate in some situations but should be denoted as such (for example - "I think this occurred because……" or "it is possible that …….). The entries on each shift should include the following, at a minimum:

Beginning of Shift

1. Date (if the book is not pre-dated) and shift start time. All times entered should be military time.
2. Indication of general weather conditions at the start of the shift (clear, rainy, cold, windy, snow, hot, fair, etc.)
3. List of operators on duty during the shift and their general assignments. (e.g., Smith-primary; Jones-secondary; Harbrace-incineration)
4. Important: Note in the logbook the name of any operators scheduled to work, but absent due to vacation, sick leave, holiday leave, etc., along with the reason for absence.

B. During Shift

1. List any significant equipment failure(s) during the shift, the time discovered, and what was done

about it (taken O/S; repair (by whom); work order requested, etc.

2. Note any major equipment that has been O/S but has now been repaired and released by maintenance. Indicate whether the unit or equipment was placed back in service during the shift, whether it should be placed back I.S. by the next shift, or whether it is just available to be placed back I/S at the discretion of the operator-in-charge.

3. Describe any important or uncleared alarm conditions and indicate any need for concern for following shifts.

4. Describe any significant non-routine tasks performed by operators during the shift. Include time-of-day regarding tasks in the logbook as appropriate.

5. Describe any significant process changes made during the shift, including time and reason for the change, such as:

Equipment placed in service or taken out of service.
Tanks drained, filled, or put in service.
Valve changes (if not daily routine)
Set points changed (if not daily routine)

6. List any important phone calls or complaints handled by or referred to the operators. Also, report any plant visitor(s) on odd shifts (at night, on weekends, holidays, etc.). Report the time, the name of the caller or visitor, and the nature of the occurrence in the logbook, even if listed in a separate visitors or complaint log.

7. Describe any noteworthy condition during the shift not addressed above. Examples: "extremely heavy rain (snow, ice)," "heavy flow peaked at 1.5 MGD at 1750", "grit tank overflowed at 1310", "Smith went home ill at 0445", "power failure from 0650 until 0817,", etc.

9.0 TRAINING FOR EMPLOYEES

Project Manager and operations staff. Basic understanding of how to perform the procedure on a routine basis.

10.0 REVIEW AND APPROVAL

Reviewer / Title	Revision No.	Review Date
Name, Title	Revision reviewed	Date or review
Name, Title	Revision reviewed	Date or review
Name, Title	Revision reviewed	Date or review

Approved by:	Brad Thibault
Title:	Director of Asset Management
Date:	12/29/22

SUBJECT: Logbook

11.0 CHANGE HISTORY

Revision Number	Summary of Changes	Issue Date	Effective Date
1.0	Initial issue	Date of the first issue	Effective Date of the first issue.
1.1, 2.0, etc.	Briefly describe what was changed from the earlier issue. List each revision as a separate line item on this table.	Date of issue of revision	Effective Date of revision

Central States Water Resources

Standard Operating Procedure (SOP)

Issued by:	**Hideaway, TN WWTP**	SOP No:	01
Approval:	Brad Thibault	Revision No:	1.0
	Director of Asset Management	Effective Date:	7/1/2023

SUBJECT: Logbook

Appendix A

Appendices may be included to provide other information, such as guidance or reference information.

Appendices may include forms, but keeping forms separate from procedure documents is best. This allows the form to be separately controlled and managed.

Appendices have no specific format requirements but should include the same document header and footer.

Other Document Format Requirements:

The text font is Arial 10 point. The main headings are bold and all caps.

The numbering of subsections is appropriate if desired to break up longer sections.

All right margins should be ragged for ease of reading.

Graphics, fonts, and formats in the header and footer should not be changed from what is shown in this formatted document.

Since a document is likely to be used internationally (Canada, etc), all effective and issue dates should be formatted as “dd Mon yyyy”. Example “04 Jul 2011”.

Excessive use of hyperlinks should be avoided as they can change and become outdated. It might be more appropriate to say, for example:

Footer Requirements:

The footer should always include the page number and total pages.

For all documents, state: “Controlled document. Uncontrolled copies may not be up-to-date. Information contained herein is company confidential and for internal use only.

Central States Water Resources

Standard Operating Procedure (SOP)

Issued by: **Hideaway, TN WWTP**
Approval: Brad Thibault
Director of Asset Management

SOP No: 01
Revision No: 1.0
Effective Date: 7/1/2023

SUBJECT: Logbook

TRAINING AND ACKNOWLEDGEMENT

By signing below, employees acknowledge receipt and understanding of this Standard Operating Procedure.

Procedure Name: Logbook

Revision No. 1.0

Effective Date: January 1, 2023

NAME (Print)	NAME (Signature)	DATE

Central States Water Resources

Standard Operating Procedure (SOP)

Issued by: **Hideaway, TN WWTP**
Approval: Brad Thibault
Director of Asset Management

SOP No: 01
Revision No: 1.0
Effective Date: 7/1/2023

SUBJECT: Logbook

CENTRAL STATES WATER RESOURCES

Standard Operating Procedure (SOP)

Issued by:	**Hideaway, TN WWTP**	SOP No:	1
Approval:	Brad W. Thibault	Revision No:	1.1
	Director of Asset Management	Effective Date:	July 2023

SUBJECT: Sludge Holding Tank Odor Problems

1.0 SCOPE

This document applies to the Project Manager and operations personnel.

2.0 PURPOSE

The digester receives waste sludge from the primary and waste-activated sludge processes, and treatment is continued until it is disposed of via a solids dumpster. If the aerobic digestion process is operating correctly, there will be minimal to no odors from the unit.

3.0 TRIGGER

Odors

4.0 RESPONSIBILITIES

All operations personnel have the responsibility for carrying out the procedures outlined herein. If the operations staff is not available to conduct the procedures, the area supervisor will carry out the procedures herein.

5.0 REFERENCES AND FORMS

O&M Manuals

6.0 EQUIPMENT AND SUPPLIES

The pH meter and sampling equipment (bucket, rope, beaker, etc.)

7.0 SAFETY REQUIREMENTS

Normal PPE steel-toed boots, hard hats, hearing protection, and safety glasses.

8.0 PROCEDURE

If foul odors are coming from the SHT, the problem will most likely be that the dissolved oxygen levels are inadequate or low pH.

Increase sludge removal output to decrease aged sludge in the tank.

NOTES

Below are some causes to look into for pH problems.

SUBJECT: Sludge Holding Tank Odor Problems

Low pH – due to long-term treatment – pH will deteriorate during long-term treatment – tank contents should be mixed thoroughly, and pH adjusted as needed. Rapid recurrence of odors soon after mixing and pH adjustment – usually due to incomplete mixing – refer to digester tank mixing problems.

9.0 TRAINING FOR EMPLOYEES

This SOP and any revision shall be communicated in the following manner:

Employee Group Affected:	Communication Method
Operations and Maintenance personal	Meeting

10.0 REVIEW AND APPROVAL

Reviewer / Title	Revision No.	Review Date
Brad Thibault, Director of Asset Management	4/23/2020	4/23/2020
Name, Title	Revision reviewed	Date or review
Name, Title	Revision reviewed	Date or review

Approved by:	Brad W. Thibault
Title:	Director of Asset Management
Date:	2/1/2023

11.0 CHANGE HISTORY

Revision Number	Summary of Changes	Issue Date	Effective Date
1.0	Initial issue	2/1/2023	2/3/2023

SUBJECT: Sludge Holding Tank Odor Problems

Appendix A

Appendices may be included to provide other information such as guidance or reference information.

Appendices may include forms, but it is best to keep forms separate from procedure document. This allows the form to be separately controlled and managed.

Appendices have no specific format requirements but should include the same document header and footer.

Other Document Format Requirements:

The text font is Arial 10 point. The main headings are bold and all caps.

The numbering of subsections is appropriate if desired to break up longer sections.

All right margins should be ragged for ease of reading.

Graphics, fonts, and formats in the header and footer should not be changed from what is shown in this formatted document.

Since a document is likely to be used, all effective and issue dates should be formatted as “dd Mon yyyy”. Example “04 Jul 2011”.

Excessive use of hyperlinks should be avoided as they can change and become outdated. It might be more appropriate to say for example: “Form No. MS 101-3 is available on the AM SharePoint”, rather than insert a hyperlink in a document.

Footer Requirements:

The footer should always include the page number and total pages.

For all documents state: “Controlled document. Uncontrolled copies may not be up-to-date. Information contained herein is company confidential and for internal use only. Issued by CSWR”.

TRAINING AND ACKNOWLEDGEMENT

By signing below, employees acknowledge receipt and understanding of this Standard Operating Procedure

Procedure Name:_____

Revision No._____

Effective Date:_____

NAME (Print)	NAME (Signature)	DATE

LABORATORY QUALITY ASSURANCE PROGRAM MANUAL (LQAPM)

FOR

Central States Water Resources WASTEWATER TREATMENT PLANT LABORATORY

Hideaway WWTP

Responsible Official – Dana Douglas **Date**

615-603-6812

Quality Assurance Officer – Josh Martin **Date**

636-900-4123

Laboratory Manager – Dana Douglas **Date**

615-603-6812

QA Manual Template

Quality Manual Review for the Hideaway WWTP					
Date					
Reviewer					

TABLE OF CONTENTS

1.0 Quality Policy Statement

This quality manual is intended for the laboratory operations of the Hideaway WWTP. This laboratory provides analysis of samples as required by the National Pollutant Discharge Elimination System (NPDES) permit issued to Limestone Water Utility Operating Company, LLC UOC (CSWR) and analysis of process samples to ensure proper operation of the Hideaway WWTP. Only the samples required to be analyzed under the NPDES permit are covered by this quality system.

Quality Policy Statement
The laboratory management is committed to providing the necessary resources and to defining acceptable laboratory practices in the quality documentation to ensure compliance with 40 CFR part 136 and the permit requirements. Management's policy is to ensure the information in quality documentation is communicated to, implemented, and understood by all the laboratory staff performing work in the laboratory.

The quality manual documents the policies and references the procedures to ensure that test data generated for submittal to the Department of Environment and Conservation Division of Water Resources - ***Nashville Environmental Field Office at 1-888-891-TDEC; are scientifically acceptable as defined by the method performance criteria.***

The objectives of the laboratory are to produce data of known and documented quality in order to demonstrate conformance to the permit and laboratory accreditation requirements. The objectives are measured with internal audits and evaluated as part of the management review.

The Hideaway WWTP aims to produce data that is in compliance with permit # SOP-07090***, and pertinent regulations under the Department of Environment and Conservation Water Quality Permit Program.***

2.0 Organization and Management Structure

This section should --

- describe the organization and management structure of the laboratory,
- indicate its place in any parent organization, and
- describe the functional responsibility, level of authority, and interrelationship or lines of communication of all personnel who manage, perform or verify work affecting the quality of testing and analysis.

Each manager and employee of the laboratory shall have a clear understanding of his or her duties and responsibilities and the relationship of those responsibilities to the overall work of the laboratory.

2.1 Organizational Chart

Sasha Huven, Lab Tech
Robert Schaaf, Lab Tech
Dana Douglas, Regional Manager
Josh Martin, Compliance Tech
Joe Stoops, Compliance Manager

2.2 Management Responsibilities

Management has the overall responsibility for the technical operations and the authority needed to generate the required quality of laboratory operations. Management includes the Laboratory Manager and the Quality Assurance Officer.

2.3 Job Descriptions of Staff Positions

The Laboratory Manager(if applicable) is responsible for:

- *ensuring the supervision of all personnel employed by the laboratory.*
- *ensuring the quality of data produced by the laboratory.*
- *training and keeping personnel up to date on laboratory procedures, operation of instrumentation, and laboratory support equipment.*
- *appointing personnel in the absence of laboratory staff.*
- *review and approve any quality manual changes and associated quality documentation.*

The Quality Assurance Officer is responsible for:

- *implementing and overseeing the quality system.*
- *review and approve any quality manual changes and associated quality documentation.*

The Laboratory Technician is responsible for:

- *performing technical laboratory tests and procedures.*
- *adhering to the quality assurance plan.*
- *reporting deviations from the quality assurance plan and taking necessary action to bring the quality management system back into compliance.*

2.4 Personnel Qualifications

Laboratory Manager: Dana Douglas

Quality Assurance Officer: Documented training or experience in quality assurance and quality control procedures and knowledgeable in the quality system. (if applicable)

Laboratory Technician: Documented demonstration of capability for each method.

2.5 Identification of Approved Signatories

The following individuals are authorized to sign laboratory reports:

Dana Douglas, Area Supervisor
Sasha Huven, Lab Tech
Josh Martin, Compliance Tech
Robert Schaaf, Lab Tech

3.0 Ethics Policy and Data Integrity

See www.epa.gov/quality/bestlabs.html for quality management tools related to data integrity and ethics. The link provided there to the American Council of Independent Laboratories Environmental Sciences Publications page includes a representative code of ethics and an ethics and data integrity agreement. In the example below, training is discussed. No policy statement material is provided.

The laboratory has developed an ethics policy and established procedures to educate and train personnel in their ethical and legal responsibilities. The laboratory performs routine data review to ensure the records are complete and that they demonstrate ethical conduct. Data integrity procedures are part of this quality manual.

The ethics agreement defines the employees' ethical and legal responsibilities, including the potential punishments and penalties for improper, unethical, or illegal actions.

4.0 Document Control

The purpose of the document control system is to ensure that only the most recent revisions of SOPs, worksheets, forms, logs, etc. are available to the appropriate personnel, are timely, and receive the required approvals. All internal regulatory documentation, standard operating procedures, work instructions, service manuals, and product instructions are under document control. The Quality Assurance Officer is responsible for the document control system and keeps a master list of the location of all documents and their current revision. The Laboratory Manager and the Quality Assurance Officer approve all newly released and revised documents. Worksheets, forms, and logbooks are designed to include all information pertinent to the

analysis or task performed. Each worksheet, form, and logbook includes a unique identifier. Worksheets and forms have a revision number and effective date. Attachment 3 lists documents in use at Hideaway WWTP.

5.0 Subcontracting Sample Analysis and Review of New Work

5.1 Subcontracting of Sample Analysis

Any subcontracting of work for regulatory reporting shall be subcontracted to laboratories accredited under **TNLAP** whenever possible. A chain of custody form is used to track samples from wastewater sampling activities to the subcontracting laboratory. The chain of custody lists the tests requested for analysis.

5.2 Review of New Work

All new work is initiated by the Laboratory Manager-Technician who delegates responsibilities for the new work according to available resources. Staff will meet prior to the initiation of new work in order to determine if appropriate facilities and resources are available. The Laboratory Manager shall review and approve any new testing plan before commencing such work. After an agreement is reached, facilities and resources are organized to perform the work efficiently. For any new testing requirements, the designated employee shall write a standard operating procedure and demonstrate the capability to perform those tests prior to reporting results. The SOP(s) shall be under document control, and a Demonstration of Capability Statement(s)shall be on file.

6.0 Purchasing

Instructions: This section should contain a description of the laboratory's procedures for selecting and purchasing services and supplies used for testing.

Lab Manager will create a work order to track the purchase date and the type of the new equipment being put into use.

7.0 Complaints

All complaints about the laboratory’s activities are documented in a complaint file maintained in the laboratory. The file contains the date and name of the person receiving the complaint, a description of the complaint, the source of the complaint, the resolution, and any written material accompanying the complaint. A corrective action form is used to document the complaint.

The Quality Assurance Officer investigates complaints and promptly investigates all areas of activity and responsibility involved. The written results of the investigation, including actions taken by the laboratory are reviewed by the Laboratory Manager. The results of the investigation are signed and dated by the Laboratory Manager-Technician and the Quality Assurance Officer.

8.0 Departures from documented policies and procedures or from standard specifications

The Laboratory Manager-Technician has the responsibility for ensuring adherence to the laboratory's policies and procedures. Arrangements for known and controlled departures from documented policies and procedures are allowed. Planned departures do not require audits; however, the departure will be fully documented and include the reason for the departure, the affected SOP(s), the intended results of the departure, and the actual results. If the data reported to TDEC(State) are affected adversely, the TDEC will be notified in writing. The procedure used to document any specific departure affecting DEQ data is the same as the corrective action procedure.

9.0 Corrective Action

(Attachment 5 provides a sample Corrective Action Form that can be used to document corrective actions.)

Corrective actions are the result of concerns regarding work performed by the laboratory, detected problems, or nonconformance and may be from clients, laboratory personnel, assessors or any person or organization with concerns. Records of the concern, nonconformance or complaint and subsequent actions are maintained.

The laboratory takes corrective action whenever unacceptable conditions exist, or departures from policies and procedures occur. The following indicators are used to determine unacceptable conditions:

- QC samples outside of the established acceptance criteria
- Calibrations outside acceptable criteria
- Equipment failure
- PT studies outside acceptable limits
- Non-conformance identified during internal reviews
- Non-conformance identified during ODEQ on-site inspections
- Non-conformance or problems identified after receiving a question or complaint

Once an unacceptable condition is identified, the laboratory investigates the problem and outlines a corrective action plan.

Corrective action may include, but is not limited to, one or all of the following:

- Re-analysis of samples
- Re-calculation of results
- Re-calibration of instrument
- Preparation of new standards
- Re-analysis of blanks

- Dilution of samples
- Additional analyst training
- Replace equipment or supplies
- Re-sampling
- Recalled analysis results or amended reports

TYPE	RECOMMENDED ACTION	DOCUMENTATION
Contaminated Method Blank (Chemistry)	1. Determine source of contamination. 2. Eliminate the source of contamination. 3. Re-analyze blank.	Worksheet/log book
LCS outside acceptance limit (Chemistry)	1. Check preparation log for errors 2. Check analysis for errors 3. Check calculations 4. Remake standard or use a different standard 5. Re-analyze standard and all affected samples 6. Run a matrix spike	Worksheet/log book
Positive/Negative controls (Microbiology)	1. Check expiration date of the media 2. Check media preparation 3. Confirm incubator temperatures 4. Prepare new media from same lot. If still not acceptable, prepare new media from different lot 5. Examine analytical technique	Work sheet/log book
Analyst not following the SOP (All methods)	1. Provide additional training 2. Do demonstration of performance 3. Analyze a PT sample	Analyst training file Work sheet/log book

All corrective actions are documented. A corrective action form may be used for issues that warrant more detailed documentation.

10.0 Records Management

The laboratory has implemented a record management system that allows the historical reconstruction of all laboratory activities. The laboratory keeps a record of each environmental analysis for at least three years as required by environmental regulation.

The laboratory maintains the following records: Sample Results, Benchsheets, Calibration logs, Maintenance Records, and Change of Custody

11.0 Internal Quality System Audits

The Compliance Manager arranges for an internal quality system review annually. The audit is carried out by trained personnel who are independent (if possible) of the activity being audited. The review assesses the requirements of the quality assurance manual against laboratory operations, and laboratory operations against the laboratory's quality assurance manual and SOPs.

The results of the audits are documented in writing. Where audit findings cast doubt on the validity or correctness of the data, the laboratory will take immediate corrective action. Any corrective actions are documented. The Laboratory Manager ensures that the corrective actions are discharged within the agreed-upon time frame. Any authority whose work was possibly adversely affected shall be notified in writing.

12.0 Management Review

The laboratory management annually reviews the laboratory quality system and its testing and calibration activities to introduce necessary changes or improvements. The review takes into account the outcome of recent internal audits, inspections by external bodies (e.g. DEQ), the results of interlaboratory comparisons, the results of proficiency tests, any changes in the volume and type of work undertaken, feedback from authorities or others, and corrective actions. The findings and any corrective actions from this review are documented.

13.0 Personnel Training

Before conducting any analysis, each analyst receives training by another analyst or supervisor who has completed training. An analyst in training is supervised by an experienced individual.

In addition to in-house training, additional training may be provided to the analyst in the form of educational courses, professional seminars, and continuing proficiency testing.

Analyst training and performance is considered complete after the analyst has produced a successful initial demonstration of method capability for the analysis for which he/she is responsible. In addition, acceptable results from a proficiency testing sample or internal blind quality control sample are documented for the analyst.

All training is documented and kept on file. At a minimum, documentation includes the analyst's name, the reference method/SOP, the training dates, the person providing training, the initial demonstration of method capability (if appropriate), and PT results (if appropriate). To document the training, the Hideaway Laboratory uses a training form for each analytical procedure. After successful training and demonstration, the Laboratory Manager-Technician and Quality Assurance Officer sign the Demonstration of Capability Form as certification of the analyst's performance.

14.0 Facilities and Environmental Conditions

Testing occurs only within the laboratory. Laboratory space is maintained and monitored to the specifications required. Electronic balances are located away from drafts and doorways and mounted on marble slabs in areas where their use is affected by vibrations.

The laboratory is kept clean. Attention is given to good housekeeping at all times. The laboratory is designed, and activities are conducted, so that sample contamination is avoided. The laboratory has adequate lights and ventilation. When required, laboratory temperature and barometric pressure are monitored; the acceptable range is defined in the test method to ensure the proper operation of instrumentation. As defined in Standard Operating Procedures, appropriate data corrections are made using these monitored values (such as in the BOD method). If environmental conditions are outside the defined method limits, results are qualified.

15.0 Test Methods and Validation

Instructions: This section should contain a description of the test methods the laboratory uses. The laboratory maintains an in-house method manual for each certified analyte or test method. The manual may consist of copies of published or referenced methods or standard operating procedures written by the laboratory. Attachment 4 provides an SOP format that includes the sections or references for a test method. The description should include references to the specific method and technology used, the detection and reporting limits. The section should contain a discussion of the demonstration of the initial method performance or validation.

15.1 List of Analytical Tests, Parameters, Method Reference, MDL, and Reporting Limits

All sampling for SOP-07090 Hideaway is done in accordance with Standard Methods 23rd edition. CBOD, TSS, NH3, Total Phosphorous, and Total Nitrogen are collected and stored in an incubator until picked up by a state-certified laboratory for analysis.

15.2 Conducting Demonstration of Method Performance

Prior to implementation of a method, the laboratory prepares an initial demonstration of method performance in accordance with method specifications. When the approved method does not specify initial demonstration of performance, the laboratory uses the following guidelines as

described in Standard Methods 1020B :

- Determination of Limit of Detection (LOD)
- Determination of Limit of Quantitation (LOQ)
- Evaluation of Precision and Bias
- Evaluation of Selectivity

Initial demonstration of method performance must be repeated each time significant changes are made to instrumentation, personnel, or the method. Initial demonstration of performance is documented in Demonstration of Capability records. The process for conducting method validation and/or initial demonstration of performance is included in the Lab SOPS

16.0 Equipment, Reagents, Supplies, and Reference Materials

All equipment, reagents, supplies, and reference materials necessary for analyses are kept on hand for the specific analysis for which the Hideaway Laboratory performs.

For calibrations of analytical instrumentation, the laboratory uses standards that assure that measurements made by the laboratory are traceable to national standards of measurement, such as NIST traceable standards (when available) or certified reference materials. To achieve traceability of measurements, the laboratory maintains detailed records identifying the analyst(s) responsible for each step of the analytical processes, the origin of all consumables, standards, and reagents used, unique identification of analytical instruments used, calibration records for all equipment used, dates and times of analyses conducted, procedures used for preparing reagents and for analyzing samples, and unique identification of each sample analyzed. Calibration procedures are established for all applicable tests. These procedures are detailed in the SOP for analysis.

16.1 Laboratory equipment

- All equipment is properly maintained. Procedures for maintenance of equipment are documented in SOPs and equipment manuals.
- Any defective equipment or part is removed from service and labeled until repaired. Equipment or parts are not put back in service until the laboratory demonstrates that it is functioning correctly.
- All routine and non-routine maintenance and repairs are documented in laboratory records including Benchsheets, log books, and utility cloud.
- Calibration records are maintained for all measuring equipment. See laboratory bench sheets and logs.
- Laboratory Support Equipment. All laboratory support equipment is calibrated, or verified, or both, before being put into service, and on a continuing basis. The

procedures for calibrating and verifying the laboratory support equipment are found in the SOPs and equipment manuals.

16.2 Reagents and supplies

- Glassware is properly cleaned and maintained as specified in the SOPs. Any cleaning or maintenance requirements specified in the approved test procedure are followed.
- Analytical reagent-grade materials, if available, are used by the laboratory.
- The laboratory does not use prepared reagents, standards, or purchased chemicals outside the expiration date of the material.
- All stock and standard solution containers are labeled with content, preparation date, expiration date, concentration, and initials of the analyst preparing the solution. For the preparation of reagents, standards, and rinsing glassware, the laboratory uses the water of the purity and quality specified by the Standard Operating Procedure, published method, or regulation. [

16.3 Reference materials

- To ensure accurate and precise measurements, the laboratory uses reference materials traceable to a national standard of measurement where commercially available, such as NIST, or are traceable to certified reference materials.
- The laboratory retains the Calibration Certificates of Reference Materials to demonstrate their traceability.
- The laboratory has a program and procedure for calibrating or re-certifying its reference standards (e.g., Class 1 or 2 weights or equivalent thermometers).
- The original containers are labeled with an expiration date.

16.4 Listing of Laboratory Equipment and Reference Materials

LABORATORY EQUIPMENT AND REFERENCE MATERIALS			
Name	*Brand*	*Model*	*Date Placed in Service*
Balance	*Mettler*	*AE1000C*	*1995*
Vacuum Pump	*Fisher Scientific*	*5KH36KN906X*	*1996*
BOD Incubator	*Precision Scientific*	*815*	*2005*
DO Meter	*Hach*	*HQ 10*	*2005*

LABORATORY EQUIPMENT AND REFERENCE MATERIALS			
Name	*Brand*	*Model*	*Date Placed in Service*
Refrigerator	*G E Select*		
Laboratory Oven	*Quinly*	*20 GC*	
DO Meter	HQ	40d	
Colorimeter	Hach	DR/820	
pH meter	Thermo Scientific	Dual Star	
Balance	Satorial		
Spectroline	Spectroline	CM-10A	
Incubator	Quinly	12-140	
Quanti-tray	Quanti	2x	
Influent Sampler	Sentinel	M96	
Effluent Sampler	Sentinel	M96	
Gas detector	Evoqua		
Gas Feed Pump	Evoqua		

LABORATORY EQUIPMENT AND REFERENCE MATERIALS			
Name	*Brand*	*Model*	*Date Placed in Service*

16.5 Calibration and Maintenance Procedures and Frequency

All laboratory equipment is calibrated daily before each use, as well as annually by an outside source to verify functioning correctly. Refer to section 16.4 for laboratory equipment. All

17.0 Samples

Instructions: This section should contain information concerning the laboratory's sample acceptance policy and how samples are identified, tracked, and stored. This section should also address the disposal of samples. (Note: The laboratory may want to include the requirements for sample collection, handling, preservation, and holding times here or they can have a separate document. The laboratory may want to include a table specific to its required monitoring.)

Example:

Each sample is uniquely identified from collection to disposal. All samples are identified on the outside of the sample bottle. Each sample is recorded in the sample log.

17.1 Sample Acceptance Policy

After sample collection and transportation to the facility, the laboratory will verify the integrity of the sample by checking for the following items:

- *Leakage or breakage.*
- *Completeness of sample collection logs.*
- *Correct sample identification.*
- *Appropriate use of sample labels (such as water resistant) and use of permanent ink.*
- *Use of appropriate sample containers, adequate volume, preservation, and holding time as required by specific test methods and 40 CFR Part 136. All testing is done in accordance with Standard Methods 23rd*

Edition

- *Temperature of samples requiring thermal preservation (checked and recorded at time of sampling).*

When the sample received does not meet the acceptance requirements, the condition of the sample is documented and the sample is rejected and re-collected in accordance with the laboratory's written sample acceptance policy. Samples that are out of temperature parameters, or in other such ways that would disqualify testing shall be discarded and re-sampled.

All samples are logged into the sample logbook. Samples are tracked through chain of custody forms and benchsheets.]

17.2 Storage of Samples in the Laboratory

The laboratory will store samples, sub-samples, and/or other preparation products, such as extracts or digests, according to the specified conditions in the approved methodology. All samples, sub-samples, etc., will be protected from contamination, deterioration, or damage sources.

17.3 Sample Disposal

The laboratory follows its waste management plan or chemical safety program for sample disposal appropriate for the samples handled and wastes generated. Wastewater samples are disposed of in the laboratory drain. Any material determined to be hazardous for disposal in a sanitary sewer will be taken to a hazardous disposal site.
Samples are disposed of accordingly.

18.0 Assuring the Quality of Test Results

The specific quality control requirements of the test methods performed by the laboratory or the specific quality control requirements.

Instructions: This section should describe or reference the laboratory's quality control procedures used in running its test methods. The laboratory must follow the specific quality control procedures that are required by the test methods run by the laboratory. Laboratories using test methods that do not have quality control procedures associated with them must use the quality controls specified in 40 CFR 136.7. Laboratories using the test methods published by *Standard Methods* must use the quality controls published in the separate pertinent section of *Standard Methods* if the method does not specify the quality controls required (e.g., 1020, 2020, 3020, 4020, 5020). The laboratory should set out in detail in this section of the manual the specific quality controls for the method or provide a reference to the test method SOP that includes the required quality controls for the method. This section should also describe the proficiency testing the laboratory is performing for its test methods. NOTE: Detailed examples are not given in this section. The laboratory should go to the applicable section Standard Methods or 40 CFR part 136.7 for guidance in outlining the quality control requirements for each test method. *Information stated in SOPs does not have to be re-stated in the Quality Manual*.

The laboratory demonstrates the quality of analytical results through the implementation of a quality control plan.

18.1 Quality Control Samples

Refer to the SOP on quality control samples.

19.1 Procedures to Ensure Reported Data are Free from Errors

Data Validation:
The analyst performing the analysis verifies all data. The data review is to include the following items:

- Calibration of the instrumentation. (Confirm the calibration criteria are met.)
- Quality control data. (Confirm QC meets the acceptance criteria.)
- Calculations. (Check for calculation errors.)
- Documentation. (Check worksheets, logbooks, and printouts for accuracy and completeness.)

Before final reporting is done, data are validated by the Lab Manager and the Compliance Manager to verify that all quality control measures are reviewed and evaluated and to ensure the reported data are free from transcription and calculation errors. [

19.2 Procedures for Data Qualifiers
Data qualifiers are added to all data not meeting collection, analytical, or internal QC acceptance criteria.

19.3 Procedures for Reporting Analytical Results

Results of testing will be reported to Regulatory Agencies Via NetDMR and MORs

20.0 Glossary

"Acceptance criteria" means specified limits placed on characteristics of an item, process, or service defined in requirement documents.

"Accuracy" means the degree of agreement between an observed value and an accepted reference value. Accuracy includes a combination of random error (precision) and systematic error (bias) components that are due to sampling and analytical operations. Accuracy is an indicator of data quality.

"Aliquot" means a portion of a sample taken for analysis.

"Analyst" or "laboratory technician" means the designated individual who performs the "hands-on" analytical methods and associated techniques and who is the one responsible for applying required laboratory practices and other pertinent quality controls to meet the required level of quality. (NELAC)

"Analyte" means the substance or physical property to be determined in samples examined.

"Analytical method" means a technical procedure for providing analysis of a sample, defined by a body such as the Environmental Protection Agency or the American Society for Testing and Materials, which may not include the sample preparation method.

"Audit" means a systematic evaluation to determine the conformance to quantitative and qualitative specifications of some operational function or activity.

"Batch" means environmental samples that are prepared together or analyzed together or both with the same process and personnel, using the same lot or lots of reagents. "Analytical batch" means a batch composed of prepared environmental samples (extracts, digestates or concentrates) that are analyzed together as a group. An analytical batch can include prepared samples originating from various environmental matrices and can exceed 20 samples. "Preparation batch" means a batch composed of one to 20 environmental samples of the same matrix that meets the criteria in this definition for "batch" and with a maximum time between the start of processing of the first and last sample in the batch to be 24 hours.

"Blank" means a sample that has not been exposed to the analyzed sample stream in order to monitor contamination during sampling, transport, storage or analysis. The blank is subjected to the usual analytical and measurement process to establish a zero baseline or background value and is sometimes used to adjust or correct routine analytical results. Blanks include the following types:

1. Field blank. A blank prepared in the field by filling a clean container with pure deionized water and appropriate preservative, if any, for the specific sampling activity being undertaken.

2. Method blank. A sample of a matrix similar to the batch of associated samples (when available) that is free from the analytes of interest and is processed simultaneously with and under the same conditions as samples through all steps of the analytical procedures, and in which no target analytes or interferences are present at concentrations that impact the analytical results for sample analyses.

"Calibration" means to determine, by measurement or comparison with a standard, the correct value of each scale reading on a meter, instrument, or other devices. The levels of the applied calibration standard should bracket the range of planned or expected sample measurements.

"Calibration curve" means the graphical relationship between the known values, such as concentrations, of a series of calibration standards and their instrument response.

"Calibration standard" means a substance or reference material used to calibrate an instrument.

"Certified reference material" means a reference material, one or more of whose property values are certified by a technically valid procedure, accompanied by or traceable to a certificate or other documentation issued by a certifying body.

"Commercial environmental laboratory" means an environmental laboratory where environmental analysis is performed for another person.

"Corrective action" means the action taken to eliminate the causes of an existing nonconformity, defect, or other undesirable situation in order to prevent a recurrence.

“DEQ” or “ODEQ” means the Oregon Department of Environmental Quality.

"Demonstration of capability" means establishing the analyst’s ability to generate data of acceptable accuracy and precision.

"Detection limit" means the lowest concentration or amount of the target analyte that can be determined to be different from zero by a single measurement at a stated degree of confidence.

"Document control" means ensuring that documents, and revisions to the documents, are proposed, reviewed for accuracy, approved for release by authorized personnel, distributed properly, and controlled to ensure the correct version is used at the location of the prescribed activity performed. (AQSC)

"Environmental laboratory" or "laboratory" means a facility or a defined area within a facility where environmental analysis is performed. A structure built solely to shelter field personnel and equipment from inclement weather shall not be considered an environmental laboratory.

"Facility" means something built or installed to serve a particular function.

"Field testing and measurement" means any of the following:

1. Any test for parameters under 40 CFR Part 136 for which the holding time indicated for the sample requires immediate analysis; or

2. Any test defined as a field test in federal regulation.

The following is a limited list of currently recognized field tests or measures that is not intended to be inclusive: continuous emissions monitoring; on-line monitoring; flow monitoring; tests for pH, residual chlorine, temperature and dissolved oxygen; and field analysis for soil gas.

"Finding" means an inspection conclusion that identifies a condition having a significant effect on an item or activity. An inspection finding is normally a deficiency and is normally accompanied by specific examples of the observed condition.

"Holding time (or maximum allowable holding time)" means the maximum time that a sample may be held prior to analysis and still be considered valid or not compromised.

"Internal standard" means a known amount of standard added to a test portion of a sample as a reference for evaluating and controlling the precision and bias of the applied analytical method. (NELAC)

"International System of Units (SI)" means the coherent system of units adopted and recommended by the General Conference on Weights and Measures.

"Laboratory control sample" or "LCS" means a sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes. It is generally used to establish intra-laboratory or analyst specific precision and bias or to assess the performance of all or a portion of the measurement system. "Laboratory control sample" or "LCS" may also be named laboratory fortified blank, spiked blank, or QC check sample.

"Laboratory duplicate" means aliquots of a sample taken from the same container under laboratory conditions and processed and analyzed independently. (NELAC)

"Laboratory manager" means the person who has overall responsibility for the technical operation of the environmental laboratory and who exercises actual day-to-day supervision of laboratory operation for the appropriate fields of testing and reporting of results. The title of this person may include but is not limited to laboratory director, technical director, laboratory supervisor or laboratory manager.

"Legal entity" means an entity, other than a natural person, who has sufficient existence in legal contemplation that it can function legally, be sued or sue and make decisions through agents as in the case of corporations.

"Limit of detection" or "LOD" means an estimate of the minimum amount of a substance that an analytical process can reliably detect. An LOD is analyte and matrix specific and may be laboratory dependent.

"Limit of quantitation" or "LOQ" means the minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence.

"Matrix" means the component or substrate that may contain the analyte of interest.

a. Drinking water. Any aqueous sample that has been designated a potable or potential potable water source.

b. Non-potable water. Any aqueous sample that has not been designated a potable or potential potable water source. Includes surface water, groundwater, effluents, water treatment chemicals, and TCLP or other extracts.

c. Saline/estuarine. Any aqueous sample from an ocean, estuary, or other saltwater source.

c. Solid and chemical materials. Includes soils, sediments, sludges, products, and byproducts of an industrial process that result in a previously defined matrix

d. Biological tissue. Any sample of a biological origin, such as fish tissue, shellfish, or plant material. Such samples shall be grouped according to origins.

e. Air and emissions. Whole gas or vapor samples, including those contained in flexible or rigid wall containers and the concentrated analytes of interest from a gas or vapor collected with a sorbent tube, impinger solution, filter, or other devices.

d. Nonaqueous liquid. Any organic liquid with less than 15% settleable solids.

f. Solids. Includes soils, sediments, sludges, and other matrices with more than 15% settleable solids.

g. Chemical waste. A product or by-product of an industrial process that results in a matrix not previously defined.

h. Air and emissions. Whole gas or vapor samples, including those contained in flexible or rigid wall containers and the concentrated analytes of interest from a gas or vapor collected with a sorbent tube, impinger solution, filter, or other devices.

"Matrix spike (spiked sample or fortified sample)" means a sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. Matrix spikes are used, for example, to determine the effect of the matrix on a method's recovery efficiency.

"Matrix spike duplicate (spiked sample or fortified sample duplicate)" means a second replicate matrix spike prepared in the laboratory and analyzed to obtain a measure of the precision of the recovery for each analyte.

"Method detection limit" means one way to establish a limit of detection, defined as the minimum concentration of a substance (an analyte) that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte. (NELAC)

"National Environmental Laboratory Accreditation Conference (NELAC)" is a voluntary organization of state and federal environmental officials and interest groups to establish mutually acceptable standards for accrediting environmental laboratories. A subset of NELAP.

"National Environmental Laboratory Accreditation Program (NELAP)" means the overall National Environmental Laboratory Accreditation Program of which NELAC is a part.

"National Institute of Standards and Technology" or "NIST" means an agency of the U.S. Department of Commerce's Technology Administration that is working with EPA, states, NELAC, and other public and commercial entities to establish a system under which private sector companies and interested states can be certified by NIST to provide NIST-traceable proficiency testing (PT) samples.

"Negative control" means measures to ensure that a test, its components, or the environment do not cause undesired effects or produce incorrect test results.

"Noncommercial environmental laboratory" means either of the following:

1. An environmental laboratory where environmental analysis is performed solely for the owner of the laboratory.

2. An environmental laboratory where the only performance of environmental analysis for another person is one of the following:

a. Environmental analysis performed by an environmental laboratory owned by a local government for an owner of a small wastewater treatment system treating domestic sewage at a flow rate of less than or equal to 1,000 gallons per day.

b. Environmental analysis performed by an environmental laboratory operated by a corporation as part of a general contract issued by a local government to operate and maintain a wastewater treatment system or a waterworks.

c. Environmental analysis performed by an environmental laboratory owned by a corporation as part of the prequalification process or to confirm the identity or characteristics of material supplied by a potential or existing customer or generator as required by a hazardous waste management permit under DEQ rules.

d. Environmental analysis performed by an environmental laboratory owned by a Publicly Owned Treatment Works (POTW) for an industrial wastewater source under a permit issued by the POTW to the industrial source as part of the pretreatment program requirements.

e. Environmental analysis performed by an environmental laboratory owned by a county authority for any municipality within the county's geographic jurisdiction when the environmental analysis pertains solely to the purpose for which the authority was created.

f. Environmental analysis performed by an environmental laboratory owned by an authority or a sanitation district for any participating local government of the authority or sanitation district when the environmental analysis pertains solely to the purpose for which the authority or sanitation district was created.

"Owner" means anyone who owns, operates, leases, or controls an environmental laboratory.

"Preservation" means refrigeration and/or reagents added at the time of sample collection or later to maintain the sample's chemical and/or biological integrity. (NELAC)

"Person" means an individual, corporation, partnership, association, company, business, trust, joint venture or other legal entity.

"Physical," for the purposes of fee test categories, means the tests to determine the physical properties of a sample. Tests for solids, turbidity, and color are examples of physical tests.

"Positive control" means measures to ensure that a test or its components are working properly and producing correct or expected results from positive test subjects.

"Precision" means the degree to which a set of observations or measurements of the same property, obtained under similar conditions, conform to themselves. Precision is an indicator of data quality. Precision is usually expressed as standard deviation, variance, or range in absolute or relative terms.

"Primary accrediting authority" means the agency or department designated at the territory, state or federal level as the recognized authority with the responsibility and accountability for granting NELAC accreditation to a specific laboratory for a specific field of accreditation.

"Proficiency test or testing (PT)" means evaluating a laboratory's performance under controlled conditions relative to a given set of criteria through analysis of unknown samples provided by an external source.

"Proficiency test (PT) field of testing" means the approach to offer proficiency testing by matrix, technology/method, and analyte/analyte group.

"Proficiency test (PT) sample" means a sample, the composition of which is unknown to both the analyst and the laboratory provided to test whether the analyst or laboratory or both can produce analytical results within specified acceptance criteria.

"Proficiency testing (PT) program" means the aggregate of providing rigorously controlled and standardized environmental samples to a laboratory for analysis, reporting of results, statistical evaluation of the results and the collective demographics and results summary of all participating laboratories.

"Program," in the context of a regulatory program, means the relevant U.S. Environmental Protection Agency program such as the water program under the Clean Water Act (CWA), the air program under the Clean Air Act (CAA), the waste program under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA or Superfund) or the waste program under the Resource Conservation and Recovery Act (RCRA).

"Publicly Owned Treatment Works (POTW)" means a treatment works as defined by § 212 of the CWA, which is owned by a state or municipality (as defined by § 502(4) of the CWA). This definition includes any devices and systems used in the storage, treatment, recycling, and reclamation of municipal sewage or industrial wastes of a liquid nature. It also includes sewers, pipes, and other conveyances only if they convey wastewater to a POTW treatment plant. The term also means the municipality as defined in § 502(4) of the CWA, which has jurisdiction over the indirect discharges to and from such treatment works.

"Quality assurance" means an integrated system of activities involving planning, quality control, quality assessment, reporting, and quality improvement to ensure that a product or service meets defined standards of quality with a stated level of confidence.

"Quality assurance officer" means the person who has responsibility for the quality system and its implementation. The quality assurance officer may also be the laboratory manager where staffing is limited.

"Quality control" means the overall system of technical activities whose purpose is to measure and control the quality of a product or service to meet users' needs.

"Quality control sample" or "QC sample" means a sample used to assess the performance of all or a portion of the measurement system. QC samples may be certified reference materials, a quality system matrix fortified by spiking, or actual samples fortified by spiking. (NELAC)

"Quality manual" means a document stating the management policies, objectives, principles, organizational structure and authority, responsibilities, accountability, and implementation of an agency, organization, or laboratory, to ensure the product's quality and its product's utility to its users.

"Quality system" means a structured and documented management system describing an organization's policies, objectives, principles, organizational authority, responsibilities, accountability, and implementation plan for ensuring quality in its work processes, products

(items), and services. The quality system provides the framework for planning, implementing, and assessing work performed by the organization and for carrying out required quality assurance and quality control.

"Range" means the difference between the minimum and maximum of a set of values.

"Reference material" means a material or substance, one or more properties of which are sufficiently well established to be used to calibrate an apparatus, assess a measurement test method, or assign values to materials.

"Reference standard" means a standard, generally of the highest metrological quality available at a given location, from which measurements made at that location are derived.

"Responsible official" means one of the following, as appropriate:

1. If the laboratory is owned or operated by a private corporation, "responsible official" means (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function or any other person who performs similar policy-making or decision-making functions for the corporation or (ii) the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated in accordance with corporate procedures.

2. If the laboratory is owned or operated by a partnership, association, or a sole proprietor, "responsible official" means a general partner, an officer of the association, or the proprietor, respectively.

3. If the laboratory is owned or operated by a governmental body, "responsible official" means a director or highest official appointed or designated to oversee the operation and performance of the activities of the environmental laboratory.

4. Any person designated as the responsible official by an individual described in subdivision 1, 2 or 3 of this definition, provided the designation is in writing, the designation specifies an individual or position with responsibility for the overall operation of the environmental laboratory, and the designation is submitted to DEQ.

"Sample tracking" means procedures employed to record the possession of the samples from the time of sampling until analysis, reporting, and archiving. These procedures include the use a Chain of Custody Form that documents the collection, transport, and receipt of compliance samples to the laboratory. In addition, access to the laboratory is limited and controlled to protect the integrity of the samples. (NELAC)

"Sampling" means the act of collection for the purpose of analysis.

"Sewage" means the water-carried human wastes from residences, buildings, industrial establishments, or other places together with such industrial wastes and underground, surface, storm, or other water as may be present.

"Simple test procedures" means any of the following:

1. Field testing and measurement performed in an environmental laboratory.

2. The test procedures to determine:

    a. Biochemical oxygen demand (BOD);

    b. Fecal coliform;

    c. Total coliform;

    d. Fecal streptococci;

    e. E. coli;

    f. Enterococci;

    g. Settleable solids (SS);

    h. Total dissolved solids (TDS);

    i. Total solids (TS);

    j. Total suspended solids (TSS);

    k. Total volatile solids (TVS); and

    l. Total volatile suspended solids (TVSS).

"Spike" means a known mass of target analyte added to a blank sample or sub-sample, used to determine recovery efficiency or for other quality control purposes. (NELAC)

"Standard operating procedure (SOP)" means a written document that details the method of an operation, analysis or action whose techniques and procedures are thoroughly prescribed and which is accepted as the method for performing certain routine or repetitive tasks.

"Standardized reference material (SRM)" means a certified reference material produced by the U.S. National Institute of Standards and Technology or other equivalent organization and characterized for absolute content, independent of the analytical method.

"Statistical Minimum Significant Difference (SMSD)" means the minimum difference between the control and a test concentration that is statistically significant, a measure of test sensitivity or power. The power of a test depends in part on the number of replicates per concentration, the significance level selected, e.g., 0.05, and the type of statistical analysis. If the variability remains constant, the test's sensitivity increases as the number of replicates increases. (NELAC)

"System laboratory" means a noncommercial laboratory that analyzes samples from multiple facilities having the same owner.

"TCLP" or "toxicity characteristic leachate procedure" means Test Method 1311 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, as incorporated by reference in 40 CFR 260.11. This method is used to determine whether a solid waste exhibits the characteristic of toxicity (see 40 CFR 261.24).

"Test" means a technical operation that determines one or more characteristics or performance of a given product, material, equipment, organism, physical phenomenon, process or service according to a specified procedure.

"Test method" means an adoption of a scientific technique for performing a specific measurement as documented in a laboratory standard operating procedure or as published by a recognized authority.

"Test sensitivity/Power" means the minimum significant difference (MSD) between the control and test concentration that is statistically significant. It is dependent on the number of replicates per concentration, the selected significance level, and the type of statistical analysis. (NELAC)

"Traceability" means the property of a result of a measurement whereby it can be related to appropriate standards, generally international or national standards, through an unbroken chain of comparisons.

"U.S. Environmental Protection Agency" means the federal government agency with responsibility for protecting, safeguarding, and improving the natural environment (i.e., air, water, and land) upon which human life depends.

"Validation" means the confirmation by examination and provision of objective evidence that the particular requirements of a specific intended use are fulfilled. (NELAC)

"Verification" means confirming by examination and providing evidence that specified requirements have been met. (NELAC) NOTE: In connection with the management of measuring equipment, verification provides a means for checking that the deviations between values indicated by a measuring instrument and corresponding known values of a measured quantity are consistently smaller than the maximum allowable error defined in a standard, regulation or specification peculiar to the management of the measuring equipment. The result of verification leads to a decision to restore in service, perform adjustment, repair, downgrade,

or declare obsolete. In all cases, it is required that a written trace of the verification performed shall be kept on the measuring instrument's individual record.

"Wastewater" means liquid and water-carried industrial wastes and domestic sewage from residential dwellings, commercial buildings, industrial and manufacturing facilities and institutions.

"Waterworks" means each system of structures and appliances used in connection with collecting, storing, purifying, and treating water for drinking or domestic use and the distribution thereof to the public, except distribution piping.

"Working range" means the difference between the limit of quantitation and the upper limit of measurement system calibration. (NELAC)

Definition Sources

American Society for Quality Control (ASQC), Definitions of Environmental Quality Assurance Terms, 1996

National Environmental Laboratory Accreditation Conference (NELAC), 2003 Standards.

Attachment 1 Organization Chart

Attachment 2 Signature Page

(List as appropriate)

Laboratory Manager-Technician [Name]

Signature	Initials	Date

Quality Assurance Officer [Name]

Signature	Initials	Date

Attachment 3 *Example:* Document Listing

(The following are examples and should be modified/expanded to fit the operation.)

Document Number	Document Name	Revision Number
SOP 001	Biochemical Oxygen Demand	1
SOP 002	Total Suspended Solids	3
SOP 003	Ph	1
SOP 004	Fecal Coliform	2
		1
WS001	Biochemical Oxygen Demand Worksheet	1
WS002	Total Suspended Solids Worksheet	1
WS003	pH Work Sheet	1
WS004	Fecal Coliform	2
		1
TR001	Analyst Training Form	1
TR002	Demonstration of Capability	1
MR001	Management Review Format	1
IA001	Internal Audit Form	1
CA001	Corrective Action Form	1

Attachment 4 Test Method SOP Format

HEADER

SOP # Effective Date:
Revision #:
Laboratory Manager Approval: _____ Date:_____

Quality Assurance Officer Approval :_____ Date:_____

SOP NAME

1. Identification of test method

Indicate the title of the method or alternative names for the method as used by the laboratory or found in the laboratory records.

2. Applicable matrix or matrices

List the applicable matrix for the method.

3. Method detection limit

List the method detection limit or reference the location where this information is found. Also include the quantitation limit listing for each analyte or define the relationship between the MDL and QL to allow personnel to determine these and document in the record or report format rather than the SOP. Define the location of the information if referenced and not presented in the SOP.

4. Scope and application, including components to be analyzed

This section outlines the method's purpose, range, limitations, and intended use and identifies the analytes or compounds measured with the method.

5. Summary of the test method

This section provides an overview of the method procedure and quality assurance.

6. Definitions

This section includes definitions of terms, acronyms, and abbreviations used in the method. Definitions may be provided in a glossary at the end of the method or quality manual if preferred. In this case, the definitions section appears in the method, with a notation that definitions are provided in a glossary in the specified location.

7. Interferences

This section identifies known or potential interferences that may occur during the use of the method and describes ways to reduce or eliminate interferences. If there are no interferences as part of the test method, then state,“ No interferences known or identified for this method.” Do not leave this section blank. Do not remove the section.

8. Safety

This section describes special precautions needed to ensure personnel safety during the performance of the method. Procedures described here should be limited to those which are above and beyond good laboratory practices. The section contains information regarding specific toxicity of analytes or reagents.

9. Equipment and supplies

This section lists and describes all non-consumable supplies and equipment needed to perform the method.

10. Reagents and standards

This section lists and describes all reagents and standards required to perform the method and provides preparation instructions and/or suggested suppliers as appropriate. Indicate the quality of the reagents and standards. This section is used to ensure the purchase of the appropriate quality of materials.

11. Sample collection, preservation, shipment, and storage

This section provides requirements and instructions for collecting, preserving, shipping, and storing samples.

12. Quality control

This section cites the procedures and analyses required to document the quality of data generated by the method fully. The required components of the laboratory's quality assurance (QA) program and specific quality control (QC) analyses are described in this section. For each QC analysis, the complete analytical procedure, the frequency of required analyses, and the interpretation of results are specified.
Note: Some test methods may contain specific QC elements and may specify QC acceptance criteria for each of those elements.

13. Calibration and standardization

This section describes the method/instrument calibration and standardization process and required calibration verification. Corrective actions are described for cases when performance specifications are not met.

14. Procedure

This section describes the sample processing and instrumental analysis steps of the method and provides detailed instructions to analysts.

15. Calculations

This section provides instructions for analyzing data and equations and definitions of constants used to calculate final sample analysis results.

16. Method performance

This section provides method performance criteria for the method, including precision/bias statements regarding detection limits and source and/or limitations of data produced using the method. This section provides the information for the analyst or data reviewer to ensure the method is performed consistently with a defined and measured performance specification.

17. Pollution prevention

This section describes aspects of the method that minimize or prevent pollution known to be or potentially attributable to the method. Reference may be made to a separate document where this is located if found in a waste management or other document.

18. Data assessment and acceptance criteria for quality control measures

This section defines the specific quality control acceptance criteria for the method. This may be presented in a table or other format. Describe how the data is assessed, who is responsible, and the documentation required. Place the reference here if the information is referenced in another SOP or document.

19. Corrective actions for out-of-control data

Describe some possible solutions for correcting the problem to ensure the data is returned to control or the person to contact if the method is out of control. Possible maintenance options to try before running samples may be placed in this section.

20. Contingencies for handling out-of-control or unacceptable data

Describe how to handle the data when it is not acceptable, such as the process for reporting and qualifying (or flagging) data.

21. Waste management

This section describes the minimization and proper disposal of waste and samples. Refer to the document where this is located if found in a waste management or other document.

22. References

This section lists references for source documents and publications that contain ancillary information. Note: Each SOP should be a free-standing document, providing all information necessary for the method user to perform the method.

23. Any tables, diagrams, flowcharts, and validation data

This section contains all method tables and figures (diagrams and flowcharts), and may contain or reference the location of method validation data.

ADDITIONAL NOTES:

Changes to SOPs should be documented with a Change Log that accompanies the current version and captures the timeline and content of changes. A sample format is below:

Date:	Revision #:	Summary of Changes:	Submitted By:	Approved By/Date:	Effective Date:

Attachment 5 CORRECTIVE ACTION (CA) FORM

LABORATORY NAME: _____ EPA ID: _____

DEPARTMENT OR ANALYSIS TYPE: _____

EVENT NAME / CATEGORY___ _____LOG # _____
Example names/categories: QC failure; PT failure; customer complaint; sample mishandled by lab; instrument malfunction; reporting error, etc. THE LOG NUMBER IS A UNIQUE IDENTIFIER ASSIGNED BY THE LABORATORY.

RESPONSIBLE SUPERVISOR / MANAGER: _____

PERSON COMPLETING CA FORM (NAME, TITLE): _____ DATE: _____

The QA Manager retains all Corrective Action reports in an organized system. The Log # is used to ensure all CAs are uniquely identified. Filing records by Log # is recommended; complete records will account for all Log #s. The Event Name/Category is used to track CAs for trends/patterns.

RECORD INFORMATION BELOW OR ATTACH ADDITIONAL SHEETS. PROVIDE DOCUMENTATION WHENEVER POSSIBLE.

EVENT DESCRIPTION:
Describe the nonconforming event or analysis result. Include details of staff member notified, date and time of notification, customer or outside involvement, analysis data, etc., as applicable. Attach any documentation that supports and/or supplements this description. If PT Failure, attach copy of PT report.

EVENT RESPONSE / INVESTIGATION STEPS:
Indicate the response(s) to the nonconformance, including all processes or raw data reviewed, QA or Management staff notified, analysis repeated, analysis halted, etc.

ROOT CAUSE DETERMINATION:

State the root cause (reason) for the nonconformance with the analysis or process.

CORRECTIVE ACTION (CA) FORM (cont'd)

ACTION(S) TAKEN TO RESOLVE ISSUE AND PREVENT RECURRENCE: *Include SOP revision, staff training, purchase of standards or equipment, document/form revision, etc.*

Corrective Action(s)	Contact Person Responsible	Proposed Implementation Date	Date Completed	Evidence Of Completion
Additional Comments/Supplemental Information:				

Submitted By:		Date:
Reviewed By:	Responsible Supervisor or Manager	Date:

By signature and comments below, the QA Manager and Laboratory Director or Technical Manager approve this corrective action plan and the proposed implementation date(s) given. The QA Manager or designee will provide follow-up until the corrective action is closed with documentation/evidence of completion as noted above.

Approved By:	Quality Assurance Manager	Date:
Approved By:	Laboratory Director or Technical Manager	Date:
Reviewer Comments or Additional Actions Recommended:		

Closing the Corrective Action: The QA Manager is responsible for effectiveness review. The CA should stay OPEN for a sufficient time to ensure all stated actions were taken and address/solve the initial issue.

Corrective Action Closed By QA Manager: Signature: _____ Date:_____

OPERATIONS MANAGEMENT PLAN

Hideaway STP

College Grove, Tennessee

Prepared for:

Hideaway Operators

Lab Technicians

LAST UPDATE:

08-15-2023

1 Introduction

This Operations Plan has been prepared to assist the plant staff in College Grove, TN to properly monitor and control the wastewater treatment plant to consistently meet Central State Water Resources (CSWR) objective of perfect compliance.

An overview of the facility, including process components and general operational approach, is discussed in the following section. Detailed process monitoring and target set points are shown later in the Operations Strategy.

This Plan also contains the sampling plan for the facility. While there is some latitude on collecting and analyzing process samples, the permit samples noted in the plan MUST be collected in accordance with the approved TDEC permit, unless unusual circumstances prevent their collection as required.

The operator schedule outlines a rational methodology for accomplishing all the required tasks to operate and maintain the facility, complete all lab testing and documentation, and meet all safety and regulatory requirements. While circumstances, such as sewer calls, may alter this schedule, the tasks must still be completed. This schedule was prepared by the plant staff that is required to accomplish these tasks. When the staff in the project believes the schedule is not workable, they should revise it and include an updated schedule in this section.

The overall objective of the facility's operation is to ensure continuous compliance with the permit limits shown in the table below.

Attached Refer to SOP-07090 for monitoring requirements.

2 Facility Description

This section discusses the basic purpose of each process in the plant and what process units/equipment are provided for each. Operating parameters are shown in the Operations Strategy that follows and in more detail in the Unit Process Control Plan (UPCP) for each process.

2.1 Overall Plant

The Hideaway WWTP is a 0.1175 MGD BNR Lagoon and trickling filter type facility. The Hideaway WWTP treats municipal wastewater.

Wastewater enters the facility and follows the following treatment process:

Stage	Process(es)
Pre-Treatment (prior to headworks)	eOne Grinder stations
Primary Treatment	Bar Screen
Secondary Treatment	Activated Sludge 3 Stage Lagoon-Trickling Filter Attached Growth Cambrian BNR and Secondary Clarification
Tertiary Treatment	Disinfection

Pre-treatment is provided by eOne grinder stations at each home connected to the system. These stations grind solids material prior to arrival at the facility. Primary treatment via a bar screen that mechanically removes large debris. Secondary Treatment is the activated sludge process. Secondary Treatment utilizes mechanical blower units to provide mixing and aeration. Effluent from the aeration basin flows directly into the final clarifier. A telescopic valve is used to control both the sludge blanket in the clarifier and RAS rate. The final clarifier effluent gravity flows to the chlorine contact chamber for disinfection. After the disinfection process, effluent treated water is discharged to a receiving Outfall 001 to Harpeth River at mile 68.8.

Waste sludge is hauled away from WWTP by septic haulers and disposed of per TDEC requirements.

Facility Design Parameters

Parameter	Units	Design Capacity
Flow	MGD	0.25

When the design loading on the plant is achieved the design parameters will be reviewed and confirmed that it can meet the NPDES Permit limits listed above. The plant is currently meeting permit limits.

2.2 Pre-treatment

Pre-treatment is provided by individual residential eOne grinder stations. These stations help to minimize main line blockages and larger solids from inadvertently entering the treatment process.

2.3 Primary Treatment

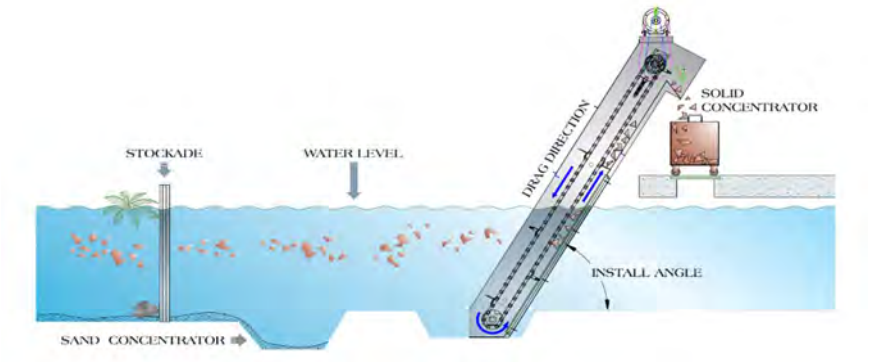
Primary treatment removes material that will either float or readily settle out by gravity. It includes the physical processes of screening, grit removal, and sedimentation.

Primary treatment processes at this plant consist of the following:

Process	Components
Bar Screen	Bar Screen and compactor

2.3.1 Bar Screen

A bar screen is a mechanical filtration device with large openings that captures coarse solids that may otherwise damage downstream equipment or negatively affect the treatment process. Typical bar screens are self-cleaning and are either triggered by a rise in the upstream water level or are set on timers.



The bar screen has the following specifications:

Component	Quantity	Description	Location
Bar Screen	1	Bar screen physically removes large solids.	

2.4 Secondary Treatment

Secondary, or biological treatment, uses microorganisms to biologically remove contaminants from wastewater. Secondary biological processes can be aerobic or anaerobic, each process utilizing a different type of bacterial community. These processes remove dissolved and colloidal compounds measured as biochemical oxygen demand (BOD), total suspended solids (TSS), ammonia and other compounds undesirable in the final effluent.

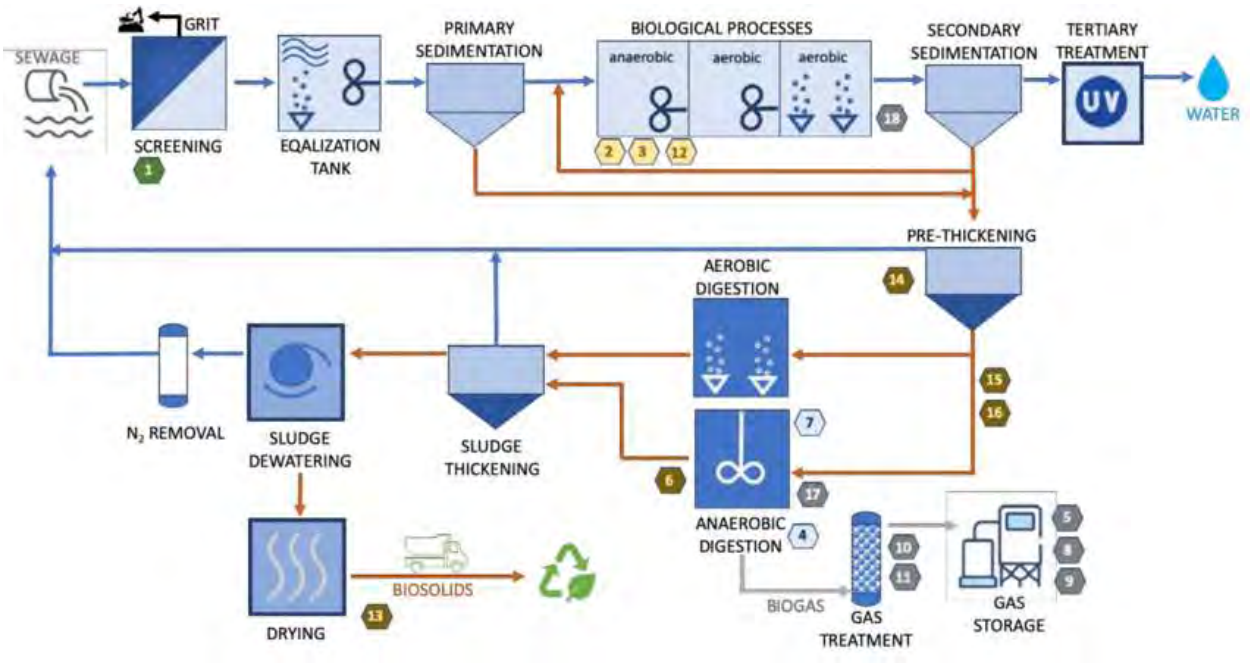
Secondary treatment processes at this plant consist of the following:

Process	Components
Activated Sludge and Clarification	3 Stage BNR lagoon and trickling filter-attached growth BNR type process known as Cambrian system and one (1) secondary clarifier.

2.4.1 Activated Sludge-Attached Growth

PROCESS OBJECTIVE:

The process takes advantage of aerobic micro-organisms that can digest organic matter in sewage, and clump together (by flocculation) as they do so. It thereby produces a liquid that is relatively free from suspended solids and organic material, and flocculated particles that will readily settle out and can be removed.



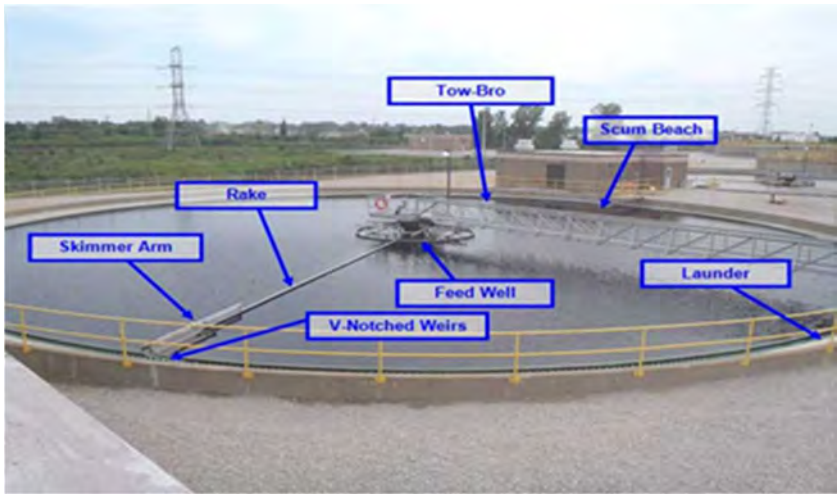
GENERAL STRATEGY:

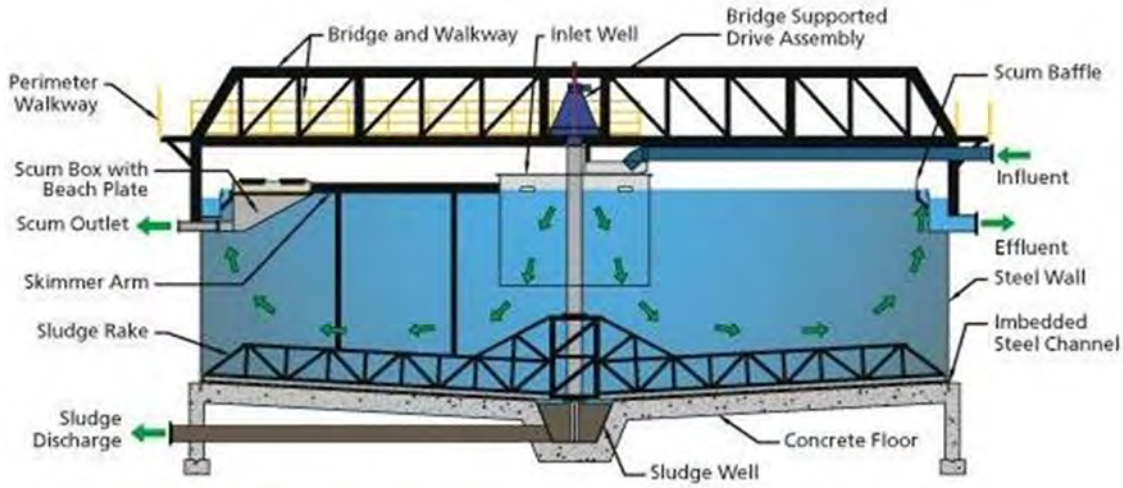
The activated sludge process is biological in which microorganisms oxidize and mineralize organic matter (the Cambrian unit process is a combination of a suspended and attached growth AS process). All microorganisms enter the system with the influent wastewater. The composition of the species depends not only on the influent wastewater but also on the design and operation of the wastewater treatment plant. Microorganisms are kept suspended either by blowing air into the tank or using agitators. Microorganisms use oxygen to oxidize organic matter. To maintain the microbiological population, sludge from the settler is recirculated to the aerated tank.

The growth of the microorganisms and influent particulate inert matter is removed from the process as excess sludge. The excess sludge flow rate controls microorganism concentration.

2.4.3 Secondary Clarification

The objective of treatment by secondary clarification that follows the Cambrian system is to produce a clarified effluent. All sludge from the secondary clarifier is sent through the facility influent pump station and ultimately returned to the primary clarifier(s) to be settled with primary solids.





GENERAL STRATEGY:

- Limit Hydraulic Load by Placing the Correct Number of Clarifiers in service based on hydraulic and solids loading rates. (See Table Above.)
- Hydraulic balancing is required when multiple clarifiers are placed in service. Based on Average DT, WOR, SLR & SoLR. (See Table Above.)
- Waste Secondary Sludge should be continuous. The exception is during excessive flow periods in excess of 0.10MGD.
- During flow periods above 0.10 MGD rate, sludge wasting should be conducted twice daily in the morning, after obtaining meter readings, and before the end of a shift in the afternoons.
- Maintain target sludge blanket depth of 1.0 feet.
- Clarifier visual observations should include, but are not limited to:
    - Wastewater should be slightly grey.
    - No gasification or floating solids present.
    - No odors present. It should have a humus / earthy aroma.
    - Rotation of the scum skimmer/sludge collector arm.

- Secondary clarifier sludge is less thick than primary clarifier sludge.

2.5 Tertiary Treatment

Tertiary treatment provides a final treatment stage to further improve the effluent quality before it is discharged.

2.4.4 Turbo Disc Filters

Turbo Disc filters provide filtration to prevent pin floc and other debris that may inadvertently be discharged from the effluent pumping station.

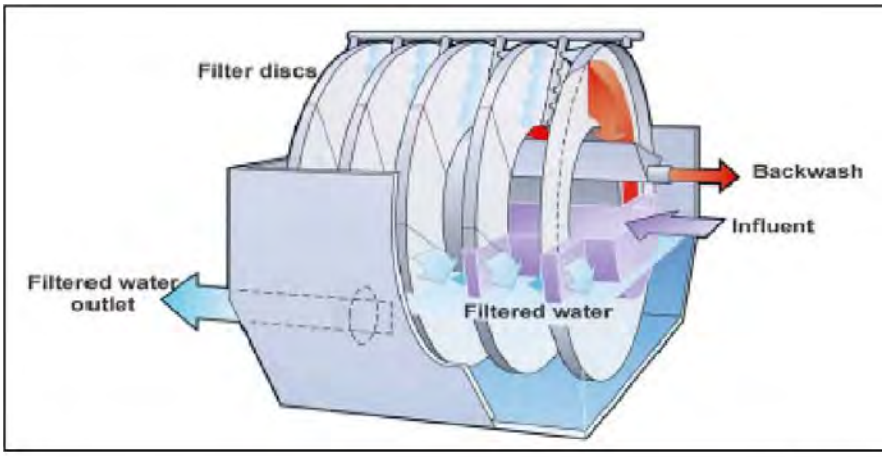


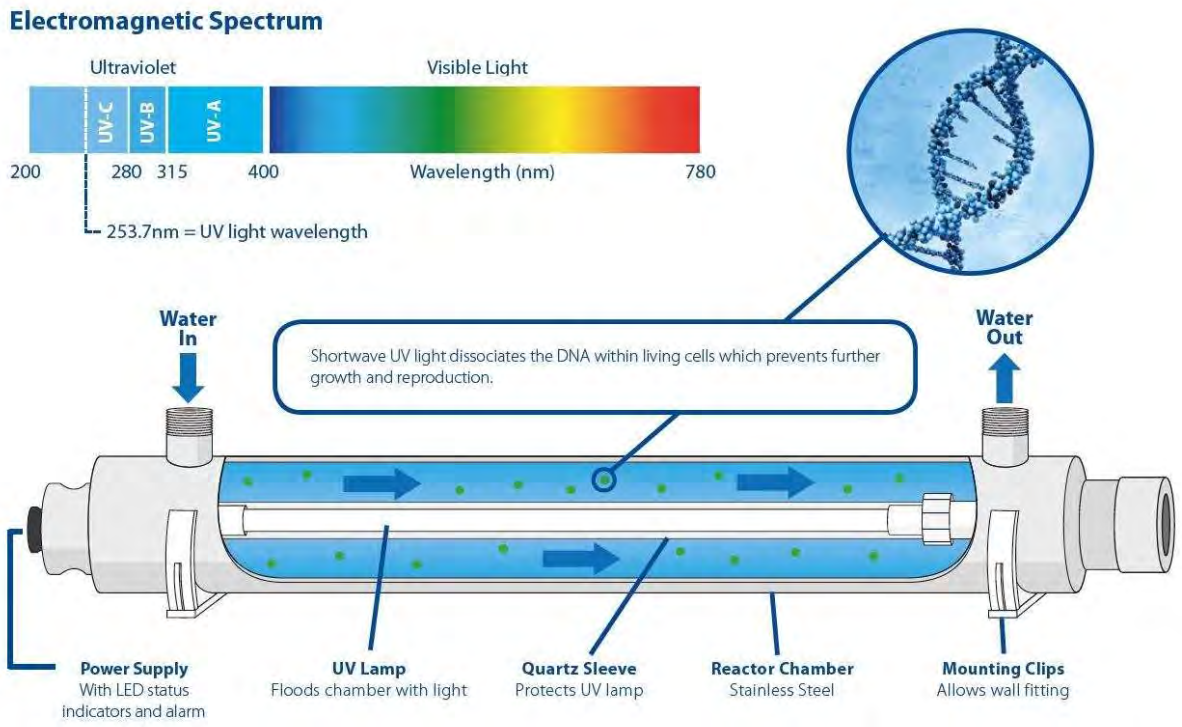
Figure 2

2.4.5 Disinfection

Good, efficient disinfection requires a high-quality effluent and adequate contact time.

Process Objective

The purpose of the UV facility is to disinfect the final effluent, killing E-coli coliforms to levels below the license limit.



General Strategy:

Wastewater generally requires disinfection to meet specific bacterial limits before discharge to surface waters. The main objective of disinfection is to reduce the number of waterborne pathogens to safe levels, thereby lowering the risk of exposing the public to infectious diseases. The persistence of some pathogens in receiving waters and soils indicates that disinfection of wastewater effluents provides the first line of defense for drinking water from surface water or groundwater.

The disinfection process has the following specifications:

Component	Quantity	Description	Location
UV	2	Flow through closed channel Evoqua UV system	Discharge piping

2.6 Effluent Discharge

Following treatment, the effluent is discharged to sub-surface drip irrigation.

3 Control Parameters

Process Control Strategy			
Project Name	Hideaway WWTP	Date/Revision	08-15-2023
Process Overview	The Hideaway Wastewater Treatment Plant is a 0.1175 MGD activated sludge process designed to achieve full nitrification. The plant has the following processes: Screening and three (3) stage lagoon with mechanical blowers, final clarifier, turbo disc filters, and UV disinfection prior to drip irrigation. The sludge system consists of 1 holding tank that is utilized for sludge thickening.		
Control Strategy	Wastewater is passed through the preliminary treatment and flows to the oxic-anoxic-oxic three-cell lagoons to the Cambrian BNR system followed by secondary clarification. Sludge is wasted to maintain a constant solids inventory in the Cambrian system. Inventory is determined and changed based on plant loading, volatile content and basin temperature. Waste sludge is removed by sludge hauling contractor when needed and disposed of according to TDEC regulations.		

Process	Parameter	Units	Design	Minimum	Maximum
Aerobic Suspended Biomass	TSS	Mg/L	2,100 – 3,100		
Aerobic WASss Biomass	TSS	Mg/l	6,300		
Activated Sludge	DO	mg/L	0 – 3.0		
Activated Sludge	pH		0 – 14		
Anoxic Biomass	TSS	Mg/L	2,100 – 3,100		

3.1 Mass Balance

The BNR system at the Hideaway Wastewater Plant is currently still in the build out phase. Until the design flow and OLR is achieved, design performance cannot be verified.

Due to the above constraints, wasting frequencies will be determined as plant loadings come in line with design flows. To date, the current influent loading has not generated enough solids accumulation to warrant wasting.

3.2 Solids Processing

Wasting operation requires monitoring of numerous variables. When solids need to be removed from the facility the following process needs to be followed to thicken and waste the maximum percent solids at a low cost.

1) Process testing results will determine if solids under aeration need to be removed to maintain proper treatment.

2) Waste and Contact Local Septic hauling to schedule removal of solids.

3) To achieve a higher percentage of solids concentration to be hauled away, follow the listed steps prior to Septic Hauler arriving.

4) Wasting will be done based upon D.O.B. (depth of blanket) in clarifier and digester volume.

5) When wasting is warranted, waste sludge will be transferred from the sludge holding tank to the sludge dewatering dumpster. To date, the current influent loading has not generated enough solids accumulation to warrant wasting.

6) Complete sludge hauling work order located in Utility Cloud (CMMS). Upload picture of hauling manifest into work order to document the removal of solids for state reporting requirements.

7) Need to grab sludge sample and run percent solids, Test results will be used to calculate total pounds of MLSS removed from process.

8) A manifest of solids removal will be kept onsite as required by the permit, to include solids percentage, tonnage, and disposal location.

4 Sampling Plan

Proper sampling is required to determine the efficiency of the process, to meet CSWR standards and to comply with Federal Law. The samples that are routinely collected in the Hideaway WWTP are shown in the attached document. Highlighted samples are required by the NPDES Permit under which the facility operates. All sampling points are labeled to clearly identify where the sample is to be collected. The sampling points are shown on the attached sampling location drawing.

Refer to the Laboratory Procedures for proper collection and storage of samples, chain of custody requirements and quality assurance/quality control requirements.

The Wastewater Plant Sampling plan is detailed in another document titled “Sampling Plan.”

5 Facility Maintenance

CSWR utilizes the Computerized Maintenance Management System (CMMS), Utility Cloud to facilitate field work, inspections, maintenance schedules, and reporting for the Hideaway WWTP. This allows CSWR to manage data, work, and compliance across plant and distributed field assets. Utility Cloud has been implemented to assist in avoiding compliance and equipment failures with real-time data monitoring across people, machines, and sensors throughout the wastewater system.

As part of the CMMS maintenance and regulatory tracking program, the requirements for the facility have been implemented in Utility Cloud. Scheduled work can be auto generated in Utility Cloud with notifications being sent via email. If field staff have questions or concerns pertaining to work orders, please contact their immediate supervisor for clarity. When the staff in the project believe maintenance and/or regulatory requirements need to be changed or updated, staff will need to contact the CSWR IT Team to make the necessary changes to the CMMS.

Items and tasks that are available in Utility Cloud:

- NPDES Sampling schedules and COCs
- NPDES Permit information uploaded, and Certified Lab results tracked and uploaded.
- Preventative maintenance schedules were established for all major pieces of equipment.
- Preventative maintenance schedules for major collection and distribution tasks e.g., hydrant flushing, sewer jetting, and manhole inspection.
- All corrective action work orders for CSWR Assets, based on manufacturer recommendations.
- All Customer facing work orders dispatched from Customer Service Call Center and following the Customer service procedure for weekend and holiday calls.
- Uploading O&M Manuals for assets and Facilities and SOPs for facility operations.

6 Operator Schedule

The schedule for routine operations tasks has been established to ensure the major tasks required for proper operation of the facility and required by the operating permit are completed as required.

Variations in the schedule that are required based on operating conditions will be discussed at the monthly meeting during normal workdays. Other schedule changes during the normal workday or after hours or on weekends should be reviewed by the Plant Manager or Operations Supervisor to ensure that all required tasks are being completed.

Digester load based on previous 90-days operating data

Biomass calculation - Orbal		**Orbal Total Load**		**Digester Total Load**				**DESIGN DATA**	
Orbal MLSS, gal 2% volume feed	0.04	BOD, lbs	4170	BOD, lbs	2027	Target		**Biomass**	
MLVSS concentration, mg/l	3080	TSS, lbs	4670	TSS, lbs	3133	MLVSS, lbs	24,000	Total Orbal volume, cft	276002
Mass of bugs, lbs per transfer	1027	OLR, lbs 1,000		OLR, lbs 1,000		based on		Total Orbal volume, mg	2.0
		cuft/day	15.1	cuft/day	13.7	current		Current MLSS, mg/l	3500
Biomass calculation - Clarification		Total Hydraulic		Total Hydraulic		OLR		VSS %	0.88
Sec Clar MLSS, mg/l	1874	DT	24.8 hrs	DT	15.5 hrs			MLVSS, mg/l	3080
Mass of bugs, lbs from transfer	17189			Target F/M	0.08			Total VSS in Orbal, lbs	51374
Assume a total of 7 transfers to meet target MLVSS, lbs									

		50% feed/day	25% feed/day	10% feed/day	**Food**	
Influent BOD						
Maximum influent flow, gpd	2.0	1.0	0.5	0.1	Average Design Inf Flow, total, MGD	2.00
BOD concentration, mg/l	143	143	143	143	Flow split Orbal & Digester	90/10
Daily BOD load potential, lbs	2385	1193	596	119	Influent Flow to Digester, MGD	0.2
					Inf BOD concentration, mg/l	143
F/M at maximum possible	2.32	1.16	0.58	0.12	Daily BOD load to Digester, lbs	239
					F/M Digester based on initial transfer from Secondary Clarification	**0.014**

Use ONLY 10% influent and increased in daily increments of 10

Projecting 10-days for digester to start receiving 100% Q.

Digester load based on previous 90-days operating data

Biomass calculation - Digester		**Orbal Total Load**		**Orbal Current Total Load**			
Digester MLSS, gal 7% volume feed	0.08	BOD, lbs	4170	BOD, lbs	2027	Target	
MLVSS concentration, mg/l	3080	TSS, lbs	4670	TSS, lbs	3133	MLVSS, lbs	22,000
Mass of bugs, lbs per transfer	2055	OLR, lbs 1,000		OLR, lbs 1,000		based on	
Assume a total of 12 transfers to meet target MLVSS, lbs		cuft/day	15.1	cuft/day	7.3	current	
		Total Hydraulic		Total Hydraulic		OLR	
		DT	24.8 hrs	DT	29.6		
				Target F/M	0.09		

Influent BOD		50% feed/day	25% feed/day	10% feed/day
Maximum influent flow, gpd	2.0	1.0	0.5	0.1
BOD concentration, mg/l	143	143	143	143
Daily BOD load potential, lbs	2385	1193	596	119
F/M at maximum possible	1.16	0.58	0.29	0.06

Use ONLY 10% influent and increased in daily increments of 10
Projecting 10-days for Orbal to start receiving 100% Q.

DESIGN DATA

Biomass	
Total Orbal volume, cft	276002
Total Orbal volume, mg	2.0
Current MLSS, mg/l	3500
VSS %	0.88
MLVSS, mg/l	3080
Total VSS in Orbal, lbs	51374

Food	
Average Design Inf Flow, total, MGD	2.00
Flow split Orbal & Digester	90/10
Influent Flow to Orbal, MGD	0.2
Inf BOD concentration, mg/l	143
Daily BOD load to Orbal, lbs	239
F/M Orbal based on target MLVSS, lbs from Secondary Clarification	**0.116**

September 12th, 2023

Ms. Christina Wingett
Division of Water Resources
Nashville Field Office
711 R.S. Gass Blvd
Nashville TN 37216

Sent Via email: Christina.Wingett@tn.gov

Re: State Operating Permit No. SOP-07090
Hideaway Wastewater Treatment Facility
Limestone Water UOC, LLC
College Grove, Williamson County, TN

Dear Ms. Wingett,

This letter is in response to violations requiring response by 9-13, numbered 8, 9, and 10 in the Compliance Evaluation Inspection and Notice of Violation dated July 10th, 2023. And also a follow up for item 7. Limestone Water purchases distressed small water and wastewater systems that often require extensive upgrades and repairs. Limestone Water transforms these utilities by using technology and innovation to quickly assess and invest in infrastructure that meets or exceeds state and federal standards. Based on your Inspection Report we understand the following deficiencies need addressed at this time:

Hideaway Wastewater Treatment Facility Deficiencies

7. *Provide written process control procedures and analyses as required in the permit for Proper Operation and Maintenance.*

    - Limestone Water had originally asked for an extension on the previous response sent to the Division on 8/8/23. However, all the required documents were able to be compiled quicker than anticipated. These documents were sent via email on 8/29/23.

8. *Remove the wastewater from the finishing pond as was indicated in the correspondence to the Division in 2017.*

    - A trash pump is onsite to transfer the short-term storage (STS) pond to the 3-cell lagoon. Wastewater is pumped from the STS lagoon to the main lagoon in stages as lagoon levels allow. The air is turned off for 24 hours before to allow any solids to settle at the bottom and then water is pumped off the top. Currently there are only a few feet of water left in the STS lagoon. Water will continue to be transferred to the main lagoon until it becomes feasible to remove the remaining

solids. I have included in Attachment 1 a recent picture of the STS lagoon taken on 9/11/23.

9. *Provide as-built specifications for what systems are "in the ground" at the facility.*

   - These as-built plans were sent via email through a provided SharePoint folder on August 8th, 2023, as an attachment to the first response. According to our records, plans were submitted on April 2, 2021, and approved by the division on May 18, 2021. Those plans were then revised to include the Long-Term Storage Mods and resubmitted to the Division on September 2, 2021, and approved on October 19, 2021. The changes to the process flow diagram are clouded on G-001.

10. *Investigate solids in the system and provide an explanation of the solids handling process.*

   - To date, no solids have been processed and removed from the facility. The operator for this facility has stated that the loading rate of the influent flow is low enough that, between the microorganisms and Cambrian system, no sludge wasting is necessary. We believe that the solids being seen in the system were from a past event prior to Limestone Water purchasing the system, where flow was bypassed to the STS lagoon for a repair. It is our understanding that no solids are currently being wasted through the system. As stated in item 8, the solids will be removed from the lagoon as soon as lagoon levels allow.

We appreciate your ongoing compliance assistance at our facilities throughout Tennessee. If you have any questions regarding this submittal, please contact me directly at 314-492-8425.

Sincerely,

Justin Lundgren

Justin Lundgren
EHS Compliance Coordinator

Attachment 1

November 7th, 2023

Ms. Christina Wingett
Division of Water Resources
Nashville Field Office
711 R.S. Gass Blvd
Nashville TN 37216

Sent Via email: Christina.Wingett@tn.gov

Re: State Operating Permit No. SOP-07090
Hideaway Wastewater Treatment Facility
Limestone Water UOC, LLC
College Grove, Williamson County, TN

Dear Ms. Wingett,

This letter is to serve as a follow up response to the Compliance Evaluation Inspection Notice of Violations dated July 10th, 2023. Specifically, item number eight. Which stated, "Remove the wastewater from the finishing pond as was indicated in the correspondence to the Division in 2017." As you can see in the image provided as "Attachment 1", the water level is down to the top of the diffusers and the operator has stated that there is no sludge build up to remove.

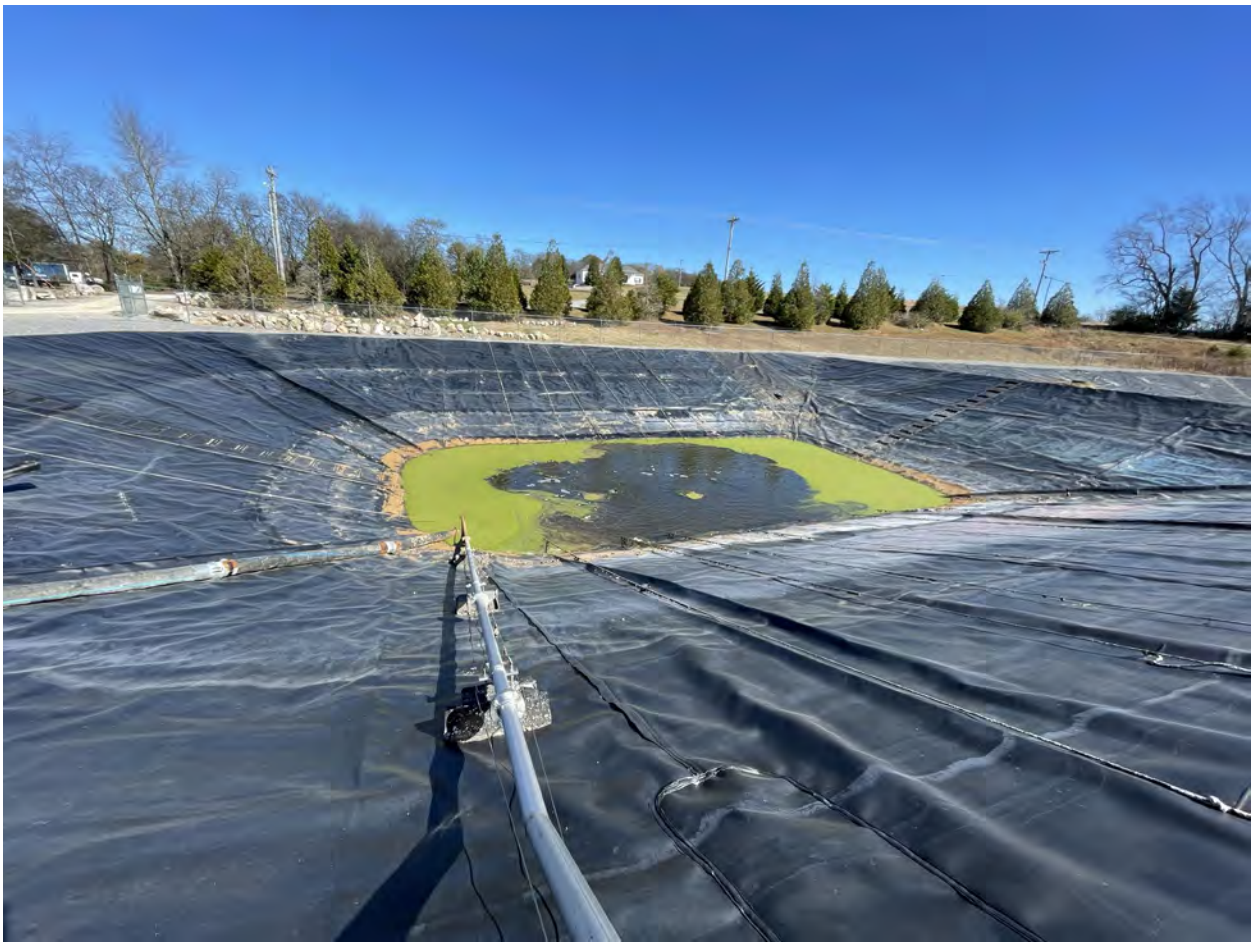
If you find this to be satisfactory, please advise so that we may put the finishing pond back into service and used as it was intended.

Thank you,

Justin Lundgren

Justin Lundgren
EHS Compliance Coordinator

Attachment 1



OFFICE CORRESPONDENCE
TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER POLLUTION CONTROL
KNOXVILLE ENVIRONMENTAL FIELD OFFICE

DATE: May 8, 2012

TO: Files

FROM: Bryan Epperson, Environmental Specialist

SUBJECT: Field Activity Report for Sunset Cove Condominiums

OBSERVATIONS

On May 3, 2012, I met with Terry Gunn and Jerry Lucas on site at Sunset Cove Condominiums. I was accompanied by Division of Water Pollution Control, Environmental Specialist Geoff Klein. Currently, there is one, twelve (12) unit condo building that has been erected. We also noticed signs advertising for sale, lots 13-18, adjacent to the condo building. I asked Mr. Gunn and Mr. Lucas if this was part of Phase II, and they said "probably". Since the condo only has 12 BR's, and the system has been built-out for 24 BR, they thought they could add four, three (3) BR homes on the Phase I drip system.

We located two tanks on the left side of the condo building. The original plans and the final engineering plans show one, 8000 gallon tank with a duplex pump, in a Biotube vault. The first tank was a Barger, 5000 gallon septic tank. The logo was visible, due to the exposed edge on the lower side. It is approximately two feet from the condo building. The other tank is setting parallel with this tank and is the pump tank. It has a pump assembly in a Biotube vault. The tank size is unknown. Mr. Lucas called the installer, Jeff Brownfield, who indicated it to be a 3000 gallon tank. According to meters on the side of the building, at least four of the units have electricity, and one is occupied.

We next verified the location and installation of the plant, including the re-circulation tank, duplex pumping assembly, recirculation splitter valve, UV disinfection assembly, telemetry and controls panel and AdvanTex pod filter system.

Lastly, we verified the location and installation of the drip irrigation field in the soil-mapped area. We located a blow-off valve cover in the field. We could also see the impression of the return line to the treatment plant. The ground was too dry to accurately ascertain the location of all the drip lines. We also noticed and located a well at the upper edge of the drip field. This well is shown on the soil map, by Soil Solutions. It is indicated on the preliminary and final engineering plans that the well was to be sealed by a licensed well driller, according to Division of Water Supply standards. We found no evidence of the well being sealed.

CONCLUSIONS & CONCERNS

Though there is an obvious installation of an AdvanTex Filter Treatment System and Drip Emitter Field, without a set of as-built plans and the discrepancies from the final engineering plans on file, I have the following concerns over the system in place:

1) The final engineering plans show the re-circulation tank as being a 10,000 gallon Xerxes, pre-manufactured tank. The tank on site appears to be a concrete tank. As-built plans or a record the tank purchase, showing the size, would need to be submitted.
2) The well next to the drip field has not been sealed. The minimum distance a well must be from a drip field is 50'. Currently, public water is not available. A grant has been applied for to run public water down Hickory Valley Road, but according to City of Maynardville officials, probably won't get that far, even if the grant becomes available. The current well in question serves an existing home, not in this development. The plant could not be put into service until the well issue is resolved.
3) Even though the plant and drip disposal field have been built-out for the 24 BR's, the question arises on how to get the additional flow from the sale of individual lots to the plant without appropriate easements for the STEP systems.
4) Currently, there is no set of plans for Phase II of this development, including soil mapping. The soils area proposed is across Hickory Valley Road and will require common easements for supply lines from the STEP/collection systems, as well as utility easements for road and utility crossings.

OFFICE CORRESPONDENCE
TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER POLLUTION CONTROL
KNOXVILLE ENVIRONMENTAL FIELD OFFICE

DATE: May 8, 2012

TO: Files

FROM: Bryan Epperson, Environmental Specialist

SUBJECT: Field Activity Report for Sunset Cove Condominiums

OBSERVATIONS

On May 3, 2012, I met with Terry Gunn and Jerry Lucas on site at Sunset Cove Condominiums. I was accompanied by Division of Water Pollution Control, Environmental Specialist Geoff Klein. Currently, there is one, twelve (12) unit condo building that has been erected. We also noticed signs advertising for sale, lots 13-18, adjacent to the condo building. I asked Mr. Gunn and Mr. Lucas if this was part of Phase II, and they said "probably". Since the condo only has 12 BR's, and the system has been built-out for 24 BR, they thought they could add four, three (3) BR homes on the Phase I drip system.

We located two tanks on the left side of the condo building. The original plans and the final engineering plans show one, 8000 gallon tank with a duplex pump, in a Biotube vault. The first tank was a Barger, 5000 gallon septic tank. The logo was visible, due to the exposed edge on the lower side. It is approximately two feet from the condo building. The other tank is setting parallel with this tank and is the pump tank. It has a pump assembly in a Biotube vault. The tank size is unknown. Mr. Lucas called the installer, Jeff Brownfield, who indicated it to be a 3000 gallon tank. According to meters on the side of the building, at least four of the units have electricity, and one is occupied.

We next verified the location and installation of the plant, including the re-circulation tank, duplex pumping assembly, recirculation splitter valve, UV disinfection assembly, telemetry and controls panel and AdvanTex pod filter system.

Lastly, we verified the location and installation of the drip irrigation field in the soil-mapped area. We located a blow-off valve cover in the field. We could also see the impression of the return line to the treatment plant. The ground was too dry to accurately ascertain the location of all the drip lines. We also noticed and located a well at the upper edge of the drip field. This well is shown on the soil map, by Soil Solutions. It is indicated on the preliminary and final engineering plans that the well was to be sealed by a licensed well driller, according to Division of Water Supply standards. We found no evidence of the well being sealed.

CONCLUSIONS & CONCERNS

Though there is an obvious installation of an AdvanTex Filter Treatment System and Drip Emitter Field, without a set of as-built plans and the discrepancies from the final engineering plans on file, I have the following concerns over the system in place:

1) The final engineering plans show the re-circulation tank as being a 10,000 gallon Xerxes, pre-manufactured tank. The tank on site appears to be a concrete tank. As-built plans or a record the tank purchase, showing the size, would need to be submitted.
2) The well next to the drip field has not been sealed. The minimum distance a well must be from a drip field is 50'. Currently, public water is not available. A grant has been applied for to run public water down Hickory Valley Road, but according to City of Maynardville officials, probably won't get that far, even if the grant becomes available. The current well in question serves an existing home, not in this development. The plant could not be put into service until the well issue is resolved.
3) Even though the plant and drip disposal field have been built-out for the 24 BR's, the question arises on how to get the additional flow from the sale of individual lots to the plant without appropriate easements for the STEP systems.
4) Currently, there is no set of plans for Phase II of this development, including soil mapping. The soils area proposed is across Hickory Valley Road and will require common easements for supply lines from the STEP/collection systems, as well as utility easements for road and utility crossings.