

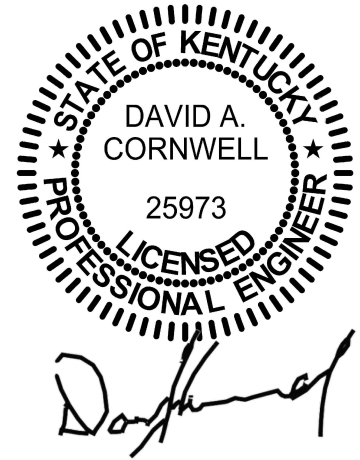


## **EXHIBIT A-6**

### **ADDENDA**

8/20/2026

**NORTHERN KENTUCKY WATER DISTRICT  
TAYLOR MILL TREATMENT PLANT  
TMTP UPGRADES & IMPROVEMENTS  
Project No. WX21117018**



**ADDENDUM NO. 1**

**July 13, 2026**

Addendum No. 1 includes modifications to the Bid Documents as described below. In addition to the noted modifications, responses and clarifications for questions received from prospective bidding contractors are provided:

The attention of all bidders is directed to the following changes in the Contract Documents:

Item 1. Minutes, Pre-Bid Meeting

Refer to Attachment 1-A enclosed with this addendum for a copy of the minutes from the non-mandatory pre-bid meeting on June 30, 2026.

Item 2. Refer to Attachment 1-B for responses to questions received by the Owner and/or Engineer.

Item 3. Plans, Sheet G1.0 (Site Plan)

Delete Note B for Site Safety Improvements Notes in its entirety along with all references shown. No ladder rung removal or new ladder work is required. The Contractor is still responsible for furnishing and installing davit sleeve systems as shown and specified on Sheet G1.0 for the five (5) locations - four (4) locations at the Residuals Building and one (1) outside location adjacent to the North Floc/Sed Basin.

Item 4. Section 001113, Invitation to Bid

Delete in its entirety

Insert new Section 001113, Invitation to Bid provided in Attachment 1-C.

Item 5. Section 004113, Bid Disclosure Form

Delete in its entirety

Insert new Section 004113, Bid Disclosure Form provided in Attachment 1-D.

Item 6. Section 010100, Summary of Work, Sect 1.1/A

Add new Item 11

"11. The Contractor shall furnish and install five (5) new davit sleeve systems as shown and specified on the Plans, Sheet G.1.0."

Item 7. Section 010170, Measurement and Payment, Section 1.3/C/1

Insert additional text at end of last sentence

"The Contractor shall also furnish and install five (5) new davit sleeve systems as shown and specified on the Plans, Sheet G.1.0."

Item 8. Section 010170, Measurement and Payment, Section 1.3/D/1

Insert additional text at end of last sentence

"The Contractor shall also furnish and install five (5) new davit sleeve systems as shown and specified on the Plans, Sheet G.1.0."

**\*\*\* NOTHING FOLLOWS \*\*\***

**\*\*\* BIDDERS MUST ACKNOWLEDGE RECEIPT OF THIS ADDENDUM IN THE SPACE PROVIDED ON THE BID FORM. FAILURE TO DO SO MAY RESULT IN REJECTION OF THE BID. \*\*\***

**ATTACHMENT 1-A**  
**PRE-BID MEETING MINUTES**



**Northern Kentucky Water District  
Taylor Mill Treatment Plant (TMTP)  
TMTP Upgrades & Improvements**

**(Non-Mandatory) Pre-Bid Meeting**

**June 30, 2026 – 11:00 AM**

**Location: Taylor Mill Treatment Plant – 608 Grand Ave – Taylor Mill, KY 41015**

**MEETING MINUTES**

**1. Sign-in / Introductions**

- Gerry Wright (Cornwell Engineering Group) began the meeting at 11:00am, and introduced himself as the primary POC for Cornwell Engineering Group providing design, bid phase, and construction admin services for NKWD on this work.
- Mr. Wright introduced Bill Wulfeck with NKWD who there to assist with the Pre-Bid
- Those present signed an attendance roster (enclosed).

**2. Project Overview**

- Base Bid Items: Remove/replace MP UV System, furnish/install a new PAC storage and feed system, along with enclosing an interior room, and a Polymer storage and feed system; and miscellaneous structural and concrete repairs.
- Optional Bid Items: Furnish/install new Ft Thomas diversion piping; and remove/replace existing MP UV system with a new UV LED system
- Mr. Wright covered the base bid items for this work, then went over the optional, aka add additional bid items.

**3. Administrative Issues**

- Bid packages due NLT 2:00pm (local) on Wed, July 22, 2026
- Last day for questions/clarifications: Thur, July 16, 2026 COB
- Direct all technical questions to Mr. Gerry Wright with Cornwell Engineering Group
  - Ph: (757) 288-7002, Email: [gwright@cornwellinc.com](mailto:gwright@cornwellinc.com)
- Bid items to be priced with consideration for Non-SRF requirements and SRF requirements.
  - Costs to be provided for all bid items.
  - Owner will have the discretion to select either Non-SRF or SRF alternative bid items.
  - Bid costs selected by Owner will be either all Non-SRF or all SRF alternative bid items.

- Add Alternative Bid Item for UV LED: Indicate the bid price credit or addition (compared to Bid Item 1, Medium-Pressure UV System Work)
  - Complete questionnaire for MP UV and UV LED. NKWD will determine if a medium-pressure UV system or a LED UV system will be furnished and installed with this work using the completed Questionnaire provided in Section 004113 along with the Alternate Bid Price.
- Mr. Wright went over the key dates for the bid phase with the bid opening and last day for questions . Technical questions are to be sent to Mr. Wright using the contact info above. Prospective bidders may also contact Casandara Zoda (NKWD) whose contact info is provided in the ITB.
  - Mr. Wright provided clarification regarding SRF and Non-SRF bid items.
  - Mr. Wright also provided clarification regarding the add additional bid item for the UV LED System, which will also include the completion of the Questionnaire as part of the bid package documents.

#### 4. Bid Documents and Forms

- Mr. Wright noted a list of required bid package documents and forms are indicated with the Instructions to Bidders and within the Specs. Prospective bidders are to complete all required forms and documents as part of their bid package submittals.

#### 5. Other Items of Interest

- Site Overview
- Mr. Wright noted aside from the specific work areas for this work within the plant site, which will be part of the site visit following this portion of the meeting, prospective bidders should be aware that the plant site is adjacent to a school and residential neighborhood. In addition to being cognizant of plant operations and deliveries, Contractors are to keep vehicle traffic and noise to a minimum to the greatest extent possible.
  - Mr. Wulfeck added there are residents that will be highly interested in the activities on site.
  - Mr Wright acknowledged some notes on the Plans that Contractors are to be aware of other work that may be occurring concurrently; however, at the moment, no major work is occurring on site. Contractors can work out proposed storage and laydown areas with the Owner/plant staff.
  - Mr Wright noted that aside from the structural repair work, most of the work would be inside the plant buildings. Mr. Wulfeck added that working hours are noted with the Specs.
  - Mr. Wulfeck also noted that Taylor Mill is an active/operational plant all year round; however, there are times of the year when Taylor Mill is shut down, say November to March, when the flocculation and sedimentation basins are

drained. That said, during this period, Taylor Mill is receiving water from another NKWD plant into the clearwell to supply water to the customers in the area.

6. Final Comments / Questions

- Questions and clarifications asked during the site visit and for those submitted during the Bid Phase will be responded to by addendum.

7. Conclude Meeting / Conduct Site Visit

- The meeting and site visit concluded at 11:45am

**\*\*\*\* END OF MEETING \*\*\*\***

**(Non-Mandatory) Pre-Bid Meeting**  
**June 30, 2026 - 11:00 a.m.**  
**Location: TMTP - 608 Grand Ave - Taylor Mill, KY 41015**

Please print legibly

[illegible]

## **ATTACHMENT 1-B**

### **RESPONSES TO QUESTIONS RECEIVED BY NKWD AND ENGINEER**

Question 1: If SRF is the funding source for this work, is there a requirement to comply with BABA (Build America, Buy America Act)?

Response: Yes, if NKWD decides to utilize SRF for the work, then compliance with BABA will be required. BABA is referenced in the Agreement (Sect 005213) as well as in Section 008100/Supplemental Conditions for Clean Water State Revolving Fund, Drinking Water State Revolving Fund, particularly in Attachment 18/Form KIA-003.

Question 2: Is there a percentage goal to comply with DBE requirements?

Response: As noted in the ITB (Sect 001113), for the SRF alternate bid items, all Bidders, Contractors and Subcontractors must comply with 41 CFR 60-4, in regard to Affirmative Action, to ensure equal opportunity to females and minorities and will apply the timetables and goals set forth in 41 CFR 60-4. Goals are discussed in more detail within Section 008100 (Supplemental Conditions for Clean Water State Revolving Fund, Drinking Water State Revolving Fund).

Question 3: What is the capacity of the elevator in the Main Building?

Response: The posted capacity of the elevator is 4,000 lbs.

Question 4: Is there an estimated cost for this work?

Response: The Engineer's estimate for all of the Work, base bid items and add additional bid items, is \$3,737,000.

Question 5: Who is responsible for clearing and preparing existing chemical lines prior to demolition/removal?

Response: NKWD will pump and clear existing chemical tanks, piping and hosing before turning over to the Contractor for demolition and removal. Contractor shall adhere to recommended practices and PPE for demolition and removal work.

Question 6: [received via email] In Division 9, Section D, "Concrete within containment area." Are the coatings specified meant to be Secondary Containment? Or is the intent, to just have chemical resistant coatings in this area? If it is meant to be Secondary Containment, then I would like to recommend a fiberglass reinforced system in this area. Tnemec's Series 252SC Chembloc is a Vinyl Ester / Novalac secondary

containment system, with very similar chemical resistance performance, when compared to the Series 5001, 5002, & 5003 that is specified.

Response: For this application, coatings would be primarily for protecting concrete surfaces from the chemicals within that particular area. When time for submittal review and approval, Contractor (Supplier) shall note the product(s) submitted for the noted application along with any variances or deviations from the specifications. Owner/Engineer will take into consideration to determine if the proposed is a comparable product when reviewing and responding to the submittal.

Questions 7: Specification Section 151000 2.3 B. 1. Will standard cast iron body be acceptable since the pressure rating is only 150 psi? Ductile iron is typically used for higher pressure applications.

Response: No, cast iron is not acceptable. Ductile iron is the preferred material of construction for this application.

**\*\*\* NOTHING FOLLOWS \*\*\***

**ATTACHMENT 1-C**

**REVISED SECTION 001113 (INVITATION TO BID)**

Section 00 11 13

INVITATION TO BID

Date: June 24, 2026

WORK: **Taylor Mill Treatment Plant Upgrades and Improvements,  
WX21117018**

**BID SUBMISSION:** SEALED BIDS WILL BE RECEIVED BY THE NORTHERN KENTUCKY WATER DISTRICT (OWNER) ONLY THROUGH THE ONLINE QUEST CDN WEBSITE ([www.questcdn.com](http://www.questcdn.com))

UNTIL: Date: **July 22, 2026**  
Time: **2:00 p.m. (local time)**

At said place and time, and promptly thereafter, all Bids that have been duly received will be opened. Entities on the registered list of plan holders will be sent a link to attend the virtual bid opening. The public may access the virtual bid opening by emailing Cassandra Zoda at [czoda@nkywater.org](mailto:czoda@nkywater.org) to get the meeting number and password.

**BRIEF PROJECT DESCRIPTION:** The proposed Work is generally described as follows:

Base Bid Item 1 (Non-SRF Scenario): Ultraviolet (UV) disinfection system upgrades and improvements work, including: removing and disposing of two (2) existing UV treatment systems, control panels, UPS panels, piping, fittings, and appurtenances; installing one (1) new UV treatment system, power supply and control panels, piping, fittings, and appurtenances; and associated electrical and controls work.

Alternate Base Bid Item 1 (SRF Scenario): Ultraviolet (UV) disinfection system upgrades and improvements work, including: removing and disposing of two (2) existing UV treatment systems, control panels, UPS panels, piping, fittings, and appurtenances; installing one (1) new UV treatment system, power supply and control panels, piping, fittings, and appurtenances; and associated electrical and controls work.

Base Bid Item 2 (Non-SRF Scenario): Powdered Activated Carbon (PAC) system upgrades and improvements work, including: removing and disposing of existing PAC systems and Filter-Aid Polymer systems; furnishing and installing new PAC systems and Filter-Aid Polymer systems; constructing an enclosed area within an existing facility for the PAC systems; and associated structural, mechanical, and electrical/controls work.  
**The Contractor shall also furnish and install five (5) new davit sleeve systems as shown and specified on the Plans, Sheet G.1.0. {Addendum 1}**

Alternate Base Bid Item 2 (SRF Scenario): Powdered Activated Carbon (PAC) system upgrades and improvements work, including: removing and disposing of existing PAC systems and Filter-Aid Polymer systems; furnishing and installing new PAC systems and Filter-Aid Polymer systems; constructing an enclosed area within an existing facility for the PAC systems; and associated structural, mechanical, and electrical/controls work.  
**The Contractor shall also furnish and install five (5) new davit sleeve systems as shown and specified on the Plans, Sheet G.1.0. {Addendum 1}**



Base Bid Item 3 (Non-SRF Scenario): Structural concrete repair and rehabilitation work for the interior and exposed exterior surfaces of the flocculation and sedimentation basins as well as inside the below-grade walkway tunnel.

Alternate Base Bid Item 3 (SRF Scenario): Structural concrete repair and rehabilitation work for the interior and exposed exterior surfaces of the flocculation and sedimentation basins as well as inside the below-grade walkway tunnel.

Add Alternate Bid Item 4 (Non-SRF Scenario): Fort Thomas diversion piping modifications, which include removing existing piping, fittings, and appurtenances; furnishing and installing piping, fittings, valves with electric motor actuators, and appurtenances; and associated electrical and controls work. This work shall only be performed if accepted and authorized by the Owner.

Add Alternate Bid Item 5 (SRF Scenario): Fort Thomas diversion piping modifications, which include removing existing piping, fittings, and appurtenances; furnishing and installing piping, fittings, valves with electric motor actuators, and appurtenances; and associated electrical and controls work. This work shall only be performed if accepted and authorized by the Owner.

Add Alternate Bid Item 6 (Non-SRF Scenario): Ultraviolet (UV) LED disinfection system upgrades and improvements work, including: removing and disposing of two (2) existing UV treatment systems, control panels, UPS panels, piping, fittings, and appurtenances; installing one (1) new UV LED treatment system, piping, fittings, and appurtenances; and associated electrical and controls work. This work shall only be performed if accepted and authorized by the Owner. Bidder will indicate the difference in cost (addition or deduction) on the Bid Disclosure Form (Section 004113) between Add Alternate Bid Item 6 (Non-SRF Scenario) and Base Bid Item 1 (Non-SRF Scenario). The Owner will determine if a medium-pressure UV system or a LED UV system will be furnished and installed with this work using the completed Questionnaire provided in Section 004113 along with the Alternate Bid Price.

Add Alternate Bid Item 7 (SRF Scenario): Ultraviolet (UV) LED disinfection system upgrades and improvements work, including: removing and disposing of two (2) existing UV treatment systems, control panels, UPS panels, piping, fittings, and appurtenances; installing one (1) new UV LED treatment system, piping, fittings, and appurtenances; and associated electrical and controls work. This work shall only be performed if accepted and authorized by the Owner. Bidder will indicate the difference in cost (addition or deduction) on the Bid Disclosure Form (Section 004113) between Add Alternate Bid Item 7 (SRF Scenario) and Alternate Base Bid Item 1 (SRF Scenario). The Owner will determine if a medium-pressure UV system or a LED UV system will be furnished and installed with this work using the completed Questionnaire provided in Section 004113 along with the Alternate Bid Price.

After evaluating the base bid items, the Owner reserves their right to accept or reject the add alternate bid items and to whether or not include this option as part of the Contract. If accepted, then the add alternative work to be included will become part of the Contract

Documents. However, should the Owner not authorize, then the add alternative work will not be part of the Contract Documents.

Owner reserves the right to request any clarifying information it deems necessary from Bidders and any chosen Contractor related to the work (including information related to permitting, testing, etc.).

**PROJECT DOCUMENTS:** All Bids must be in accordance with the Instructions to Bidders and Contract Documents on file, and are available for examination virtually as described below.

To view the bid documents, go to [Northern Kentucky Water District \(nkywater.org/procurement\)](http://nkywater.org/procurement) in the section labeled "Procurement Items" at the top of the page and click the link to be click the link titled "NKWD's Quest CDN Webpage" to be redirected to the Quest CDN Electronic Bid Online Interface.

This bid is listed as Quest eBid Doc # **9213594**.

The project documents may be downloaded by registering with Quest CDN online at [www.questcdn.com](http://www.questcdn.com) or by calling 952-233-1632. After registration is complete, an On-Line Bid ID code must be created by clicking on "My Account", then the "User Info" tab. A prospective bidder will create this code in the designated field per requirements noted. To be considered a Plan-holder, a bidder must complete registration and download the Proposal Documents in digital form for a \$22.00 charge. There will be a charge of \$42.00 to submit a bid. Plan-holders will receive addenda and other proposal document updates via Quest CDN. Prospective bidders must be on the plan holders list through Quest CDN for a bid to be accepted.

A non-mandatory pre-bid meeting will be held on **June 30, 2026 starting at 10:00 a.m.** in the meeting room at the Taylor Mill Treatment Plant (608 Grand Avenue, Taylor Mill, KY 41015). Prospective bidders are not required to attend although attendance is highly encouraged. Following the meeting attendees will be afforded the opportunity to orient themselves to the site and work areas as well as ask additional questions.

Outside of the scheduled pre-bid meeting, all inquiries must be submitted in writing to Mr. Gerald Wright with the Cornwell Engineering Group, Inc. (712 Gum Rock Court, Newport News, Virginia 23606, Email: [gwright@cornwellinc.com](mailto:gwright@cornwellinc.com)) **before the COB on July 16, 2026**. Please include Mrs. Cassandra Zoda for any inquiries submitted (Email: [czoda@nkywater.org](mailto:czoda@nkywater.org)). All responses as well as the pre-bid meeting minutes will be provided by addendum.

**FUNDING:** This project may be funded by the Kentucky Drinking Water State Revolving Fund (SRF) with federal funds provided by the Environmental Protection Agency and Kentucky Infrastructure Authority. Alternate bid items are included to allow for SRF funding.

**BIDDER QUALIFICATIONS & AWARD:** Bids will be received as a total sum of all the bid items as described in the Contract Documents. After evaluating all bid items, Owner will determine whether or not the alternative base bid and add alternate bid item will be authorized and included as part of the Work. The Successful Bidder will be advised of the Owner's decision.

Each Bid must contain evidence of Bidder's qualifications to transact business in the State of Kentucky or covenant to obtain such qualifications prior to award of the Contract. The Bidder's Organization Number from the Kentucky's Secretary of State and principal place of business as filed with Kentucky's Secretary of State must be included where applicable.

Bid security, in the form of an electronic Bid Bond (insuring/bonding company shall be rated "A" by AM Best) in the amount of ten percent (10%) of the maximum total bid price, must accompany each Bid.

The Successful Bidder will be required to furnish a Construction Payment Bond and a Construction Performance Bond (insuring/bonding company shall be rated "A" by AM Best) as security for the faithful performance of the contract and the payment of all bills and obligations arising from the performance of the Contract.

For the SRF alternate bid items, SRF requirements (including American Iron and Steel; Build America Buy America requirements of the Infrastructure Investment and Jobs Act; and the Davis Bacon Act) and provisions must be met by the Bidder and all subcontractors.

For the SRF alternate bid items, SRF requires federal prevailing wage rates to be paid to all employees of the Bidder and all employees of any subcontractor.

For the SRF alternate bid items, all Bidders must comply with the President's Executive Order No. 11246 (Equal Employment Opportunity) as amended, which prohibits discrimination in employment regarding race, creed, color, sex, or national origin.

For the SRF alternate bid items, all Bidders must comply with Title VI of the Civil Rights Act of 1964, the Anti-Kickback Act, and the Contract Work Hours Standard Act.

For the SRF alternate bid items, all Bidders, Contractors and Subcontractors must comply with 41 CFR 60-4, in regard to Affirmative Action, to ensure equal opportunity to females and minorities and will apply the timetables and goals set forth in 41 CFR 60-4.

For the SRF alternate bid items, Bidders must make positive efforts to use small, minority, women-owned and disadvantaged businesses.

For the SRF alternate bid items, all Bidders must comply with OSHA (P.L. 91-596) and the Contract Work Hours and Safety Standards Act (P.L. 91-54).

For the SRF alternate bid items, the Successful Bidder and all Subcontractors will be required to conform to the labor standards set forth in the Contract Documents.

For the SRF alternate bid items, this procurement is subject to Kentucky Division of Water Uniform Guidance Contract Requirements set forth in the Contract Documents.

Evaluation of Bids and the awarding of the final contract are subject to the reciprocal preference for Kentucky resident bidders pursuant to KRS 45A.490 to 45A.494 and KAR 200 5:400.

Owner reserves the right to reject any or all Bids, including without limitation the right to reject any or all nonconforming, non-responsive, incomplete, unbalanced, or conditional Bids, to waive informalities, and to reject the Bid of any Bidder if Owner believes that it would not be in the best interest of Owner to make an award to that Bidder. Owner also reserves the right to negotiate with the apparent successful Bidder(s) to such an extent as may be determined by Owner.

Small, Minority, and Disadvantaged Business Enterprises are encouraged to bid on this project.

Bids shall remain subject to acceptance for 120 days after the day of bid opening or for such longer period of time to which a Bidder may agree in writing upon request of the Owner. If a Contract is to be awarded, the Owner will give the successful Bidder a Notice of Award during the period of time during which the successful Bidder's bid remains subject to acceptance.

Award of the Contract will be made to the lowest, responsive, responsible bidder as specified in the Instructions to Bidders.

The Northern Kentucky Water District is an Equal Opportunity Employer.

**INSTRUCTIONS TO BIDDERS:** For all further requirements regarding bid submittal, qualifications, procedures, and contract award, refer to the Instructions to Bidders that are included in the Bidding Documents.

End of Section

**ATTACHMENT 1-D**

**REVISED SECTION 004113 (BID DISCLOSURE FORM)**

BID DISCLOSURE FORM

WORK IDENTIFICATION: **Taylor Mill Treatment Plant Upgrades & Improvements**

THIS BID IS SUBMITTED ELECTRONICALLY VIA QUEST CDN TO THE NORTHERN KENTUCKY WATER DISTRICT

THIS BID IS SUBMITTED BY: \_\_\_\_\_  
(Bidder's Company Name)

1. The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Contract Documents to perform all Work as specified or indicated in the Contract Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Contract Documents.

Bidder accepts all of the terms and conditions of the Invitation to Bid and the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. Bids shall remain subject to acceptance for the period of time required for the apparent successful Bidder to provide satisfactory evidence to the Owner that the necessary approvals and/or permits required for disposal are in place. The Owner shall have the sole authority to determine what is "satisfactory evidence" of the necessary approvals and/or permits. If a Contract is to be awarded, the Owner will give the successful Bidder a Notice of Award within 90 days of providing such evidence or for such longer period of time to which a Bidder may agree in writing upon request of the Owner. Bidder understands that certain extensions to the time for acceptance of this Bid may require the consent of the surety for the Bid Bond.

Bids shall remain subject to acceptance for the period of time required for the apparent successful Bidder to provide satisfactory evidence to the Owner that the necessary approvals and/or permits required for disposal are in place. If a Contract is to be awarded, the Owner will give the successful Bidder a Notice of Award within 90 days of providing such evidence or for such longer period of time to which a Bidder may agree in writing upon request of the Owner.

2. In submitting this Bid, Bidder represents and covenants, as set forth in the Agreement, that:
  - a. Bidder has examined and carefully studied the Contract Documents, the other related data identified in the Contract Documents, and all Addenda, receipt of all of which is hereby acknowledged.
  - b. Bidder has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
  - c. Bidder is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.

- d. Bidder has obtained and carefully studied (or assumes responsibility for having done so) all additional or supplementary explorations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents to be employed by Bidder, and safety precautions and programs incident thereto.
  - e. Bidder does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times and in accordance with the other terms and conditions of the Bidding Documents.
  - f. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
  - g. Bidder has correlated the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents.
  - h. Bidder has given Owner written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by Owner is acceptable to Bidder.
  - i. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.
  - j. Bidder's Organization Number from Kentucky's Secretary of State is #\_\_\_\_\_ [if applicable] and Bidder is qualified to transact business in the State of Kentucky or hereby covenants to obtain such qualifications prior to award of the Contract.
3. Bidder further represents that this Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any agreement or rules of any group, association, organization, or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; Bidder has not solicited or induced any individual or entity to refrain from bidding; and Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over Owner.
4. The Bidder understands and agrees that during the performance of the Contract, it shall maintain a presence within such proximity of the Site which will allow it to respond to an emergency at the Site within one hour of receiving notice of an emergency, including emergencies occurring during non-working hours. The Bidder shall provide a list of emergency phone numbers for such purposes. If the Bidder does not have such a presence, it may satisfy this requirement by sub-contracting with a sub-contractor that does

have such a presence, provided that any such sub-contractor must be approved by the Owner, in its sole discretion, prior to the project pre-construction meeting.

5. Bidder will complete the Work for Bidder's prices entered in the QuestCDN Bid Worksheet. Unit prices will be computed in accordance with paragraph 11.03.B of the General Conditions. Bidder acknowledges that estimated quantities are not guaranteed (and may be increased or lowered), and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Bid items will be based on actual quantities authorized and approved by the Owner, as provided in the Contract Documents or supplemental guidance provided by the Owner.
6. NOTE: The SRF options included as Alternate Base Bid items must include all of the conditions, limitations, processes and any other costs related to providing those bid items strictly in accordance with requirements of the State Revolving Loan Fund. See Section 010170-1.1.E and Section 004113.

**REFERENCE COPY OF BID WORKSHEET. BID PRICING MUST BE SUBMITTED IN THE  
QUESTCDN BID WORKSHEET TO BE CONSIDERED**

**BASE BID SCHEDULE – TMTP UPGRADES AND IMPROVEMENTS:**

**Base Bid Item #1: UV Treatment System Upgrades and Improvements (Non-SRF Scenario)**

Ultraviolet (UV) disinfection system upgrades and improvements work, including: removing and disposing of two (2) existing UV treatment systems, control panels, UPS panels, piping, fittings, and appurtenances; installing one (1) new UV treatment system, power supply and control panels, piping, fittings, and appurtenances; and associated electrical and controls work.

**Lump Sum Cost, Bid Item #1 (Non-SRF Scenario):**

\$ \_\_\_\_\_

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**Lump Sum Cost, Bid Item #1 (Non-SRF Scenario) (written out in words)**

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**Alternate Base Bid Item #1: UV Treatment System Upgrades and Improvements (SRF Scenario)**

Ultraviolet (UV) disinfection system upgrades and improvements work, including: removing and disposing of two (2) existing UV treatment systems, control panels, UPS panels, piping, fittings, and appurtenances; installing one (1) new UV treatment system, power supply and control panels, piping, fittings, and appurtenances; and associated electrical and controls work.

**Lump Sum Cost, Alt. Bid Item #1 (SRF Scenario):**

\$ \_\_\_\_\_

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**Lump Sum Cost, Alt. Bid Item #1 (SRF Scenario) (written out in words)**



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**Base Bid Item #2: PAC Storage and Feed System Upgrades and Improvements (Non-SRF Scenario)**

PAC system upgrades and improvements work, including: removing and disposing of existing PAC systems and Filter-Aid systems; furnishing and installing new PAC systems and Filter-Aid systems; constructing an enclosed area within an existing facility for the PAC systems; and associated structural, mechanical, and electrical/controls work. **The Contractor shall also furnish and install five (5) new davit sleeve systems as shown and specified on the Plans, Sheet G.1.0. {Addendum 1}**

**Lump Sum Cost, Bid Item #2 (Non-SRF Scenario):**

\$ \_\_\_\_\_

\_\_\_\_\_  
**Lump Sum Cost, Bid Item #2 (Non-SRF Scenario) (written out in words)**

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**Alternate Base Bid Item #2: PAC Storage and Feed System Upgrades and Improvements (SRF Scenario)**

PAC system upgrades and improvements work, including: removing and disposing of existing PAC systems and Filter-Aid systems; furnishing and installing new PAC systems and Filter-Aid systems; constructing an enclosed area within an existing facility for the PAC systems; and associated structural, mechanical, and electrical/controls work. **The Contractor shall also furnish and install five (5) new davit sleeve systems as shown and specified on the Plans, Sheet G.1.0. {Addendum 1}**

**Lump Sum Cost, Alt. Bid Item #2 (SRF Scenario):**

\$ \_\_\_\_\_

\_\_\_\_\_  
**Lump Sum Cost, Alt. Bid Item #2 (SRF Scenario) (written out in words)**

-----

**Base Bid Item #3: Flocculation and Sedimentation Basins Structural Rehabilitation (Non-SRF Scenario)**

Structural repair and rehabilitation work for the interior and exposed exterior surfaces of the flocculation and sedimentation basins as well as inside the below-grade walkway tunnel. Fill in the unit costs and total costs for the various repair work items noted in the Repair Schedule below and provide a total sum cost at the bottom. Reiterate the total sum cost written in words and numerically in the spaces provided below the schedule.

| REPAIR SCHEDULE (Non-SRF Scenario) |                    |       |           |                    |            |
|------------------------------------|--------------------|-------|-----------|--------------------|------------|
| Repair*                            | Type               | Units | Unit Cost | Estimated Quantity | Total Cost |
| G                                  | Gravity feed epoxy | LF    | \$        | 350                | \$         |
| P                                  | Epoxy injection    | LF    | \$        | 100                | \$         |

|                                                                                                               |                                                                                                                                                                                                                                                                             |    |    |       |    |
|---------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|-------|----|
| C                                                                                                             | Expansion joint crack repair                                                                                                                                                                                                                                                | LF | \$ | 245   | \$ |
| E                                                                                                             | Exposed rebar                                                                                                                                                                                                                                                               | LF | \$ | 16    | \$ |
| S                                                                                                             | Concrete spall repair                                                                                                                                                                                                                                                       | SF | \$ | 76    | \$ |
| B                                                                                                             | Remove existing coating system on bottom of floc/sed basins and replace with a new coating system.                                                                                                                                                                          | SF | \$ | 7,200 | \$ |
| W                                                                                                             | Remove existing coating system on walls of floc/sed basins and replace with a new coating system.                                                                                                                                                                           | SF | \$ | 35    | \$ |
| F                                                                                                             | Remove and replace existing failing repair                                                                                                                                                                                                                                  | CF | \$ | 300   | \$ |
| A                                                                                                             | Corbel repair                                                                                                                                                                                                                                                               | EA | \$ | 1     | \$ |
| T                                                                                                             | Apply new coating system to the inside walls of the floc/sed basin troughs                                                                                                                                                                                                  | SF | \$ | 4,500 | \$ |
| D                                                                                                             | Strip rusted steel to bare metal. Clean steel in accordance with SSPC3 and paint with zinc rich primer before applying new paint system to match existing.                                                                                                                  | SF | \$ | 350   | \$ |
| U                                                                                                             | Underpin the existing concrete pad to at least 2 ft below existing grade                                                                                                                                                                                                    | CF | \$ | 100   | \$ |
| R                                                                                                             | Existing steel beam has deteriorated at the end and needs to be replaced. Provide a new section and connections to match the existing and install to match the existing. Shore all remaining elements supported by the beam and shall be shored and reattached to the beam. | LS | \$ | 1     | \$ |
| Total Sum Cost, Structural Repair and Rehabilitation Work (Non-SRF Scenario)                                  |                                                                                                                                                                                                                                                                             |    |    | \$    |    |
| * Refer to Structural Plans and Specifications for location(s) as well as additional clarification and detail |                                                                                                                                                                                                                                                                             |    |    |       |    |

**Total Sum Cost, Bid Item #3 (Non-SRF Scenario):**

\$ \_\_\_\_\_

**Total Sum Cost, Bid Item #3 (Non-SRF Scenario) (written out in words)**

-----

**Alternate Base Bid Item #3: Flocculation and Sedimentation Basins Structural Rehabilitation (SRF Scenario)**

Structural concrete repair and rehabilitation work for the interior and exposed exterior surfaces of the flocculation and sedimentation basins as well as inside the below-grade walkway tunnel. Fill in the unit costs and total costs for the various repair work items noted in the Repair Schedule below, and provide a total sum cost at the bottom. Reiterate the total sum cost written in words and numerically in the spaces provided below the schedule.

| <b>REPAIR SCHEDULE (SRF Scenario)</b> |                                                                                                                                                                                                                                 |              |                  |                           |                   |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------------------|---------------------------|-------------------|
| <b>Repair*</b>                        | <b>Type</b>                                                                                                                                                                                                                     | <b>Units</b> | <b>Unit Cost</b> | <b>Estimated Quantity</b> | <b>Total Cost</b> |
| G                                     | Gravity feed epoxy                                                                                                                                                                                                              | LF           | \$               | 350                       | \$                |
| P                                     | Epoxy injection                                                                                                                                                                                                                 | LF           | \$               | 100                       | \$                |
| C                                     | Expansion joint crack repair                                                                                                                                                                                                    | LF           | \$               | 245                       | \$                |
| E                                     | Exposed rebar                                                                                                                                                                                                                   | LF           | \$               | 16                        | \$                |
| S                                     | Concrete spall repair                                                                                                                                                                                                           | SF           | \$               | 76                        | \$                |
| B                                     | Remove existing coating system on bottom of floc/sed basins and replace with a new coating system.                                                                                                                              | SF           | \$               | 7,200                     | \$                |
| W                                     | Remove existing coating system on walls of floc/sed basins and replace with a new coating system.                                                                                                                               | SF           | \$               | 35                        | \$                |
| F                                     | Remove and replace existing failing repair                                                                                                                                                                                      | CF           | \$               | 300                       | \$                |
| A                                     | Corbel repair                                                                                                                                                                                                                   | EA           | \$               | 1                         | \$                |
| T                                     | Apply new coating system to the inside walls of the floc/sed basin troughs                                                                                                                                                      | SF           | \$               | 4,500                     | \$                |
| D                                     | Strip rusted steel to bare metal. Clean steel in accordance with SSPC3 and paint with zinc rich primer before applying new paint system to match existing.                                                                      | SF           | \$               | 350                       | \$                |
| U                                     | Underpin the existing concrete pad to at least 2 ft below existing grade                                                                                                                                                        | CF           | \$               | 100                       | \$                |
| R                                     | Existing steel beam has deteriorated at the end and needs to be replaced. Provide a new section and connections to match the existing and install to match the existing. Shore all remaining elements supported by the beam and | LS           | \$               | 1                         | \$                |

|                                                                                                                      |                                             |  |  |           |  |
|----------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--|--|-----------|--|
|                                                                                                                      | shall be shored and reattached to the beam. |  |  |           |  |
| <b>Total Sum Cost, Structural Repair and Rehabilitation Work (SRF Scenario)</b>                                      |                                             |  |  | <b>\$</b> |  |
| <i>* Refer to Structural Plans and Specifications for location(s) as well as additional clarification and detail</i> |                                             |  |  |           |  |

**Total Sum Cost, Alt. Bid Item #3 (SRF Scenario):**

\$ \_\_\_\_\_

**Total Sum Cost, Alt. Bid Item #3 (SRF Scenario) (written out in words)**

-----

**Total Base Bid Cost (Sum of Base Bid Items #1, #2, and #3 Non-SRF Scenario):**

\$ \_\_\_\_\_

**Total Base Bid Cost (Sum of Base Bid Items #1, #2, and #3 Non-SRF Scenario)  
(written out in words)**

-----

**Total Alternate Base Bid Cost (Sum of Base Bid Items #1, #2, and #3 SRF Scenario):**

\$ \_\_\_\_\_

**Total Alternate Base Bid Cost (Sum of Base Bid Items #1, #2, and #3 SRF Scenario) (written out in words)**

-----

**ADD ALTERNATIVE BID ITEM #4 – FORT THOMAS DIVERSION PIPING MODIFICATIONS (Non-SRF Scenario):**

**Add Alternative Bid Item #4: Fort Thomas Diversion Piping Modifications**

Fort Thomas diversion piping modifications, which include removing existing piping, fittings, and appurtenances; furnishing and installing piping, fittings, valves with electric motor actuators, and appurtenances; and associated electrical and controls work. This work shall only be performed if accepted and authorized by the Owner.

This work will be an add alternative bid item. After evaluating the base bid items, the Owner reserves their right to accept or reject this bid item and to whether or not include this alternative

as part of the Contract. If accepted, then the add alternative work will become part of the Contract Documents. However, should the Owner not exercise its option, then the add alternative work will not be part of the Contract Documents.

**Lump Sum Cost, Add Alternative Bid Item #4 (Non-SRF Scenario):**

\$ \_\_\_\_\_

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**Lump Sum Cost, Add Alternative Bid Item #4 (Non-SRF Scenario) (written out in words)**

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**ADD ALTERNATIVE BID ITEM #5 – FORT THOMAS DIVERSION PIPING MODIFICATIONS (SRF Scenario):**

**Add Alternative Bid Item #5 SRF Scenario: Fort Thomas Diversion Piping Modifications**

Fort Thomas diversion piping modifications, which include removing existing piping, fittings, and appurtenances; furnishing and installing piping, fittings, valves with electric motor actuators, and appurtenances; and associated electrical and controls work. This work shall only be performed if accepted and authorized by the Owner.

This work will be an add alternative bid item. After evaluating the base bid items, the Owner reserves their right to accept or reject this bid item and to whether or not include this alternative as part of the Contract. If accepted, then the add alternative work will become part of the Contract Documents. However, should the Owner not exercise its option, then the add alternative work will not be part of the Contract Documents.

**Lump Sum Cost, Add Alternative Bid Item #5 (SRF Scenario):**

\$ \_\_\_\_\_

---

**Lump Sum Cost, Add Alternative Bid Item #5 (SRF Scenario) (written out in words)**

-----

**ADD ALTERNATIVE BID ITEM #6 – UV LED SYSTEM (Non-SRF Scenario):**

**Add Alternative Bid Item #6: UV LED System**

Furnish and install an Ultraviolet (UV) LED System complete with: removing and disposing of two (2) existing UV treatment systems, control panels, UPS panels, piping, fittings, and appurtenances; installing one (1) new UV LED System with three (3) UV LED Lamp Modules, a remote HMI station, piping, fittings, and appurtenances including cooling water supply and discharge piping for each of the three UV LED Lamp Modules; and associated electrical and controls work.

Bidder will indicate the difference in cost (addition or deduction) on the Bid Disclosure Form (Section 004113) between Add Alternate Bid Item 6 (Non-SRF Scenario) and Base Bid Item 1 (Non-SRF Scenario). The Owner will determine if a medium-pressure UV system or a LED UV

system will be furnished and installed with this work using the completed Questionnaire provided in Section 004113 along with the Alternate Bid Price.

The Owner reserves their right to accept or reject this bid item and to whether or not include this alternative as part of the Contract. If accepted, then the add alternative work will become part of the Contract Documents. However, should the Owner not exercise its option, then the add alternative work will not be part of the Contract Documents.

**Lump Sum Cost, Add Alternative Bid Item #6 (Non-SRF Scenario):**

\$ \_\_\_\_\_

---

**Lump Sum Cost, Add Alternative Bid Item #6 (Non-SRF Scenario) (written out in words)**

-----

**ADD ALTERNATIVE BID ITEM #7 – UV LED SYSTEM (SRF Scenario):**

**Add Alternative Bid Item #7 SRF Scenario: UV LED System**

Furnish and install an Ultraviolet (UV) LED System complete with: removing and disposing of two (2) existing UV treatment systems, control panels, UPS panels, piping, fittings, and appurtenances; installing one (1) new UV LED System with three (3) UV LED Lamp Modules, a remote HMI station, piping, fittings, and appurtenances including cooling water supply and discharge piping for each of the three UV LED Lamp Modules; and associated electrical and controls work.

Bidder will indicate the difference in cost (addition or deduction) on the Bid Disclosure Form (Section 004113) between Add Alternate Bid Item 7 (SRF Scenario) and Alternate Base Bid Item 1 (SRF Scenario). The Owner will determine if a medium-pressure UV system or a LED UV system will be furnished and installed with this work using the completed Questionnaire provided in Section 004113 along with the Alternate Bid Price.

The Owner reserves their right to accept or reject this bid item and to whether or not include this alternative as part of the Contract. If accepted, then the add alternative work will become part of the Contract Documents. However, should the Owner not exercise its option, then the add alternative work will not be part of the Contract Documents.

**Lump Sum Cost, Add Alternative Bid Item #7 (SRF Scenario):**

\$ \_\_\_\_\_

---

**Lump Sum Cost, Add Alternative Bid Item #7 (SRF Scenario) (written out in words)**

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7. Bidder agrees that the Base Bid Work will be substantially complete as provided in paragraph 15.03 of the General Conditions within **365** days after the date when the Contract Times commence to run as provided in accordance with paragraph 4.01.A of the General Conditions, and completed and ready for final payment in accordance with

paragraph 15.06.B of the General Conditions within **395** days after the date when the Contract Times commence to run.

If Add Alternative Bid Items #4, #5, #6, and/or #7 is/are accepted and authorized by the Owner, Bidder agrees that the Alternate Bid Work will be substantially complete as provided in paragraph 15.03 of the General Conditions within **365** days after the date when the Contract Times commence to run as provided in accordance with paragraph 4.01.A of the General Conditions, and completed and ready for final payment in accordance with paragraph 15.06.B of the General Conditions within **395** days after the date when the Contract Times commence to run.

The terms used in this Bid with initial capital letters have the meanings indicated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions. The terms in this Bid, which are defined in the General Conditions included as part of the Contract Documents, have the meanings assigned to them in the General Conditions.

8. References

| Contact Person | Company Name | Phone No. | Project Name |
|----------------|--------------|-----------|--------------|
| 1.             |              |           |              |
|                |              |           |              |
| 2.             |              |           |              |
|                |              |           |              |
| 3.             |              |           |              |
|                |              |           |              |
| 4.             |              |           |              |
|                |              |           |              |

SUBMITTED on \_\_\_\_\_, 2026.

9. Communications concerning this Bid shall be sent to Bidder at the following address:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
Phone: \_\_\_\_\_  
Email: \_\_\_\_\_

Email: \_\_\_\_\_

10. The terms in this Bid, which are defined in the General Conditions included as part of the Contract Documents, have the meanings assigned to them in the General Conditions.

11. Major Equipment Manufacturer's List (Part of Bid Form)

- a. Each Bidder shall enter, in the spaces provided below, the names of manufacturers of equipment which he proposes to furnish if awarded the Contract. Upon award of the Contract, the named manufacturer shall be furnished. This list is an integral part of the bid form.
- b. Not more than one manufacturer's name shall be listed for each item of equipment. If the Bidder fails to list a manufacturer's name, lists more than one manufacturer, lists a manufacturer that is not specified by name, or lists a manufacturer which is subsequently rejected during the shop drawing submittal phase, the Owner will select the equipment of his choice with no increase in Contract price. Substitutions after the bid will be permitted at the discretion of the Owner only if the named manufacturer is unable to meet the delivery requirements of the construction schedule, or the manufacturer is dilatory in complying with the requirements of the Contract Documents.
- c. Preliminary acceptance of the manufacturers named below shall not in any way constitute a waiver of the requirements of the Contract Documents covering such equipment; final acceptance will be based on full conformity with the Contract Documents.

| Specification<br>Section | Equipment/Materials           | Manufacturer  |
|--------------------------|-------------------------------|---------------|
| 113650                   | Filter-Aid System Feed Pumps  | _____         |
| 132000                   | PAC Bulk Loader & Feed System | _____         |
| 137000                   | UV Disinfection System        | _____         |
| 137000                   | UV System, PLC / HMI          | _____ / _____ |
| 137100                   | UV LED Disinfection System    | _____         |
| 137100                   | UV LED System, PLC / HMI      | _____ / _____ |
| 151000                   | Butterfly Valves              | _____         |
| 151000                   | Plug Valve                    | _____         |
| 151000                   | Electric Motor Actuators      | _____         |



## 12. Evaluation of UV Disinfection Systems

The Owner requests supplemental information in addition to the bid costs provided above in order to further evaluate and select the preferred UV Disinfection System for this work (Medium-Pressure UV Treatment Systems and UV LED Systems).

Each Bidder shall fill in the requested information below in the spaces provided:

| #    | Item                                                                                                                                                                                                       | Unit         | MP UV System | UV LED System |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------|---------------|
| 12.a | Bare cost of UV System equipment and components ONLY (does not include installation or other equipment such as electrical or structural components, and does not separately consider SRF vs non-SRF costs) | Dollars      |              |               |
| 12.b | Estimated service life of reactors                                                                                                                                                                         | Hours        |              |               |
| 12.c | Cost of each UV Lamp                                                                                                                                                                                       | Dollars      |              |               |
| 12.d | # of UV Lamps required to treat 10 mgd                                                                                                                                                                     | Each         |              |               |
| 12.e | Normal UV Lamp Operating Life (90% effective treatment)                                                                                                                                                    | Hours        |              |               |
| 12.f | Power required per UV lamp                                                                                                                                                                                 | kW           |              |               |
| 12.g | Warm-up time                                                                                                                                                                                               | Minutes      |              |               |
| 12.h | Estimated annual maintenance cost at 10 mgd for 6 months per year                                                                                                                                          | Dollars/Year |              |               |

**AUTHORIZED SIGNATURE OF BIDDER**  
(see signature instructions below)

Individual/Entity Name/DBA \_\_\_\_\_(print)

By: \_\_\_\_\_(sign)  
(Attach evidence of authority to sign if a corporation, LLC, joint venture, or partnership)

Title: \_\_\_\_\_

Business address \_\_\_\_\_

\_\_\_\_\_

Phone No.: \_\_\_\_\_ Fax No.: \_\_\_\_\_

Email Address for Electronic Signatures: \_\_\_\_\_

Date \_\_\_\_\_

Signatures should meet the following requirements:

- Signatures for partnerships must be made by a general partner.
- Signatures for LLCs must be made by a manager or member, as dictated by the entity's Articles of incorporation/bylaws.
- If a joint venture, each venturer must complete the above complete the above authorized signature of bidder form and attach a copy to the Bid Disclosure Form.

8/20/2026

**NORTHERN KENTUCKY WATER DISTRICT  
TAYLOR MILL TREATMENT PLANT  
TMTP UPGRADES & IMPROVEMENTS  
Project No. WX21117018**



**ADDENDUM NO. 2**

**July 17, 2026**

Addendum No. 2 includes modifications to the Bid Documents as described below. In addition to the noted modifications, responses and clarifications for questions received from prospective bidding contractors are provided:

The attention of all bidders is directed to the following changes in the Contract Documents:

Item 1. Refer to Attachment 2-A for responses to questions received by the Owner and/or Engineer.

Item 2. Section 004113, Bid Disclosure Form

Delete in its entirety

Insert new Section 004113, Bid Disclosure Form provided in Attachment 2-B.

Item 3. Specifications 151000, Section 2.2/C/2

Delete 'nickel-chromium edge'

Insert 'Type 316 stainless steel edge'

Item 4. Specifications 151000, Section 2.2/E

Delete in its entirety

Insert new Section 2.2/E:

'E. Valve Seats:

1. Rubber seats may be applied to the body or the disc. In either case, the mating seat surface shall be stainless steel or sprayed in accordance with AWWA C504. Rubber seats shall be constructed of EPDM and may be reinforced by the Manufacturer.

2. Rubber seats mounted on the disc shall be a continuous, full circle 360-degree seal clamped on with corrosion-resistant retaining rings and threaded fasteners.
3. Rubber seats mounted in the groove of the valve body on 24-inch and smaller valves may be bonded to the body. Bonded seats shall withstand a 75 pound pull in accordance to the 90-degree stripping test procedure, Method B of ASTM D 429.
4. Rubber seats mounted in the valve body on valves larger than 24-inches shall be full circle 360-degree and shall be retained in the valve body by mechanical means in such a manner that the seat can be adjusted to provide a tight shutoff. The valve shaft shall not penetrate the rubber seat.'

Item 5. Specifications 151000, Section 2.2/G

Insert additional text:

- '1. Unless otherwise indicated, electric motors actuators shall be 460V, 3 Ph powered.
2. Add Alternative Bid Ft. Thomas Diversion Piping: If this work is authorized by the Owner, the electric motor actuator to be replaced along with the 16-in FL butterfly valve is 208V, 3 Ph powered. Contractor shall preserve the conduit and wiring when removing the existing actuator, and connect the wiring to the new actuator. Refer to the Plans for additional information and clarification.'

Item 6. Specifications 151000, Section 2.3/F

Insert additional text:

- '1. Unless otherwise indicated, electric motors actuators shall be 460V, 3 Ph powered.
2. Add Alternative Bid Ft. Thomas Diversion Piping: If this work is authorized by the Owner, the electric motor actuator to be replaced for the 12-in FL (angled globe) diverter valve is 208V, 3 Ph powered. Contractor shall preserve the conduit and wiring when removing the existing actuator, and connect the wiring to the new actuator. Refer to the Plans for additional information and clarification.'

Item 7. Specifications 233113, Section 2.3/E

Delete 'E' in its entirety

- Item 8. Specifications 233113, Section 3.10/E/7
- Delete '7' in its entirety
- Item 9. Sheet P3.0, Add Alternative Bid Item: Ft. Thomas Diversion Piping Plan & Sections
- Delete in its entirety
- Insert new Sheet P3.0, Add Alternative Bid Item: Ft. Thomas Diversion Piping Plan & Sections, provided in Attachment 2-C.
- Item 10. Sheet P3.1, Add Alternative Bid Item: Ft. Thomas Diversion Piping Sections
- Delete in its entirety
- Insert new Sheet P3.1, Add Alternative Bid Item: Ft. Thomas Diversion Piping Sections, provided in Attachment 2-D.
- Item 11. Sheet P4.3, Add Alternative Bid Item: Ft. Thomas Diversion Piping P&ID
- Delete in its entirety
- Insert new Sheet P4.3, Add Alternative Bid Item: Ft. Thomas Diversion Piping P&ID, provided in Attachment 2-E.
- Item 12. Sheet S0.1, General Notes, Repair Schedule, Repair 'B', Bid Quantity
- Delete '7200'
- Insert '8,450'
- Item 13. Sheet S0.1, General Notes, Repair Schedule, Repair 'W', Bid Quantity
- Delete '35'
- Insert '55'

Item 14. Sheet S0.1, General Notes, Repair Schedule, Repair 'U', Bid Quantity

Delete '100'

Insert '130'

Item 15. Sheet S1.2, Sed Basin Repair Plan, Repair 'B' (2 locations)

Delete '3600' for both locations

Insert '4225' for both locations

**\*\*\* BIDDERS MUST ACKNOWLEDGE RECEIPT OF THIS ADDENDUM IN THE SPACE PROVIDED ON THE BID FORM. FAILURE TO DO SO MAY RESULT IN REJECTION OF THE BID. \*\*\***

## **ATTACHMENT 2-A**

### **RESPONSES TO QUESTIONS RECEIVED BY NKWD AND ENGINEER**

Question 1: Where in the Base Bid Schedule does the Davit and new ladder purchase and install need to be included?

Response: This is addressed in Addendum 1 recently issued. The removal and the replacement of the ladder system shown and specified on Sheet G1.0 is no longer required and shall not be included with this Work. The davit sleeve systems (5 total) are still required as shown and specified on Sheet G1.0, and shall be included under Item 2 of the Base Bid Schedule (SRF and Non-SRF).

Question 2: Do all the concrete pad areas that are getting removed need to be finished flush with the existing floor?

Response: Yes, and patched as needed to be flush and level.

Question 3: Does the new filter-aid batch tank get a new pad under it?

Response: Yes, a concrete housekeeping pad shall be furnished and installed for the new 100-gal filter-aid batch tank and steel support stand. Refer to Sheet S5.1, Detail 7 – Typical Housekeeping Pad Detail for pad construction.

Question 4: What type of material is the filter-aid piping from pump to connection to old? What type of fittings welded, threaded, flanged??

Response: Unless otherwise noted, the new piping shall be 1-in Sch 80 PVC, solvent weld. Contractor shall be responsible for the installation of piping, hosing, fittings, valves, and appurtenances as necessary to complete the piping installation for this application.

Question 5. Sheet S0.1 - GENERAL NOTES - Repair Schedule Item R - Existing steel beam has deteriorated...: Can more details be provided about the procedures for this repair? We are unable to locate this repair on plan drawings. Are any repair Details available showing the extent of the deterioration and the length of the section that needs to be replaced?

Response: The corroded portion of the steel beam at the bearing end shall be removed and replaced with new steel field welded into place. All exposed steel should have the corrosion removed to bare metal and coated with a zinc rich paint or cold galvanizing.

On Sheet S1.2, Item 'R' is located on the North side at the Flocculation Basin, near the connecting wall to the Sedimentation Basin. Contractor shall be

responsible for field verifying the current condition of the steel beam member and supports, and for confirming the proposed plan is suitable for the condition.

Question 6. Sheet S0.1 - GENERAL NOTES - Repair Schedule Item U - Underpin the existing concrete pad... Can more details be provided about the procedures for this repair? Are any repair Details available showing the dimensions/design of underpinning at the locations shown on the plan drawings?

Response: The Contractor shall be responsible for the appropriate repair underpin work in accordance with Section 315010. Contractor shall advise Owner and Engineer of the intended repair plan.

Question 7. The repair schedule identifies repair "W" which is the removal and replace of the coating on the walls of the basins, can you please identify these locations as 35 square feet seems low for the area.

Response: The 35 sf indicated in the Repair Schedule on Sheet S0.1 is incorrect and should be 55 sf. The 'W' repair locations are shown on Sheet S2.2 to show where on the flocculation/sedimentation walls that the coating systems are to be removed and replaced. Revisions to the Repair Schedule are noted in Addendum 2, and the change in quantity is also reflected in the revised Section 004113 (Bid Disclosure Form) enclosed with Addendum 2.

Question 8. According the the HVAC specifications, all the duct work is galvanized duct. In the specs it calls for an antimicrobial coating on the inside. Please confirm if required.

Response: An antimicrobial coating is not required for ductwork on this project. Revisions to Section 233113 are noted in Addendum 2.

Question 9. On drawing M1.1, construction note #5, calls for duct to be insulated. Please provide further information on the type of insulation required.

Response: Ductwork insulation shall be a 2-in thick reflective foil fiberglass blanket.

**\*\*\* NOTHING FOLLOWS \*\*\***



**ATTACHMENT 2-B**

**SECTION 004113 – BID DISCLOSURE FORM**

BID DISCLOSURE FORM

WORK IDENTIFICATION: **Taylor Mill Treatment Plant Upgrades & Improvements**

THIS BID IS SUBMITTED ELECTRONICALLY VIA QUEST CDN TO THE NORTHERN KENTUCKY WATER DISTRICT

THIS BID IS SUBMITTED BY: \_\_\_\_\_  
(Bidder's Company Name)

1. The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Contract Documents to perform all Work as specified or indicated in the Contract Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Contract Documents.

Bidder accepts all of the terms and conditions of the Invitation to Bid and the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. Bids shall remain subject to acceptance for the period of time required for the apparent successful Bidder to provide satisfactory evidence to the Owner that the necessary approvals and/or permits required for disposal are in place. The Owner shall have the sole authority to determine what is "satisfactory evidence" of the necessary approvals and/or permits. If a Contract is to be awarded, the Owner will give the successful Bidder a Notice of Award within 90 days of providing such evidence or for such longer period of time to which a Bidder may agree in writing upon request of the Owner. Bidder understands that certain extensions to the time for acceptance of this Bid may require the consent of the surety for the Bid Bond.

Bids shall remain subject to acceptance for the period of time required for the apparent successful Bidder to provide satisfactory evidence to the Owner that the necessary approvals and/or permits required for disposal are in place. If a Contract is to be awarded, the Owner will give the successful Bidder a Notice of Award within 90 days of providing such evidence or for such longer period of time to which a Bidder may agree in writing upon request of the Owner.

2. In submitting this Bid, Bidder represents and covenants, as set forth in the Agreement, that:
  - a. Bidder has examined and carefully studied the Contract Documents, the other related data identified in the Contract Documents, and all Addenda, receipt of all of which is hereby acknowledged.
  - b. Bidder has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
  - c. Bidder is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.

- d. Bidder has obtained and carefully studied (or assumes responsibility for having done so) all additional or supplementary explorations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents to be employed by Bidder, and safety precautions and programs incident thereto.
  - e. Bidder does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times and in accordance with the other terms and conditions of the Bidding Documents.
  - f. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
  - g. Bidder has correlated the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents.
  - h. Bidder has given Owner written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by Owner is acceptable to Bidder.
  - i. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.
  - j. Bidder's Organization Number from Kentucky's Secretary of State is #\_\_\_\_\_ [if applicable] and Bidder is qualified to transact business in the State of Kentucky or hereby covenants to obtain such qualifications prior to award of the Contract.
3. Bidder further represents that this Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any agreement or rules of any group, association, organization, or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; Bidder has not solicited or induced any individual or entity to refrain from bidding; and Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over Owner.
4. The Bidder understands and agrees that during the performance of the Contract, it shall maintain a presence within such proximity of the Site which will allow it to respond to an emergency at the Site within one hour of receiving notice of an emergency, including emergencies occurring during non-working hours. The Bidder shall provide a list of emergency phone numbers for such purposes. If the Bidder does not have such a presence, it may satisfy this requirement by sub-contracting with a sub-contractor that does

have such a presence, provided that any such sub-contractor must be approved by the Owner, in its sole discretion, prior to the project pre-construction meeting.

5. Bidder will complete the Work for Bidder's prices entered in the QuestCDN Bid Worksheet. Unit prices will be computed in accordance with paragraph 11.03.B of the General Conditions. Bidder acknowledges that estimated quantities are not guaranteed (and may be increased or lowered), and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Bid items will be based on actual quantities authorized and approved by the Owner, as provided in the Contract Documents or supplemental guidance provided by the Owner.
6. NOTE: The SRF options included as Alternate Base Bid items must include all of the conditions, limitations, processes and any other costs related to providing those bid items strictly in accordance with requirements of the State Revolving Loan Fund. See Section 010170-1.1.E and Section 004113.

**REFERENCE COPY OF BID WORKSHEET. BID PRICING MUST BE SUBMITTED IN THE  
QUESTCDN BID WORKSHEET TO BE CONSIDERED**

**BASE BID SCHEDULE – TMTP UPGRADES AND IMPROVEMENTS:**

**Base Bid Item #1: UV Treatment System Upgrades and Improvements (Non-SRF Scenario)**

Ultraviolet (UV) disinfection system upgrades and improvements work, including: removing and disposing of two (2) existing UV treatment systems, control panels, UPS panels, piping, fittings, and appurtenances; installing one (1) new UV treatment system, power supply and control panels, piping, fittings, and appurtenances; and associated electrical and controls work.

**Lump Sum Cost, Bid Item #1 (Non-SRF Scenario):**

\$ \_\_\_\_\_

---

**Lump Sum Cost, Bid Item #1 (Non-SRF Scenario) (written out in words)**

-----

**Alternate Base Bid Item #1: UV Treatment System Upgrades and Improvements (SRF Scenario)**

Ultraviolet (UV) disinfection system upgrades and improvements work, including: removing and disposing of two (2) existing UV treatment systems, control panels, UPS panels, piping, fittings, and appurtenances; installing one (1) new UV treatment system, power supply and control panels, piping, fittings, and appurtenances; and associated electrical and controls work.

**Lump Sum Cost, Alt. Bid Item #1 (SRF Scenario):**

\$ \_\_\_\_\_

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**Lump Sum Cost, Alt. Bid Item #1 (SRF Scenario) (written out in words)**

-----

**Base Bid Item #2: PAC Storage and Feed System Upgrades and Improvements (Non-SRF Scenario)**

PAC system upgrades and improvements work, including: removing and disposing of existing PAC systems and Filter-Aid systems; furnishing and installing new PAC systems and Filter-Aid systems; constructing an enclosed area within an existing facility for the PAC systems; and associated structural, mechanical, and electrical/controls work. **The Contractor shall also furnish and install five (5) new davit sleeve systems as shown and specified on the Plans, Sheet G.1.0. {Addendum 1}**

**Lump Sum Cost, Bid Item #2 (Non-SRF Scenario):**

\$ \_\_\_\_\_

\_\_\_\_\_  
**Lump Sum Cost, Bid Item #2 (Non-SRF Scenario) (written out in words)**

-----

**Alternate Base Bid Item #2: PAC Storage and Feed System Upgrades and Improvements (SRF Scenario)**

PAC system upgrades and improvements work, including: removing and disposing of existing PAC systems and Filter-Aid systems; furnishing and installing new PAC systems and Filter-Aid systems; constructing an enclosed area within an existing facility for the PAC systems; and associated structural, mechanical, and electrical/controls work. **The Contractor shall also furnish and install five (5) new davit sleeve systems as shown and specified on the Plans, Sheet G.1.0. {Addendum 1}**

**Lump Sum Cost, Alt. Bid Item #2 (SRF Scenario):**

\$ \_\_\_\_\_

\_\_\_\_\_  
**Lump Sum Cost, Alt. Bid Item #2 (SRF Scenario) (written out in words)**

-----

**Base Bid Item #3: Flocculation and Sedimentation Basins Structural Rehabilitation (Non-SRF Scenario)**

Structural repair and rehabilitation work for the interior and exposed exterior surfaces of the flocculation and sedimentation basins as well as inside the below-grade walkway tunnel. Fill in the unit costs and total costs for the various repair work items noted in the Repair Schedule below and provide a total sum cost at the bottom. Reiterate the total sum cost written in words and numerically in the spaces provided below the schedule.

| REPAIR SCHEDULE (Non-SRF Scenario) |                    |       |           |                    |            |
|------------------------------------|--------------------|-------|-----------|--------------------|------------|
| Repair*                            | Type               | Units | Unit Cost | Estimated Quantity | Total Cost |
| G                                  | Gravity feed epoxy | LF    | \$        | 350                | \$         |
| P                                  | Epoxy injection    | LF    | \$        | 100                | \$         |

|                                                                                                               |                                                                                                                                                                                                                                                                             |    |    |       |    |
|---------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|-------|----|
| C                                                                                                             | Expansion joint crack repair                                                                                                                                                                                                                                                | LF | \$ | 245   | \$ |
| E                                                                                                             | Exposed rebar                                                                                                                                                                                                                                                               | LF | \$ | 16    | \$ |
| S                                                                                                             | Concrete spall repair                                                                                                                                                                                                                                                       | SF | \$ | 76    | \$ |
| B                                                                                                             | Remove existing coating system on bottom of floc/sed basins and replace with a new coating system.                                                                                                                                                                          | SF | \$ | 8,450 | \$ |
| W                                                                                                             | Remove existing coating system on walls of floc/sed basins and replace with a new coating system.                                                                                                                                                                           | SF | \$ | 55    | \$ |
| F                                                                                                             | Remove and replace existing failing repair                                                                                                                                                                                                                                  | CF | \$ | 300   | \$ |
| A                                                                                                             | Corbel repair                                                                                                                                                                                                                                                               | EA | \$ | 1     | \$ |
| T                                                                                                             | Apply new coating system to the inside walls of the floc/sed basin troughs                                                                                                                                                                                                  | SF | \$ | 4,500 | \$ |
| D                                                                                                             | Strip rusted steel to bare metal. Clean steel in accordance with SSPC3 and paint with zinc rich primer before applying new paint system to match existing.                                                                                                                  | SF | \$ | 350   | \$ |
| U                                                                                                             | Underpin the existing concrete pad to at least 2 ft below existing grade                                                                                                                                                                                                    | CF | \$ | 130   | \$ |
| R                                                                                                             | Existing steel beam has deteriorated at the end and needs to be replaced. Provide a new section and connections to match the existing and install to match the existing. Shore all remaining elements supported by the beam and shall be shored and reattached to the beam. | LS | \$ | 1     | \$ |
| Total Sum Cost, Structural Repair and Rehabilitation Work (Non-SRF Scenario)                                  |                                                                                                                                                                                                                                                                             |    |    | \$    |    |
| * Refer to Structural Plans and Specifications for location(s) as well as additional clarification and detail |                                                                                                                                                                                                                                                                             |    |    |       |    |

**Total Sum Cost, Bid Item #3 (Non-SRF Scenario):**

\$ \_\_\_\_\_

**Total Sum Cost, Bid Item #3 (Non-SRF Scenario) (written out in words)**

-----

**Alternate Base Bid Item #3: Flocculation and Sedimentation Basins Structural Rehabilitation (SRF Scenario)**

Structural concrete repair and rehabilitation work for the interior and exposed exterior surfaces of the flocculation and sedimentation basins as well as inside the below-grade walkway tunnel. Fill in the unit costs and total costs for the various repair work items noted in the Repair Schedule below, and provide a total sum cost at the bottom. Reiterate the total sum cost written in words and numerically in the spaces provided below the schedule.

| <b>REPAIR SCHEDULE (SRF Scenario)</b> |                                                                                                                                                                                                                                 |              |                  |                           |                   |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------------------|---------------------------|-------------------|
| <b>Repair*</b>                        | <b>Type</b>                                                                                                                                                                                                                     | <b>Units</b> | <b>Unit Cost</b> | <b>Estimated Quantity</b> | <b>Total Cost</b> |
| G                                     | Gravity feed epoxy                                                                                                                                                                                                              | LF           | \$               | 350                       | \$                |
| P                                     | Epoxy injection                                                                                                                                                                                                                 | LF           | \$               | 100                       | \$                |
| C                                     | Expansion joint crack repair                                                                                                                                                                                                    | LF           | \$               | 245                       | \$                |
| E                                     | Exposed rebar                                                                                                                                                                                                                   | LF           | \$               | 16                        | \$                |
| S                                     | Concrete spall repair                                                                                                                                                                                                           | SF           | \$               | 76                        | \$                |
| B                                     | Remove existing coating system on bottom of floc/sed basins and replace with a new coating system.                                                                                                                              | SF           | \$               | <b>8,450</b>              | \$                |
| W                                     | Remove existing coating system on walls of floc/sed basins and replace with a new coating system.                                                                                                                               | SF           | \$               | <b>55</b>                 | \$                |
| F                                     | Remove and replace existing failing repair                                                                                                                                                                                      | CF           | \$               | 300                       | \$                |
| A                                     | Corbel repair                                                                                                                                                                                                                   | EA           | \$               | 1                         | \$                |
| T                                     | Apply new coating system to the inside walls of the floc/sed basin troughs                                                                                                                                                      | SF           | \$               | 4,500                     | \$                |
| D                                     | Strip rusted steel to bare metal. Clean steel in accordance with SSPC3 and paint with zinc rich primer before applying new paint system to match existing.                                                                      | SF           | \$               | 350                       | \$                |
| U                                     | Underpin the existing concrete pad to at least 2 ft below existing grade                                                                                                                                                        | CF           | \$               | <b>130</b>                | \$                |
| R                                     | Existing steel beam has deteriorated at the end and needs to be replaced. Provide a new section and connections to match the existing and install to match the existing. Shore all remaining elements supported by the beam and | LS           | \$               | 1                         | \$                |

|                                                                                                                      |                                             |  |  |           |  |
|----------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--|--|-----------|--|
|                                                                                                                      | shall be shored and reattached to the beam. |  |  |           |  |
| <b>Total Sum Cost, Structural Repair and Rehabilitation Work (SRF Scenario)</b>                                      |                                             |  |  | <b>\$</b> |  |
| <i>* Refer to Structural Plans and Specifications for location(s) as well as additional clarification and detail</i> |                                             |  |  |           |  |

**Total Sum Cost, Alt. Bid Item #3 (SRF Scenario):**

**\$** \_\_\_\_\_

**Total Sum Cost, Alt. Bid Item #3 (SRF Scenario) (written out in words)**

-----

**Total Base Bid Cost (Sum of Base Bid Items #1, #2, and #3 Non-SRF Scenario):**

**\$** \_\_\_\_\_

**Total Base Bid Cost (Sum of Base Bid Items #1, #2, and #3 Non-SRF Scenario)  
(written out in words)**

-----

**Total Alternate Base Bid Cost (Sum of Base Bid Items #1, #2, and #3 SRF Scenario):**

**\$** \_\_\_\_\_

**Total Alternate Base Bid Cost (Sum of Base Bid Items #1, #2, and #3 SRF Scenario) (written out in words)**

-----

**ADD ALTERNATIVE BID ITEM #4 – FORT THOMAS DIVERSION PIPING MODIFICATIONS (Non-SRF Scenario):**

**Add Alternative Bid Item #4: Fort Thomas Diversion Piping Modifications**

Fort Thomas diversion piping modifications, which include removing existing piping, fittings, and appurtenances; furnishing and installing piping, fittings, valves with electric motor actuators, and appurtenances; and associated electrical and controls work. This work shall only be performed if accepted and authorized by the Owner.

This work will be an add alternative bid item. After evaluating the base bid items, the Owner reserves their right to accept or reject this bid item and to whether or not include this alternative



as part of the Contract. If accepted, then the add alternative work will become part of the Contract Documents. However, should the Owner not exercise its option, then the add alternative work will not be part of the Contract Documents.

**Lump Sum Cost, Add Alternative Bid Item #4 (Non-SRF Scenario):**

\$ \_\_\_\_\_

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**Lump Sum Cost, Add Alternative Bid Item #4 (Non-SRF Scenario) (written out in words)**

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**ADD ALTERNATIVE BID ITEM #5 – FORT THOMAS DIVERSION PIPING MODIFICATIONS (SRF Scenario):**

**Add Alternative Bid Item #5 SRF Scenario: Fort Thomas Diversion Piping Modifications**

Fort Thomas diversion piping modifications, which include removing existing piping, fittings, and appurtenances; furnishing and installing piping, fittings, valves with electric motor actuators, and appurtenances; and associated electrical and controls work. This work shall only be performed if accepted and authorized by the Owner.

This work will be an add alternative bid item. After evaluating the base bid items, the Owner reserves their right to accept or reject this bid item and to whether or not include this alternative as part of the Contract. If accepted, then the add alternative work will become part of the Contract Documents. However, should the Owner not exercise its option, then the add alternative work will not be part of the Contract Documents.

**Lump Sum Cost, Add Alternative Bid Item #5 (SRF Scenario):**

\$ \_\_\_\_\_

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**Lump Sum Cost, Add Alternative Bid Item #5 (SRF Scenario) (written out in words)**

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**ADD ALTERNATIVE BID ITEM #6 – UV LED SYSTEM (Non-SRF Scenario):**

**Add Alternative Bid Item #6: UV LED System**

Furnish and install an Ultraviolet (UV) LED System complete with: removing and disposing of two (2) existing UV treatment systems, control panels, UPS panels, piping, fittings, and appurtenances; installing one (1) new UV LED System with three (3) UV LED Lamp Modules, a remote HMI station, piping, fittings, and appurtenances including cooling water supply and discharge piping for each of the three UV LED Lamp Modules; and associated electrical and controls work.

Bidder will indicate the difference in cost (addition or deduction) on the Bid Disclosure Form (Section 004113) between Add Alternate Bid Item 6 (Non-SRF Scenario) and Base Bid Item 1 (Non-SRF Scenario). The Owner will determine if a medium-pressure UV system or a LED UV

system will be furnished and installed with this work using the completed Questionnaire provided in Section 004113 along with the Alternate Bid Price.

The Owner reserves their right to accept or reject this bid item and to whether or not include this alternative as part of the Contract. If accepted, then the add alternative work will become part of the Contract Documents. However, should the Owner not exercise its option, then the add alternative work will not be part of the Contract Documents.

**Lump Sum Cost, Add Alternative Bid Item #6 (Non-SRF Scenario):**

\$ \_\_\_\_\_

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**Lump Sum Cost, Add Alternative Bid Item #6 (Non-SRF Scenario) (written out in words)**

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**ADD ALTERNATIVE BID ITEM #7 – UV LED SYSTEM (SRF Scenario):**

**Add Alternative Bid Item #7 SRF Scenario: UV LED System**

Furnish and install an Ultraviolet (UV) LED System complete with: removing and disposing of two (2) existing UV treatment systems, control panels, UPS panels, piping, fittings, and appurtenances; installing one (1) new UV LED System with three (3) UV LED Lamp Modules, a remote HMI station, piping, fittings, and appurtenances including cooling water supply and discharge piping for each of the three UV LED Lamp Modules; and associated electrical and controls work.

Bidder will indicate the difference in cost (addition or deduction) on the Bid Disclosure Form (Section 004113) between Add Alternate Bid Item 7 (SRF Scenario) and Alternate Base Bid Item 1 (SRF Scenario). The Owner will determine if a medium-pressure UV system or a LED UV system will be furnished and installed with this work using the completed Questionnaire provided in Section 004113 along with the Alternate Bid Price.

The Owner reserves their right to accept or reject this bid item and to whether or not include this alternative as part of the Contract. If accepted, then the add alternative work will become part of the Contract Documents. However, should the Owner not exercise its option, then the add alternative work will not be part of the Contract Documents.

**Lump Sum Cost, Add Alternative Bid Item #7 (SRF Scenario):**

\$ \_\_\_\_\_

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**Lump Sum Cost, Add Alternative Bid Item #7 (SRF Scenario) (written out in words)**

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7. Bidder agrees that the Base Bid Work will be substantially complete as provided in paragraph 15.03 of the General Conditions within **365** days after the date when the Contract Times commence to run as provided in accordance with paragraph 4.01.A of the General Conditions, and completed and ready for final payment in accordance with

paragraph 15.06.B of the General Conditions within **395** days after the date when the Contract Times commence to run.

If Add Alternative Bid Items #4, #5, #6, and/or #7 is/are accepted and authorized by the Owner, Bidder agrees that the Alternate Bid Work will be substantially complete as provided in paragraph 15.03 of the General Conditions within **365** days after the date when the Contract Times commence to run as provided in accordance with paragraph 4.01.A of the General Conditions, and completed and ready for final payment in accordance with paragraph 15.06.B of the General Conditions within **395** days after the date when the Contract Times commence to run.

The terms used in this Bid with initial capital letters have the meanings indicated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions. The terms in this Bid, which are defined in the General Conditions included as part of the Contract Documents, have the meanings assigned to them in the General Conditions.

8. References

| Contact Person | Company Name | Phone No. | Project Name |
|----------------|--------------|-----------|--------------|
| 1.             |              |           |              |
|                |              |           |              |
| 2.             |              |           |              |
|                |              |           |              |
| 3.             |              |           |              |
|                |              |           |              |
| 4.             |              |           |              |
|                |              |           |              |

SUBMITTED on \_\_\_\_\_, 2025.

9. Communications concerning this Bid shall be sent to Bidder at the following address:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Phone: \_\_\_\_\_

Email: \_\_\_\_\_

10. The terms in this Bid, which are defined in the General Conditions included as part of the Contract Documents, have the meanings assigned to them in the General Conditions.

11. Major Equipment Manufacturer's List (Part of Bid Form)

- a. Each Bidder shall enter, in the spaces provided below, the names of manufacturers of equipment which he proposes to furnish if awarded the Contract. Upon award of the Contract, the named manufacturer shall be furnished. This list is an integral part of the bid form.
- b. Not more than one manufacturer's name shall be listed for each item of equipment. If the Bidder fails to list a manufacturer's name, lists more than one manufacturer, lists a manufacturer that is not specified by name, or lists a manufacturer which is subsequently rejected during the shop drawing submittal phase, the Owner will select the equipment of his choice with no increase in Contract price. Substitutions after the bid will be permitted at the discretion of the Owner only if the named manufacturer is unable to meet the delivery requirements of the construction schedule, or the manufacturer is dilatory in complying with the requirements of the Contract Documents.
- c. Preliminary acceptance of the manufacturers named below shall not in any way constitute a waiver of the requirements of the Contract Documents covering such equipment; final acceptance will be based on full conformity with the Contract Documents.

| Specification<br>Section | Equipment/Materials           | Manufacturer  |
|--------------------------|-------------------------------|---------------|
| 113650                   | Filter-Aid System Feed Pumps  | _____         |
| 132000                   | PAC Bulk Loader & Feed System | _____         |
| 137000                   | UV Disinfection System        | _____         |
| 137000                   | UV System, PLC / HMI          | _____ / _____ |
| 137100                   | UV LED Disinfection System    | _____         |
| 137100                   | UV LED System, PLC / HMI      | _____ / _____ |
| 151000                   | Butterfly Valves              | _____         |
| 151000                   | Plug Valve                    | _____         |
| 151000                   | Electric Motor Actuators      | _____         |

## 12. Evaluation of UV Disinfection Systems

The Owner requests supplemental information in addition to the bid costs provided above in order to further evaluate and select the preferred UV Disinfection System for this work (Medium-Pressure UV Treatment Systems and UV LED Systems).

Each Bidder shall fill in the requested information below in the spaces provided:

| #    | Item                                                                                                                                                                                                       | Unit         | MP UV System | UV LED System |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------|---------------|
| 12.a | Bare cost of UV System equipment and components ONLY (does not include installation or other equipment such as electrical or structural components, and does not separately consider SRF vs non-SRF costs) | Dollars      |              |               |
| 12.b | Estimated service life of reactors                                                                                                                                                                         | Hours        |              |               |
| 12.c | Cost of each UV Lamp                                                                                                                                                                                       | Dollars      |              |               |
| 12.d | # of UV Lamps required to treat 10 mgd                                                                                                                                                                     | Each         |              |               |
| 12.e | Normal UV Lamp Operating Life (90% effective treatment)                                                                                                                                                    | Hours        |              |               |
| 12.f | Power required per UV lamp                                                                                                                                                                                 | kW           |              |               |
| 12.g | Warm-up time                                                                                                                                                                                               | Minutes      |              |               |
| 12.h | Estimated annual maintenance cost at 10 mgd for 6 months per year                                                                                                                                          | Dollars/Year |              |               |

**AUTHORIZED SIGNATURE OF BIDDER**  
(see signature instructions below)

Individual/Entity Name/DBA \_\_\_\_\_(print)

By: \_\_\_\_\_(sign)  
(Attach evidence of authority to sign if a corporation, LLC, joint venture, or partnership)

Title: \_\_\_\_\_

Business address \_\_\_\_\_

\_\_\_\_\_

Phone No.: \_\_\_\_\_ Fax No.: \_\_\_\_\_

Email Address for Electronic Signatures: \_\_\_\_\_

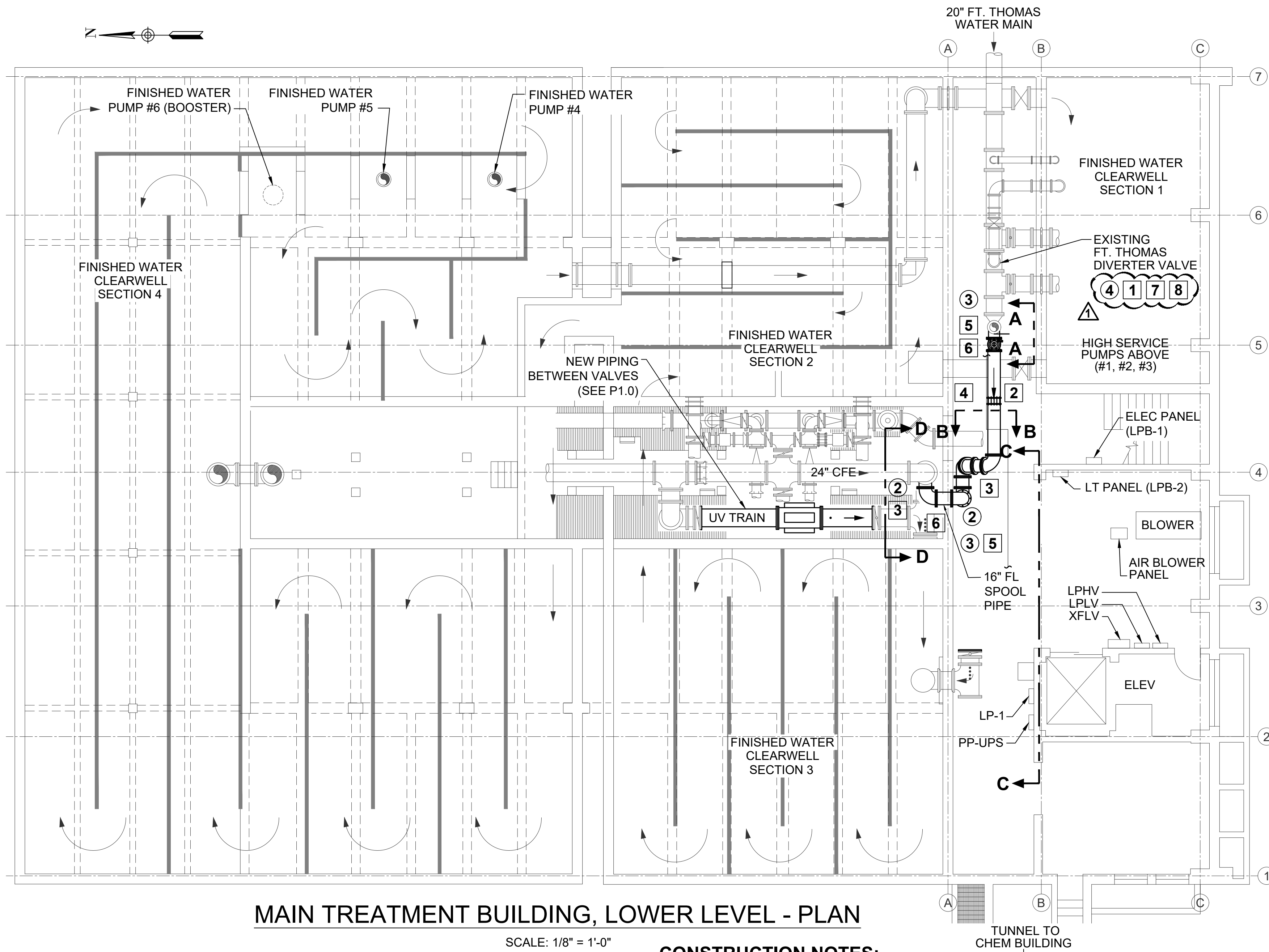
Date \_\_\_\_\_

Signatures should meet the following requirements:

- Signatures for partnerships must be made by a general partner.
- Signatures for LLCs must be made by a manager or member, as dictated by the entity's Articles of incorporation/bylaws.
- If a joint venture, each venturer must complete the above complete the above authorized signature of bidder form and attach a copy to the Bid Disclosure Form.

**ATTACHMENT 2-C**  
**REVISED SHEET P3.0**





MAIN TREATMENT BUILDING, LOWER LEVEL - PLAN

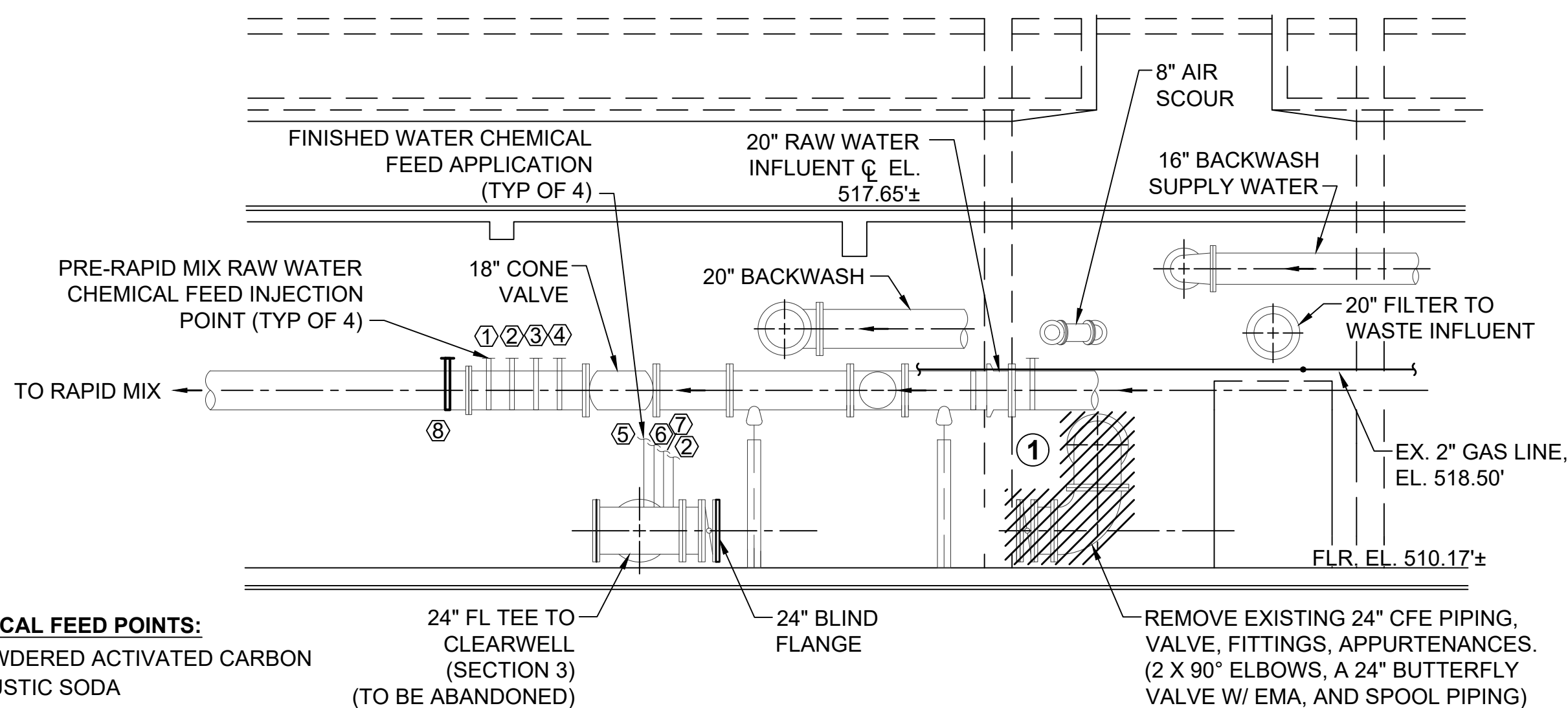
SCALE: 1/8" = 1'-0"

GENERAL NOTES:

- ALL REMOVED EQUIPMENT AND MATERIALS SHALL BE PROPERLY DISPOSED OF BY THE CONTRACTOR. OWNER WILL ADVISE IF ANY REMOVED EQUIPMENT OR MATERIALS ARE TO BE TURNED OVER TO THE OWNER'S STAFF.
- EXISTING UV TRAIN #1 SYSTEM SHALL REMAIN IN OPERATION UNTIL WORK FOR NEW UV TRAIN IS COMPLETE, ACCEPTED BY OWNER & ENGINEER, AND AVAILABLE TO BE PLACED INTO REGULAR SERVICE.
- FOR ANY PLANT POWER OUTAGES AND SHUTDOWNS, THE CONTRACTOR SHALL TAKE INTO CONSIDERATION THAT FINISHED WATER PUMPS NOS. 1, 2, & 6 CAN ONLY BE OUT OF SERVICE FOR UP TO SIX (6) HOURS AT A TIME.
- ELECTRICAL OUTAGES SHALL BE REQUESTED BY THE CONTRACTOR IN WRITING TO THE OWNER AND ENGINEER AT LEAST SEVEN (7) DAYS IN ADVANCE OF THE PLANNED OUTAGE. AT A MINIMUM, THE REQUEST SHOULD INCLUDE THE REASON FOR THE OUTAGE, WHAT PORTIONS OF THE PLANT WILL BE WITHOUT SERVICE, WHAT TIME THE SHUTDOWN WOULD BEGIN, AND THE ESTIMATED DURATION OF THE OUTAGE. THE CONTRACTOR SHALL PREPOSITION EQUIPMENT AND MATERIALS IN ADVANCE SO AS TO KEEP THE DURATION OF THE OUTAGE AT A MINIMUM.
- NKWD HAS A SEPARATE PROJECT TO INSTALL EMERGENCY GENERATORS AND REPLACE THE ELECTRICAL SUBSTATION ON-SITE, AND THIS OTHER WORK MAY ALSO BE OCCURRING DURING CONSTRUCTION. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER & ENGINEER TO DETERMINE THE STATUS OF OTHER PROJECTS AND THE IMPACTS, IF ANY, TO THE UPGRADES UNDER THIS WORK, PARTICULARLY THE NEW UV EQUIPMENT.

CONSTRUCTION NOTES:

- THE CURRENT DIVERSION VALVE AND PIPING INSTALLATION IS SLIGHTLY DIFFERENT THAN THAT SHOWN. THE EXISTING DIVERSION VALVE AND PIPING SHALL REMAIN, AND SHALL BE AN ALTERNATE METHOD FOR SUPPLYING WATER TO THE CLEARWELL.
- REFER TO NEW FT. THOMAS DIVERSION PIPING SECTION ON SHEET P3.1
- FIELD VERIFY DIMENSIONS AND ELEVATIONS. FIELD MODIFICATIONS MAY BE ALLOWED, BUT APPROVED BY OWNER AND ENGINEER PRIOR TO PROCURING EQUIPMENT AND MATERIALS AND INSTALLATION.
- NEW FT. THOMAS DIVERSION PIPING TO BE INSTALLED UNDER EXISTING 2" GAS LINE, APPROX. 100" AFF (EL. 518.50'±)
- EXISTING 20" RAW WATER LINE (EL. 517.65'±) NOT SHOWN FOR CLARITY. SEE 20" RAW WATER IN SECTIONAL VIEWS ON SHEETS P3.0 AND P3.1.
- FOR NEW VALVES AND ACTUATORS CONTRACTOR SHALL INSTALL ALL SIGNAL WIRING AND CONDUIT FOR EQUIPMENT AND APPURTENANCES BACK TO THE OPERATOR CONTROL ROOM ON THE 2ND FLOOR OF THE MAIN TREATMENT BUILDING, INCLUDING CONNECTIONS TO EXISTING PANELS. CONTRACTOR SHALL LABEL/TAG ALL NEW CONDUCTORS. OWNER WILL UPDATE/MODIFY THE MAIN PLANT SCADA, INCLUDING PROGRAMMING, FOR DIVERTING FORT THOMAS WATER DIRECTLY TO THE CLEARWELL.
- CONTRACTOR SHALL FURNISH AND INSTALL A 208V-3PH ELECTRIC ACTUATOR FOR CONNECTION TO THE EXISTING FT. THOMAS DIVERTER (ANGLED GLOBE) VALVE. POWER SOURCE SHALL REMAIN THE SAME. USE WIRING PRESERVED FROM THE REMOVAL OF THE EXISTING VALVE ACTUATOR. FURNISH AND INSTALL ADDITIONAL ELECTRICAL/POWER COMPONENTS AND MATERIALS AS NEEDED FOR VALVE OPERATIONS.
- ELECTRIC ACTUATOR SHALL BE MODULATING TYPE, SIMILAR TO EXISTING, AND PRESERVED SIGNAL WIRING SHALL BE RECONNECTED. SIGNAL AND CONTROLS SHALL REMAIN THE SAME. CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING CAPABILITY BETWEEN THE EXISTING VALVE AND NEW ELECTRIC ACTUATOR. FURNISH AND INSTALL ADDITIONAL SIGNAL COMPONENTS AND MATERIALS AS NEEDED FOR VALVE OPERATIONS.

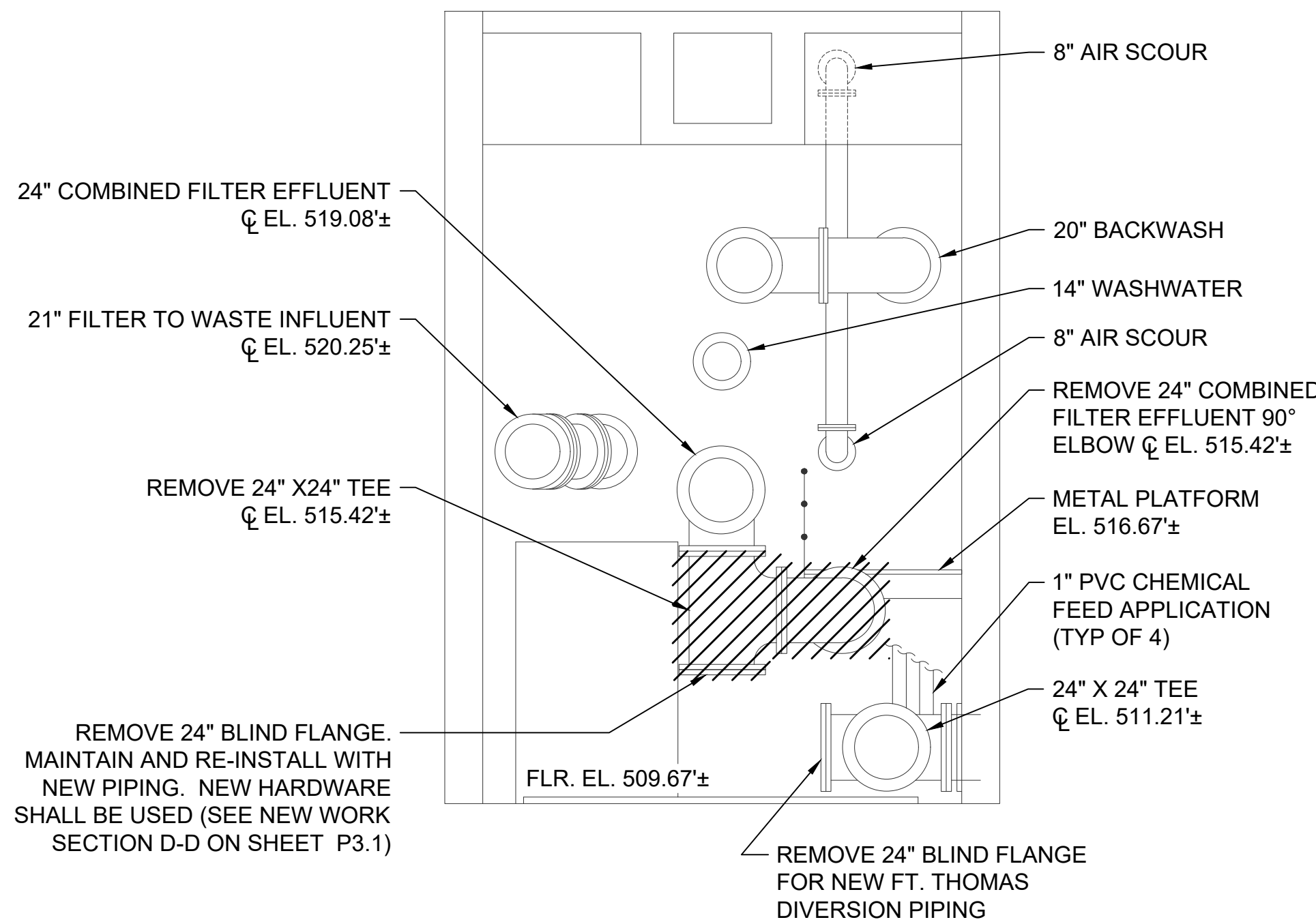


FT. THOMAS DIVERSION PIPING DEMOLITION - SECTION C-C

SCALE: 3/16" = 1'-0"

DEMOLITION NOTES:

- REFER TO ELECTRICAL PLANS FOR RELATED WORK AS WELL AS P&ID SCHEMATICS (P4.0 - P4.3).
- REFER TO DEMOLITION SECTIONS ON SHEET P3.0
- EXISTING 20" RAW WATER LINE (EL. 517.65'±) NOT SHOWN FOR CLARITY. SEE 20" RAW WATER IN SECTIONAL VIEWS ON SHEETS P3.0 AND P3.1.
- CONTRACTOR SHALL REMOVE THE 208V-3PH ELECTRIC ACTUATOR FOR THE FT. THOMAS DIVERTER (ANGLE GLOBE) VALVE. CONTRACTOR SHALL PRESERVE THE POWER AND SIGNAL AND WIRING TO RE-CONNECT TO A NEW ELECTRIC ACTUATOR.



FT. THOMAS DIVERSION PIPING - DEMOLITION - SECTION D-D

SCALE: 1/4" = 1'-0"

THE FT. THOMAS DIVERSION PIPING WORK SHALL BE AN ADD ALTERNATE BID ITEM AND THE WORK SHALL BE PERFORMED ONLY IF AUTHORIZED BY THE OWNER. REFER TO THE CONTRACT DOCUMENTS BOOK FOR ADDITIONAL INFORMATION AND CLARIFICATION.

| REVISIONS |     |         |  | REMARKS              |
|-----------|-----|---------|--|----------------------|
| NO.       | BY  | DATE    |  |                      |
| 1         | GSW | 7.14.26 |  | ADDENDUM 2 REVISIONS |
|           |     |         |  |                      |
|           |     |         |  |                      |
|           |     |         |  |                      |

DES GSW  
DWN CLT  
CKD EPS

ORIGINAL SEAL  
DAVID A. CORNWELL  
KY LICENSE #: 25973  
DATE: 6/5/2026

TAYLOR MILL TREATMENT PLANT  
TMTP UPGRADES & IMPROVEMENTS

ADD ALTERNATE BID ITEM:  
FT. THOMAS DIVERSION PIPING  
PLAN AND SECTIONS

SCALE: AS NOTED

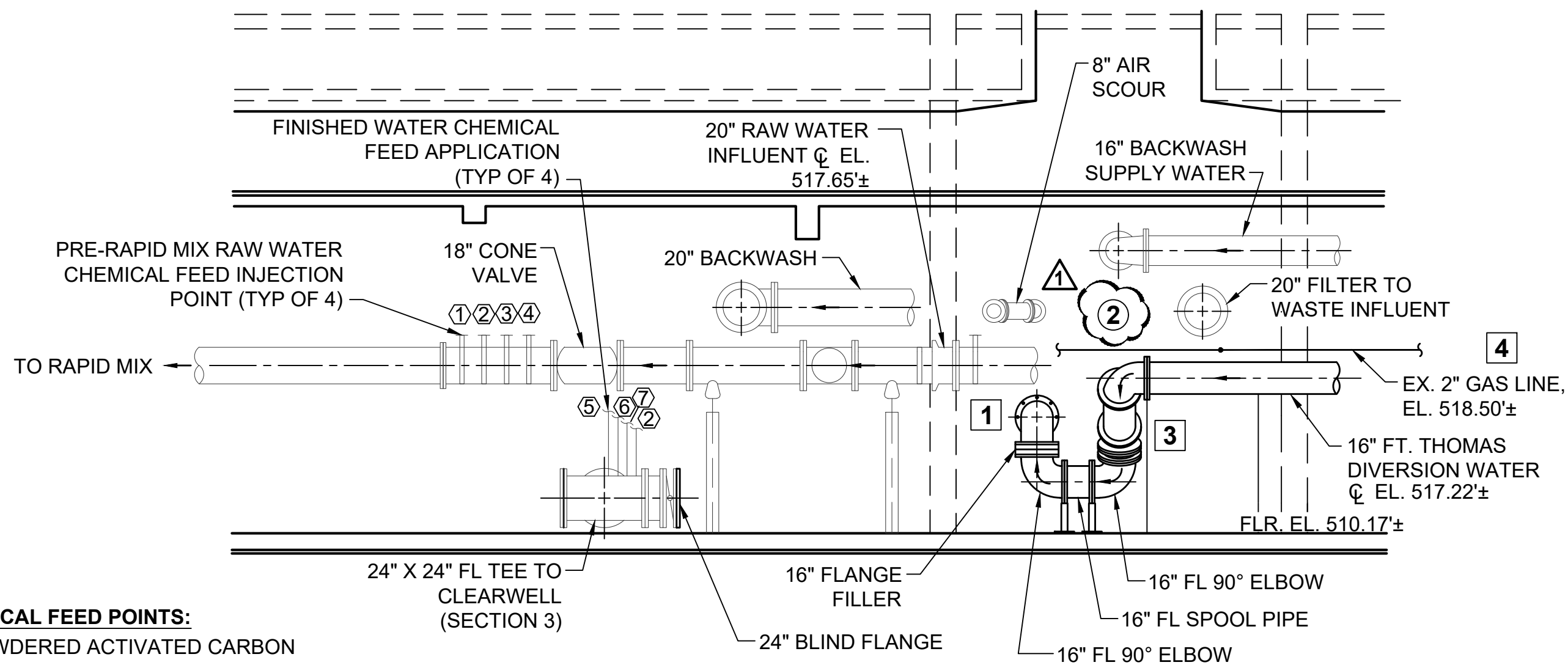
DATE JUNE 2026

P3.0

JOB NO. 011904

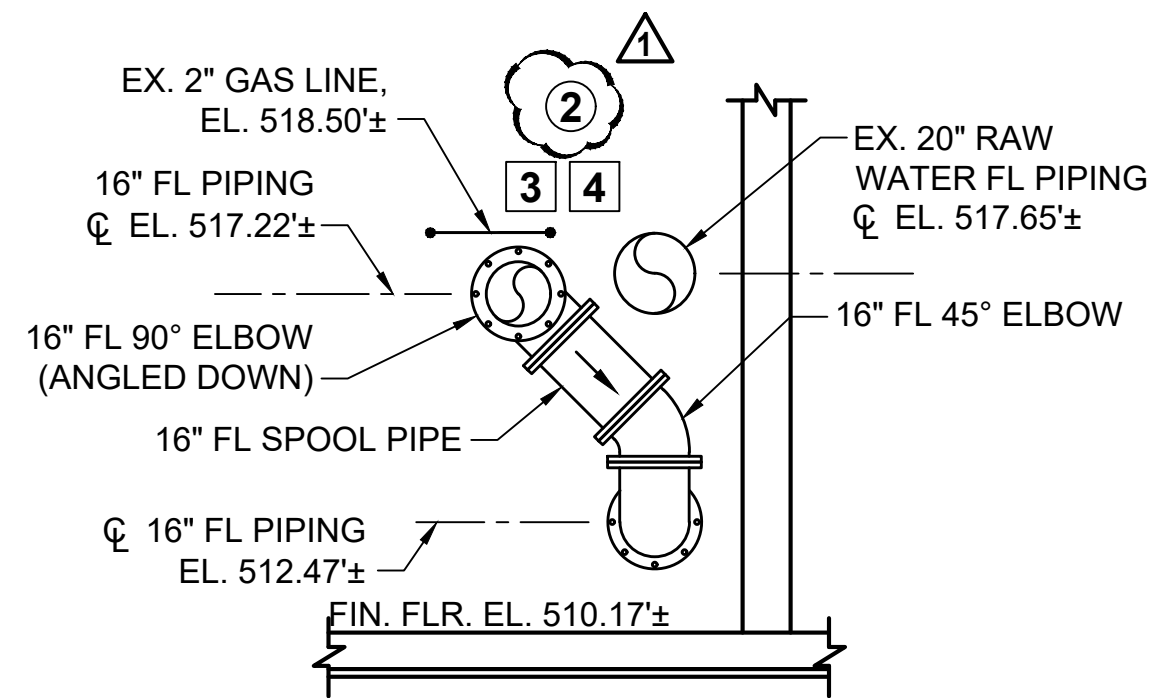


**ATTACHMENT 2-D**  
**REVISED SHEET P3.1**



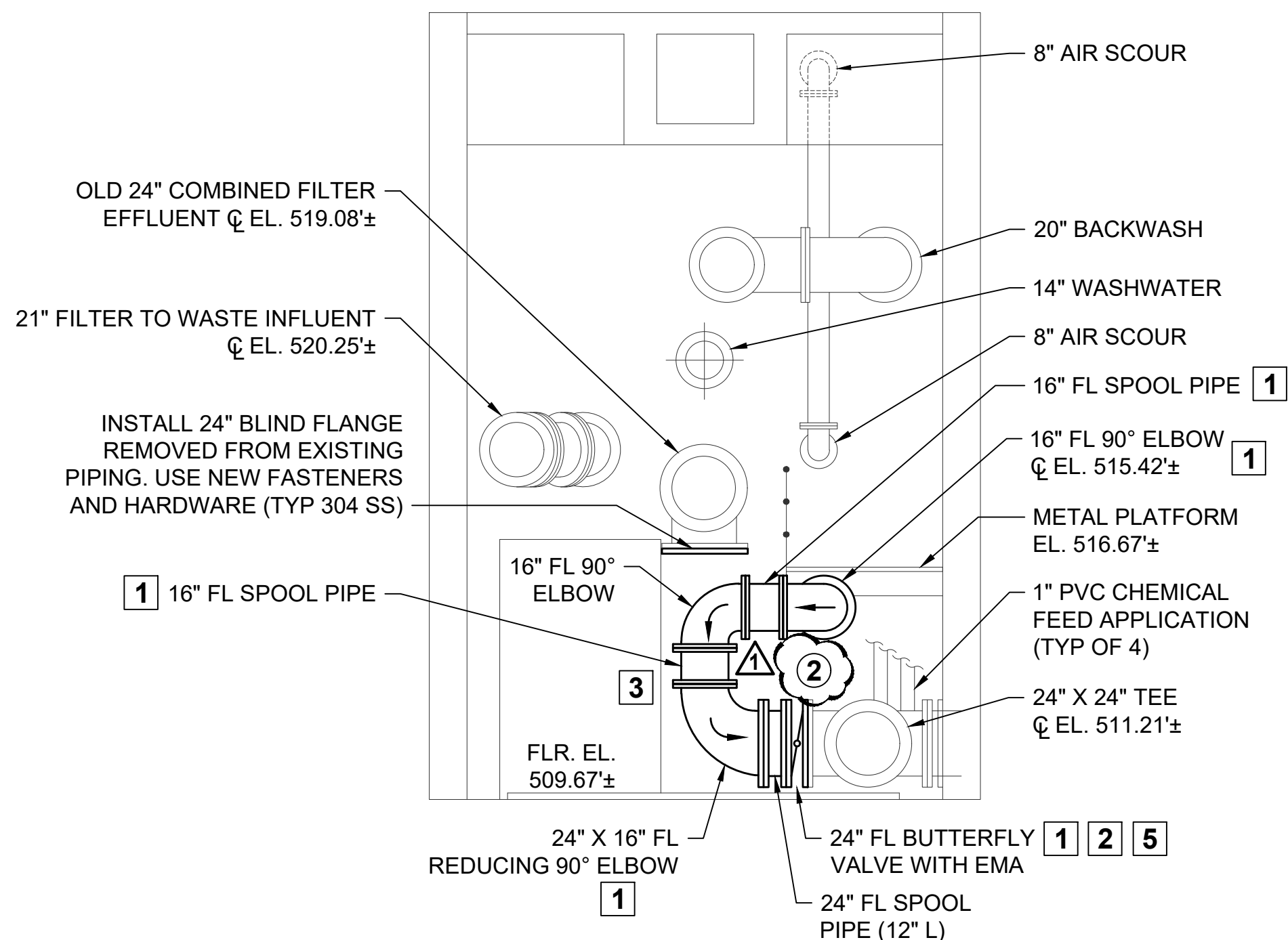
FT. THOMAS DIVERSION PIPING - SECTION C-C

SCALE: 3/16" = 1'-0"



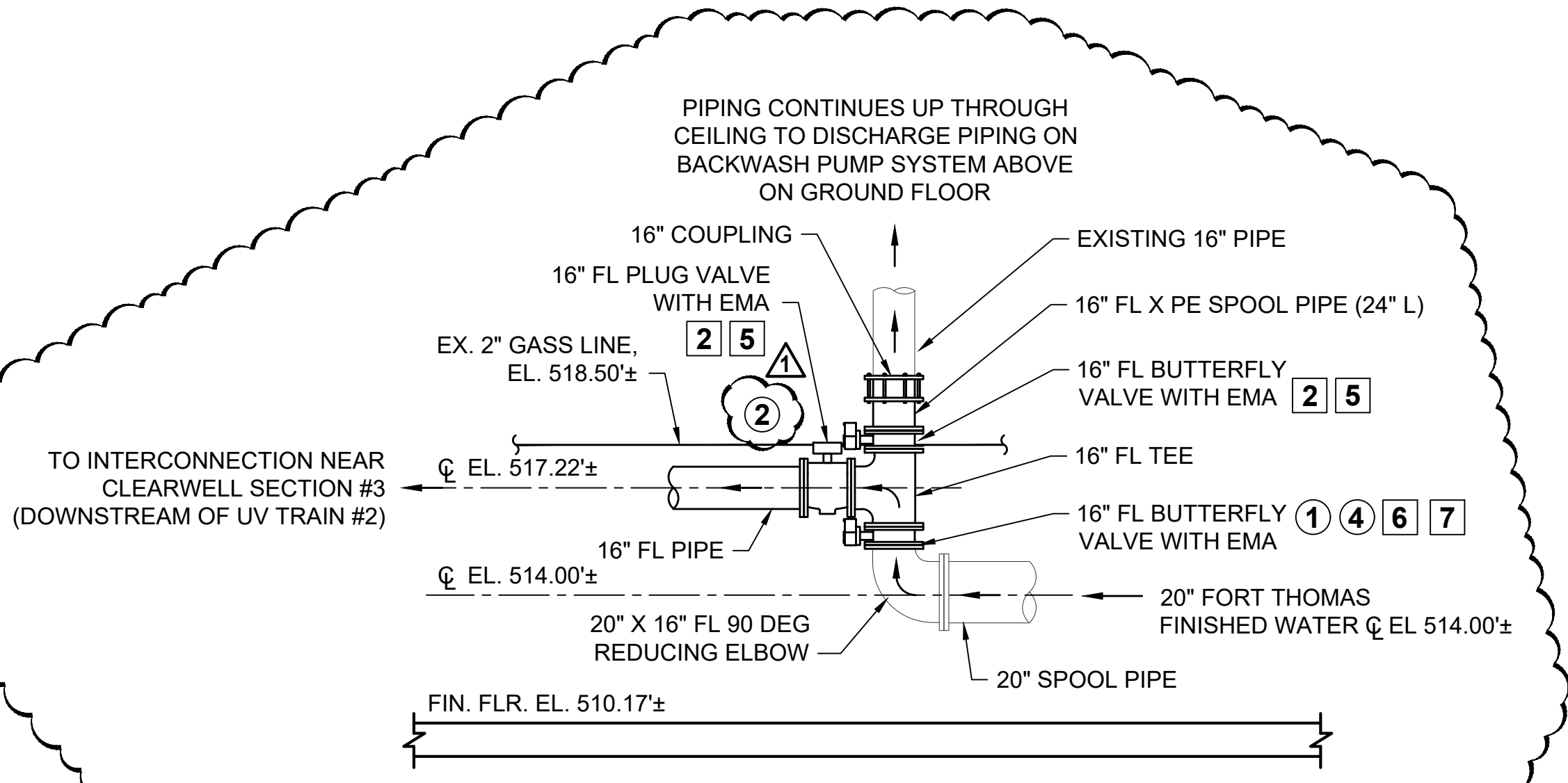
FT. THOMAS DIVERSION PIPING - SECTION B-B

SCALE: 1/4" = 1'-0"



FT. THOMAS DIVERSION PIPING - SECTION D-D

SCALE: 1/4" = 1'-0"



FT. THOMAS DIVERSION PIPING - SECTION A-A

SCALE: 1/4" = 1'-0"

#### GENERAL NOTES:

- ALL REMOVED EQUIPMENT AND MATERIALS SHALL BE PROPERLY DISPOSED OF BY THE CONTRACTOR. OWNER WILL ADVISE IF ANY REMOVED EQUIPMENT OR MATERIALS ARE TO BE TURNED OVER TO THE OWNER'S STAFF.
- FOR ANY PLANT POWER OUTAGES AND SHUTDOWNS, THE CONTRACTOR SHALL TAKE INTO CONSIDERATION THAT FINISHED WATER PUMPS NOS. 1, 2, & 6 CAN ONLY BE OUT OF SERVICE FOR UP TO SIX (6) HOURS AT A TIME.
- ELECTRICAL OUTAGES SHALL BE REQUESTED BY THE CONTRACTOR IN WRITING TO THE OWNER AND ENGINEER AT LEAST SEVEN (7) DAYS IN ADVANCE OF THE PLANNED OUTAGE. AT A MINIMUM, THE REQUEST SHOULD INCLUDE THE REASON FOR THE OUTAGE, WHAT PORTIONS OF THE PLANT WILL BE WITHOUT SERVICE, WHAT TIME THE SHUTDOWN WOULD BEGIN, AND THE ESTIMATED DURATION OF THE OUTAGE. THE CONTRACTOR SHALL PREPOSITION EQUIPMENT AND MATERIALS IN ADVANCE SO AS TO KEEP THE DURATION OF THE OUTAGE AT A MINIMUM.
- NKWD HAS A SEPARATE PROJECT TO INSTALL EMERGENCY GENERATORS AND REPLACE THE ELECTRICAL SUBSTATION ON-SITE, AND THIS OTHER WORK MAY ALSO BE OCCURRING DURING CONSTRUCTION. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER & ENGINEER TO DETERMINE THE STATUS OF OTHER PROJECTS AND THE IMPACTS, IF ANY, TO THE UPGRADES UNDER THIS WORK, PARTICULARLY THE NEW UV EQUIPMENT.

#### DEMOLITION NOTES:

- REFER TO ELECTRICAL PLANS FOR RELATED WORK AS WELL AS P&ID SCHEMATICS (P4.0 - P4.3).
- REFER TO DEMOLITION SECTIONS ON SHEET P3.0.
- CONTRACTOR SHALL REMOVE ALL SIGNAL WIRING AND CONDUIT FOR EQUIPMENT AND APPURTENANCES BACK TO THE OPERATOR CONTROL ROOM ON THE 2ND FLOOR OF THE MAIN TREATMENT BUILDING. COORDINATE WITH OWNER FOR CONNECTIONS TO THE MAIN PLANT SCADA.
- CONTRACTOR SHALL REMOVE THE EXISTING 16-IN FL BUTTERFLY VALVE AND ELECTRIC ACTUATOR FOR THE FT. THOMAS DIVERSION PIPING. CONTRACTOR SHALL PRESERVE THE POWER AND SIGNAL CONDUIT AND WIRING TO RE-CONNECT FOR A NEW ELECTRIC VALVE ACTUATOR. CONTRACTOR SHALL PREPARE THE FLANGE FACE FOR THE INSTALLATION OF THE NEW VALVE.

#### CONSTRUCTION NOTES:

- ONCE THE EXISTING 24" CFE PIPING IS REMOVED, NEW 16" FT. THOMAS DIVERSION PIPING SHALL GO THROUGH EXISTING WALL OPENING TO COMPLETE THE INSTALL IN THE FILTER PIPE GALLERY.
- REFER TO ELECTRICAL PLANS FOR RELATED WORK AS WELL AS P&ID SCHEMATICS (P4.0 - P4.3).
- FIELD VERIFY DIMENSIONS AND ELEVATIONS. FIELD MODIFICATIONS MAY BE ALLOWED, BUT CONTRACTOR MUST HAVE APPROVAL BY OWNER AND ENGINEER PRIOR TO PROCURING EQUIPMENT AND MATERIALS AND INSTALLATION.
- NEW FT. THOMAS DIVERSION PIPING TO BE INSTALLED UNDER EXISTING 2" GAS LINE, APPROX. 100" AFF (EL. 578.50'±).
- FOR NEW VALVES AND ACTUATORS, CONTRACTOR SHALL INSTALL ALL SIGNAL WIRING AND CONDUIT FOR EQUIPMENT AND APPURTENANCES BACK TO THE OPERATOR CONTROL ROOM ON THE 2ND FLOOR OF THE MAIN TREATMENT BUILDING. INCLUDING CONNECTIONS TO EXISTING PANELS. CONTRACTOR SHALL LABEL/TAG ALL NEW CONDUCTORS. OWNER WILL UPDATE/MODIFY THE MAIN PLANT SCADA, INCLUDING PROGRAMMING, FOR DIVERTING FORT THOMAS WATER DIRECTLY TO THE CLEARWELL. UPON COMPLETION OF ALL WORK, CONTRACTOR SHALL PREPARE AND PROVIDE OWNER WITH AS-BUILT PLANS AND AN UPDATED I/O INVENTORY. OWNER SHALL FURNISH CONTRACTOR WITH EXISTING WIRING DIAGRAMS ON WHICH THE CONTRACTOR SHALL MAKE HAND-WRITTEN UPDATES AND RETURN TO OWNER.
- CONTRACTOR SHALL FURNISH A 208V-3PH ELECTRIC ACTUATOR TO CONNECT TO THE EXISTING VALVE. POWER SOURCE SHALL REMAIN THE SAME. FURNISH AND INSTALL ADDITIONAL ELECTRICAL/POWER COMPONENTS AND MATERIALS AS NEEDED FOR VALVE OPERATIONS.
- ELECTRIC ACTUATOR SHALL BE OPEN-CLOSE TYPE, SIMILAR TO EXISTING, AND EXISTING SIGNAL WIRING SHALL BE RECONNECTED. SIGNAL AND CONTROLS SHALL REMAIN THE SAME. CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING CAPABILITY BETWEEN THE VALVE AND ELECTRIC ACTUATOR. FURNISH AND INSTALL ADDITIONAL SIGNAL COMPONENTS AND MATERIALS AS NEEDED FOR VALVE OPERATIONS.

THE FT. THOMAS DIVERSION PIPING WORK SHALL BE AN ADD ALTERNATE BID ITEM AND THE WORK SHALL BE PERFORMED ONLY IF AUTHORIZED BY THE OWNER. REFER TO THE CONTRACT DOCUMENTS BOOK FOR ADDITIONAL INFORMATION AND CLARIFICATION.

| REVISIONS |     |         |                      |  |
|-----------|-----|---------|----------------------|--|
| NO.       | BY  | DATE    | REMARKS              |  |
| 1         | GSW | 7.14.26 | ADDENDUM 2 REVISIONS |  |
|           |     |         |                      |  |
|           |     |         |                      |  |
|           |     |         |                      |  |

DES GSW  
DWN CLT  
CKD EPS

ORIGINAL SEAL  
DAVID A. CORNWELL  
KY LICENSE #: 25973  
DATE: 6/5/2026

TAYLOR MILL TREATMENT PLANT  
TMTP UPGRADES & IMPROVEMENTS

ADD ALTERNATE BID ITEM:  
FT. THOMAS DIVERSION PIPING SECTIONS

SCALE: AS NOTED

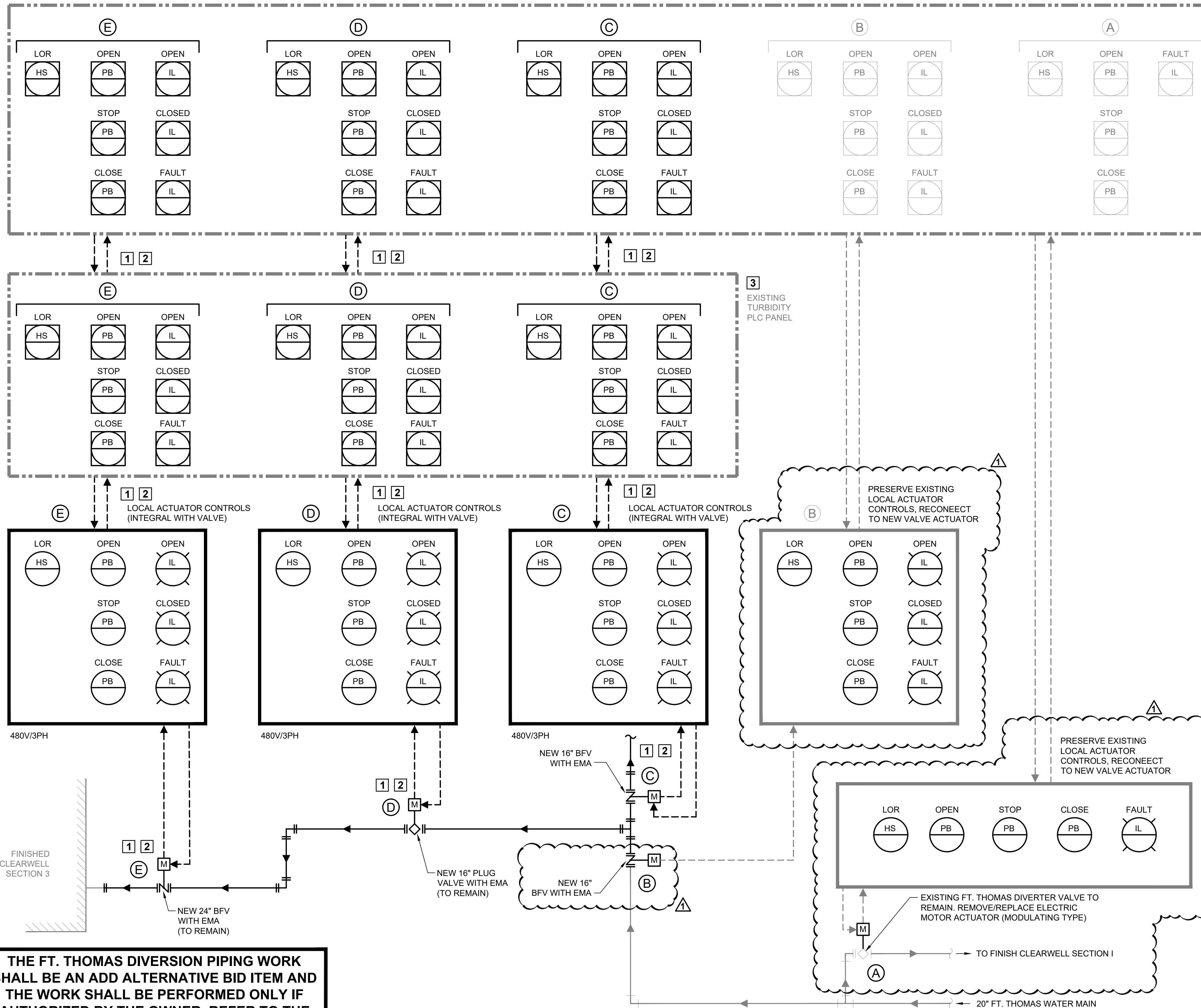
DATE JUNE 2026

P3.1

JOB NO. 011904

**ATTACHMENT 2-E**  
**REVISED SHEET P4.3**





**GENERAL NOTES:**

- ALL REMOVED EQUIPMENT AND MATERIALS SHALL BE PROPERLY DISPOSED OF BY THE CONTRACTOR. OWNER WILL ADVISE IF ANY REMOVED EQUIPMENT OR MATERIALS ARE TO BE TURNED OVER TO THE OWNER'S STAFF.
- FOR ANY PLANT POWER OUTAGES AND SHUTDOWNS, THE CONTRACTOR SHALL TAKE INTO CONSIDERATION THAT FINISHED WATER PUMPS NOS. 1, 2, & 6 CAN ONLY BE OUT OF SERVICE FOR UP TO SIX (6) HOURS AT A TIME.
- ELECTRICAL OUTAGES SHALL BE REQUESTED BY THE CONTRACTOR IN WRITING TO THE OWNER AND ENGINEER AT LEAST SEVEN (7) DAYS IN ADVANCE OF THE PLANNED OUTAGE. AT A MINIMUM, THE REQUEST SHOULD INCLUDE THE REASON FOR THE OUTAGE, WHAT PORTIONS OF THE PLANT WILL BE WITHOUT SERVICE, WHAT TIME THE SHUTDOWN WOULD BEGIN, AND THE ESTIMATED DURATION OF THE OUTAGE. THE CONTRACTOR SHALL PREPOSITION EQUIPMENT AND MATERIALS IN ADVANCE SO AS TO KEEP THE DURATION OF THE OUTAGE AT A MINIMUM.
- NKWD HAS A SEPARATE PROJECT TO INSTALL EMERGENCY GENERATORS AND REPLACE THE ELECTRICAL SUBSTATION ON-SITE, AND THIS OTHER WORK MAY ALSO BE OCCURRING DURING CONSTRUCTION. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER & ENGINEER TO DETERMINE THE STATUS OF OTHER PROJECTS AND THE IMPACTS, IF ANY, TO THE UPGRADES UNDER THIS WORK, PARTICULARLY THE NEW UV EQUIPMENT.

**DEMOLITION NOTES:**

- REFER TO ELECTRICAL PLANS FOR RELATED WORK.
- CONTRACTOR SHALL CONFIRM THE NUMBER OF AVAILABLE I/O CHANNELS FOR THE NEW WORK. CONTRACTOR SHALL FACTOR IN THE EQUIPMENT TO BE REMOVED/REPLACED INTO THE COUNT. COORDINATE WITH OWNER'S STAFF PRIOR TO COMMENCING WITH WORK.

**CONSTRUCTION NOTES:**

- REFER TO ELECTRICAL PLANS FOR RELATED WORK.
- CONTRACTOR SHALL INSTALL ALL CONDUIT AND SIGNAL WIRING FOR NEW FT. THOMAS DIVERSION PIPING VALVES FROM VALVE ACTUATORS TO THE MAIN PLANT SCADA (2ND FLOOR). CONTRACTOR SHALL BE RESPONSIBLE FOR SIGNAL WIRING CONNECTIONS AT THE VALVE ACTUATORS, AND LANDING TERMINATIONS TO SCADA PANEL TERMINAL BLOCKS. CONTRACTOR SHALL BE RESPONSIBLE FOR LABELING AND TAGGING ALL NEW CONDUCTORS. UPON COMPLETION AND ACCEPTANCE OF WORK, CONTRACTOR SHALL PREPARE AND PROVIDE P&ID TO OWNER.  
  
OWNER WILL BE RESPONSIBLE FOR UPDATING/MODIFYING THE MAIN PLANT SCADA FOR THE FT. THOMAS DIVERSION PIPING VALVES, INCLUDING PROGRAMMING IN THE MAIN PLANT SCADA.
- I/O FOR THE NEW VALVE OPERATORS SHALL COME FROM THE EXISTING TURBIDITY PLC PANEL IN THE BASEMENT OF THE MAIN TREATMENT BUILDING. THE I/O SHALL INCLUDE AN ALLEN-BRADLEY IF8I, AN OF8, AND A 24 VDC OUTPUT OR RELAY CARD.

| FORT THOMAS DIVERSION PIPING - VALVE OPERATIONS FOR NEW VALVES C, D, AND E |    |    |    |    |                 |                 |                |
|----------------------------------------------------------------------------|----|----|----|----|-----------------|-----------------|----------------|
| Location: Existing Turbidity PLC Panel (lower level main building)         |    |    |    |    |                 |                 |                |
| Tag Name                                                                   | DI | DO | AI | AO | Voltage/Current | # of Conductors | Conductor Size |
| Valve C Open Command                                                       |    | 1  |    |    | 24 VDC          | 2               | 14 AWG         |
| Valve C Close Command                                                      |    | 1  |    |    | 24 VDC          | 1               | 14 AWG         |
| Valve C Opened                                                             | 1  |    |    |    | 24 VDC          | 2               | 14 AWG         |
| Valve C Closed                                                             | 1  |    |    |    | 24 VDC          | 2               | 14 AWG         |
| Valve C Remote                                                             | 1  |    |    |    | 24 VDC          | 2               | 14 AWG         |
| Valve C position Feedback                                                  |    |    | 1  |    | 4-20 mA         | Shielded Pair   | 18             |
| Valve C Position Command                                                   |    |    |    | 1  | 4-20 mA         | Shielded Pair   | 18             |
| Valve C Fault                                                              | 1  |    |    |    | 24 VDC          | 2               | 14 AWG         |
| Valve D Open Command                                                       |    | 1  |    |    | 24 VDC          | 2               | 14 AWG         |
| Valve D Close Command                                                      |    | 1  |    |    | 24 VDC          | 1               | 14 AWG         |
| Valve D Opened                                                             | 1  |    |    |    | 24 VDC          | 2               | 14 AWG         |
| Valve D Closed                                                             | 1  |    |    |    | 24 VDC          | 2               | 14 AWG         |
| Valve D Remote                                                             | 1  |    |    |    | 24 VDC          | 2               | 14 AWG         |
| Valve D Position Feedback                                                  |    |    | 1  |    | 4-20 mA         | Shielded Pair   | 18             |
| Valve D Position Command                                                   |    |    |    | 1  | 4-20 mA         | Shielded Pair   | 18             |
| Valve D Fault                                                              | 1  |    |    |    | 24 VDC          | 2               | 14 AWG         |
| Valve E Open Command                                                       |    | 1  |    |    | 24 VDC          | 2               | 14 AWG         |
| Valve E Close Command                                                      |    | 1  |    |    | 24 VDC          | 1               | 14 AWG         |
| Valve E Opened                                                             | 1  |    |    |    | 24 VDC          | 2               | 14 AWG         |
| Valve E Closed                                                             | 1  |    |    |    | 24 VDC          | 2               | 14 AWG         |
| Valve E Remote                                                             | 1  |    |    |    | 24 VDC          | 2               | 14 AWG         |
| Valve E Position Feedback                                                  |    |    | 1  |    | 4-20 mA         | Shielded Pair   | 18             |
| Valve E Position Command                                                   |    |    |    | 1  | 4-20 mA         | Shielded Pair   | 18             |
| Valve E Fault                                                              | 1  |    |    |    | 24 VDC          | 2               | 14 AWG         |
| TOTALS                                                                     | 12 | 6  | 3  | 3  |                 | 33              |                |

THE FT. THOMAS DIVERSION PIPING WORK SHALL BE AN ADD ALTERNATIVE BID ITEM AND THE WORK SHALL BE PERFORMED ONLY IF AUTHORIZED BY THE OWNER. REFER TO THE CONTRACT DOCUMENTS BOOK FOR ADDITIONAL INFORMATION AND CLARIFICATION.

**FT. THOMAS DIVERSION PIPING**  
NO SCALE



## **EXHIBIT A-7**

### **ASSET MANAGEMENT PLAN – RELEVANT EXCERPTS**

# CHAPTER 3 EVALUATION OF TREATMENT FACILITIES

## 3.1 Introduction and Scope of Work

The Northern Kentucky Water District (NKWD) supplies water to over 85,000 residential, commercial, industrial, and wholesale customers in Northern Kentucky. To supply these customers, NKWD treats and purifies raw water from two sources, the Ohio River and the Licking River. The treatment plants consist of the Fort Thomas Treatment Plant (FTTP) 44 million gallons per day (MGD), Memorial Parkway Treatment Plant (MPTP) 10 MGD, and the Taylor Mill Treatment Plant (TMTP) 10 MGD. Each plant is equipped with its own independent raw water intake. The FTTP and MPTP draw from the Ohio River (Ohio River Pumping Station (ORPS) 1 and ORPS2)) and the TMTP draws from the Licking River.

In accordance with 807 KAR 5:006, NKWD is required to inspect facilities as often as necessary but at least annually and in the event a potentially hazardous condition is reported. The inspection record includes the date and time of the inspection, the name of the person conducting the inspection, deficiencies found, and action taken to correct the deficiencies. The annual inspections include:

- All structures pertaining to source of supply for their safety and physical and structural integrity including dams, intakes, and traveling screens.
- All structures pertaining to water purification for their safety, physical and structural integrity, and for leaks, including sedimentation basins, filters, and clear wells; chemical feed equipment; pumping equipment and water storage facilities, including electric power wiring and controls.

In 2019, NKWD contracted with HDR to review the condition of these facilities as part of the update to their Asset Management Program. This update is a wide-ranging effort that addresses nearly 30 initiatives across the entire breadth of the utility. The ultimate purpose of this task (Task 410) is to assess the current facility condition and performance in an effort to identify and prioritize any necessary improvements. The exact work to be performed is provided below.

**Task 410 – Evaluate Water Treatment Plants.** FTTP is the primary source of finished water for the District. This plant is a conventional settling/filtration plant that treats surface water from the Ohio River. After the pre-sedimentation reservoirs, the water is treated by four flocculation/clarification basins, then filtered through twelve (12) mixed-media filters. The plant has the capability to feed treatment chemicals including ferric sulfate, caustic soda, sodium hypochlorite (chlorine), fluoride, polyaluminum chloride, powdered activated carbon, corrosion inhibitor, and potassium permanganate. The plant includes filter-to-waste. Granular activated carbon (GAC) treatment and ultraviolet light (UV) disinfection were added in 2012.

The TMTP is also a conventional settling/filtration facility with a capacity of 10 MGD. Raw water pumped from the Licking River enters a single rapid mix chamber and then flows to one of two sedimentation basin trains. Following sedimentation, water is filtered through eight mixed-media filters and treated with UV disinfection. The plant has the capacity to feed treatment chemicals including potassium permanganate, ferric sulfate, polyaluminum chloride, sodium hypochlorite (chlorine),



fluoride, sodium hydroxide, corrosion inhibitor, and caustic soda. The plant has filter-to-waste capability and UV disinfection.

In addition, the Taylor Mill plant serves as a critical pumping facility for NKWD, taking water produced both at Taylor Mill and Fort Thomas (which flows by gravity to Taylor Mill) and transferring it to the distribution system.

The MPTP was originally constructed in 1961. The treatment process includes ballasted flocculation with two 7.5 MGD Actiflo trains, which were put into service in 1998, followed by filtration and disinfection. The six filters were rehabilitated with new underdrains and media with air-scour backwash systems in 2008. Treated water is stored in a 3-million-gallon baffled Clearwell that is currently under repair. Water flows by gravity from the clearwell through two 20-inch lines to the City of Newport area and is also pumped from the Waterworks Road Pumping Station to northern Campbell County. The plant has provisions for storing and feeding sodium hypochlorite, ferric sulfate, powdered activated carbon, caustic soda, fluoride, copper sulfate, and polyaluminum chloride. Granular activated carbon treatment and UV disinfection were added in 2012.

The consultant shall determine the recommended improvements needed to renew or replace the treatment facilities through the year 2040. The consultant shall develop a summary description of each improvement, implementation plan, anticipated method of incorporating the facilities into the system, opinion of probable construction cost, and estimated annual operating cost.

If modifications are recommended for the District's plants, those improvements will need to comply with *Ten States Standards*.

To achieve these ends, HDR created a multi-disciplinary investigative team paired with NKWD operations and maintenance leadership for 5 days of field visits. The purpose of these field visits was to gain an understanding of their current condition, performance and reliability through direct observation, non-destructive testing, and commentary from staff on their experience with the assets. Specific tasks included:

- Review available plans, operating reports, and other system data provided by NKWD to understand facility infrastructure and identify possible design impediments.
- Development of system-level data sheets that included an identification of components and the system criticality.
- Assess each system's current condition, reliability, and performance at all three water plants.
- Recommend measures to improve performance, reliability, and delivery.
- Identify any concerns about maintaining the Level of Service (LOS) to customers.

## 3.2 Condition Assessment Approach

The assessment of the FFTP, MPTP, and TMTP includes a review of existing plans to understand the original design intent, conducting of on-site inspections, evaluation of current asset conditions, performing a desktop estimate of remaining life, and preparing a cost opinion range for equipment renewal. The on-site inspections considered the condition, performance, and reliability of each facility to determine how they compared to typical industry standards. Using the field observation and desktop data analysis results, a facility rating by asset class was designated and an overall rating was developed.

HDR's approach for this project is focused on the process areas of the water plants. Individual assets are evaluated, but for the purpose of this assessment, are grouped into one of the following fourteen process areas:

1. Raw Water Intakes/Pumping Stations
2. Raw Water Transfer Stations
3. Pre-sedimentation Reservoirs
4. Pre-treatment/PAC Facilities
5. Rapid Mix/Clarifiers
6. Filters/Filter Buildings
7. UV Facilities
8. GAC Facilities
9. Chemical Facilities/Sodium Hypochlorite Facilities
10. High Service Pump Stations
11. Washwater Pumps and Recovery Basin
12. Gravity Thickeners
13. Sludge Pump Stations/Processing
14. Yard/Site Infrastructure

### 3.2.1 Asset Rating Methodology

The assessment for each process area consists of three primary components: performance, condition, and reliability. Recommendations for each process area were developed using the methodology in Figure 3-1.

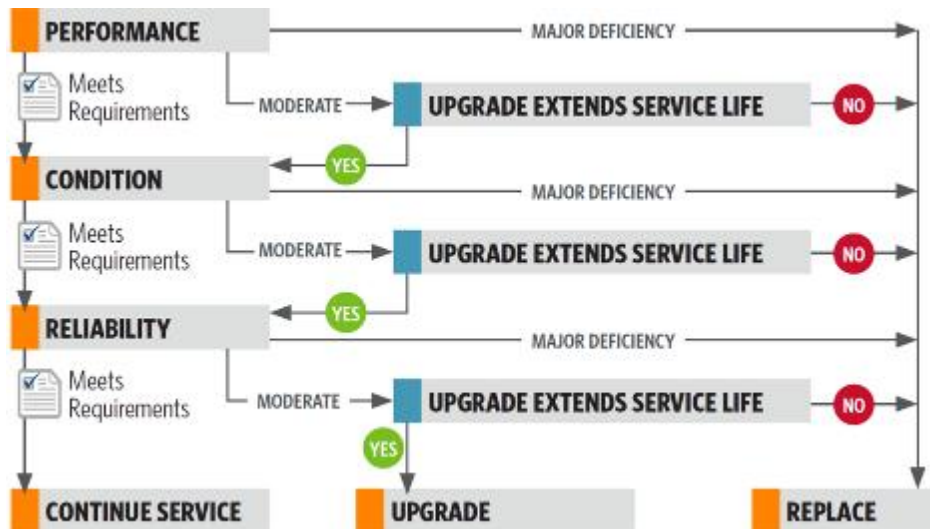


Figure 3-1: Condition Assessment Methodology



**Performance** – The performance criteria consist of two parts, hydraulic capacity and treatment performance. This is discussed in detail in this section.

- Hydraulic capacity: HDR performed a capacity assessment for each process area to determine if it can effectively pass both average daily flow and peak design flow.
- Treatment Performance: HDR evaluated if each process area can effectively perform its function.

**Condition** – The condition criteria assessed the physical condition of the assets of the process area. This methodology is evaluated as a weighted condition score from 1 to 5 for mechanical, structural, electrical, and instrumentation and controls to determine a prioritized list of needs.

**Reliability** – The reliability criteria is used to evaluate the redundancy of assets within each process area. We assume that each process area should have a N+1 level of redundancy, which means that it can meet performance requirements with one of each asset out of service. Again, a weighted score from 1 to 5 is utilized.

Each process area (of the fourteen listed above) was evaluated in the following 4 disciplines:

- Mechanical – this includes rotating equipment (pumps, etc.), valves, piping, gates, and specialized treatment equipment.
- Structural – this includes concrete and steel tanks, foundations, reservoirs, drywells, cranes, and building structures.
- Electrical – this includes electrical equipment specific to the process area. The Site Electrical process area focuses solely on plant-wide electrical assets such as switchgear, motor control centers, and backup generators.
- Instrumentation and Controls – this includes the instrumentation, analyzers, and control philosophies specific to the process area. The supervisory control and data acquisition (SCADA) system process area focuses on the centralized SCADA system that controls the entire pumping station.

Condition assessments were made using visual and tactile means and did not incorporate testing or invasive access. Visual data collection was limited to areas and items that could be observed from the ground, permanent facility platforms, and areas intended for regular operator access. Locations requiring portable ladders or permit-required confined space entry were not accessed as part of this study. Basin areas in use or filled with water or solids were assessed from observable areas, as well. The general extent of visual access is documented herein, facility by facility. Figure 3-2 provides guidance on the rating criteria for condition, performance, and reliability of each system.



| ITEM                                  | PERFORMANCE OF ASSET                                                            |                                                                                       |                                                                            |                                                                                  |                                                                           |
|---------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------|----------------------------------------------------------------------------------|---------------------------------------------------------------------------|
|                                       | RATINGS DEFINITION                                                              |                                                                                       |                                                                            |                                                                                  |                                                                           |
|                                       | 1 (Best)                                                                        | 2                                                                                     | 3                                                                          | 4                                                                                | 5 (Worst)                                                                 |
| Clarifiers/UV/Pumps/Process Equipment | Asset performs as intended with output as expected                              | Has occasional difficulties with either output or results                             | Asset performance or output is regularly inconsistent                      | Asset output or results diminishing in comparison to recent years                | Asset does not operate regularly nor produce expected results             |
| Piping                                | Sized correctly for design conditions and functions as expected                 | Sized correctly but functioning concerns                                              | Underoversized but not currently affecting performance                     | Sizing likely to affect future performance                                       | Sized incorrectly for design conditions impacting performance             |
| Valves/Actuators                      | Valve opens/ seats fully or modulates properly and actuator functions correctly | Minor valve or actuator issues that don't affect performance. Some corrosion apparent | Valve does not seat fully but basic function is acceptable                 | Valve seating and function unknown and can't be tested.                          | Valve and actuator does not function properly and no confidence           |
| Filter/GAC Media                      | Designed properly and achieving expected results                                | Proper design but results not as expected                                             | Current acceptable results for despite design issues                       | Deteriorating results and design issues                                          | Incorrectly designed for desired results                                  |
| SCADA / Monitoring Equipment          | Working and recording properly                                                  | Operating accurately but not recording correctly                                      | Undefined concerns about accuracy but recording                            | Inaccurate results but operational                                               | Currently not working nor recording                                       |
| Structures                            | Properly designed and functioning - watertight, etc. No movement apparent       | Minor issues leading to potential long-term issues or water issues                    | Some movement observed or water issues leading to likely long-term issues. | Moderate issues with water or movement                                           | In state of advanced deterioration with water or movement issues apparent |
| Electrical Components                 | Working and functioning properly                                                | Some infrequent issues with heat, vibration, noise, breaker trips, etc.               | Operational with limitations from either heat, vibration or noise          | Periodic outages in operation due to heat, vibration, noise, breaker trips, etc. | Currently out-of-service or not working                                   |
| HVAC Components                       | Mechanical devices functioning properly                                         | Infrequent issues with heat, vibration, improper cooling/heating or ventilation       | Operational with limitations on heating/cooling capacity                   | Periodic outages in operation on heating/cooling                                 | Currently out-of-service or not working                                   |

| ITEM                                  | CONDITION OF ASSET                                                                                                               |                                                                                       |                                                                                                                      |                                                                                                        |                                                                                            |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
|                                       | RATINGS DEFINITION                                                                                                               |                                                                                       |                                                                                                                      |                                                                                                        |                                                                                            |
|                                       | 1                                                                                                                                | 2                                                                                     | 3                                                                                                                    | 4                                                                                                      | 5                                                                                          |
| Clarifiers/UV/Pumps/Process Equipment | Free of visual corrosion, properly installed, lubricated, with mechanicals currently operating. No obvious heat or noise issues. | Minor corrosion or maintenance condition but no noise/heat issues                     | Some corrosion or maintenance issues that need attention. Noise or heat issues present but not affecting performance | Advancing deterioration from corrosion or lack of maintenance. Noise or heat issues that are worsening | Serious corrosion or installation issues including obvious noise or heat issues            |
| Piping                                | No visible corrosion or leaking                                                                                                  | Initial corrosion apparent without leaking                                            | Some corrosion without metal loss. Minor leaking apparent                                                            | Moderate corrosion including some metal loss. Substantive leaking apparent                             | Significant corrosion with metal loss. Significant leaking                                 |
| Valves / Actuators                    | No visible corrosion and all operating elements functional. No noise issues                                                      | Initial corrosion apparent without leaking                                            | Some corrosion without metal loss. Minor leaking apparent                                                            | Moderate corrosion including some metal loss. Substantive leaking apparent                             | Significant corrosion with metal loss. Significant leaking                                 |
| Filter/GAC Media                      | New or like new without visible build-up or wear                                                                                 | Some noticeable build-up or wear                                                      | Unable to determine build-up or wear                                                                                 | Moderate build-up or wear                                                                              | Excessive build-up or wear                                                                 |
| SCADA / Monitoring Equipment          | Free of corrosion on monitors, samplers and recorders. Visibly acquiring or producing data                                       | Minor corrosion or maintenance/ calibration needed - functional                       | Corrosion apparent and some limitations to data. Maintenance                                                         | Unknown condition of asset - inaccessible                                                              | Not acquiring or producing data                                                            |
| Structures                            | Structurally sound - no apparent cracks, corrosion or connection issues.                                                         | Minor structural deficiencies not requiring immediate action to prevent deterioration | Structural concerns (corrosion, cracks, etc.) that need further investigation to determine magnitude                 | Short-term structural concerns requiring remedy to prevent deterioration                               | Significant cracking, corrosion or connection issues - concerns about structural soundness |
| Electrical Components                 | Free of corrosion, heat or vibration                                                                                             | Some corrosion, heat or vibration apparent but not impacting service                  | Moderate corrosion, heat or vibrations determined to be long-term concern but not short-term issue                   | Inaccessible components - unknown condition                                                            | Heavy corrosion, exposed components, excessive heat and/or vibration                       |
| HVAC Components                       | Free of corrosion, heat or vibration                                                                                             | Some corrosion, heat or vibration apparent but not impacting service                  | Moderate corrosion, heat or vibrations determined to be long-term concern but not short-term issue                   | Inaccessible components - unknown condition                                                            | Heavy corrosion, exposed components, excessive heat and/or vibration                       |

| ITEM                                  | RELIABILITY OF ASSET                                                                          |                                                                                                        |                                                                            |                                                                                    |                                                                         |
|---------------------------------------|-----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
|                                       | RATINGS DEFINITION                                                                            |                                                                                                        |                                                                            |                                                                                    |                                                                         |
|                                       | 1                                                                                             | 2                                                                                                      | 3                                                                          | 4                                                                                  | 5                                                                       |
| Clarifiers/UV/Pumps/Process Equipment | Component is fully redundant with no significant maintenance history                          | Partially redundant with no significant maintenance history/issues                                     | Partially redundant with significant maintenance history                   | No redundancy but no current issues                                                | No redundancy and has significant maintenance history/current issues    |
| Piping                                | Piping has bypass that can accommodate similar flow                                           |                                                                                                        | Piping has bypass that can accommodate partial flow                        |                                                                                    | Piping has no bypass options and a history of breaks                    |
| Valves/Actuators                      | Components are regularly operated, function properly and have a bypass or back-up around them | Valves operated periodically and appear to function - bypass or back-up isolation/modulation available | Valves operated periodically and appear to function - no bypass or back-up | Valve open/close reliability is unknown and have not been operated in recent years | Valves are not functional and not relied upon                           |
| Filter/GAC Media                      | Media full depth, clean, design loading rate or less and N+1 filters                          | Media full depth, clean at design loading with N filters                                               | Media loss at design loading rate, mild coating and N+1                    | Media shallow, overcoated, design loading rate and N+1                             | Media is shallow, overcoated, with high loading rate and only N filters |
| Monitoring Equipment                  | No significant maintenance issues, restorable or backed up and supported by manf              | Occasional maintenance issues but backed up and supported by manf                                      | Regular maintenance issues but still supported by manf                     | Not restorable or backed up and support has ended for software or equipment        | Equipment not operating properly as designed                            |
| Structures                            | Seismically protected with alternate facility available                                       | Seismically designed without alternative design                                                        | Partial seismic design or coverage for asset                               | Unknown seismic protection status                                                  | No seismic protections                                                  |
| Electrical Components                 | No significant maintenance issues, Multiple feeds/supplies. Spare parts still available       | Occasional maintenance issues but spare parts available - multiple feeds/supplies                      | Regular maintenance issues but still supported by manf                     | Regular maintenance issues and not supported by manf - no spare parts              | Equipment not operating properly                                        |
| HVAC Components                       | No significant maintenance issues, Spare parts still available                                | Occasional maintenance issues but spare parts available - multiple units in system                     | Regular maintenance issues but still supported by manf                     | Regular maintenance issues and not supported by manf                               | Equipment not operating properly                                        |

### Figure 3-2: Guidance on Assessment Scoring

Structural condition assessments of concrete structures generally followed the standard guidance provided by the American Concrete Institute (ACI) Committee 364, “Guide for Assessment of Concrete Structures before Rehabilitation”, (ACI 364.1). ACI 364.1 provides recommendations for both “Preliminary Assessment” and “Detailed Assessments”, as defined in the standard. The scope of this condition assessment incorporated a review of plans and relevant documents and a visual condition survey with documentation of visible deterioration and distress. Review of plans and available documents was conducted with an emphasis on understanding the timeline of original construction and the nature of subsequent projects that modified original construction, where this has occurred. An understanding of this structural provenance helped give an indication of structures’ ability to perform according to current code requirements. The terminology used to describe structural distress is generally consistent with ACI 201.1, “Guide for Making a Condition Survey of Concrete in Service”.

Further testing and investigation may be recommended for the design phase of any identified improvements pursuant to a “Detailed Assessment”, per ACI 364.1. This may be appropriate where aging structures are identified for ongoing use or re-use and will involve structural modifications and/or changes to structural loadings imposed on the structures. Detailed assessments can involve both non-destructive and destructive means. Potential testing and evaluation that can be recommended and used in detailed condition assessments could include, but are not limited to:

- Mechanical sounding
- Physical openings to rebar in assessment of in-situ cover depth and rebar condition
- Reinforcing steel corrosion testing, including half-cell corrosion potential testing and linear polarization resistance testing
- Carbonation depth testing
- In-situ sample collection for strength testing
- Petrographic analyses (to assess a variety of concrete properties and potential deterioration mechanisms)
- Chloride testing in concrete, rapid chloride permeability testing
- Sulfate testing, including x-ray diffraction of surficial deposits to evaluate the potential for surficial salt hydration distress
- Detailed structural analysis
- Structural load testing

These detailed means of additional evaluations have varying cost implications. Their recommendation and use would relate to the degree of certainty desired in remaining useful life evaluation or the design of more advanced or sophisticated repairs.

#### 3.2.1.1 Probability – Consequences – Safety (PCS) Multipliers

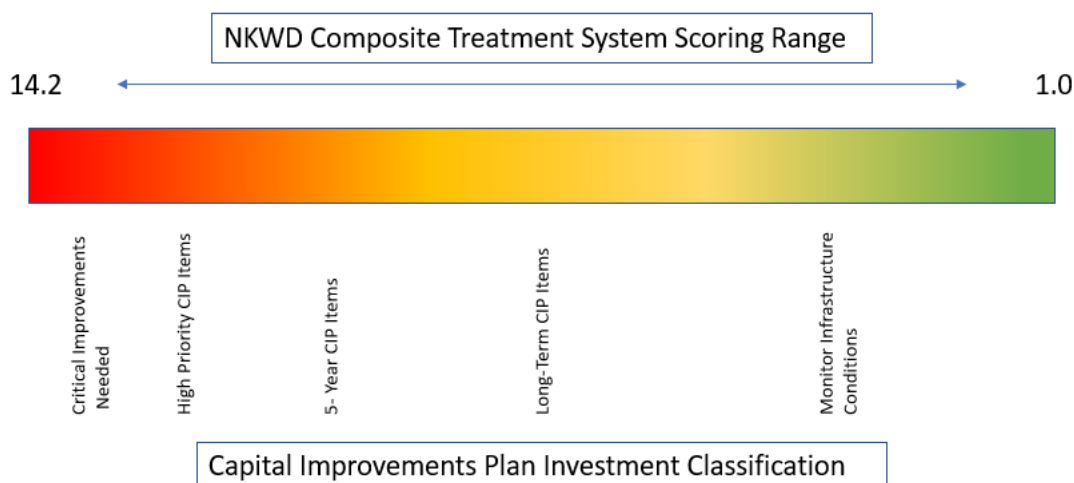
The scoring criteria previously identified in this article are direct assessments of the individual system or asset. Each system should be evaluated based upon indirect, utility-focused criteria to get a complete understanding of the condition and importance of an asset relative to the comprehensive system performance. A further description of each of these multipliers is provided below.

- Probability of Failure (P) – This multiplier is a function of the likelihood of failure of an asset. Each system has a functional design life, but equipment age alone does not predict the likelihood of failure. To compensate for this, this multiplier can be used at the system level to adjust for increased frequency of failure for some of the systems/equipment as compared to others. For instance, failure of mechanical components is far more likely than a structural asset. In addition, a more frequently operated asset may be likely to fail as compared to others. To reflect this in our assessment, a multiplier for P has been developed with degrees defined as: Low (1.0), Moderate (1.15), and High (1.25).
- Redundancy (R) – This multiplier reflects the resiliency that is designed into the system to overcome a process disruption. A high level of duplicate or backup systems is more likely to produce countermeasures to a negative event. Accordingly, the rating criteria is scored inversely to system rating with complete 100% backup being scored the lowest, while a reduction in plant flow is scored the highest. The multipliers for R are defined as: 100% Redundancy (1.0), 50% Redundancy (1.15), None (1.25), and Reduced Capacity (1.35).
- Consequences of Failure (C) – This multiplier enables the severity of failure of the asset to be accounted for in the evaluation. The failure of an asset could lead to equipment, process, facility, or system disruptions. The multipliers for C are defined as: Minimal (1.0), Moderate (1.15), Significant (1.25), and Severe (1.35).
- Safety (S) – This multiplier enables the inspector to consider whether asset failure could lead to a safety issue – either for NKWD employees or to their customers. Like other multipliers, this enables specific assets to be prioritized over others based on the potential outcome of their failure. The multipliers for this variable are: Low Hazard (1.0), Moderate Hazard (1.15), and High Hazard (1.25).

It is noteworthy that the multipliers identified are typically compounding (PxCxS) leading to a cumulative score of asset condition importance when used to enhance the asset condition score.

In summary, this analytical approach to the review of the treatment facilities and their composite systems produces a net scoring range of 1.0 – 14.2, with three numerical assessments and four multipliers considered. This provides NKWD with a broad ratings system to better understand the conditions of treatment infrastructures and where capital improvements are most needed. Figure 3-3 provides a graphic to reflect the intent of the scoring that will be summarized in the following sections.

**Figure 3-3: Scoring Range for Composite Rating of Treatment Systems**



The exact numerical thresholds for each of the classifications are not pre-determined but are based on the overall conditions of systems evaluated and the distribution of those scores. In each of the following sections, the summaries of scores at each treatment and intake pump station facilities will be highlighted if above the 70<sup>th</sup> percentile of all system scores (6.25 points is the threshold for this set of assets).

### 3.3 Facility Review Findings – Raw Water Intake Pumping Facilities

The findings in this Section include a brief overview of each intake pumping station facility along with identification and ratings of individual functional systems. The ratings are provided in a summary table along with the associated Capital Investment Classification. General information on notable deficiencies within the facility and potential remedial improvements are provided.

Budgetary cost estimates (Class 4 per AACE 18R-97) were prepared for the recommended improvements.

Prior to undertaking the field assessments of the intake pumping stations, HDR reviewed available information on each of the facilities. This included previous Asset Management documents and existing plans. This enabled the field assessment teams to understand the equipment age, expected condition, and original design intent for the facility. A short description of each intake pumping station is provided in the following sections, along with a summary of scoring results for the treatment system components.

#### 3.3.1 Ohio River Pump Station No. 1 (ORPS1)

ORPS1 was constructed in 1997 and serves as the only raw water supply source to the Fort Thomas Treatment Plant. The intake pumping station is connected on the Ohio River with a direct connection using piping, gates, and screens. ORPS1 has three (3) interconnected intake chambers with two (2) raw water pumps located within each chamber. A review of the overall design identified three key features of the capacity rating for the station. These include:



- Pump capacity (largest pump out of service) is 61.8 MGD.
- Intake rated capacity may be limited to 49 MGD since each chamber has two pumps. If gates or screens were to fail, two pumps could be isolated.
- ORPS1 has three raw water transmission mains (one – 42-inch main and two – 30-inch mains) that convey flow to FTTP. At the flows noted above, the line velocities are approximately 4.0 ft/s and 4.9 ft/s, which are within typical design guidance.

ORPS1 is a critical facility to NKWD, given it is the sole pumping facility to the largest treatment plant in the utility. In the following section, a short description will be provided for each structural, process, electrical, and control system and their current condition. Any notable concerns are included.

### 3.3.1.1 ORPS1 System Descriptions

Structural, process, electrical, and control reviews were performed independently at the ORPS1 facility. Brief descriptions of each system and notable findings are provided in the following articles.

#### Structural

Coffer Dam – Five caissons remain from the original construction of ORPS1. These currently serve as protective structures from river debris impacts and help stabilize the intake structure. Some structure movement/cracking has been noted.

Entry Level (Screen Access Filter/Potassium Permanganate) – ORPS1 was divided into two structural areas. The lower entry level includes discharge piping and chemical storage feed facilities. No substantial issues were noted at this level.

Top Level Pumping and Electrical Room Structure – The upper level at ORPS1 includes pumps, gates, and screening equipment, along with an electrical room. A 10-ton bridge crane and monorails are also present. No issues noted with this system.

Diesel Generator & Switchgear Structure – Exterior pad-mounted facilities. These structures were assessed to determine if any impact had occurred from hillside movement. At this time, no major impacts were observed.

#### Process

Potassium Permanganate Chemical Mixer & Dosing – System consists of 1,800-gallon KMNO<sub>4</sub> bulk storage tank with Magnetrol level indicator and three (3) Prominent peristaltic metering pumps and meters. The system feeds to all three (3) screens. Upgrades were made in 2019 by NKWD to prevent flooding and improve delivery efficiency. Replacement of level indicators and flow meters should be considered. No other notable issues were identified.

Raw Water Pumps – ORPS1 has six vertical turbine pumps. Pumps No. 1-5 were installed between 1997-1999, with Pump No. 6 being installed after that date. All pumps are still within their design lives without apparent deficiencies. Details of the pumps are provided below in Table 3-1 and scheduled replacement should be considered for one or two pumps.

**Table 3-1: ORPS1 Raw Water Pumps**

| Pump No. | Design Flow (GPM) | Discharge Head (TDH) | Pump RPM | Pump Hp |
|----------|-------------------|----------------------|----------|---------|
| 1        | 9,455             | 348                  | 1190     | 1,250   |

|   |       |     |      |       |
|---|-------|-----|------|-------|
| 2 | 7,000 | 375 | 1770 | 1,250 |
| 3 | 9,200 | 430 | 1185 | 1,250 |
| 4 | 9,200 | 430 | 1185 | 1,250 |
| 5 | 8,400 | 430 | 1190 | 1,250 |
| 6 | 9,200 | 430 | 1190 | 1,250 |

Pump Discharge Valves – Each raw water pump has multiple valves for isolation and protection. Pump discharge valves include:

- Rodney Hunt Cone Valves (Pumps No. 1,2,3,5,6) and a GA Electrically Actuated Pump Control Valve (Pump No. 4) to control pump operations. The cone valves are actuated by a hydraulic power system. In addition, each pump includes an APCO check valve with either a lever/weight or spring actuator. All valves are 18" to match pump discharge sizing. Cone valves were rehabilitated in 2011. Check valves were installed in 1997, and replacement should be considered within CIP (Capital Improvement Plan) horizon.
- Each pump has an air release valve (4"-Valmatic Model 152). Valves were installed in 1997. Replacement for age should be considered within CIP horizon.
- Multiple butterfly and ball valves (36"/16") for isolation were installed in 1997. Replacement should be considered within CIP horizon.

Pump Discharge Metering/Piping – ORPS1 has two - 36" discharge mains that exit the station. These connect to the three transmission mains outside the facility. Two Krohne in-line, magnetic flow meters provide readings to the FTTP control room. Meter replacement should be considered within the CIP horizon.

Raw Water Traveling Screens – ORPS1 has three electrically-driven traveling screens. These screens all appear to be replacements from the original screens. The current screens are all Atlas SSI screens but appear to be different models. Based on current conditions, the replacement of traveling screens should be considered during the CIP horizon.

Surge Anticipation Valve – Surge anticipation valve is provided on raw water discharge line. Replacement of the surge anticipation valve should be considered during the CIP horizon.

Suction System Gates – ORPS1s three intake wells contain eight gates with hydraulic actuators that allow for isolation of the chambers. This system was installed in 1997 and are operated regularly. Conversion to electric actuators is recommended based on condition, and replacement of gates should be considered.

#### Electrical/Instrumentation

Raw Pumps and Motors (No. 1, 2, 3, 4, 5, 6 MV Switchgear) - Cutler Hammer 4160V, 1200A. Pumps 1-3 and 6 have across the line starters. Pumps 4-5 were recently changed to RVSS.

- Emergency generator backup capabilities are limited to a bank of three pumps. These are typically assigned to Pumps 4, 5 and 6 but can be transferred to Pumps 1, 2 and 3. Incorporation of reduced voltage starters is recommended during the CIP horizon.
- All pumps have 1,250 Hp US Motors. Pump No. 6 performs poorly. Motors all appear original. Rewinding or replacement is recommended during the CIP horizon.



Motor Control Center – Cutler Hammer Series 2100, 600 A, 480 V. Availability of replacement gear leads to recommendation of upgrades during planning horizon.

Power Supply – Pump starts voltage fluctuations on Duke distribution system. Solutions may be available to reduce voltage fluctuations and eliminate power factor penalties.

Emergency Generators – Parallel generators are in good condition with some issues with paralleling switchgear that need to be included in CIP during planning horizon. Generators are capable of running two pumps.

Instrumentation – Programmable logic controller (PLC) replacement and other upgrades are programmed to occur with the SCADA Phase 2 project, expected in 2024.

### 3.3.1.2 Summary of ORPS1 Findings

ORPS1 is a critical facility in the NKWD system. For each major operating system identified previously, a field assessment was performed with each system being scored based upon its condition, reliability, and performance. These values were multiplied to include external considerations such as probability of occurrence, level of redundancy, severity of loss, consequences, and safety to staff/public. A summary of the system ratings above the 75<sup>th</sup> percentile (6.36) for ORPS1 is provided in Table 3-2.

**Table 3-2: ORPS1 Facility System Ratings**

| Facility System                            | System Assessment Rating | PCS Multipliers | Composite System Rating Score |
|--------------------------------------------|--------------------------|-----------------|-------------------------------|
| Structures                                 |                          |                 |                               |
| Process/Equipment                          |                          |                 |                               |
| Hydraulic Valve System                     | 3.67                     | 1.96            | 7.20                          |
| Pump Discharge Valves                      | 3.50                     | 1.96            | 6.87                          |
| Electrical/Control                         |                          |                 |                               |
| Valve Control Panel                        | 4.00                     | 2.32            | 9.28                          |
| Raw Pumps (1, 2, 3, 4, 5, 6 MV Switchgear) | 4.00                     | 2.13            | 8.54                          |
| Motor Control Center                       | 3.50                     | 1.80            | 6.29                          |

### 3.3.2 Ohio River Pump Station No. 2 (ORPS2)

ORPS2 was originally constructed in 1875 and is an AWWA Water Landmark. The facility was constructed within Ohio River and has been subject to numerous modifications over the last 145 years. The structure has been subjected to flooding, barge strikes, and siltation over the years, but remains in good structural condition for a facility of its age. ORPS2 serves as the only raw water supply source to the Memorial Parkway Treatment. The intake pumping station is currently a dry well pump facility



with a screen to protect the river inlet well. The well supplies raw water via piping to three vertical turbine pumps. These pumps convey flow to MPTP through two raw water transmission mains (20" - 1875 and 24" - 1961). A comprehensive assessment of ORPS2 was completed by HDR in 2015, and many of the findings from that study are still relevant, including:

- Pumping capacity per *Ten State Standards* is 14.3 MGD (10,000 GPM) with the largest pump out of service. However, modeling indicates that C factors as low as 70 are likely to be present in certain line segments, especially the 20" cast iron raw water transmission line installed during the original 1872 construction of ORPS2. It is likely that this flow rate cannot be achieved without unacceptable velocities in the raw water lines. Velocities in the dual lines are acceptable at approximately 4.25 ft/s at 10,000 GPM.
- Increasing the MPTP plant expansion to 20 MGD would require the ability to run more than 1 river pump at a time and possibly an additional raw water main.
- Intake has a single screen and valve. Failure may lead to extended disruption.
- Historically, the 1937 flood inundated the facility above the first floor. This caused the complete failure of the station and produced heavy siltation in several areas. The station was re-built over a three-year period being re-commissioned in 1942 with the elevated pumping platforms, which are still present. Ohio River flood control measures now make inundation less likely, but elevated river levels create many challenges to this station and it is vulnerable to structural damage from debris strikes.

ORPS2 is an important facility to NKWD. It is the sole pumping facility to the MPTP. While NKWD can meet average-day system demands without MPTP, it is needed to support maximum-day demands, and any prolonged service interruptions would create operational challenges. The 741 to 763 Pump Station will have shutdown impacts, potentially resulting in more staffing for round-the-clock operations, or marginally affecting pumping/production throughout the first and second shift. In the following section, a short description will be provided of each structural, process, electrical, and control system and their current condition. Any notable concerns will be included.

### 3.3.2.1 ORPS2 System Descriptions

ORPS2 is a historic facility with many non-conforming elements/systems when comparing to modern designs. Structural, process, electrical, and control reviews were performed independently at the facility. Brief descriptions of each system and notable findings are provided in the following articles.

#### Structural

**Building Structure** – ORPS2 is 145 years old and contains multiple chambers that have served different purposes. The structure was reviewed comprehensively in 2015 with materials testing, ground penetrating radar (GPR), and other methods. The original structure appears to have included a wet well lower level. Reinforcing and additional concrete is present from when the structure was converted to drywell. The structure is located within the river without protection from debris except at pipe inlet. Improvements were made in 2018 to address the worst issues at ORPS2. Some structure movement/cracking has been noted. Further rehabilitation appears to have diminishing returns. Replacement appears to be the likely alternative.

**Lower-Level Wall Supports and Arches** – The ORPS2 lower level has multiple chambers and support walls. The 2015 evaluators entered each chamber and observed conditions. Cracking was noted that did not appear to compromise the structure. This was revisited during the assessments. No critical issues were noted at this level, but additional monitoring locations are recommended.

Roofing/Windows – Roofing and windows were noted in 2015 as severely deficient. The windows were rehabilitated in the 2018 ORPS2 improvements. Roofing was not replaced in 2018, repairs and patches are conducted as necessary. No issues were apparent.

#### Process

Potassium Permanganate Chemical Mixer & Dosing – System consists of 1,800-gallon KMNO<sub>4</sub> bulk storage tank with Magnetrol level indicator and two Prominent peristaltic metering pumps and meters. The system feeds to the screen. The system does not have a potable water supply. Other upgrades were made in 2020, and the equipment is in good condition.

Raw Water Pumps – ORPS2 has three vertical turbine pumps. See Table 3-3 for details. Pumps were installed between 1999 and 2005. Pump No. 3 currently performs poorly, though the exact reason for this is unknown. All pumps are within their design lives, but replacement should be considered for two pumps during the CIP horizon.

**Table 3-3: ORPS2 Vertical Turbine Pumps**

| Pump No. | Design Flow (GPM) | Discharge Head (TDH) | Pump RPM | Pump Hp |
|----------|-------------------|----------------------|----------|---------|
| 1        | 6,000             | 400                  | 1190     | 800     |
| 2        | 6,000             | 400                  | 1770     | 800     |
| 3        | 4,000             | 400                  | 1185     | 600     |

Pump Discharge Valves – Each raw water pump has multiple valves for isolation and protection. Pump discharge valves include:

- Pump Control Valves (Pumps No. 1,2,3) to control pump operations. The pump control valve for Pump No. 3 was out of service due to maintenance. Control Valve for Pump No. 2 was recently replaced. Pump Control Valves No. 1 and 3 replacements should be considered within CIP (Capital Improvement Plan) horizon.
- Each pump has an air release valve. Valves were installed prior to 2000. Replacement for age should be considered within CIP horizon.
- Multiple butterfly valves for isolation are in various stages of condition. All valves' replacement should be considered within CIP horizon if ORPS2 isn't replaced. This would require a long-term shutdown.

Pump Discharge Metering/Piping – ORPS2 has two flow meters to measure flow leaving the station, which were installed in 2019. Two discharge mains (20" and 24") exit the station and reconnect at the old Valve Pit between the railroad tracks and Route 8. Meter replacement should be considered within the CIP horizon.

Discharge Flow Meter Building – A small building houses where pump discharge lines come together with piping wyes for the venturi meters. Difficult access for maintenance. This needs to be considered for replacement if ORPS2 remains in service.

Raw Water Screens – ORPS2 has one US Filter electrically-driven traveling screen and bar racks on the river inlet pipe. The traveling screen was installed in 2008 and operates regularly. At present, a filter rebuild is expected. Based on current conditions, the replacement of the traveling screen should

be considered during the CIP horizon. A second inlet and traveling screen should be considered if ORPS2 is to remain in service long-term.

Suction System Gates/Valves – ORPS2 dry well has five isolation butterfly valves in addition to an inlet sluice gate. The valves are manually actuated while the sluice gate is electrically driven. These appear to have been installed in different projects and are not operated regularly. Replacement should be considered for valves if ORPS2 remains in service.

#### Electrical/Instrumentation

Raw Pumps, Motors, and Starters – Reduced Voltage Starters – two Siemens, one Square D 2400 V. Pumps. Incorporation of reduced voltage starters or variable frequency drives are recommended during the CIP horizon.

- Motors are 600/800 Hp. Motor No. 2 was repaired/replaced in 2018.
- All operate, but Pump No. 3 does not perform on its curve. Replacement is recommended if ORPS2 is to remain.

Motor Control Center – Square D 600 A, 480 V. Availability of replacement gear leads to recommendation for replacement if ORPS2 remains in service. Age, replacement parts, and the uncontrolled environment are all items that make redesign and replacement a consideration.

Valve Actuators – Several of the Auma actuators do not appear to operate or their position is not seen in SCADA. Replace valve and actuator if ORPS2 remains in service.

Outdoor Substation – Three substation transformers. These units do not have available replacement transformers, and their performance and reliability are critical to ORPS2 operation. Consider redesign and replacement.

Emergency Generators – No generators at ORPS2. Need to add during planning horizon.

Oil System – Pratt system that will be decommissioned with electric actuators.

Screen Level Controller – Influent/effluent control panel. 15 years old. Replace controls/screen if ORPS2 remains in service.

Switchgear - Siemens unit, two switches for two feeds. Notable that the two feeds to switchboard come from exterior manhole that can flood. Critical unit that requires replacement if ORPS2 remains in service.

Instrumentation - PLC replacement and other upgrades are programmed to occur with the SCADA Phase 2 project expected in 2024.

### 3.3.2.2 Summary of ORPS2 Findings

ORPS2 is an important facility in the NKWD system as the only raw water supply to MPTP. For each major operating system identified previously, a field assessment was performed with each system being scored based upon its condition, reliability, and performance. These values were multiplied to include external considerations such as probability of occurrence, level of redundancy, severity of loss, consequences, and safety to staff/public. A summary of these system ratings for ORPS2 is provided in Table 3-4.

**Table 3-4: ORPS2: Facility System Ratings**

| Facility System                  | System Assessment Rating | PCS Multipliers | Composite System Rating Score |
|----------------------------------|--------------------------|-----------------|-------------------------------|
| <b>Structures</b>                |                          |                 |                               |
| Discharge Flow Metering Building | 3.83                     | 2.13            | 8.18                          |
| Lower-Level Walls/Structures     | 3.50                     | 2.00            | 7.02                          |
| Building Structure               | 3.33                     | 2.00            | 6.68                          |
| <b>Process/Equipment</b>         |                          |                 |                               |
| Suction System Gates/Valves      | 3.50                     | 2.07            | 7.23                          |
| Raw Water Traveling Screens      | 3.17                     | 2.13            | 6.76                          |
| Pump Discharge Valves/Piping     | 4.00                     | 1.58            | 6.33                          |
| <b>Electrical/Control</b>        |                          |                 |                               |
| Outdoor Substation               | 4.00                     | 2.43            | 9.70                          |
| Switchgear Main                  | 4.33                     | 2.11            | 9.14                          |
| Oil System                       | 3.67                     | 2.32            | 8.51                          |
| Raw Water Pump RVSS Starters     | 4.00                     | 2.10            | 8.44                          |
| Screen Level Control             | 3.67                     | 2.13            | 7.83                          |
| Raw Water Pump Motors            | 3.00                     | 2.43            | 7.28                          |
| Valve Actuators                  | 3.50                     | 1.98            | 6.92                          |

### 3.3.3 Licking River Intake (LRI)

LRI is a facility with many non-conforming elements/systems when comparing to modern designs. Structural, process, electrical, and control reviews were performed independently at the facility. Brief descriptions of each of the systems and notable findings are provided in the following articles.

#### **Structural**

**Building Structure** – LRI is over 50 years old and contains multiple chambers. The structure has seen modest upgrades over the last 20 years primarily on the bridge and some mortar rehabilitation. Structural deterioration has been noted on the structure including needs for concrete repair. The structure is also clearly undersized for modern design. Rehabilitation investments are needed.

**Bridge/Walkway** – The LRI bridge has had modest repairs in recent years and remains in acceptable condition for future service. Some additional work has been noted.

**Chemical Building Structure** – Small metal building enclosure near end of bridge. Appears approximately 20 years old and in good condition. Chemical spills are apparent.

**Injection Pit** – Small underground structure adjacent to Chemical Building where chemical is fed. No current improvements anticipated.

## Process

**Chemical Storage and Feed** – Potassium permanganate tank with mixer (1,500-gallon fiberglass reinforced plastic (FRP)), radar level indicator, ¼ turn valves, and two Prominent peristaltic metering pumps. Recent upgrades in 2018, House water pumps are capable of 40 GPM.

**Raw Water Pumps** – LRI has three vertical turbine pumps. See Table 3-5 for details. Pumps were installed between 1971 and 1990. All pumps operate acceptably but are beyond their design life, and at least two pumps should be considered for replacement during the CIP horizon.

**Table 3-5: LRI Vertical Turbine Pumps**

| Pump No. | Design Flow (GPM) | Discharge Head (TDH) | Pump RPM | Pump Hp |
|----------|-------------------|----------------------|----------|---------|
| 1        | 6,250             | 126                  | 885      | 350     |
| 2        | 6,250             | 126                  | 885      | 250     |
| 3        | 4,900             | 94                   | 890      | 150     |

**Pump Discharge Valves** – Pumps have a compact design that uses wyes to connect the pump discharges together. Leads to extreme velocities if Pumps No. 1 and 2 run together. The discharge pipe leg for Pump No. 3 is smaller than of that for Pump No. 1 and 2. Pump discharge valves include:

- Silent Globe Check Valves (Pumps No. 1,2,3) protect the pump during start-up and shutdown. Replacement should be considered in the CIP horizon.
- Each leg has a butterfly isolation valve and air release valve. Replacement should be considered in the CIP horizon.

**Pump Discharge Metering/Piping** – A station flow meter is clamped on the 24" raw water main on the access bridge. Meter replacement should be considered within the CIP horizon.

**Raw Water Screens** – LRI has one Atlas electrically-driven traveling screen and bar racks on the river inlet pipe. The traveling screen was rehabilitated in 2016 and operates regularly. Based on current condition, the replacement of the traveling screen should be considered during the CIP horizon. A second inlet and traveling screen should also be considered for resiliency. Screen wash system needs repairs to heat tracing.

**Suction System Gates/Valves** – LRI has two sets of inlet gates. Three gates control flow into the inlet chambers below the pump floor. Two gates are located on the river side of the traveling screen at the



inlet, which are protected by trash racks. A side channel also allows flow into LRI. Multiple gates do not operate or have been removed from service for reliability concerns.

### Electrical/Instrumentation

Raw Water Pump Motors – US Motors 350/250/150 HP 480 V. Motor beyond service life and should be considered for replacement during CIP horizon.

Electrical Main/Metering Building/Motor Control Center – 800A Westinghouse, 45 kVA step down transform. Availability of replacement gear leads to recommendation for replacement within CIP horizon. Motor controls are in acceptable condition for continued service.

Emergency Generator – No emergency generator is currently installed. Length of bridge is issue for implementation. Multiple feeds could be an alternative since LRI is the only Licking River source intake.

Potassium Permanganate Building/Heat Tracing – Wiring issues have impacted pump performance. NKWD is working on a correction, but additional improvements may be needed. Back-up power needed for the pump building.

Flow Meter – Foxboro pressure transmitter connected to venturi flow tube. Replacement of transmitter is recommended.

Instrumentation – PLC replacement and other upgrades are programmed to occur with the SCADA Phase 2 project expected in 2024.

### Summary of LRI Findings

LRI is an important facility in the NKWD system as the only Licking River source water and the raw water supply to TMTP. For each major operating system identified previously, a field assessment was performed with each system being scored based upon its condition, reliability and performance. These values were multiplied to include external considerations such as probability of occurrence, level of redundancy, severity of loss, consequences, and safety to staff/public. A summary of these system ratings for LRI is provided in Table 36.

**Table 3-6: LRI Facility System Ratings**

| Facility System             | System Assessment Rating | PCS Multipliers | Composite System Rating Score |
|-----------------------------|--------------------------|-----------------|-------------------------------|
| <b>Structures</b>           |                          |                 |                               |
| <b>Process/Equipment</b>    |                          |                 |                               |
| Discharge Valves and Piping | 3.33                     | 1.98            | 6.59                          |
| Raw Water Pumps             | 3.17                     | 1.98            | 6.26                          |
| Suction Gates               | 3.17                     | 1.98            | 6.26                          |
| <b>Electrical/Control</b>   |                          |                 |                               |
| Cameras                     | 5.00                     | 2.13            | 10.67                         |

|                                   |      |      |      |
|-----------------------------------|------|------|------|
| Flow Meter                        | 3.67 | 2.13 | 7.83 |
| Heat Tracing for Chemical Lines   | 3.00 | 2.28 | 6.83 |
| Potassium Permanganate Electrical | 3.00 | 2.13 | 6.40 |

## 3.4 Facility Review Findings – Water Treatment Plants

The findings in this Section include a brief overview of each of the water treatment plant facility, along with an identification and rating of individual functional systems. The ratings are provided in a summary along with the associated Capital Investment Classification. General information on notable deficiencies within the facility and potential remedial improvements are provided.

Budgetary cost estimates (Class 4 per AACE 18R-97) were prepared for the recommended improvements.

Prior to undertaking the field assessments of the water treatment plants, HDR reviewed available information on each of the facilities. This includes previous Asset Management documents and existing plans. This enabled the field assessment teams to understand the equipment age, expected condition, and original design intent for the facility. A short description of each water plant is provided in the following sections, along with a summary of the scoring results for the treatment system components.

### 3.4.1 Fort Thomas Treatment Plant (FTTP)

FTTP serves as the base loading treatment plant for the NKWD system. It is NKWD's most critical treatment asset and typically produces more daily volume than MPTP and TMTP combined. FTTP was constructed in several stages between 1891 and the present. Major facility upgrades include:

1936 - Construction of Clarifiers 2 and 3 along with the Filter Building (12 Filters) and Clearwell 1.

1987- Clarifier 1 Construction

1988 – Clearwell No. 2 Construction

1992 – Gravity Thickener

1993 – Clarifier 4 Construction

1999 – Sodium Hypochlorite Building Construction

2001 – Chemical Building Addition

2006 – Pre-treatment Building/PAC Silo Construction

2010 – Additional Gravity Thickener

2012 – Advanced Treatment (GAC/UV) Facilities Construction

FTTP is supplied solely by the ORPS1 intake pumping station. FTTP has a current treatment capacity rated at 44 MGD. A brief review of each major process component is provided in Table 37 to reflect the individual process capabilities.

**Table 3-7: FTTP Process Component ratings**

| Process Component (No.)      | Sizing/Capability Notes                                                                                                                                                                                                                                                                                                           |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PAC Feed System              | 87,000 lbs (2,500 CF) stored. At 44 MGD/ 40 mg/L – this results in approximately 6 days of storage.                                                                                                                                                                                                                               |
| Reservoirs/Pre-sedimentation | <p><u>Total raw water storage of 72 MG, split between two reservoirs:</u></p> <ul style="list-style-type: none"> <li>• <u>North Reservoir</u> – 34 million gallons (estimated) - recently cleaned and 1+ full day of plant storage</li> <li>• <u>South Reservoir</u> – 38 million gallons (estimated) Recently cleaned</li> </ul> |
| Rapid Mix                    | <p>RM1 (4,370 gal) – 17 sec detention @ 44 MGD, G value is approximately <math>700 \text{ s}^{-1}</math></p> <p>RM2 (6,020 gal) - 25 sec detention @ 44 MGD, G Value is approximately <math>370 \text{ s}^{-1}</math>, G value below recommended Hp</p>                                                                           |
| Flocculators                 | <p>Basin 2 and 3 (281,530 gal – all stages), 37 min detention at 44 MGD. G Values between 75 and <math>30 \text{ s}^{-1}</math></p> <p>Basin 1 and 4 being rehabilitated to resemble Basin 2 and 3.</p>                                                                                                                           |
| Sedimentation Basins         | Basins 1-4 have recently had plate settlers added which modifies the sedimentation zone and increases available surface area for the sedimentation process.                                                                                                                                                                       |
| Filters                      | 12 Filters (560 SF Each, 6,160 Total SF w/ OOS) – At 5 GPM/SF filtration rating, 44.3 MGD Rated Capacity                                                                                                                                                                                                                          |
| Clearwells                   | <p>Clearwell No. 1 – 3.0 million gallons with baffling</p> <p>Clearwell No. 2 – 3.5 million gallons with baffling</p> <p>Total Storage – 17% of Plant Capacity, 1.5 CT log Reduction at max flow and 2.0 mg/L of disinfectant.</p>                                                                                                |
| GAC Contactors               | 8 Contactors (10,560 CF Each, 84,480 CF Total) – at 20 Min EBCT, 45 MGD Rated Capacity                                                                                                                                                                                                                                            |
| UV Equipment                 | 3-36" UV Reactors – $32 \text{ mJ}/\text{CM}^2$ Dosage                                                                                                                                                                                                                                                                            |
| Backwash Pumps               | <p>Filter BW Pump (1) – 11,200 GPM, 20 GPM/SF</p> <p>GAC BW Pump (1) - 11,200 GPM, 13 GPM/SF</p>                                                                                                                                                                                                                                  |
| High Service Pumping (US 27) | <p>6 HS Pumps Serving south into Campbell Co. – Pump #2 is out of service with replacement planned for 2027, station currently operates with 5 pumps.</p> <p>All Pumps 3,550 GPM with around 300'. Station Rated Capacity – 14,200 GPM (20.4 MGD)</p>                                                                             |



|                              |                                                                                                           |
|------------------------------|-----------------------------------------------------------------------------------------------------------|
| Backwash Holding Basin       | 680,000 gallon storage with two 1,200 GPM return pumps to reservoirs                                      |
| Gravity Thickener Basins (2) | Thickener basins with plate settlers, effluent transferred back to reservoir while solids sent to presses |
| Belt Filter Presses          | (2) Belt Filter Presses (1 meter) with ancillary systems for polymer addition and solids disposal.        |

In summary, our review confirms that no apparent design limitations exist that would affect the 44 MGD composite production rating of the facility. A few notable items that were revealed during this assessment are:

- Pump capacity (largest pump out of service) at US27 is 20.4 MGD, but this station only supplies water to portions of Campbell County.
- Design of new plate settlers in Sedimentation Basins is assumed to match the 44 MGD rating. The previous design included tube settlers met the rated capacity.
- Solids accumulation and handling appear to be the most challenging process elements to operation at the maximum flow rate of 44 MGD. New press infrastructure will help this condition, but other infrastructure may be necessary.

As noted, FTTP is a critical facility to NKWD. In the following section, a short description will be provided of each structural, process, electrical, and control system and their current condition. Any notable concerns are included.

#### 3.4.1.1 FTTP System Descriptions

Structural, process, electrical, and control reviews were performed independently at the FTTP facility. Over 200 systems were identified and reviewed at FTTP during this process and the findings are summarized in Table 3-7. Summary descriptions of each major facility system and notable findings are provided in the following articles.

##### **Structural**

Pretreatment Building/PAC Silo – Masonry building (2,400 SF) constructed in 2010. Facility constructed over 60" raw water line. No cracking noted within structure or containment. PAC silo (2,400 CF) shows no signs of rusting. PAC feeder area has mild corrosion.

Rapid Mix/Chemical Building – Rapid Mixes and the Chemical Building are essentially a combined structure. Chemical Building was expanded in 2001 to centralize chemicals (except sodium hypochlorite). The masonry building (8,800 SF total) includes maintenance areas, storage, offices, and restrooms. No cracking or deterioration was noted within the structure. Some corrosion was noted within the chemical containment areas but nothing that created a structural concern.

Flocculators – Four treatment trains include multiple flocculation basins in each train. Basins 1 and 4 are currently being rehabilitated while Basins 2 and 3 were recently upgraded (2016). Concrete restoration has been performed during both recent projects. No notable deficiencies were noted.

Sedimentation Basins – Similar to the flocculators, Sedimentation Basins 1 and 4 are being rehabilitated with plate settlers being installed. Basins 2 and 3 were rehabilitated in 2016 and have

plate settlers being installed. The wall design has been previously noted as a limiting factor in supporting any cover structures.

**Filter Building** – Filter building is a masonry structure (16,000 SF) that was constructed in 1936 and is a historically relevant structure. The filters have had upgrades over the years, but the structure itself remains largely as it was built 85 years ago. The Filter Building is a 4-level with conditions showing the structure has had several upgrades since then. The structure includes Clearwell No.1 (under the Pipe Gallery/Lower Level). The area of greatest concern is the lowest level where water is consistently present on floors. Clearwell No. 1 appears to be able to pressurize the filter gallery floor during high water level periods. Structural improvements and repairs are needed in the lower areas.

**Clearwells** – Clearwell No. 1 and No. 2 are very different structures. Clearwell No. 1 is located below the FTTP Pipe Gallery and could not be observed. Clearwell No. 2 is an external, circular tank located in front of the Filter Building. Clearwell No. 2 was constructed in 1988 and remains structurally sound. Some surface and crack repair, as well as new coatings, are necessary.

**Sodium Hypochlorite Building** – Masonry building (3,000 SF) constructed in 2001 to house the corrosive chemical. The building's piping has exhibited leakage and structural corrosion. Masonry cracking in building corners is also noted. Some recent improvements have been installed to contain leaking chemicals. More structural improvements are recommended.

**Advanced Treatment Building** – Constructed in 2012 to house GAC and UV treatment components along with an equalization tank, pump room, and controls area. The construction of the facility included several locations for grout injection at cold joints. A few of these locations continue to exhibit leaks. Roof leakage from green roof failure appears to have been addressed satisfactorily. Some mortar and masonry cracking on the north wall is also noticeable.

**Backwash Holding Tank/Sludge Pumping Station** – Both elements were constructed (possibly as a single structure) in 1987. Holding tank could only be observed from top and perimeter. The pump station could be seen from the inside. Minor cracks and spalling noted but no major investment necessary.

**Gravity Thickeners**– Unit No. 1 was constructed in 1992 and Unit No. 2 was built in 2010. Unit No. 1 shows signs of deterioration. The internal rake was replaced in 2010 and appears to be in good operating condition, but other elements have deteriorated. Concrete basins likely require limited crack repair.

**Press Building** – Multi-level masonry building (4,400 SF) modified in 2020 to accommodate the installation of two new belt filter presses, polymer systems, solids conveyors, dumpsters and related appurtenances. Additional structural supports are needed. Some corrosion apparent in supports, etc.

**Laboratory Building** – Multi-level masonry building (3,400 SF) built in 1990's to consolidate lab operations. Facility includes restrooms, offices, workspaces, and extensive lab equipment. Overall condition is good with minor investments recommended for consideration.

## **Process**

**Pretreatment Building/PAC Silo** – Three raw water pre-treatment chemicals are fed at this building. Liquid chemicals include potassium permanganate and a spare liquid feed unit (originally designed for copper sulfate). Powdered Activated Carbon (PAC) is stored outside in a silo and educed into solution for injection. Improvements to the Potassium Permanganate feed system pumps may be needed to overcome clogging and PAC feed at high levels may require further assessment. Otherwise, the storage tanks and related appurtenances appear to be satisfactory in condition and performance.

**Reservoirs** – Both north and south reservoirs serve to pre-settle flow from the river and recycle processes from the backwash storage tank, equalization tank, and gravity thickener. North Reservoir stores approximately 34 million gallons and has recently been cleaned to restore full capacity. The South Reservoir stores 38 million gallons and was cleaned and placed back in service in September 2023. NKWD is planning to dewater and clean with their staff over next year. Raw water valves are the greatest areas of concern at this time. Several cannot be relied upon and need to be replaced in areas difficult to access.

**Rapid Mix/Chemical Building** – Rapid Mix No. 1 was replaced as part of the 2016 Improvements and Rapid Mixer No. 2 was recently upgraded. Rapid Mix appears to wobble, and performance is currently sub-optimal. Each mixer serves two trains, which may be a significant challenge for production. Instrumentation (turbidimeters) for raw water is also less than 5 years old and working satisfactory.

**Flocculators** – Flocculators for Basins No. 1 and 4 are being rehabilitated. Basins No. 2 and 3 were rebuilt in 2016 and are in good condition.

**Sedimentation Basins** – Similar to the flocculators, Sedimentation Basins No. 1 and 4 are being rehabilitated with plate settlers being installed. Basins 2 and 3 were rehabilitated in 2016 and have plate settlers installed. Sludge and discharge gates/valves need to be replaced.

**Filter Building** – Filter building condition is greatly complicated by the maintenance access in critical areas. As noted previously, the upper levels have been well maintained and are in good condition. There is some coating delamination that should be replaced. The lower level (pipe gallery) is the area of greatest concern. Portions of this area have standing water. Whether this is leakage through filter walls (above), or other sources is not clear. However, this needs to be assessed in order to prevent deterioration of the building. The pipe gallery area is very congested, and valve/pipe access is difficult. Multiple valves and actuators need to be removed and replaced. Some of the effluent flow monitoring elements need to be replaced. Piping in certain areas has advanced corrosion, especially on the north end of the gallery. A comprehensive upgrade in the lower level would be beneficial but would be very challenging to implement.

**Clearwells** – Clearwell No. 1 (3.0 million gallons) and No. 2 (3.5 million gallons) are baffled and serve as expected from a process perspective. These create sufficient detention time for CT requirements to be met. Notably, the baffling in Clearwell No. 1 is deteriorating in condition and will be replaced in 2025.

**Sodium Hypochlorite Building** – Process elements include six bulk tanks (54,000 gallons) and two day tanks. Five metering pumps deliver the chemical to the multiple injection points. The transfer pumps show some vibration and should be evaluated. The sodium hypochlorite, in total, is capable of storing and delivering more than FTTP performance requires (i.e., 3 tanks currently out of service). This creates an excess that can be used for other opportunities. Pumps, piping, and valves have recently been replaced and appear to operate as expected.

**Chemical Storage and Feed** – Five chemicals are stored and fed in the Chemical Building. These include two coagulants (DeIPAC and Ferric Sulfate), fluoride (HFS), corrosion control (ortho-polyphosphate blend), and pH adjustment (Caustic Soda), along with a potassium permanganate tote feed system. This facility was built in 2001 and some of the original metering pumps have been replaced (notably the caustic feed system). The remaining systems need to be upgraded along with the instrumentation and monitoring to provide maximum controls and range to operators.

**Advanced Treatment Building** – Facility includes eight GAC contactors, three medium pressure UV reactors, equalization tank, and a pump room (GAC Influent (3), Filter backwash (1), and GAC

backwash (1)), along with controls and monitoring areas. These facilities are 10 years old with satisfactory operation. Each major element appears to perform as anticipated, however, some of the materials have begun to experience deterioration. Many stainless-steel items have experienced accelerated corrosion. These include supports, panels, valve housing, etc. Valve stems that control the influent gates and the backwash supply valves have deteriorated and should be replaced, as well. The pumps currently operate as designed without any identified deficiency. The GAC contactors have issues with the drain and influent valve shafts that need to be addressed. Several valve actuators do not appear to reach their full limit and leakage through them has been identified as a possible issue. GAC media has also been seen in the EQ basin. Monitoring of this should be undertaken to understand any losses. UV reactors show signs of mild corrosion but operate as designed. Lamps are changed every 5,000 hours; valves appear to work as expected. UV monitors need to be evaluated regularly.

Equalization Basin – Pump condition is not observable while operating. Operators indicate performance is satisfactory. Check and isolation valves are in satisfactory condition and operation.

Backwash Holding Tank/Sludge Pumping Station – Backwash tank is sized at approximately 650,000 gallons. This is roughly three filter backwash volumes daily. This is undersized for the facility when considering total flow, especially if GAC contactor and Belt Press filtrate flows are considered. Pumps that are present include Backwash Decant (2), Solids Transfer (2), Backwash Return (2), and Thickener Return (2). Pumps and associated valves appear to be in acceptable condition and operation. Backwash Decant pumps (50 Hp each) share a common 10" line with Thickener Supernatant Pumps, which impact performance of both. The Reservoir Return Valve Vault is in acceptable condition, but a parallel line is needed.

Gravity Thickeners– Old and New Gravity Thickeners (2) have several areas where improvement is needed. The units have a single draw level, which impacts operator flexibility. Influent gates are in poor condition and need replacement. The supernatant pumps struggle to return a sufficient flow to the north reservoir since they compete with Backwash Decant Pumps. The Solids Transfer pumps that move slurries between the Backwash Holding Tank and the Gravity Thickener are currently in satisfactory condition and operation.

Press Building – Press facility includes two new Andritz belt filter presses together with influent valves, a polymer make-up and feed system, as well as solids augers/conveyors and dumpsters. New equipment was installed in 2020. Presses prefer devoted pump supply. Distributing flow to both presses from single supply has proven challenging. Valves' sensors and gauges are still in new condition and appear to operate satisfactorily.

Yard Piping and Appurtenances -Yard piping and valves are critical to maintaining plant operations and asset repair. The recent assessment revealed that many of the yard valves between structures have not been regularly exercised due to concerns about reliability. Valves are typically quite challenging to replace and can create plant shutdowns that are hardships for the utility. Specific areas to be addressed in a replacement program include:

- Raw Water Valves - 31 Valves between the Pre-Treatment Building and the Rapid Mixes. At least eight of these are known not to work and need to be replaced.
- Finished Water Valves – Isolation valves between Clearwell No. 1 and the US 27 Pump Station facility. Includes eight valves with two to four being 90 years old.

Electrical/Instrumentation

Pretreatment Building – Facility constructed in 2007. Housekeeping issues with potassium permanganate and carbon silo, but no upgrades necessary. Instrumentation modernization will occur under SCADA Phase 2.

Rapid Mix/Flocculators/Sedimentation Basins – Actuators on sedimentation basins should be replaced during the planning horizon based on conditions.

Filter Building – Age of facility creates challenging conditions for electrical gear. Location of electrical areas and poor ventilation will continue to plague the system without relocation. Panels and motor control centers exhibit extreme corrosion and need to be replaced for reliability. Valve actuators in basement are challenging to access and should be replaced. Modulating valves need to be converted to 4-20 mA signals for performance. Motor control centers (MCCs) need to be converted to 480V.

Chemical Storage and Feed – MCC and multiple panels are beyond useful life with limited availability of parts. Fluoride panels and gear have experienced significant corrosion. Improved ventilation needed to prevent significant corrosion issues. Most panels and electrical gear are in acceptable condition.

Sodium Hypochlorite Building – Building was constructed in 2000 and electrical gear is still within design life. Panels and MCCs are in acceptable condition. Facility is connected to an emergency generator. Flow meters and level indication are in poor condition and are a high maintenance issue. Replacement during planning horizon is recommended.

Advanced Treatment Building – Entire facility was constructed in 2012 and all elements are still within design life. One area of note is the stainless-steel panels in the UV and GAC pipe gallery areas. These panels have exhibited accelerated corrosion, and countermeasures should be considered to improve ventilation. It is also possible the material is an issue. All systems are connected to an emergency generator.

Sludge Pumping Station - Pump Station Pumps that are present include Backwash Decant (2), Solids Transfer (2), Backwash Return (2), and Thickener Return (2). Maintenance staff noted the safety need for a master disconnect switch at the door to avoid having to enter the station and potentially walk-through leaked liquids to turn power off. MCC for facility needs to be replaced for age. Station is below ground and can flood from leaks. Better ventilation is needed. Relocation to top slab of pumping station should be considered during the planning horizon.

Press Building – Press facility is less than 5 years old and had a complete replacement of all MCCs, gear and panels. The condition of all these items is acceptable.

Facility Transformers/Generators - Outdoor primary metered pad mount transformers downstream of the generator are 20+ years old and have not been recently upgraded. The failure of any of these transformers would impact operations. These transformers are owned by NKWD and need to be replaced within the planning horizon. Emergency generator and switchgear were installed in 2012 and are in acceptable condition.

Instrumentation - PLC replacement and other upgrades are programmed to occur with the SCADA Phase 2 project expected in 2024.

### 3.4.1.2 FTTP Asset Ratings

As noted previously, over 200 systems were reviewed at FTTP for their condition, performance, and reliability. These ratings were assessed for their risk profile (failure probability, consequence,

redundancy, and safety impacts) A summary of the highest rated (worst condition) systems at FFTP is provided below in Table 3-8.

**Table 3-8: Fort Thomas Treatment Plant System Composite Ratings**

| Facility System                        | System Assessment Rating | PCS Multipliers | Composite System Rating Score |
|----------------------------------------|--------------------------|-----------------|-------------------------------|
| <b>Structures</b>                      |                          |                 |                               |
| Filter Building - Basement East        | 4.50                     | 2.13            | 9.61                          |
| Filter Building – Pipe Gallery         | 4.00                     | 2.13            | 8.54                          |
| Chemical Building – South End          | 4.00                     | 1.86            | 7.43                          |
| Filter Building 3 <sup>rd</sup> Floor  | 3.50                     | 2.00            | 7.02                          |
| <b>Process/Equipment</b>               |                          |                 |                               |
| Outside (lower Intakes/River Pit)      | 5.00                     | 1.95            | 9.77                          |
| Backwash Decant Pumps                  | 3.83                     | 1.98            | 7.58                          |
| Sludge Pumps                           | 3.83                     | 1.98            | 7.58                          |
| Clearwell No.1 Finished Water Valve    | 4.00                     | 1.72            | 6.88                          |
| Backwash Supply Valves                 | 3.33                     | 2.00            | 6.68                          |
| Raw Water Lines                        | 3.67                     | 1.82            | 6.67                          |
| Raw Water Yard Valves                  | 3.67                     | 1.82            | 6.67                          |
| Filter Influent Flume/Level Indication | 4.00                     | 1.65            | 6.61                          |
| GAC Influent Valves/Stems              | 4.00                     | 1.65            | 6.61                          |
| <b>Electrical/Control</b>              |                          |                 |                               |
| MCC-B                                  | 4.33                     | 2.32            | 10.05                         |
| Panelboards – Basement Filter Building | 4.17                     | 2.13            | 8.89                          |

|                                      |      |      |      |
|--------------------------------------|------|------|------|
| Electrical Switchgear – SB-1         | 3.50 | 2.51 | 8.77 |
| Pretreatment Building – Carbon Silo  | 3.17 | 2.64 | 8.35 |
| Chemical Building/Sodium Hypo Panels | 3.67 | 2.13 | 7.83 |
| Filter Gallery Panelboards           | 3.83 | 1.98 | 7.58 |
| Filter Valve Actuators               | 3.83 | 1.94 | 7.44 |
| Sludge PS Flow Meter                 | 4.00 | 1.80 | 7.19 |
| Filter Building Basement MCC         | 3.33 | 2.13 | 7.12 |
| HFS Electrical/Mechanical            | 3.83 | 1.80 | 6.89 |
| Sodium Hypo Flow Meters              | 4.00 | 1.69 | 6.75 |
| Sludge PS MCC                        | 3.67 | 1.80 | 6.59 |

### 3.4.2 Memorial Parkway Treatment Plant (MPTP)

#### 3.4.2.1 Overview

MPTP serves as primary supply to the NKWD customers in Newport, Southgate, Bellevue, and Dayton as well as other areas in Campbell County. It also can serve as a peak plant for other NKWD zones through the system interconnects. MPTP is an important facility that can increase or decrease volume quickly without diminishing the water quality. The typical production day is well below the plant capacity. MPTP has some elements that were part of the original plant construction from the 1920's. However, the plant was completely rebuilt in 1961. Subsequent upgrade projects include:

1987- Facility Expansion

1996 – Solids Building and Lab

2000 – Actiflo Clarification Process

2001/04 – Filter Upgrades

2008 – Chemical Building Addition/PAC Facility

2012 – Advanced Treatment (GAC/UV) Facilities Construction

MPTP is supplied solely by the ORPS2 intake pumping station. MPTP has a current treatment capacity rated at 10.5 MGD. However, the rating on individual components is often higher. A brief review of each major process component is provided in Table 3-9 to reflect the individual process capabilities.

**Table 3-9: MPTP Process Component Ratings**

| Process Component (No.) | Sizing/Capability Notes |
|-------------------------|-------------------------|
|-------------------------|-------------------------|



|                                             |                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PAC Feed System                             | Bulk PAC feed (900 lb totes). Feeder capable of delivering 1,700 lbs/Hour to meet 40 mg/L dose rules. At 10 MGD/ 40 mg/L – NKWD would use 3.7 totes per day. Single feed system currently.                                                                                                                                                                                                          |
| Reservoirs/Pre-sedimentation                | <p><u>South Reservoir</u> – Constructed in 1924 and serves as pre-settling reservoir. Estimated volume between 17.5 and 20.0 million with significant siltation. 1+ full day of plant storage.</p> <p><u>North Reservoir</u> – Currently serving as solids disposal reservoir. Estimated volume of 9.0-11.0 million gallons but heavily sediment laden from visual inspection. Dredging needed.</p> |
| Raw Water Transfer Station (RWTS)           | Three Raw Water Pumps (1- 5 MGD, 2 – 10 MGD). All operating within expectation. Resulting capacity of RWTS was 15 MGD.                                                                                                                                                                                                                                                                              |
| Raw Transmission Lines                      | Single 24" Concrete Transfer Main – Velocity approximately 7 FT/S at 15 MGD.                                                                                                                                                                                                                                                                                                                        |
| Actiflo Clarification Process               | Actiflo Basin Settling Zone (2) – 11'-0" x 15'-0" – 330 SF Total. Approved Rise Rate – 32 GPM/SF = 16.6 MGD capacity.                                                                                                                                                                                                                                                                               |
| Filters                                     | 6 Filters (612 SF Each, 3,060 Total SF w/ OOS) – At 5 GPM/SF filtration rating, 22.0 MGD rated capacity.                                                                                                                                                                                                                                                                                            |
| Clearwells                                  | <p>Clearwell – 3.0 million gallons with baffling.</p> <p>Total Storage – 20% of Plant Capacity (at 15 MGD), 1.5 CT log Reduction at max flow and 2.0 mg/L of disinfectant.</p>                                                                                                                                                                                                                      |
| GAC Contactors                              | 6 Contactors (6,240 CF Each, 37,440 CF Total) – at 20 Min EBCT, 20 MGD Rated Capacity.                                                                                                                                                                                                                                                                                                              |
| UV Equipment                                | 2-24" UV Reactors – 32 mJ/CM <sup>2</sup> Dosage. No Hydraulic Limit                                                                                                                                                                                                                                                                                                                                |
| Backwash Pumps                              | Filter/GAC BW Pumps (2) – 6,500 GPM Each, 11,000 GPM High Rate – 18 GPM/SF. Both have VFDs.                                                                                                                                                                                                                                                                                                         |
| Chemical Storage                            | Liquid/Dry Storage and feed for 11 Chemicals – All liquids contained adequately. Can meet chemical feed beyond 15 MGD.                                                                                                                                                                                                                                                                              |
| Solids Handling/Storage/Transfer Pumps      | Current practice is discharge and storage in North Reservoir with periodic dredging. MPTP has a solids concentration basin and a belt press facility, but it has been out of service since 2003.                                                                                                                                                                                                    |
| Waterworks Road (High Service) Pump Station | <p>Portion of flow is pumped into Fort Thomas 1017 system.</p> <p>(3) VT 4,200 GPM/500 HP high service pumps. 12 MGD firm capacity to upper system.</p>                                                                                                                                                                                                                                             |

In summary, our review confirms that no apparent design limitations exist that would affect the current 10.5 MGD composite production rating of the facility. The limitation for going to a higher flow is in the suction and discharge piping of the raw water pumping station. The current suction piping is limited



to 10.5 MGD. To increase flow would require replacing the 24-inch suction pipe with a 36-inch pipe (sized for 20 MGD) from the reservoir to the pumping station. If the suction piping was replaced and upsized, it appears to be feasible to request a composite rating of 15.0 MGD from the Kentucky Division of Water should NKWD choose to do so. A few notable items that were revealed during this assessment are:

- Raw Water Transfer remains the limiting factor. The current pumping arrangement is capable of 15 MGD but may still encounter some NPSH concerns if the south reservoir level is not maintained. Prior modeling indicated it is critical to keep the reservoir operating level at elevation 716.0 or higher.
- Dredging of both north and south reservoirs are in the planning stages.
- NKWD has been investigating ways to restore the solids concentration/belt press facility back to operation.

As noted, MPTP is very important to NKWD. In the following section, a short description will be provided of each structural, process, electrical, and control system and their current condition. Any notable concerns will be included.

### 3.4.2.2 MPTP System Descriptions

Structural, process, electrical, and control reviews were performed independently at the MPTP facility. Over 115 systems were identified and reviewed at MPTP during this process and the findings of this are summarized in Table 3-9. Summary descriptions of each of the major facility systems and notable findings are provided in the following articles.

#### **Structural**

North and South Reservoirs – Reservoirs are earthen structures with concrete/masonry cladding. Constructed in 1924 as part of the original water treatment plant, these reservoirs have a berm that separates them creating distinct impoundments. Both reservoirs have overflows. The berm is perpetually wet at the surface indicating solution channels are likely between them. During the inspection, both reservoirs were full so the overflow structures could not be observed. A raw water pipe tunnel is present below the North Reservoir. This tunnel contains two pump suction lines for the Raw Water Transfer Station (RWTS), and it was previously inspected in 2006. There were deficiencies noted at that time including a leaking pipe at the terminal wall leading to significant sediment accumulation.

Raw Water Transfer Station (RWTS) – The pump station is a 1,250 SF masonry clad structure with a poured concrete foundation. The structure was built in 1963. CMU and exterior masonry cracking is apparent in several areas and need further analysis to assess its activity. The raw water tunnels need to be revisited to determine condition and countermeasures to leaks and pipe deterioration.

Powder Activated Carbon (PAC) Facility – PAC Building is approximately 750 SF with a split-face CMU block surface and concrete slab floor/foundation. Roof is precast concrete. No deficiencies or concerns were noted. There is room available to expand the facility.

Actiflo Building and Basins – Two sedimentation basins were converted to Actiflo Basins in 1999. Conversions utilized existing concrete, raised walls (in one basin) and constructed a pre-engineered metal building (PEMB) to cover Actiflo equipment. Concrete has severe cracking/spalling on the deck outside the Actiflo Building. Concrete deterioration on effluent feed channel to filters. Concrete inside

basins shows modest cracking. Some deterioration of concrete and piping is noted in lower level. PEMB roofline requires some repairs and building is worn but still in acceptable condition.

**Filters and Filter Building** – Filter building is approximately 13,000 SF with upper and lower levels. Building contains six filters, filter pipe gallery, laboratory area, offices, break area, and locker room. Standing seam metal roof was installed in 2001. Other structural remediation occurred in 2012 to prevent masonry separation and water entry, which appear to have been successful. Masonry cracks still exist at the southern end of building and should be monitored. Lower level is reinforced concrete. Notable cracking and active leaks seen in the middle of each filter wall around air piping. Substantial crack along gallery floor as well. These need to be assessed and repaired. Additional pipe supports may be needed. Portions of filter influent channel were covered and could not be observed.

**GAC Building** – This 9,500 SF building was built in 2012 and contains multiple levels (total height of 41'). The building is reinforced concrete with a masonry veneer. GAC Building includes three areas including the influent pumps station area, the GAC contactor area, the central hallway area, and the multi-level roof. The influent pump station, central hallway, and roof appear to be in good condition with only a few notable issues. However, the GAC contactor area has multiple areas with significant efflorescence. This is most apparent in the pipe gallery area; these require further assessment and possible pressure grouting for remediation.

**UV Building** – The UV Building was constructed adjacent to the GAC Building as part of the same Advanced Treatment project in 2012. This structure utilized an existing flocculation basin as the foundation and then built a CMU/Masonry Structure over the top of the existing basin. A connecting access door was also constructed through an existing wall in the lower level to access the GAC Building. No apparent major deficiencies were observed in either the lower or upper levels, nor with the roofing. The 2-ton monorail did have a minor issue that should be addressed.

**Clearwell** – The 3-million-gallon reinforced concrete finished water storage basin was originally constructed in 1962. The Clearwell has an inner wall that segregates two chambers (allowing for maintenance, etc.). The structure has experienced leakage during its service life and has had concrete rehabilitation measures applied. The most recent work was a repair and recoating of the visible walls and roof deck surfaces in 2020 that has extended the service life of the structure. There are also two below grade vaults associated with the Clearwell (Finished Water Chemical Vault and Clearwell Effluent Valves). The former was constructed in 2012 and is in good condition. The latter was constructed in 1962 and has significant concrete structural issues and should be rehabilitated or re-built.

**Chemical Building** – Built in 2008, the 7,400 SF structure was constructed within one of the existing sedimentation basins (similar to the Actiflo). The building is a CMU/masonry structure that was built on a reinforced concrete foundation. The aggressive chemical areas (fluoride and caustic soda) have floor coatings that have deteriorated or delaminated and should be recoated to protect the concrete floor. These two chemical areas have also experienced attacks on supports, panels, and equipment. These areas will require rehabilitation within the planning horizon. The precast concrete roof of the building appears to be sound.

**Old Chemical Building/Raw Water Pipe Tunnels** – MPTP has a decommissioned Chemical Building that remains on the site. This facility was constructed in 1962 and contains asbestos pipe insulation and some areas of lead paint. NKWD investigated its removal in 2012 but decided to leave it in place due to cost. The building itself serves only as storage currently, but it does have an important raw water piping tunnel in the lower level. This tunnel has piping that comes from the RWTS and from ORPS2. The tunnel environmental conditions are not good, there is standing water from leaks, and

the walls have areas of exposed reinforcing steel as well as significant efflorescence. The piping also exhibits significant surface deterioration. This area is very important for production therefore rehabilitation of this area is recommended.

Waterworks Pump Station – Pump Station appears to have been constructed in 1990's to pump to higher elevations in Newport/Campbell County. The building is approx. 1,000 SF and is constructed of CMU/Masonry walls, reinforced concrete floor, and precast concrete roof panels with skylights for pump access. The facility has a 4-ton monorail for access. Minor cracking observed at expansion joints, which should be monitored. Roof appears sound.

Solids Concentration/Belt Press Facility - This 2,000 SF split-face CMU facility was constructed in 1997 and has been out of operation since 2003. It has two levels. The lower-level concentration tank is restricted access and was not observed. The main level has a laboratory area, as well as the belt press area. An 800 SF covered dumpster area is also part of the facility. All of these areas are covered by a truss roof with shingles. Roof shows no leaks currently but is near the end of its service life. The CMU structure appears to be in satisfactory condition.

Miscellaneous Structures – MPTP has several yard vaults, both precast and poured in place concrete. These include the raw water valve pit, finished water meter pit, and an unknown pit near Waterworks Road PS. These are typically in satisfactory structural condition, but some have standing water that will deteriorate the structure over time. Drainage should be observed at each of these locations and improvements are recommended.

## **Process**

North and South Reservoirs – Both north and south reservoirs serve to pre-settle flow from the river. The north reservoir feeds from one influent pipe that has no valves. One 36-inch manual butterfly valve diverts flow to sludge beds. North reservoir's connection to the river was identified as a long-term risk to the system. South reservoir is contained behind a dam and uses a level transmitter to monitor water content. One influent line feeds the south reservoir. An additional observation was made to increase the RWTS pipe size to achieve 20 MGD capacity. Both reservoirs have significant siltation. NKWD is planning to dewater and clean with their staff, following similar activities at Fort Thomas Treat Plant.

Raw Water Transfer Station (RWTS) – The pump station is a 1,250 SF structure built in 1963 with a major rehabilitation project in 2008. Facility includes three 10-inch horizontal split case pumps, two 36" station influent valves, and header piping with valves ranging from 10" to 20". Valving obstructs station's river supply / influent, any failure would impact MPTP's raw water supply. Flow meter needs to be upgraded.

Powder Activated Carbon (PAC) Facility – The PAC facility is composed of a single super sack system including hoist, vibrators, auger feed, eductor, and wetting cone to handle and distribute the dry PAC. No backup unit to this system.

Actiflo Building and Basins – Two sedimentation basins were converted to Actiflo Basins in 1999. Actiflo system consists of hydrocyclones, injection and maturation mixers, solids rakes, weirs and tube settlers, sand pumps, recycle piping, and supports. Minimal upgrades have occurred since implementation other than necessary maintenance, while technology surrounding Actiflo systems has advanced since this implementation. NKWD has a preliminary engineering report detailing Actiflo system upgrades and a capital project allocated. Overall sand abrasion has worn some process piping and equipment. Mixing equipment and other process equipment is approaching typical life and will need replacement.

Filters and Filter Building – Water leakage occurring in the basement interior coming through filter walls including filter one. Filters 4-6 appear low on media based on available observation. Difficulties with the filter effluent valves and venturis were observed. The five Auma actuators that have been installed, modulate frequently and are prone to maintenance issues. NKWD is piloting a Beck actuator for modulating valves. Filter 1 effluent valve leaks and will not close. Venturi meters need significant bleeding. Upgrades to modulating valves recommended based on the results of the pilot study. The filter air scour system uses discharge piping, electric actuator butterfly header, modulating valve, and blower. No backup to air scour system blower without the system backwash effectiveness would be impacted.

Backwash Facility – Facility was built with the original plant in 1963 but upgrades were installed in 2008. Two 150 HP horizontal split case pumps with a 30" influent valves. Discharge piping for each pump consists of 16" check valves, 16" electrically actuated butterfly valves and miscellaneous instrumentation. Pump No. 2 has to be running to get high-rate flow. Flow meter is in poor condition and needs to be replaced.

GAC Building – Facility includes six GAC contactors along with the necessary piping and valving. Each major element appears to perform as anticipated. Valves should be recoated during the planning horizon. GAC air scour system was not installed during original construction, but some piping was installed. Blower and additional piping would be required to implement an air scour system. Two slurry water supply pumps installed; however, Pump No. 2 is out of service and has never functioned correctly. Four GAC influent pumps with a design capacity of 20 MGW with one out of service.

UV Building – Influent water into the UV building is controlled through the use of two 24" butterfly valves with two pressure and flow meters. The Calgon Carbon Sentinel lamps were installed in 2012 and are in good condition. The discharge is controlled by two 36" butterfly valves with two pressure meters. Each UV reactor was designed to handle MPTP's design capacity allowing provide 100% backup.

Clearwell – Two 30 in. butterfly valves with headwater are used for influent water. A major rehabilitation occurred in 2020. Five effluent valves allow water to be controlled to Waterworks Pump Station and gravity to the adjacent basin HGL. They are in satisfactory condition.

Chemical Building –The chemical building houses sodium hypochlorite, fluoride (HFS), Caustic Soda, ortho-polyphosphate blend, copper sulfate, ferric sulfate, and PACL. The facility was constructed in 2007 with minimal improvements implemented in the past 15 years. Bulk fluoride tank was rebuilt in 2017. Repaired sodium hypochlorite bulk tank No. 2 along with numerous valves replacements. Multiple valve replacements for PACL system.

Old Chemical Building/Raw Water Pipe Tunnels – Raw water pipe tunnels located and accessed from the basement of the Old Chemical Building. Consists of raw water piping, seven 36" raw valves, and raw water chemical injector for potassium permanganate. Five of the seven valves are important to water service.

Waterworks Pump Station – The Waterworks Pump Station has three yard valves, two lines, and unknown suction valves to isolate. The pump station contains three vertical turbine cans sized at 4,200 GPM at 500 horsepower each. Pumps are in acceptable condition.

Solids Concentration/Belt Press Facility – The belt press building contains a press, solids pumps, decant pumps, and a polymer system. It is currently not in service but has been sparingly used previously. Facility limitations have shifted operations to recycling waste back to the reservoir resulting in increased siltation. NKWD plans to implement an improvement project.

## Electrical/Instrumentation

Raw Water Transfer Station (RWTS) – Pump station was upgraded in 2007. MCCs, VFDs and other electrical components are in good condition. RWTS is connected to MPTP emergency generator. Part of the electrical equipment needed to operate this facility is located in the Solids Concentration/ Belt Filter Press Facility.

Powder Activated Carbon (PAC) Facility – PAC Building built in 2007 and panels appear to be in good condition. No upgrades are needed during planning horizon.

Actiflo Building and Basins – Actiflo control room has VFDs that are in poor condition. A recent project was designed to replace these and upgrade the panels. Disconnects and lighting in the facility were also scheduled to be replaced. This work has been delayed but needs to be completed during the planning horizon. Instrumentation is scheduled to be upgraded in the SCADA Phase 2 project.

Filters and Filter Building – Panels installed in last 20 years for filters and blower. NEMA 12 enclosures need to be replaced. Actuators for modulating valves need to be replaced and changed to 480V. Ethernet communication should be installed to replace Devicenet. Additional filter instrumentation upgrades including DP cells, turbidimeters, etc. are needed during planning horizon. Backwash flow meter should also be considered for replacement within the planning horizon. All filters are included in emergency power.

Backwash Facility – Facility was built with the original plant in 1963, but upgrades were installed in 2008. MCC, switchgear and panels are in acceptable condition with the only notable need is to replace Devicenet with Ethernet.

GAC Building/UV Building – This building was built in 2012 and all components are within their design life. No corrosion noted on equipment. Ethernet communication should be installed to replace Devicenet. GAC valves and UV lamps are connected to emergency generator.

Chemical Building – Built in 2007, all components are still within their design life. MCC in acceptable condition. Two of the chemical areas have exhibited advanced corrosion on panels and gear due to poor ventilation. Some improvements have been made but additional work may be needed during planning horizon.

Old Chemical Building/Raw Water Pipe Tunnels – MPTP has a decommissioned Chemical Building that remains on their site. If this facility is to remain in place, some upgrades need to be made to replace aging equipment and improve facility safety.

Waterworks Pump Station (WWPS) – Pump Station appears to have been constructed in 1990's. MCC, switchgear, VFDs and panels are advancing in age but do not show clear signs of corrosion or deterioration. VFDs are outside their service life and replacement needs to be programmed during the planning horizon. WWPS has its own service and is not connected to generator.

Solids Concentration/Belt Press Facility – This facility was constructed in 1997 and has been out of operation since 2003. The facility houses the electrical equipment for the RWTS. The Belt Press MCC and electrical equipment appear to be in acceptable condition but have not been operated in several years. If this facility were re-commissioned, multiple upgrades would be needed.

### 3.4.2.3 MTP Asset Ratings

As noted previously, over 115 systems were reviewed at MPTP for their condition, performance and reliability. These ratings were then assessed for their risk profile (failure probability, consequence,

redundancy, and safety impacts) A summary of the highest rated (worst condition) systems at MPTP is provided below in Table 3-10. A full review of MPTP systems can be found in Section 3.4.2.2.

**Table 3-10: Memorial Parkway Treatment Plant System Composite Ratings**

| Facility System                    | System Assessment Rating | PCS Multipliers | Composite System Rating Score |
|------------------------------------|--------------------------|-----------------|-------------------------------|
| <b>Structures</b>                  |                          |                 |                               |
| Filter Walls/ Filter Gallery Floor | 4.00                     | 1.98            | 7.91                          |
| Transfer Station/Raw Water Tunnels | 3.00                     | 2.23            | 6.70                          |
| Actiflo Concrete Repair            | 3.00                     | 2.13            | 6.40                          |
| <b>Process/Equipment</b>           |                          |                 |                               |
| Finished Water Meter Pit           | 3.83                     | 1.80            | 6.89                          |
| Actiflo Solids Pumps/Valves        | 3.83                     | 1.65            | 6.34                          |
| <b>Electrical/Control</b>          |                          |                 |                               |
| Backwash Flow Meter                | 4.00                     | 1.65            | 6.61                          |
| Filtration Instruments             | 4.00                     | 1.65            | 6.61                          |
| Filter Electrical Panels           | 3.33                     | 1.98            | 6.59                          |

### 3.4.3 Taylor Mill Treatment Plant (TMTP)

#### 3.4.3.1 Overview

The Taylor Mill Treatment Plant is entirely supplied by raw water from the Licking River Intake (LRI). This is the only plant supplied by this source which gives NKWD a degree of resiliency to issues in the Ohio River. TMTP is a peaking plant that supplies water to NKWD customers in the southern areas of Kenton County. TMTP also serves as a blending and pumping station for FTTP which can flow by gravity to the TMTP Clearwell. This mixing approach enabled NKWD to delay implementation of granular activated carbon contactors at TMTP when they were installed at FTTP in 2012. TMTP is a facility that currently operates well below its rated capacity of 10 MGD. Data from 2019 and 2020 show a plant with an average daily production of approximately 3.0 MGD and peak daily production over the period of 6.2 MGD. There are numerous days within the period where TMTP was shut down for maintenance or demand with flow simply being accepted from FTTP and pumped into the distribution system. TMTP was originally constructed in 1953 as a conventional treatment plant and has undergone the following upgrades or expansions since:

- 1960 – Facility Expansion



- 1989 – Process Upgrades/Solids Handling
- 1998 – Chemical Building Construction
- 2001 – Filter Rehabilitation
- 2003 – Clarification Upgrades/Filter to Waste Systems
- 2008 – Backwash Treatment System

As noted previously, TMTP has a current treatment capacity rated at 10.0 MGD. The rating for individual process components is provided Table 3-11 to reflect the individual process capabilities.

**Table 3-11: TMTP Process Component Ratings**

| Process Component (No.) | Sizing/Capability Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rapid Mix/Flocculation  | <p>Rapid Mix - Single concrete basin – Approx 900 gallons. At design flow, detention time of 8 seconds. Currently, has a 3 Hp motor indicating an estimated gradient of <math>600 \text{ s}^{-1}</math>.</p> <p>Flocculation Zones – 4 stage flocculation for each train (2). Total volume of flocculation zones is approximately 14,000 CF or 105,500 gallons (211,000 gallons total). At 10 MGD, the chemical flocculation period is 30 min.</p> <p>Flocculation basin cross section – <math>14 \times 16.5 \times 2</math> basins = 462 SF At the design loading rate of 10 MGD (15.5 CFS) = 0.03 ft/s</p>                                                                                     |
| Sedimentation Basins    | <p><u>North/South Basins</u> – Constructed in 1953 and 1960. Dimensions of rectangular basins are 65' x 65' with tube settlers around the perimeter.</p> <p>Total basin volume – <math>65 \times 65 \times 17.1 \times 2 = 1,080,000</math> gallons</p> <p>Sedimentation Period at Design Flow = 155 minutes</p> <p>Tube Settler SF = <math>2,000 \times 2</math> basins = 4,000 SF</p> <p>At 2 GPM/SF loading rate for 2-hour detention = 8,000 GPM rated capacity.</p> <p>Weir loading rate = 260 LF of weir per basins x <math>2 \times 20,000 \text{ GPD/LF} = 10,400,000 \text{ GPD}</math> overflow rate.</p> <p>Both basins have rakes and drain valves to removal accumulated solids.</p> |
| Filters                 | <p>8 Filters (15'-0" x 18'-0") = 270 SF Each, Total SF = 2,160 SF</p> <p>With 1 Filter OOS – 1,890 SF</p> <p>At 5 GPM/SF - 9,450 MGD (13.5 MGD) Rated Filter Capacity.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Clearwells              | <p>Clearwell – 1 million gallons with baffling.</p> <p>Total Storage – 10% of Plant Capacity, 1.0 CT log Reduction at max flow and 2.0 mg/L of disinfectant assuming well baffled.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

|                                                 |                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| UV Equipment                                    | 24" UV Reactors – 32 mJ/CM <sup>2</sup> Dosage. No Hydraulic Limit.                                                                                                                                                                                                                                                                               |
| Backwash Pumps                                  | BW Pumps (1) – 4,500 GPM Each – 16.7 GPM/SF<br>Air Scour Assisted.                                                                                                                                                                                                                                                                                |
| Chemical Storage                                | Liquid/Dry Storage and feed for 9 liquid chemicals and 2 dry chemicals. Two systems are not in service currently.<br><br>All liquids contained adequately. Can meet chemical feed beyond 10 MGD.<br><br>PAC feed – new bulk sack system being installed.                                                                                          |
| High Service Pumps                              | Six (6) vertical turbine pumps.<br><br>Pumps 1& 2 – 8,750 GPM/150 TDH (Booster from FTTP)<br><br>Pump 3 – Out of Service<br><br>Pump 4 – 6,950 GPM/490 TDH (TMTP Treated)<br><br>Pump 5 – 6,950 GPM/365 TDH (TMTP Treated)<br><br>Pump 6 – 8,750 GPM 150 TDH (Booster from FTTP with VFD control)                                                 |
| Solids Handling/Storage/<br>Concentration Pumps | Current practice is to concentrate solids by storing in backwash holding basins, applying to plate settlers (polymer added) with supernatant being discharged and solids being pumped to belt press.<br><br>Backwash holding tank is approximately 200,000 gallons. Solids holding tanks have a composite volume of approximately 75,000 gallons. |
| Dewatering                                      | Belt press (2m) is utilized to dewater the plant residuals stream after it has been. Supernatant is discharged by permit and solids are conveyed to a dumpster and hauled to landfill.                                                                                                                                                            |

In summary, our review confirms that no apparent design limitations exist that would affect the current 10 MGD composite production rating of the facility. A few notable items that were revealed during this assessment include:

- Filter backwashing would likely benefit from a rate higher than the current one.
- Bulk GAC feed design should account for delivery up to 40 mg/L per NKWD staff.
- Pump No. 6 was under maintenance and expected to be replaced within 12 months.
- UV system is being replaced in CIP to improve performance/condition.

In the following section, a short description will be provided of each structural, process, electrical, and control system and their current condition. Any notable concerns are included.



### 3.4.3.2 TMTP System Descriptions

Structural, process, electrical, and control reviews were performed independently at the TMTP facility. Over 100 systems were identified and reviewed at TMTP during this process and the findings are summarized in Table 3-12. Brief descriptions of each of the major facility systems and notable findings are provided in the following articles.

#### **Structural**

**Rapid Mix/Flocculation Basins** – Rapid Mix Chamber disperses flow to four flocculation basins. These structures (along with a conveyance channel) are generally interior to the clarifiers. Support frames show areas of rusting and metal loss. Concrete spalling is apparent on most surfaces. The north flocculation chambers have some wall separations and evidence of leakage is visible. NKWD is aware of the basin structural concerns and has been planning a capital project.

**Sedimentation Basins** – North Basin was constructed in 1953 and the South Basin was added in 1960. Basins are both reinforced concrete and rectangular in shape. Each basin has steel rakes to collect solids at the bottom. Each basin has a portion dedicated to tube settlers and collection troughs for effluent. Similar to Flocculation Basins, the exterior walls have separated in locations and exhibit active leakage. Numerous areas of concrete spalling and deterioration. Exposed metal had multiple areas of advanced corrosion and metal loss. Replacement or major repair of these structures is necessary.

**Sedimentation Basin Tunnel** – Part of the Sedimentation Basin structure is a tunnel that passes under the conveyance channel and connects the Filter Building and the Chemical Building. This tunnel is a critical passage and maintenance area. There are several locations of leakage in the roof, coating delamination, as well as exposed rebar with corrosion. This area needs rehabilitation as part of a long-term capital program.

**Filters and Filter Building** - The Filter Building is a four-level structure reinforced concrete structure with a masonry cladding. The lowest level is the pipe gallery/Clearwell area. The first level includes the pipe gallery and pumping levels. This level is in the worst structural condition with multiple areas of corrosion and leakage. The second level is the main filter control room and access to the Flocculation/Sedimentation Basins and this level exhibits coating delamination and minor corrosion. The upper level is currently a storage level that previously served as a chemical area. This area is currently in acceptable structural condition.

**Clearwells/Finished Water Storage** – A structural concrete Clearwell was part of the original 1953 plant construction with additional volume being added in 1960. The Clearwell has a total of four chambers with extensive baffling. During the assessment period, access was not available to the clearwells.

**High Service Pumping Areas** – Two areas within the Filter Building house pumping equipment. One area was constructed during the 1953 construction and the second was added in 1960. These areas are in good condition with some minor visible floor cracks. The 1953 area has a hoist of suitable capability to remove pumps and the 1960 area has a hoist that can remove valves (skylights to remove pumps). Both hoists appear to operate satisfactorily.

**Chemical Storage and Feed Facility** – Chemical Building was constructed in 1998 to house liquid and dry chemical storage and dosing equipment. Eight different chemical areas exist within the building. The chemical building is a composite of reinforced structural concrete and CMU block cladded with masonry bricks. The roofing and wall structures appear to be in good condition. There are numerous locations where protective coatings have delaminated within the chemical storage areas. These need to be renewed to protect the concrete in these areas.

PAC Building – Chemical Building includes a dedicated area for powder activated carbon. PAC Building has a main level with a mezzanine for access to the chemical loading equipment. The structures all appear to be in satisfactory condition. This area does not have any hoisting equipment.

Solids Handling, Dewatering and Disposal Facility – Solids Building was constructed in 1989 and contains a backwash holding basin and two sludge holding basins together with a belt press area. The basins could not be fully evaluated, but they appear to be in satisfactory condition from visual examination. Some of the valves that isolate the chambers appeared to have significant deterioration. This facility also includes a thickening area that includes a lamella plate settler constructed of carbon steel and painted. This was installed in the early 2000s. The structure is reinforced concrete columns with CMU infill. Several areas of this structure have vertical wall cracks. The carbon steel lamella and equipment also exhibited accelerated corrosion due to an environment that is high in moisture.

Backwash Holding Tank and Pump Station - This basin is approximately 20 years old and below grade, so it could not be accessed for inspection. Exterior inspection of available surfaces indicated no immediate issues. In 2008, a Backwash Treatment Facility was added to the solids complex. This includes a lamella plate settler constructed of carbon steel and painted. The structure is reinforced concrete columns with CMU infill. Several areas of this structure have vertical wall cracks. The carbon steel lamella and equipment also exhibit accelerated corrosion due to an environment with high moisture.

Filter-to-Waste (FTW) Basin and Vault – FTW Basin is approximately 20 years old. Access into the basin was limited and inspection was not performed. The FTW vault is structurally sound and does not require upgrades during the planning horizon.

Miscellaneous Yard Structures – TMTP has several yard vaults that are currently in service. These vaults are in different conditions. The vaults are typically in acceptable condition although they do exhibit areas of corrosion. However, several vaults have standing water in them, which needs to be addressed in order to prevent deterioration.

## **Process**

Rapid Mix/Flocculation Basins – Rapid Mix is common to both north and south clarifiers. The mixer is 3 Hp. Rapid mix exhibits advanced corrosion and does not have VFDs to modulate mixing speeds at different flow rates. Basin is suitable size but mixer and supports should be replaced. Rapid mix gates are operated twice annually and provide “stuck closed” concern to operators.

Flocculation Basins (North/South) – Floc Basins are 4-stage and designed to taper the mixing gradient (40hz/ 35hz/25hz/13hz). Baffles are not in good condition between stages. NKWD maintains VFDs for each motor. Mixer blades could not be seen below water level, but operators indicate upgrades are needed. The North and South trains can operate effectively with one floc basin out of service but not two. Gate valves need replacement within the planning horizon.

Sedimentation Basins – Rectangular (North/South) – Sedimentation Basins are uncovered with noticeable areas of preferential flow/dead zones. These often create algae in the summer months per operators. The weir length is acceptable, but flow is inconsistent over them which allows solids to pass out of the basin. Some weirs are damaged. Tube settlers in both basins are past their design life and appear to have fractures in them which prevents effective settling. The effluent gates are difficult to operate and create a “stuck closed” concern for operators. The south sludge valve actuator needs to be replaced. The flume level instrumentation and the sodium hypochlorite feed also require upgrades.

There is also a flow path concern. North Clarifier can feed both filters, but the South Clarifier can only feed the front filters. This creates a challenge for maintenance to manage cleanings without impacting

capacity. Rakes and motors were below waterline and not observable. Operators indicate their condition is acceptable, but inspection is recommended. Desludge activities are manual and occur every 2-3 hours for 2-3 minutes. The sedimentation basin structural concerns have been previously noted. Overall, this process element was among the greatest concerns at TMTP, and a comprehensive rehabilitation is needed.

**Filters** - TMTP has eight dual media filters with 30 inches of total profile (18" anthracite/12" sand). This media is supported by a plastic underdrain with an integral media support cap to diffuse flows. The media and underdrain could not be observed for condition. The most recent media replacement at TMTP was noted to be around 2005. The filters also have steel filter troughs that carry backwash flows off during cleaning. These troughs are shallow and have wings to inhibit media carryover. Media replacement and filter assessment is recommended. The media is near its useful life. The filter underdrain is within 5 years of its design life. Issues with the IMS cap (maldistribution and plugging) has been noted at other installations but have not been reported here. The filter features and profile should be reviewed further for long-term results.

**Filter Valves** – TMTP has six valves at each of the eight filters. These valves and their actuators have been replaced from time-to-time. This is very difficult in the TMTP filter gallery. A general assessment of the valve/actuator age is estimated below:

- Filter Influent (1992/2000)
- Filter Drain (1992/1992)
- Filter Backwash Valves (1992/1992)
- Air scour valve (2001/2001)
- Filter Effluent Valves (2009/2009)
- Filter to Waste Valves (2004/2004)

Other critical valves that are located in the basement related to the filters include Clearwell Suction Valves and the FTTP Diversion Valve. These valves should be replaced within the planning horizon.

**UV Reactors** – UV Reactors and appurtenances were scheduled to be replaced as part of a project in 2023/24. The condition of the reactors justified this project.

**Clearwells** – All four Clearwell chambers are located below TMTP and could only be observed through a hatch. Operators noted no Clearwell issues. FTTP effluent flow is transferred here as well as TMTP filter flow. The valves that enable this (FTTP Diversion and Clearwell Isolation) have been previously identified for replacement.

**High Service Pumps** – TMTP has six vertical turbine pumps. Pumps 1-3 are installed within the filter building near the front entry area. HSP 1 and 2 are essentially booster pumps supplied by FTTP, which are hard piped to the suction. HSP 3 comes from the South Clearwell Chamber but is currently out of service. HSP 4-6 are located in a dedicated room on the north side of TMTP. HSP 4 and 5 are supplied from the North Clearwell. HSP 6 is currently out of service but also serves as a booster pump from FTTP. The main recommended improvement is that pumps 3 and 6 be repaired and placed back in service.

**Backwash Pumps**- Old Backwash Pump is out of service with supply coming from the distribution system. The pressure is managed through a PRV that operators monitor. Backwash protocol is: 1) High Wash (7000 GPM) 2) Low Wash (4,500 GPM), 3) Combined Wash (2,000 GPM/Air

Supplemented). Backwash pump replacement with VFD is recommended for implementation within the planning horizon.

Chemical Storage and Feed Facility – Chemical Building was constructed in 1998 to house liquid and dry chemical storage and dosing equipment. Each of these systems and their current condition is summarized below.

- Fluoride (HFS 23%) – System includes an 8,000 gallon bulk tank with a transfer pump. Day tank storage (250 gallon) supplies storage for single metering pump (100 GPH max). Fluoride has etched and corroded several components so planning for system replacement should be considered near the end of planning horizon. Transfer pumps require flooded suction. Metering pumps don't appear to be in SCADA. Replacement of metering pumps is anticipated within the planning horizon.
- Caustic Soda (40%) – System includes a 6,000 gallon bulk tank with a transfer pump. Day tank storage of approximately 100 gallons is available for metering pumps. Caustic Soda is not currently fed, and systems are being cannibalized for spare parts.
- Coagulant (ACH) - Single 13,200 gallon FRP bulk tank with centrifugal transfer pumps (2). Day tank storage (650 gallons) serve as suction to W&T diaphragm metering pumps (3). Operators noted stroke issues with diaphragm pumps, and these should be considered for replacement within the planning horizon.
- Ferric Sulfate – Single 13,200 gallon FRP bulk tank with single centrifugal transfer pump. Day tank storage (650 gallons) serve as suction to twin W&T Encore 22 diaphragm metering pumps. Operators noted stroke issues with diaphragm pumps, and these should be considered for replacement within the planning horizon.
- Filter Aid Polymer – Polymer not typically fed at TMTP. Operators indicated system is not used and serves as spare parts. Equipment was not reviewed further, and no improvements are recommended.
- Poly-orthophosphate – This is fed for corrosion control. The chemical has a 6,000 gallon bulk tank with twin Goulds 3200 centrifugal transfer pumps. The day tank (50 gal) supplies the two diaphragm metering pumps (2.5 GPH). Operators noted stroke issues with diaphragm pumps, and these should be considered for replacement within the planning horizon.
- Sodium Bisulfide – Sodium Bisulfide not typically fed at TMTP. Operators indicated system is not used and serves as spare parts. Equipment was not reviewed further, and no improvements are recommended.
- Sodium Hypochlorite – Serves as primary disinfectant for the treated water. The system consists of a 13,800 gallon FRP bulk tank with a single Ansimag centrifugal transfer pump. The XLPE day tank (500 Gal) supplies the five Watson Marlowe 520 peristaltic metering pumps. These pumps are capable of feeding disinfectant to the top of filter, clearwell with spares available. Pumps are controlled via SCADA and flow meters.
- Powder Activated Carbon (PAC) – Located in the Dry Chemical Room, PAC is stored dry and placed in a slurry for movement. This slurry is regularly mixed prior to dosing. System consists of storage hopper with feed auger and eductor for wetting. Storage tank is approximately 1,000 gallons and metering, performed by a peristaltic pump. Per the operators, this system is being replaced with Bulk PAC Supersac storage that feeds to an eductor for dosing. Based on this, the system was not investigated further.

Solids Handling, Thickening and Dewatering Facility – This facility consists of multiple elements that were built over several decades as the solids handling approach changed.

- Clarifier Sludge Pit – Concrete pit located adjacent to clarifiers in order to drain basins. Pit has two submersible pumps that could not be inspected below the waterline. Per operators, pumps and appurtenances are believed to be roughly 30 years old (1990) and should be replaced within the planning horizon.
- Filter-to-Waste Basin and FTW Valves – This basin is approximately 20 years old and below grade. FTW basin receives flow directly from the filters as well as effluent from the backwash treatment system (lamella plate effluent). Four submersible pumps are located in the basin. These pumps operate VFDs and discharge flow to stream/sewer. Pumps could not be observed but operators report no operating issues. Four (4) butterfly valves are mounted in an adjacent valve vault. Two of these valves are operated by SCADA to allow flow into and out of the basin. Access was limited for visual inspection of the structure and valves. Valves are recommended for replacement during the planning horizon.
- Solids Holding Basin and Pumping Station were constructed in 1989 to receive solids streams from sedimentation basins and filter drains. Solids holding basin has two chambers with submersible pumps that have VFDs (1990). Per operators, these pumps can only draw down about half of the basin before experiencing serious vibration or cavitation. Evaluation was limited as they were underwater, but replacement should be considered within the planning horizon. In addition to the pumps, major equipment includes the solids holding tank valves (6). Valves should be considered for replacement as well.
- Backwash Holding Tank and Pumps – Tank was constructed in 1988 to assist in storing and returning backwash from filters. Tank is a single chamber, below grade concrete structure. Storage maximum is estimated at 200,000 gallons. Inspection could not be done while in operation. Two (2) submersible pumps with VFDs return flow to the head of the TMTP process train. These pumps may have been re-built in the last 10 years, but replacement is recommended within the planning horizon, as they are very important to operations.
- Backwash Treatment Facility – Facility was added in 2008 adjacent to the Solids Building. This facility was intended to enhance backwash treatment for disposal or recycling. There are multiple process elements that were reviewed in this facility.
  - Lamella Flocculation – Two flocculators prepare the influent stream for settling. Polymer addition occurs at this stage. Flocculators are aging prematurely and show signs of unexpected corrosion. Operators did not indicate performance issues, but replacement should be further evaluated during the planning horizon.
  - Lamella Plate Settlers – Carbon steel plate settlers. Coating delamination is apparent. The plates appear to be aging faster than expected. Effluent from settlers is discharged to FTW basin or recycled. Plate settlers' corrosion needs to be arrested through better ventilation, etc.
  - Sodium Bisulfate – Used for de-chlorination of the plate settler effluent streams. This tank consists of two 500-gallon HDPE tanks, two small peristaltic metering pumps, and associated valving. This system is currently in satisfactory condition.
  - Lamella Polymer Make-up – Polymer system used to concentrate the solids in the lamella plate settlers. System consists of two preparation tanks on stands with mixers inside tanks for regular agitation. Two (2) small peristaltic pumps are used to dose the product. The condition of the system is poor, but operation appears satisfactory. Replacement should be evaluated during the planning horizon.
  - Lamella Solids/Solids Recirculation Pumps – Two Allweier solids pumps (7.5 hp) and two solids recirculation pumps (2.5 hp) are located below the lamella structure. All pumps have VFDs. Solids pumps discharge to the Solids Holding Basin, while the

recirculation pumps discharge to the head of the Lamella Flocculators. Each pump has a plug valve and wafer valve. Pumps are in poor condition with advanced corrosion and should be replaced during planning horizon.

- Solids Lamella Valves – Each pump train (4 total) includes a wafer valve and Marwin plug valve. All valves are in poor condition with advanced corrosion and should be replaced during planning horizon.
- Belt Press – Belt press, conveyors, and control panel replaced in 2018. New Andritz 2m press has been operating satisfactorily and produces high concentration solids for disposal. No improvements are noted for planning horizon.
- Polymer Preparation System and Pumping – Dry polymer make-up system using an eductor/wetting cone assembly. System is new. Metering pump is Watson-Marlowe 630 and is also new. No improvements are expected.
- Miscellaneous Yard Structures – TMTP has several yard vaults that are currently in service. These vaults are in different conditions. The vaults are typically in acceptable condition although they do exhibit areas of corrosion. However, several vaults have standing water in them, which needs to be addressed in order to prevent deterioration.

### 3.4.3.3 TMTP Asset Ratings

As noted previously, over 125 systems were reviewed at TMTP for their condition, performance and reliability. These ratings were then assessed for their risk profile (failure probability, consequence, redundancy, and safety impacts). A summary of the highest rated (worst condition) systems at TMTP is provided below in Table 3-12.

**Table 3-12: Taylor Mill Treatment Plant System Composite Ratings**

| Facility System                     | System Assessment Rating | PCS Multipliers | Composite System Rating Score |
|-------------------------------------|--------------------------|-----------------|-------------------------------|
| <b>Structures</b>                   |                          |                 |                               |
| North Inlet Column Structure        | 4.00                     | 1.98            | 7.91                          |
| Floc Basin Structure                | 4.00                     | 2.13            | 7.83                          |
| Walkway Under Sed Basin             | 3.67                     | 2.00            | 7.35                          |
| Sedimentation Basin North Structure | 3.33                     | 1.98            | 6.59                          |
| Settled Water Troughs               | 3.00                     | 2.13            | 6.40                          |
| <b>Process/Equipment</b>            |                          |                 |                               |
| UV Disinfection System              | 4.00                     | 2.43            | 12.13                         |



|                                        |      |      |      |
|----------------------------------------|------|------|------|
| Raw Water Valves – Basement            | 5.00 | 1.98 | 9.88 |
| FTTP Valves/ Control Valves – Basement | 5.00 | 1.94 | 9.70 |
| Old Backwash Valve – Basement          | 5.00 | 1.94 | 9.70 |
| Flow Meters – Pipe Gallery             | 4.83 | 1.58 | 9.55 |
| Clearwell Connection Valves - Basement | 5.00 | 1.86 | 9.28 |
| Lamella Solids/Recirculation Pumps     | 5.00 | 1.82 | 9.09 |
| FTTP Diversion Valve – Basement        | 3.83 | 2.31 | 8.84 |
| HFS Bulk and Day Tanks                 | 4.00 | 2.13 | 8.54 |
| PAC Feed System                        | 4.17 | 1.94 | 8.09 |
| Clarifier Weirs (North/South)          | 3.83 | 1.95 | 7.49 |
| Rapid Mix                              | 3.50 | 2.10 | 7.34 |
| HSP Discharge Control Valves (No.3)    | 5.00 | 1.44 | 7.19 |
| HSP 1,2,3                              | 5.00 | 1.44 | 7.19 |
| Yard Valve Pit                         | 4.50 | 1.55 | 6.99 |
| Ferric Sulfate Metering/Transfer Pumps | 3.50 | 1.98 | 6.92 |
| FTTP Diversion Piping                  | 3.83 | 1.80 | 6.89 |
| Raw Sump Pit/Valves/Pumps              | 4.17 | 1.63 | 6.81 |
| Chemical Bldg- Dry Chemical Area       | 4.33 | 1.56 | 6.77 |
| Caustic Soda System                    | 5.00 | 1.35 | 6.75 |
| Backwash PRV                           | 4.00 | 1.69 | 6.75 |
| Clarifier Rakes (North/South)          | 3.67 | 1.80 | 6.59 |
| Service Elevator                       | 3.50 | 1.86 | 6.50 |
| Solids Building BW Return Pumps        | 3.00 | 2.13 | 6.40 |
| <b>Electrical/Control</b>              |      |      |      |

|                                              |      |      |       |
|----------------------------------------------|------|------|-------|
| Filter Building Switchgear                   | 4.50 | 2.85 | 12.81 |
| Substation                                   | 4.50 | 2.85 | 12.81 |
| Pipe Gallery Sump Pumps                      | 4.50 | 2.85 | 12.81 |
| UV System Electrical                         | 5.00 | 2.51 | 12.53 |
| Filter Gallery 120 V Panels                  | 4.50 | 2.64 | 11.87 |
| Filter Gallery Lighting Panel                | 4.00 | 2.51 | 10.02 |
| Backwash Flow Meter                          | 4.00 | 2.51 | 10.02 |
| Solids Pumps Electrical                      | 4.50 | 2.11 | 9.49  |
| Step Down Transformer- Pipe Gallery          | 4.00 | 2.32 | 9.28  |
| HSP 1,2,3 Control Valve                      | 4.00 | 2.31 | 9.22  |
| Rapid Mix Electrical/Disconnect              | 4.00 | 2.31 | 9.22  |
| Solids Building Electrical Panels            | 4.00 | 2.31 | 9.22  |
| Elevator Electrical                          | 4.00 | 2.13 | 8.54  |
| Solids Building Instrumentation              | 4.00 | 2.13 | 8.54  |
| Pipe Gallery Transformer/Panels              | 4.00 | 2.13 | 8.54  |
| Backwash Pump Electrical                     | 5.00 | 1.89 | 8.44  |
| Rapid Mix Motor                              | 3.33 | 2.51 | 8.35  |
| Chemical Building Electrical (All Chemicals) | 3.50 | 2.31 | 8.07  |
| Outside Switchgear/Duke Service              | 3.50 | 2.28 | 7.97  |
| Flocculation Basin Controller                | 4.00 | 1.98 | 7.91  |
| Clarifier Motors                             | 3.67 | 2.13 | 7.83  |
| HFS Instrumentation                          | 4.00 | 1.94 | 7.76  |
| Clarifier Level Sensor                       | 3.33 | 2.32 | 7.73  |
| Filter Loss of Head/Turbidity Instruments    | 3.00 | 2.51 | 7.52  |



|                                          |      |      |      |
|------------------------------------------|------|------|------|
| Clarifiers Flume Level Sensor            | 3.50 | 2.13 | 7.47 |
| UV Service/Duke                          | 3.50 | 2.13 | 7.47 |
| Solids Building E/W Backwash Return VFDs | 3.50 | 2.13 | 7.47 |
| Solids Building Electrical General       | 3.50 | 2.13 | 7.47 |
| Solids Building MCC                      | 3.50 | 2.13 | 7.47 |
| Filter Level Sensor                      | 3.00 | 2.32 | 6.96 |
| HSP 4,5,6 Supply                         | 3.50 | 1.96 | 6.87 |
| Solids Building/FTW Valves/Actuators     | 3.50 | 1.94 | 6.79 |
| Filter Valve Actuators                   | 3.83 | 1.72 | 6.59 |
| Clarifier Control Panel                  | 3.00 | 2.13 | 6.40 |
| Floc Basin Motors                        | 3.00 | 2.13 | 6.40 |
| Belt Filter Press Control Panel          | 3.00 | 2.13 | 6.40 |
| Backwash Return Pumps                    | 3.00 | 2.13 | 6.40 |
| Clarifier Gate Valve Actuator            | 3.50 | 1.82 | 6.36 |

## 3.5 Recommendations

Based on the comprehensive assessment of NKWD's treatment facilities, the following recommendations are provided to guide strategic planning and capital investment.

### 3.5.1 Memorial Parkway Treatment Plant

#### STRUCTURAL

- Repair severe cracking and spalling on Actiflo deck and effluent feed channels, monitor masonry crack in filter building, and reinforce filter gallery floor.
- Rehabilitate raw water tunnels to address leaks, sediment accumulations, and exposed reinforcing steel.
- Restore Clearwell effluent vault with significant concrete deterioration.

#### PROCESS

- Upgrade Actiflo system components (mixers, solids rakes, sand pumps) nearing end of life and implement planned technology improvements.

- Replace worn filter media and repair leaking effluent valves; complete actuator upgrades based on pilot results.
- Add backup air scour blower to ensure backwash reliability.
- Recommission solids concentration/belt press facility to reduce reservoir siltation.

#### **ELECTRICAL/CONTROLS**

- Replace aging VFDs and panels in Actiflo controls room and complete SCADA Phase 2 instrumentation upgrades.
- Convert DeviceNet to Ethernet for filters and backwash systems, replace NEMA 12 enclosures, and upgrade actuators to 480V.

### 3.5.2 **Taylor Mill Treatment Plant (TMTP)**

#### **STRUCTURAL**

- Perform major rehabilitation of flocculation and sedimentation basins with wall separations, leakage, and corrosion; address tunnel leaks and exposed rebar.
- Repair filter gallery corrosion and coating delamination and replace deteriorated valves and actuators.

#### **PROCESS**

- Replace tube settlers and damaged weirs; improve flow distribution to reduce dead zones and algae formation.
- Upgrade rapid mix and flocculation mixers with VFDs and replace gate valves.
- Replace aging filter media and underdrains; assess IMS caps for maldistribution.
- Install VFDs on high-service and backwash pumps and replace out-of-service pumps (HSP 3 and HSP 6).
- **Complete UV system replacement and PAC feed improvements.**

#### **CHEMICAL SYSTEMS**

- Recoat deteriorated chemical storage areas and replace corroded metering pumps (fluoride, coagulant, and ferric sulfate systems).

#### **ELECTRICAL/CONTROLS**

- Replace aging switchgear, MCCs, and VFDs; upgrade SCADA communication to Ethernet.
- Address corrosion in solids building electrical panels and replace outdated instrumentation.

### 3.5.3 **Staffing & Organizational Capacity**

- Implementation of the recommended improvements for Treatment Facilities could increase workloads related to implementation, long-term operation, and maintenance.

NKWD should devalue staffing capacity and required skill sets in parallel with CIP planning to ensure adequate resources are available.

- Staffing impacts, training needs, and potential use of contract services should be considered during CIP prioritization and phasing.

## 3.6 Five Year Capital Improvement Plan Elements

NKWD's Capital Improvement Plan (CIP) has typically been developed from needs associated with Water Quality and Production (WQP) projects and Distribution projects. Table 3-13 outlines approximately \$130,000,000 in prioritized projects for inclusion in the proposed CIP. The Opinion of Probable Construction Cost shown is based upon 2025 values and represents a Class 5 estimate as defined by A

**Table 3-13: Capital Improvement Plan for WQP Projects**

| Proj # | Facility | Project Group                                                          | 2025 OPCC    |
|--------|----------|------------------------------------------------------------------------|--------------|
| 1      | TMTP     | Filter and Valve Improvements – Phase 1                                | \$7,896,475  |
| 2      | TMTP     | UV and PAC Upgrades                                                    | \$4,768,188  |
| 3      | ORPS2    | Electrical Improvements                                                | \$8,734,250  |
| 4      | TMTP     | Electrical Improvements (Revised to remove generator project elements) | \$4,026,938  |
| 5      | FTTP     | Electrical Improvements                                                | \$10,939,500 |
| 6      | FTTP     | Raw Water Improvements                                                 | \$5,581,550  |
| 7      | TMTP     | Filter and Valve Improvements – Phase 2                                | \$5,590,811  |
| 8      | FTTP     | Filter Building Structural Improvements                                | \$6,327,875  |
| 9      | TMTP     | Solids Processing Equipment                                            | \$5,405,350  |
| 10     | ORPS1    | Pump Control Valves                                                    | \$6,595,250  |
| 11     | TMTP     | Pumping Improvements                                                   | \$3,778,900  |
| 12     | MPTP     | Structural Improvements                                                | \$3,832,375  |
| 13     | ORPS1    | Electrical Improvements                                                | \$2,985,688  |
| 14     | TMTP     | Chemical Building Improvements                                         | \$2,495,500  |
| 15     | ORPS2    | Pumping Improvements                                                   | \$6,372,438  |

|                                                      |              |                                          |                      |
|------------------------------------------------------|--------------|------------------------------------------|----------------------|
| <b>16</b>                                            | <b>TMTP</b>  | <b>Clarifier Improvements</b>            | <b>\$11,051,500</b>  |
| <b>17</b>                                            | <b>LRI</b>   | <b>Improvements</b>                      | <b>\$3,056,988</b>   |
| <b>18</b>                                            | <b>FTTP</b>  | <b>Chemical Building Improvements</b>    | <b>\$1,247,750</b>   |
| <b>19</b>                                            | <b>TMTP</b>  | <b>Elevator Improvements</b>             | <b>\$668,438</b>     |
| <b>20</b>                                            | <b>FTTP</b>  | <b>Filters &amp; Valves Improvements</b> | <b>\$9,866,138</b>   |
| <b>21</b>                                            | <b>FTTP</b>  | <b>Residuals Handling Improvements</b>   | <b>\$2,784,850</b>   |
| <b>22</b>                                            | <b>ORPS2</b> | <b>Structural Improvements</b>           | <b>\$2,272,688</b>   |
| <b>23</b>                                            | <b>TMTP</b>  | <b>Yard Piping Improvements</b>          | <b>\$1,925,100</b>   |
| <b>24</b>                                            | <b>MPTP</b>  | <b>Yard Piping Improvements</b>          | <b>\$980,375</b>     |
| <b>25</b>                                            | <b>MPTP</b>  | <b>Filter Improvements</b>               | <b>\$2,335,075</b>   |
| <b>26</b>                                            | <b>SCADA</b> | <b>Improvements</b>                      | <b>\$3,700,000</b>   |
| <b>27</b>                                            | <b>MPTP</b>  | <b>Actiflo Improvements</b>              | <b>\$1,635,000</b>   |
| <b>28</b>                                            | <b>MPTP</b>  | <b>Reservoir Spillway</b>                | <b>\$1,300,000</b>   |
| <b>29</b>                                            | <b>MPTP</b>  | <b>Residuals Handling Improvements</b>   | <b>\$8,000,000</b>   |
| <b>30</b>                                            | <b>FTTP</b>  | <b>Old Clearwell Baffling Project</b>    | <b>\$2,000,000</b>   |
| <b>Total Capital Improvements OPPC (2025 Values)</b> |              |                                          | <b>\$138,154,990</b> |



## **EXHIBIT B**

### **APPROVALS AND PERMITS**

**(Franchises, Plan Review and Permit Status, Easements, Right-of-Ways, Construction Start and In-Service Date, Plant Retirements)**



## **APPROVAL AND PERMITS SUMMARY SHEET**

Franchises required – None

Plan Review and Permit Status - The District has reviewed and approved the Plans and Specifications prepared by Cornwell Engineers, titled “Taylor Mill Treatment Plant Upgrades and Improvements WX21117018” dated June 2026, digitally sealed by a P.E.

The Kentucky Division of Water approval is attached.

Easements and Right-of-Way Status – No easements will be needed for this project.

Estimated Start date of construction – November 2026

Proposed date in service – November 2027

Plant retirements – There are no retirements as a result of this project.



**Andy Beshear**  
GOVERNOR

**ENERGY AND ENVIRONMENT CABINET**  
**DEPARTMENT FOR ENVIRONMENTAL PROTECTION**

300 Sower Boulevard  
Frankfort, Kentucky 40601  
Phone: (502) 564-2150  
Fax: 502-564-4245

**Rebecca W. Goodman**  
SECRETARY

**Anthony R. Hatton**  
COMMISSIONER

March 23, 2026

Amy Stoffer, P.E.  
Northern Kentucky Water District  
PO Box 18640  
Erlanger, Kentucky 41018-0640

RE: Taylor Mill Treatment Plant  
Powdered Activated Carbon System  
F25-009S  
Campbell County, KY  
Northern KY Water District  
AI #: 2485, APE20250002/FGL20250005

Dear Amy Stoffer:

The Kentucky Division of Water (DOW) has reviewed for completeness and adequacy the construction plans and specifications submitted for the above referenced contract(s). The plans include the construction of a powdered activated carbon storage and feed system to replace the temporary feed system as well as the original non-functioning feed system, furnishing and installing a new filter-aid polymer feed system, concrete repair work for surfaces of the flocculation and sedimentation basins, piping modifications, and replacement of the ultraviolet light disinfection system. The DOW now approves these plans and specifications with respect to sanitary features of design with the following stipulations:

- The capacity of the water treatment plant shall remain unchanged.
- Chemicals and water contact materials shall be compliant with NSF Standard 60 and 61 respectively.
- Construction shall follow the requirements of 401KAR 8:100 and materials incorporated by reference.
- All chemicals shall be approved by the Division of Water's Drinking Water Branch prior to usage.
- When the project is complete, the owner shall submit a written certification to the Division of Water that the above referenced water supply facilities have been constructed and tested in accordance with the approved plans and specifications. Such certification shall be signed by a licensed professional engineer.

- Unless construction of the project commences within two years from the date of this approval letter, the approval shall expire, and the Northern Kentucky Water District shall re-submit the original plans and specifications for a new comprehensive review.

The approval conditions and a list of eligible/ineligible items are enclosed. Please note that ineligible items cannot be funded using State Revolving Fund (SRF) monies, and must be paid by other funding sources.

We will make one (1) set of approved plans and specifications available for viewing and downloading at the DEP Issued Approvals Search webpage. An identical set should be made available at the project site at all times. If modifications are made to these plans and specifications before bidding, as-bid plans and specifications must be submitted to the DOW for approval. A second DOW construction approval must be issued by separate correspondence before proceeding with advertising for bids. Any red line changes that were made by DOW personnel on the approved plans shall be incorporated into the bid set plans unless an alternative is approved.

You may now advertise for bids on the construction of this project. In addition to other notifications, this project must be advertised in the newspaper of the largest daily circulation in the project area.

You are cautioned not to advertise unless you have a proper wage decision. The Federal Davis-Bacon wage rates are applicable for this project. Please contact all other funding sources for their requirements pertaining to federal wage rates.

You are reminded that the construction contracts are subject to the equal employment opportunity requirements contained in Executive Order 11246. Equal employment opportunity affirmative action by the prime contractors and all subcontractors is mandated throughout the duration of the contract. Documentation of efforts to comply with Executive Order 11246, Equal Employment Opportunity is required to be kept by the borrower.

Review the attached Project Review and Cost Summary form for details of the information to be collected and retained in your files or to be submitted to DOW for review and approval. This form must be completed, signed by the recipient, and with the necessary information be then forwarded to the DOW. This signature will certify that all the information to be retained by the recipient has been secured and is available for review by the Division at the pre-construction conference. The required information must be approved by the DOW before executing any contracts.

Along with the Project Review and Cost Summary form, the following items must be submitted to the DOW for review and approval before executing any contracts:

- The bid advertisement
- Revised Project Budget
- Certified bid tabulation
- Documentation of compliance with DBE Good Faith Effort in accordance with 40 CFR 33.301



Taylor Mill Treatment Plant Powdered Activated Carbon System  
F25-009S  
Northern KY Water District  
AI #: 2485, APE20250002/FGL20250005  
March 23, 2026  
Page 3 of 3

These items will be reviewed as a part of the Authority to Award process. The DOW will authorize you to award the contracts once these documents are approved

After the Notice to Proceed is signed, the DOW will need a copy of the executed contract documents, including plans and specifications.

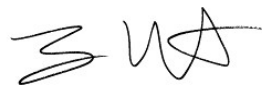
Changes orders will require approval from the DOW before payment can be authorized from the State Revolving Fund. Submission of plans and specifications may be required for change order work.

Upon completion of the project, as-built drawings shall be provided to the DOW. As-builts shall be stamped, signed and dated by a professional engineer. A written certification stating that the project was constructed according to the approved plans shall be provided to the DOW by a professional engineer.

This approval letter has been issued under the provisions of KRS Chapter 224 and the regulations promulgated pursuant thereto. Issuance of this approval does not relieve the applicant from the responsibility of obtaining any other approvals, permits or licenses required by this Cabinet and other state, federal and local agencies.

You are cautioned that the advertisement and award of this contract will be subject to the laws and regulations that govern the State Revolving Fund (SRF) and to the conditions of your loan agreement. If we can be of further assistance, please call Cassie Campbell, Project Engineer, at (502) 782-6909.

Sincerely,



---

Terry Humphries, P.E.  
Supervisor, Engineering Section  
Water Infrastructure Branch  
Division of Water

TH:CC  
Enclosures

Eligible List, Ineligible List, Approval Conditions  
Project Review and Cost Summary Form  
1 set plans and specifications

C: Quest Engineers Inc  
Kentucky Infrastructure Authority  
Cabinet for Economic Development  
Kenton County Health Department  
Division of Plumbing

F25-009S

Taylor Mill Treatment Plant Powdered Activated Carbon System

**SRF ELIGIBLE ITEMS:**

Contract No.1: No ineligible items identified.

**SRF INELIGIBLE ITEMS:**

Contract No. 1: No Ineligible Identified.

**APPROVAL CONDITIONS:**

1. Provide Clear Site Certificates
2. Complete and return the Project Review and Cost Summary Form.
3. A physical project (72 in (W) x 48 in (H)) sign shall be required displaying the EPA emblem and the identifying the project as a “project funded by U.S. Environmental Protection Agency.” See [https://www.epa.gov/sites/default/files/2016-07/documents/guidelines\\_for\\_enhancing\\_public\\_awareness\\_srf.pdf](https://www.epa.gov/sites/default/files/2016-07/documents/guidelines_for_enhancing_public_awareness_srf.pdf) for guidance.

# PROJECT REVIEW AND COST SUMMARY

*This questionnaire/checklist is furnished as an administrative aid and is required for use in supplying information and documents, reporting minor changes, and project status. The information and documents should be submitted to DOW as soon as possible after bid opening.*

DRINKING WATER SRF ☐

CLEAN WATER SRF ☐

## SECTION 1.

1. Project Name Project Number
- 
2. Changes: Have there been any changes in the project since DOW's approval of the plans and specifications?
- ☐ Yes ☐ No Construction Drawings. If yes, submit revised drawings and addenda. **See Note\***
- ☐ Yes ☐ No Specifications. If yes, submit addenda. **See Note\***
- ☐ Yes ☐ No Site Changes. If so, new Clear Site Certificates are required prior to start of construction.
- ☐ Yes ☐ No Authorized Representative (Mayor, City Manager, etc.). If so, provide name and title.

**\*Note:** Prior approval is required for changes in design, scope, type of treatment, size, capacity, time to complete the project, etc. Changes, which result in increase in the amount of a contract, must be procured in accordance with state and federal requirements, as applicable.

## SECTION 2.

Date Bids Opened: \_\_\_\_\_ Date Bids Expire: \_\_\_\_\_

1. The following items should be submitted to DOW after bid opening:
- a) Executed Project Review & Cost Summary Form (this form).
  - b) Revised (As-bid) Budget (form attached).
  - c) Original bid advertisement or copy of advertisement with affidavit of publication.
  - d) Certified Bid Tabulations with engineer's seal.
  - e) Davis-Bacon ATA Certification form (with Project Wage Rate Sheet HUD-4720 form).
  - g) Clear Site Certificates.
  - h) DBE Documentation (See Attachment No. 11 of the Supplemental General Conditions (SGC)):
    - (1) Disadvantaged Business Enterprise Participation Policy form from the successful low bidder with DBE certifications and executed subcontracts with DBEs or letters of intent signed by both parties; and documentation on the level of effort taken

to obtain DBEs including copies of correspondence with DBE contractors, requesting quotes and copies of any advertisements soliciting DBE contractors, copies of returned envelopes and certified mail receipts, telephone log, etc.

(2) Bidder's List Form from recipient and successful bidder.

2. The following items must be submitted to DOW at the Pre-construction Meeting:

- a) Executed Contract Documents (once contract is signed).
- b) Notice of Award, Notice to Proceed, Bid Bond, Payment Bond, and Performance Bond (generally included in executed contract).
- c) Technical Specification (generally included in executed contract).
- d) Contractor's Certification Regarding Lobbying (See Attachment No. 11 in the SGC).
- e) Contractor's Debarred Firm Certification (See Attachment No. 10 in the SGC).

3. A copy of the items identified in Section 2.1 and Section 2.2, above, and the following must be retained by the owner. This documentation is subject for review, by DOW, at the time of the pre-construction conference.

- a) Name and qualifications of the proposed resident inspector(s).
- b) Proposal of the successful bidder(s).
- c) EEO documentation required by Executive Order 11246 as amended. Items 1 through 11 (See Attachment No. 7 in the SGC), is required for all contracts over \$10,000 except supplier contracts. Supplier contracts require:
  - (1) Name, address, and telephone number.
  - (2) Materials to be supplied and dollar value.For contracts below \$10,000, the same information required for supplier contracts must be submitted.
- d) Engineer's letter to the loan recipient recommending award of the contract. Letter must include a description of work, dollar amount, and name of the low bidder. If award is recommended to be made to other than the low bidder, a justification indicating why the low bidder is not responsive or responsible.
- e) Contractor project construction schedule and payment schedule.
- f) Applicable wage rate determination letter.
- g) Tentative Award Resolution.

4. **Comments:** \_\_\_\_\_

*I hereby certify that all documentation outlined in Section 2.1, 2.2 and 2.3 will be retained in our project files and all documentation outlined in Section 2.1 has been submitted to DOW and all documentation outlined in Section 2.2 will be submitted to DOW during the Pre-construction meeting.*

\_\_\_\_\_  
Signature of Authorized Representative

\_\_\_\_\_  
Date

\_\_\_\_\_  
Print Name and Title

## SRF Project Cost Summary

Project Title: \_\_\_\_\_

WRIS#: \_\_\_\_\_

Project Budget: **Estimated**  enter date

**As Bid**  enter date

**Revised**  enter date

| Cost Classification | SRF KIA Loan                    | Funding Source 1 | Funding Source 2 | Funding Source 3 | Funding Source 4 | Funding Source 5 | Local Funds | Unfunded Costs | Total |
|---------------------|---------------------------------|------------------|------------------|------------------|------------------|------------------|-------------|----------------|-------|
| 1                   | Administrative Expenses         |                  |                  |                  |                  |                  |             |                |       |
| 2                   | Legal Expenses                  |                  |                  |                  |                  |                  |             |                |       |
| 3                   | Land, Appraisals, Easements     |                  |                  |                  |                  |                  |             |                |       |
| 4                   | Relocation Expenses & Payments  |                  |                  |                  |                  |                  |             |                |       |
| 5                   | Planning                        |                  |                  |                  |                  |                  |             |                |       |
| 6                   | Engineering Fees – Design       |                  |                  |                  |                  |                  |             |                |       |
| 7                   | Engineering Fees – Construction |                  |                  |                  |                  |                  |             |                |       |
| 8                   | Engineering Fees – Inspection   |                  |                  |                  |                  |                  |             |                |       |
| 9                   | Engineering Fees – Other        |                  |                  |                  |                  |                  |             |                |       |
| 10                  | Construction                    |                  |                  |                  |                  |                  |             |                |       |
| 11                  | Equipment                       |                  |                  |                  |                  |                  |             |                |       |
| 12                  | Miscellaneous                   |                  |                  |                  |                  |                  |             |                |       |
| 13                  | Contingencies                   |                  |                  |                  |                  |                  |             |                |       |
| <b>Total</b>        |                                 |                  |                  |                  |                  |                  |             |                |       |

| Funding Sources | Amount | Date Committed |
|-----------------|--------|----------------|
| 1               |        |                |
| 2               |        |                |
| 3               |        |                |
| 4               |        |                |
| 5               |        |                |
| <b>Total</b>    |        |                |

| Local Funding Sources | Amount | Date Committed |
|-----------------------|--------|----------------|
| 1                     |        |                |
| 2                     |        |                |
| 3                     |        |                |
| <b>Total</b>          |        |                |

**Total Funding** \$ \_\_\_\_\_

| Cost Categories                                | Funding Source | Total Cost |
|------------------------------------------------|----------------|------------|
| Treatment (DW)                                 |                |            |
| Transmission and Distribution (DW)             |                |            |
| Source (DW)                                    |                |            |
| Storage (DW)                                   |                |            |
| WWTP Secondary Portion (CW)                    |                |            |
| WWTP Advanced Portion (CW)                     |                |            |
| Inflow and Infiltration Correction (CW)        |                |            |
| Major Sewer Rehabilitation (CW)                |                |            |
| Collector Sewers (CW)                          |                |            |
| Interceptor Sewers including Pump Station (CW) |                |            |
| Combined Sewer Overflow Correction (CW)        |                |            |
| Purchase of Systems (DW and CW)                |                |            |
| Restructuring (DW and CW)                      |                |            |
| Land Acquisition (DW and CW)                   |                |            |
| <b>Total Costs</b>                             |                |            |



## **EXHIBIT C**

### **BID INFORMATION AND BOARD APPROVAL**



## **EXHIBIT C-1**

### **BID TABULATION**

# BID TAB

Northern Kentucky Water District

Taylor Mill Treatment Plant Upgrades and Improvements

July 22, 2026

| <u>CONTRACTOR</u>             | <u>BID AMOUNT</u><br><u>(NON-SRF SCENARIO)</u> | <u>ALTERNATE BID</u><br><u>(SRF SCENARIO)</u> |
|-------------------------------|------------------------------------------------|-----------------------------------------------|
| Building Crafts Inc.          | \$2,341,742.00                                 | \$2,410,803.00                                |
| Howell Contractors            | \$2,848,028.00                                 | \$2,873,209.00                                |
| MAC Construction & Excavating | \$3,079,000.00                                 | \$3,278,000.00                                |

|                               | <u>ADD ALTERNATE</u><br><u>FTTP DIVERSION PIPING</u><br><u>(NON-SRF SCENARIO)</u> | <u>ADD ALTERNATE</u><br><u>UV LED SYSTEM</u><br><u>(NON-SRF SCENARIO)</u> |
|-------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| Building Crafts Inc.          | \$236,576.00                                                                      | (\$55,000.00)                                                             |
| Howell Contractors            | \$202,841.00                                                                      | (\$91,844.00)                                                             |
| MAC Construction & Excavating | \$252,000.00                                                                      | (\$97,000.00)                                                             |

|                               | <u>ADD ALTERNATE</u><br><u>FTTP DIVERSION PIPING</u><br><u>(SRF SCENARIO)</u> | <u>ADD ALTERNATE</u><br><u>UV LED SYSTEM</u><br><u>(SRF SCENARIO)</u> |
|-------------------------------|-------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| Building Crafts Inc.          | \$269,608.00                                                                  | (\$52,000.00)                                                         |
| Howell Contractors            | \$265,322.00                                                                  | (\$92,844.00)                                                         |
| MAC Construction & Excavating | \$270,000.00                                                                  | (\$95,000.00)                                                         |

7/28/2026







## **EXHIBIT C-2**

### **ENGINEER'S RECOMMENDATION OF AWARD**



August 12, 2026

Amy Stoffer, P.E.  
Engineering Design Manager  
Northern Kentucky Water District  
2835 Crescent Springs Road  
Erlanger, Kentucky 44018

Re: Bid Package Reviews for  
Taylor Mill Treatment Plant Upgrades & Improvements

Dear Ms. Stoffer:

We have reviewed the three (3) bid packages received by the Northern Kentucky Water District on July 22, 2026. Below is a summary of the bids received, Base Bids plus Alternative Bids for Items #1, #2, and #3 as well as Add Alternative Bids #4, #5, #6, and #7. The apparent low bidder for each bid item is shown in bold print and in ascending order by the total sum of each bid. The bid tabulation worksheet, as prepared by NKWD, is enclosed with this letter.

Base Bid #1 – UV Treatment System Upgrades & Improvements (Non-SRF):

|                                       |                      |
|---------------------------------------|----------------------|
| • <b>Building Crafts, Inc</b>         | <b>\$ 702,000.00</b> |
| • MAC Construction & Excavating, Inc. | \$ 899,525.00        |
| • Howell Contractors, Inc.            | \$ 1,059,248.00      |

Alternative Base Bid #1 – UV Treatment System Upgrades & Improvements (SRF):

|                                       |                      |
|---------------------------------------|----------------------|
| • <b>Building Crafts, Inc</b>         | <b>\$ 716,000.00</b> |
| • MAC Construction & Excavating, Inc. | \$ 922,000.00        |
| • Howell Contractors, Inc.            | \$ 1,078,870.00      |

---

Base Bid #2 – PAC Storage and Feed System Upgrades and Improvements (Non-SRF):

|                                       |                      |
|---------------------------------------|----------------------|
| • <b>Building Crafts, Inc</b>         | <b>\$ 981,000.00</b> |
| • MAC Construction & Excavating, Inc. | \$ 1,044,000.00      |
| • Howell Contractors, Inc.            | \$ 1,095,011.00      |

Alternative Base Bid #2 – PAC Storage and Feed System Upgrades and Improvements (SRF):

|                                       |                      |
|---------------------------------------|----------------------|
| • <b>Building Crafts, Inc</b>         | <b>\$ 989,000.00</b> |
| • Howell Contractors, Inc.            | \$ 1,100,570.00      |
| • MAC Construction & Excavating, Inc. | \$ 1,121,926.00      |

---

Total Base Bid #3 – Flocculation and Sedimentation Basins Structural Rehabilitation (Non-SRF):

|                                       |                      |
|---------------------------------------|----------------------|
| • <b>Building Crafts, Inc</b>         | <b>\$ 658,742.00</b> |
| • Howell Contractors, Inc.            | \$ 693,769.00        |
| • MAC Construction & Excavating, Inc. | \$ 1,135,475.00      |

Alternative Base Bid #3 – Flocculation and Sedimentation Basins Structural Rehabilitation (SRF):

|                                       |                      |
|---------------------------------------|----------------------|
| • <b>Howell Contractors, Inc.</b>     | <b>\$ 693,769.00</b> |
| • Building Crafts, Inc                | \$ 705,803.00        |
| • MAC Construction & Excavating, Inc. | \$ 1,234,074.00      |

=====

Total Base Bid Cost – Items #1, #2, and #3 (Non-SRF):

|                                       |                        |
|---------------------------------------|------------------------|
| • <b>Building Crafts, Inc</b>         | <b>\$ 2,341,742.00</b> |
| • Howell Contractors, Inc.            | \$ 2,848,028.00        |
| • MAC Construction & Excavating, Inc. | \$ 3,079,000.00        |

Total Alternate Base Bid Cost – Items #1, #2, and #3 (SRF):

|                                       |                        |
|---------------------------------------|------------------------|
| • <b>Building Crafts, Inc</b>         | <b>\$ 2,410,803.00</b> |
| • Howell Contractors, Inc.            | \$ 2,873,209.00        |
| • MAC Construction & Excavating, Inc. | \$ 3,278,000.00        |

+++++

Add Alternative Bid Item #4 – Fort Thomas Diversion Piping Modifications (Non-SRF):

|                                      |                      |
|--------------------------------------|----------------------|
| • <b>Howell Contractors, Inc.</b>    | <b>\$ 202,841.00</b> |
| • Building Crafts, Inc               | \$ 236,576.00        |
| • MAC Construction & Excavating, Inc | \$ 252,000.00        |

Add Alternative Bid Item #5 – Fort Thomas Diversion Piping Modifications (SRF):

|                                      |                      |
|--------------------------------------|----------------------|
| • <b>Howell Contractors, Inc.</b>    | <b>\$ 265,322.00</b> |
| • Building Crafts, Inc               | \$ 269,608.00        |
| • MAC Construction & Excavating, Inc | \$ 270,000.00        |

+++++

Add Alternative Bid Item #6 – UV LED System (Non-SRF):

|                                                 |                       |
|-------------------------------------------------|-----------------------|
| • <b>MAC Construction &amp; Excavating, Inc</b> | <b>\$ (97,000.00)</b> |
| • Howell Contractors, Inc.                      | \$ (91,844.00)        |
| • Building Crafts, Inc                          | \$ (55,000.00)        |

Add Alternative Bid Item #7 – UV LED System (SRF):

|                                                 |                       |
|-------------------------------------------------|-----------------------|
| • <b>MAC Construction &amp; Excavating, Inc</b> | <b>\$ (95,000.00)</b> |
| • Howell Contractors, Inc.                      | \$ (92,844.00)        |
| • Building Crafts, Inc                          | \$ (52,000.00)        |

=====

Total Base Bid Cost – Items #1, #2, and #3 plus both Add Alternative Items #4 and #6 (Non-SRF):

- **Building Crafts, Inc** **\$ 2,523,318.00**
- Howell Contractors, Inc. \$ 2,959,025.00
- MAC Construction & Excavating, Inc. \$ 3,234,000.00

Total Base Bid Cost – Items #1, #2, and #3 plus both Add Alternative Items #4 and #6 (SRF):

- **Building Crafts, Inc** **\$ 2,628,411.00**
- Howell Contractors, Inc. \$ 3,045,687.00
- MAC Construction & Excavating, Inc. \$ 3,453,000.00

=====

As discussed, NKWD is very familiar with Building Crafts, Inc as they have done extensive construction work for NKWD and have no reservations about working with them again. Therefore, NKWD requested an analysis of the medium-pressure UV system versus the UV LED system in determining the best long-term solution for NKWD. For the purposes of the analysis, the focus was on the SRF costs furnished as that appears to be the preferred approach by NKWD at this time.

Below are the responses provided by Building Crafts, Inc. in the Questionnaire completed as part of their bid package. It should be noted that the responses provided by Building Crafts, Inc. were identical to the ones also submitted by Howell Contractors, Inc. and MAC Construction & Excavating, Inc. in their respective bid packages.

| #    | Item                                                                                                                                                                                                       | Unit         | MP UV System | UV LED System |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------|---------------|
| 12.a | Bare cost of UV System equipment and components ONLY (does not include installation or other equipment such as electrical or structural components, and does not separately consider SRF vs non-SRF costs) | Dollars      | \$108,000    | \$292,512     |
| 12.b | Estimated service life of reactors                                                                                                                                                                         | Hours        | 262,800      | 175,200       |
| 12.c | Cost of each UV Lamp                                                                                                                                                                                       | Dollars      | \$711.10     | \$26,000      |
| 12.d | # of UV Lamps required to treat 10 mgd                                                                                                                                                                     | Each         | 4            | 2             |
| 12.e | Normal UV Lamp Operating Life (90% effective treatment)                                                                                                                                                    | Hours        | 8,000        | 12,000        |
| 12.f | Power required per UV lamp                                                                                                                                                                                 | kW           | 3.6          | 14            |
| 12.g | Warm-up time                                                                                                                                                                                               | Minutes      | 2-3          | 0             |
| 12.h | Estimated annual maintenance cost at 10 mgd for 6 months per year                                                                                                                                          | Dollars/Year | \$11,188     | \$18,980      |

From above, Building Crafts, Inc. submitted a cost for Bid Item #1 (SRF) of \$716,000, which would be for the medium-pressure UV system work. Their respective cost to furnish and install a new UV LED system (Add Alternative Bid Item #7) in lieu of a new medium-pressure UV system would result in credit back to NKWD in the amount of \$52,000.

Based on the information provided in the Questionnaire, the operational costs UV LED system would be approximately \$7,800 more annually than a comparable medium-pressure UV system (\$18,980 and \$11,188, respectively). Assuming a service life of say

17.5 yrs for the UV treatment system (estimate 15 to 20 yrs) and discounted rate of 3.0%, then the net present value (NPV) of the operating costs and estimated total cost over the expected service life of the respective UV treatment system are shown below:

|                                                                   | <u>Med-Press UV</u> | <u>UV LED</u>     |
|-------------------------------------------------------------------|---------------------|-------------------|
| Capital Cost                                                      | \$716,000           | \$664,000         |
| Est. Annual Operating Costs, \$                                   | \$11,188            | \$18,980          |
| Est. Service Life of UV Infrastructure, yrs                       | 17.5                | 17.5              |
| Est. Discounted Rate, %                                           | 3.0%                | 3.0%              |
| NPV, Operating Costs, \$                                          | \$150,613           | \$255,509         |
| Est. Total Cost for Expected Service Life<br>(Capital Cost + NPV) | \$866,613           | \$919,509         |
|                                                                   |                     | <b>+ \$52,896</b> |

NKWD will need to determine if this is an acceptable return on their investment should the UV LED system is selected. If the UV LED system is not selected/authorized by NKWD, then the total project cost is shown below. As seen, although they provided the lowest credit toward the UV LED System work, Building Crafts, Inc. would still be the overall low bidder for the remaining work.

Total Base Bid Cost – Items #1, #2, and #3 plus Add Alternative Items #4 and no #6 (SRF):

|                                       |                        |
|---------------------------------------|------------------------|
| • <b>Building Crafts, Inc</b>         | <b>\$ 2,680,411.00</b> |
| • Howell Contractors, Inc.            | \$ 3,138,531.00        |
| • MAC Construction & Excavating, Inc. | \$ 3,548,000.00        |

Other factors to consider when looking at the UV LED system is that it has some advantages over a medium-pressure UV system, such as: less space requirements needed for equipment, less lamps needed, longer expected operating life for the UV lamp, and no time is needed for the lamps to warm up. Additionally, the UV LED system is mercury-free and an innovative technology expected to become more common over the next several years as the technology allows for installations at larger facilities.

However, there are also advantages of having a medium-pressure UV system (over a UV LED system) in that: the estimated service life of the reactors is longer, the cost of a UV lamp is much lower, much lower power requirements, and the estimated annual maintenance cost (at 10 mgd for 6 months per year) is roughly \$7,8000 less annually. Additionally, the basis of the bid was DeNora (parent company of Calgon), which is the same system currently in use at the other two NKWD treatment facilities. Equipment, parts, and services are still readily available, and NKWD staff are already familiar with their operations and maintenance needs.

A summary of pros and cons for each type of UV treatment system is provided below:

|                           |                                                                                                                                                                                  |                                                                                                                                                                                                             |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>UV LED</b>             | <b><u>Pro</u></b><br>Mercury-free;<br>Number of lamps needed;<br>Est. service life of reactors;<br>UV lamp operating life;<br>Warm up time;<br>Manuf HQ location (Erlanger, KY); | <b><u>Con</u></b><br>Bare cost of complete system;<br>Cost of each UV lamp;<br>More power required;<br>Est. annual maint. Cost;<br>First municipal install of this size/capacity;<br>Cooling water required |
|                           | Less space requirements                                                                                                                                                          |                                                                                                                                                                                                             |
| <b>Medium-Pressure UV</b> | <b><u>Pro</u></b><br>Bare cost of complete system;<br>Est. service life of reactors;<br>Cost of each UV lamp;<br>Less power required;<br>Est. annual maintenance cost;           | <b><u>Con</u></b><br>Not mercury-free;<br>Number of lamps needed;<br>UV lamp operating life;<br>Warm up time;<br>More space required (CPP);                                                                 |
|                           | Common type of system;<br>Similar install at other 2 WTPs;<br>Readily available parts, service;<br>Cooling water supply not required                                             |                                                                                                                                                                                                             |

At this time, UV LED technology is not required for municipal facilities by any federal mandate in the USA, and there is no set date when it will become mandatory. That said, there are trends toward replacing mercury UV lamps with non-mercury type lamps (UV), but this is for much smaller, point-of-use type systems that are typically for residential installations. At some point, it is likely that regulations and mandates will require mercury-free UV lamps (i.e., LED); however, it would likely occur after the projected service life of the UV treatment system selected for this project. In that time, the technology will likely continue developing larger, more economical solutions by the time the current system would need to be considered for replacement (approx. 15-20 yrs).

AquiSense, Inc (UV LED manufacturer) is located in Erlanger, KY, so their proximity to NKWD and the Taylor Mill Treatment Plant would be advantageous for operational and maintenance assistance. This installation would be the largest municipal installation they would have done to date. It does not include getting accreditation for the UV system, but that is not something NKWD is looking for at this time. That said, it would appear that accreditation could be obtained through case studies, data, and demonstration testing if/when needed. As with most installations, there would likely be some initial adjustments needed at start-up, but these would rely heavily on assistance from the AquiSense's team – as the contact from the Las Vegas

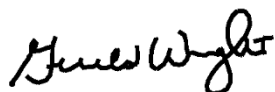
Valley Water District (a 6 mgd installation) mentioned when assessing if the UV LED system was a feasible option for NKWD.

One other aspect for whether or not to consider UV LED is that it is an innovative technology for large-scale municipal use. This would appear to be AquiSense's largest full-scale installation to date in the USA and likely the world, so not something other municipalities and treatment systems can claim. Although they do not have many installations at this time, AquiSense is continuing to expand their products into the municipal market and their R&D to increase their size and capacity as well as making more efficient and economical – the UV as well as supporting infrastructure.

If it is strictly a costing evaluation, then the medium-pressure UV system would likely be in NKWD's best interest at this time. However, if there are other criteria for which NKWD would consider for selection of their new UV treatment system, then the additional information presented for medium-pressure UV systems and UV LED systems can assist with those internal discussions and decisions. Please call/email if any questions or additional assistance is needed.

Sincerely,

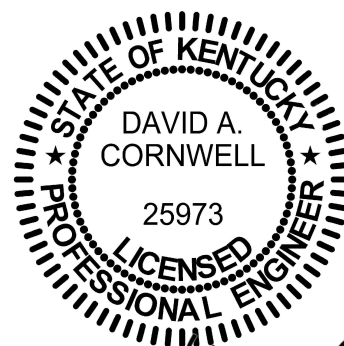
CORNWELL ENGINEERING GROUP



Gerald S. Wright, P.E.  
Chief Operating and Design Manager  
Office: (757) 873-1534 ext 237  
Cell: (757) 288-7002  
Email: [gwright@cornwellinc.com](mailto:gwright@cornwellinc.com)

enclosure

8/20/2026



# BID TAB

Northern Kentucky Water District

Taylor Mill Treatment Plant Upgrades and Improvements

July 22, 2026

| <u>CONTRACTOR</u>             | <u>BID AMOUNT</u><br><u>(NON-SRF SCENARIO)</u> | <u>ALTERNATE BID</u><br><u>(SRF SCENARIO)</u> |
|-------------------------------|------------------------------------------------|-----------------------------------------------|
| Building Crafts Inc.          | \$2,341,742.00                                 | \$2,410,803.00                                |
| Howell Contractors            | \$2,848,028.00                                 | \$2,873,209.00                                |
| MAC Construction & Excavating | \$3,079,000.00                                 | \$3,278,000.00                                |

|                               | <u>ADD ALTERNATE</u><br><u>FTTP DIVERSION PIPING</u><br><u>(NON-SRF SCENARIO)</u> | <u>ADD ALTERNATE</u><br><u>UV LED SYSTEM</u><br><u>(NON-SRF SCENARIO)</u> |
|-------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| Building Crafts Inc.          | \$236,576.00                                                                      | (\$55,000.00)                                                             |
| Howell Contractors            | \$202,841.00                                                                      | (\$91,844.00)                                                             |
| MAC Construction & Excavating | \$252,000.00                                                                      | (\$97,000.00)                                                             |

|                               | <u>ADD ALTERNATE</u><br><u>FTTP DIVERSION PIPING</u><br><u>(SRF SCENARIO)</u> | <u>ADD ALTERNATE</u><br><u>UV LED SYSTEM</u><br><u>(SRF SCENARIO)</u> |
|-------------------------------|-------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| Building Crafts Inc.          | \$269,608.00                                                                  | (\$52,000.00)                                                         |
| Howell Contractors            | \$265,322.00                                                                  | (\$92,844.00)                                                         |
| MAC Construction & Excavating | \$270,000.00                                                                  | (\$95,000.00)                                                         |

7/28/2026

David A.  
Cornwell,  
PhD, PE, BCEE

Digitally signed by  
David A. Cornwell,  
PhD, PE, BCEE  
Date: 2026.07.28  
15:17:59 -04'00'







**EXHIBIT C-3**

**BOARD MEETING MINUTES**

**Northern Kentucky Water District**  
**Board of Commissioners**  
**Regular Meeting**  
**August 20, 2026**

A regular meeting of the Board of Commissioners of the Northern Kentucky Water District was held on August 20, 2026 at the District's facility located at 2835 Crescent Springs Road in Erlanger, Kentucky and via video teleconference in accordance with KRS 61.826. All Commissioners were present, except for Commissioner Holland. Also present were Lindsey Rehtin, Stacey Kampsen, John Moor, Richard Harrison, Tom Edge, Stacey Hoeter, Kenny Ford, Mackenzie Enzweiler, Canaan Harrison, Adam Smith, Jarrod Mills, Nathan Hodges, and Kyle Boyle.

Commissioner Wagner called the meeting to order at 12:00 p.m., and Stacey Kampsen led the pledge of allegiance.

Vice President Richard Harrison and Engineering Manager – Asset Management & Infrastructure Planning Kyle Boyle gave a presentation on the District's Asset Management Plan

On motion of Commissioner Winnike, seconded by Commissioner Koester, the Board recognized the retirement of Mary Carol Wagner and unanimously approved the Retirement Resolution for Ms. Wagner.

The Commissioners reviewed correspondence received and articles published since the last regular Board meeting on June 18, 2026.

On motion of Commissioner Macke, seconded by Commissioner Koester, the Board unanimously approved the minutes for the regular Board meeting held on June 18, 2026.

The Board was provided a copy of the District's check registers, which included the check number, check date, payee, check amount and description of the reason for each payment, detailing the District's expenditures for the period June 1, 2026 through July 31, 2026. On motion of Commissioner Lange, seconded by Commissioner Winnike, and after discussion, the Board unanimously approved the expenditures of the District for the months of June and July 2026.

On motion of Commissioner Winnike, seconded by Commissioner Lange, the Board unanimously accepted the bid of \$124,995 from Lonkard Construction Company, awarded a contract for the Erlanger Street Water Main Replacement project with a total project budget of \$160,000, and authorized staff to execute the applicable contract documents.

On motion of Commissioner Macke, seconded by Commissioner Koester, the Board unanimously authorized staff to execute an engineering services agreement, and any related documents, with Cardinal Engineering to design the Highland Heights Water Main Improvements Project.

On motion of Commissioner Winnike, seconded by Commissioner Lange, the Board unanimously accepted the bid of \$121,316.00 and awarded a contract to Industrial Reliability and Repair for the replacement of MAUs at the FTTP Chemical Building and authorized staff to negotiate and execute the applicable contract documents.

On motion of Commissioner Lange, seconded by Commissioner Macke, the Board unanimously accepted the bid of \$1,584,404.62 from Inframark, LLC and awarded a contract for the Phase 2A SCADA Improvements with a revised project budget of \$4,800,000 and authorized staff to execute the appropriate contract documents.

On motion of Commissioner Winnike, seconded by Commissioner Lange, the Board unanimously accepted the base bid of \$2,341,742 from Building Crafts, Inc., accepting the alternate bid items for the diversion valve and the SRF loan, rejecting the alternate bid item for UV LED, and awarded a contract for the Taylor Mill Treatment

Plant Upgrades & Improvements with a project budget of \$3,500,000 and authorized staff to execute the appropriate contract documents subject to approval by the Kentucky Public Service Commission.

On motion of Commissioner Winnike, seconded by Commissioner Koester, the Board unanimously authorized staff to execute an engineering services agreement with Terracon for evaluation, design, and construction phase services for the Memorial Parkway Treatment Plant Causeway Repair.

On motion of Commissioner Winnike, seconded by Commissioner Lange, the Board unanimously authorized staff to execute an engineering services agreement with Black & Veatch for evaluation, design, and construction phase services for the Ohio River Pumping Station No. 2 Electrical Improvements.

The Board reviewed the District's financial reports and Department reports.

Vice President of Finance & Support Services Stacey Kampsen updated the Board on revenues and expenses, work on the 2027 budget.

Finance Manager Mackenzie Enzweiler provided a brief financial overview presentation.

Vice President of Water Quality & Production John Moor reviewed current water production quantities and provided an update regarding fluoride.

Vice President of Engineering & Distribution Richard Harrison reviewed with the Board the status of on-going projects within the 2026 Five-Year Capital Budget, including highlighting 2 change orders and provided an update on main breaks and water loss.

Commissioner Macke left the meeting at 2:30 p.m.

General Counsel, Director of Compliance, Communications and Regulatory Affairs Tom Edge provided the Board an update regarding proposed revisions to the District's Tariff.

Director of Technology, Innovation and Business Intelligence Chris Bryant provided the Board updates on the Lucy project and on recent Cybersecurity attacks on water utilities.

Other matters of a general nature were discussed.

On a motion by Commissioner Winnike, seconded by Commissioner Koester, the meeting was adjourned at 2:50 p.m.

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CHAIRMAN

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SECRETARY



## **EXHIBIT D**

### **PROJECT FINANCE INFORMATION**



## Exhibit D

Customers Added and Revenue Effect: There are no new customers anticipated.

Debt Issuance and Source of Debt: The project will be funded using \$2,948,452 (includes contractor's bid plus 10% contingency for change orders) from State Revolving Fund Loan F25-009S and \$551,548 from a future Bond Anticipation Note or cash fund. The total budget of \$3,500,000 includes design, contingencies, and miscellaneous costs. The District will have some labor expense to inspect the project. A summary of the project costs is provided below:

|                                    |                        |
|------------------------------------|------------------------|
| ○ Engineering                      | \$ 415,000.00          |
| ○ Contractor Bid                   | \$ 2,680,411.00        |
| ○ <u>Misc. &amp; Contingencies</u> | <u>\$ 404,589.00</u>   |
| <b>Total Project Cost</b>          | <b>\$ 3,500,000.00</b> |

USoA Accounts: The anticipated amounts for the project cost of \$3,500,000 will fall under the following Uniform System of Accounts Codes:

|                                       |              |
|---------------------------------------|--------------|
| Code 304 "Structure and Improvements" | \$ 750,000   |
| Code 320 "Water Treatment Equipment"  | \$ 2,750,000 |

Additional Costs and O&M: Additional annual operating and maintenance costs incurred for the project are estimated at \$55,000 per year.

Depreciation and Debt Service: Annual depreciation and debt service after construction are as follows:

Depreciation: \$20,000.00/year over 37.5 years for Code 304 Structures & Improvements  
\$91,666.67/year over 30 years for Code 320 Water Treatment Equipment

Debt Service: \$199,099.57 over 20 years for 2.75% (plus 0.3% loan servicing fee)  
State Revolving Fund Loan and \$49,285.89 over 25 years for 4.25%  
conventional loan.



## **EXHIBIT E**

### **MORTGAGES, BONDS, NOTES, AND OTHER INDEBTEDNESS**



**EXHIBIT E-1**

**SCHEDULE OF MORTGAGES, BONDS, NOTES, AND OTHER  
INDEBTEDNESS**



**Mortgages, Bonds, Notes and Other Indebtedness**

As of: 7/31/2026

| MORTGAGES               |                   |                   |                   |                              |                                                 |                                         |                         |                              |
|-------------------------|-------------------|-------------------|-------------------|------------------------------|-------------------------------------------------|-----------------------------------------|-------------------------|------------------------------|
| Mortgage Identification | Brief Description | Date of Execution | Name of Mortgagor | Name of Mortgagee or Trustee | Amount of Indebtedness authorized to be secured | Amount of Indebtedness Actually Secured | Sinking Fund Provisions | Amount Outstanding 7/31/2026 |
| NONE                    |                   |                   |                   |                              |                                                 |                                         |                         | 0                            |
|                         |                   |                   |                   |                              |                                                 |                                         |                         |                              |
|                         |                   |                   |                   |                              |                                                 |                                         |                         | <u>\$ -</u>                  |

| BONDS               |                   |               |                        |                           |               |            |                  |                  |                           |                                                 |                              |
|---------------------|-------------------|---------------|------------------------|---------------------------|---------------|------------|------------------|------------------|---------------------------|-------------------------------------------------|------------------------------|
| Bond Identification | Amount Authorized | Amount Issued | Name of Public Utility | Description of Each Class | Date of Issue | Face Value | Rate of Interest | Date of Maturity | How Secured               | Amount of Interest Paid During Last Fiscal Year | Amount Outstanding 7/31/2026 |
| 2013A               | 28,165,000        | 26,400,000    | NKWD                   | n/a                       | 6/27/2013     | 26,400,000 | 4.250 - 5.000%   | 2/1/2038         | Pledge of Future Revenues | 756,275                                         | 16,260,000                   |
| 2013B               | 26,570,000        | 24,120,000    | NKWD                   | n/a                       | 9/25/2013     | 24,120,000 | 5.000 - 4.000%   | 2/1/2028         | Pledge of Future Revenues | 283,200                                         | 3,650,000                    |
| 2014A               | 1,733,000         | 1,733,000     | NKWD                   | n/a                       | 12/11/2017    | 1,733,000  | 2.750%           | 2/1/2057         | Pledge of Future Revenues | 43,402                                          | 1,532,000                    |
| 2014B               | 16,965,000        | 15,805,000    | NKWD                   | n/a                       | 12/23/2014    | 15,805,000 | 3.125 - 4.000%   | 2/1/2029         | Pledge of Future Revenues | 83,938                                          | 1,710,000                    |
| 2016A               | 47,335,000        | 41,905,000    | NKWD                   | n/a                       | 11/22/2016    | 41,905,000 | 5.000 - 3.000%   | 2/1/2031         | Pledge of Future Revenues | 833,025                                         | 17,100,000                   |
| 2019                | 19,600,000        | 17,845,000    | NKWD                   | n/a                       | 9/26/2019     | 17,845,000 | 3.000 - 5.000%   | 2/1/2044         | Pledge of Future Revenues | 500,850                                         | 14,305,000                   |
| 2020                | 25,195,000        | 22,325,000    | NKWD                   | n/a                       | 11/5/2020     | 22,325,000 | 5.000 - 2.000%   | 2/1/2035         | Pledge of Future Revenues | 567,450                                         | 14,910,000                   |
| 2021B               | 32,395,000        | 27,730,000    | NKWD                   | n/a                       | 12/14/2021    | 27,730,000 | 4.000%           | 2/1/2027         | Pledge of Future Revenues | 452,900                                         | 3,820,000                    |
| 2023A               | 27,335,000        | 17,615,000    | NKWD                   | n/a                       | 1/26/2023     | 17,615,000 | 5.000 - 4.125%   | 2/1/2048         | Pledge of Future Revenues | 724,656                                         | 16,385,000                   |
|                     |                   |               |                        |                           |               |            |                  |                  |                           | <u>\$ 89,672,000.00</u>                         |                              |





Mortgages, Bonds, Notes and Other Indebtedness

As of: 7/31/2026

| NOTES               |               |            |                  |                  |                |                                                 |                              |
|---------------------|---------------|------------|------------------|------------------|----------------|-------------------------------------------------|------------------------------|
| Note Identification | Date of Issue | Amount     | Date of Maturity | Rate of Interest | In Whose Favor | Amount of Interest Paid During Last Fiscal Year | Amount Outstanding 7/31/2026 |
| KIA Loan F08-07     | 11/1/2008     | 4,000,000  | 12/1/2032        | 1.2000%          | KIA            | 20,566                                          | 1,388,485                    |
| KIA Loan F09-02     | 6/1/2010      | 24,000,000 | 6/1/2033         | 2.2500%          | KIA            | 248,994                                         | 9,504,854                    |
| KIA Loan F13-012    | 8/1/2014      | 8,000,000  | 6/1/2044         | 2.0000%          | KIA            | 154,948                                         | 7,319,524                    |
| KIA Loan F14-015    | 6/1/2015      | 3,545,910  | 6/1/2038         | 2.0000%          | KIA            | 49,686                                          | 2,273,751                    |
| KIA Loan F15-011    | 3/1/2016      | 3,535,094  | 6/1/2038         | 2.0000%          | KIA            | 49,535                                          | 2,266,816                    |
| KIA Loan B15-003    | 7/1/2016      | 1,392,195  | 12/1/2037        | 0.9500%          | KIA            | 8,668                                           | 826,789                      |
| KIA Loan F16-027    | 1/1/2019      | 4,000,000  | 12/1/2044        | 2.0000%          | KIA            | 31,732                                          | 1,517,826                    |
| KIA Loan F20-044*   | 2/16/2023     | 8,000,000  | N/A              | 1.7500%          | KIA            | 86,034                                          | 7,507,904                    |
| KIA Loan F23-007S*  | 6/1/2025      | 4,000,000  | N/A              | 2.5000%          | KIA            | -                                               | -                            |
| KIA Loan F25-009S*  | N/A           | 4,000,000  | N/A              | 3.0500%          | KIA            | -                                               | -                            |
|                     |               |            |                  |                  |                | <u>\$</u>                                       | <u>32,605,949.00</u>         |

\*not yet closed

| OTHER INDEBTEDNESS          |         |                         |                                                                                                                                                              |                                       |                              |
|-----------------------------|---------|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|------------------------------|
| Indebtedness Identification | Classes | Description of Security | Brief Statement of Devolution or assumption of a portion of the indebtedness upon or by person or corporation if the original liability has been transferred | Interest Paid During Last Fiscal Year | Amount Outstanding 7/31/2026 |
| NONE                        |         |                         |                                                                                                                                                              |                                       | 0                            |
|                             |         |                         |                                                                                                                                                              |                                       |                              |
|                             |         |                         |                                                                                                                                                              |                                       |                              |
|                             |         |                         |                                                                                                                                                              |                                       | <u>\$ -</u>                  |



## **EXHIBIT E-2**

### **CONDITIONAL COMMITMENT LETTER**



## KENTUCKY INFRASTRUCTURE AUTHORITY

**Andy Beshear**  
Governor

100 Airport Road  
Frankfort, Kentucky 40601  
(502) 573-0260  
[kia.ky.gov](http://kia.ky.gov)

**Sandy Williams**  
Executive Director

August 8, 2025

The Honorable Lindsey Rechtin, President/CEO  
Northern Kentucky Water District  
PO Box 18640  
Erlanger, KY 41018

### KENTUCKY INFRASTRUCTURE AUTHORITY FEDERALLY ASSISTED DRINKING WATER REVOLVING LOAN FUND CONDITIONAL COMMITMENT LETTER (F25-009S)

Dear Ms Rechtin:

The Kentucky Infrastructure Authority ("the Authority") commends your efforts to improve public service facilities in your community. On August 7, 2025, the Authority approved your loan for the Taylor Mill Treatment Plant Powdered Activated Carbon System project subject to the conditions stated in Attachment A to this letter. The total cost of the project shall not exceed \$4,350,000, without prior authorization of the Authority, of which the Authority loan shall provide \$4,000,000 of the funding. Other anticipated funding for the project is reflected in Attachment B. The final loan amount will be equal to the Authority's portion of estimated project cost applied to the actual project cost. Attachment B incorporated herein by reference fully describes the project.

An Assistance Agreement will be executed between the Authority and the Northern Kentucky Water District upon satisfactory performance of the conditions set forth in Attachment A. You must meet the conditions set forth in Attachment A and enter into an Assistance Agreement by August 8, 2026 (twelve months from the date of this letter). A one-time extension of up to six months may be granted for applicants that experience extenuating circumstances. Funds will be available for disbursement only after execution of the Assistance Agreement.



Please inform the Authority of any changes in your financing plan as soon as possible. We wish you every success for this project which will benefit both your community and the Commonwealth as a whole.

Sincerely,



Milward Dedman  
Deputy Executive Director

Attachments

cc: Amy Stoffer, Northern Kentucky Water District

Please sign and return a copy of this letter indicating your acceptance of this commitment and its terms along with the completed "Transparency Act Reporting Information Form". Complete the attached "Authorization for Electronic Deposit of Vendor Payment Form" and the "ACH Debit Authorization Form" **and return to the US Bank address at the bottom of each form**. Also included are the "Legal Counsel Certification Letter" sample and the "Statement of Approval of Projections of Revenue and Expenses" for you to complete at the appropriate time. These forms and an SRF loan checklist guide can be found in Attachment C of this letter.

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Accepted

---

Date

## ATTACHMENT A

### Conditions

#### Northern Kentucky Water District F25-009S

The Assistance Agreement and this commitment shall be subject, but not limited to, the following terms:

1. The Authority project loan shall not exceed \$4,000,000 without prior authorization.
2. This loan does not qualify for principal forgiveness
3. The loan shall bear interest at the rate of 2.75% per annum commencing with the first draw of funds.
4. Interest shall be payable on the unforgiven amount of actual funds received. The first payment shall be due on June 1, or December 1, immediately succeeding the date of the initial draw of funds, provided that if such June 1, or December 1, shall be less than three months since the date of the initial draw of funds, then the first interest payment date shall be the June 1, or December 1, which is at least six months from the date of the initial draw of funds. Interest payments will be due each six months thereafter until the loan is repaid. KIA requires the use of Automated Clearing House (ACH) debits for payment of all balances due on the loan. This will ensure that payments are credited timely to your account without the risk of incurring late payment fees. If the due date falls on a weekend or holiday your account will be debited on the next business day. Please complete and return the "ACH Debit Authorization" form in Attachment C of this letter to U.S. Bank for processing.
5. Full principal payments will commence on the appropriate June 1, or December 1, within twelve months from initiation of operation. Full payments will be due each six months thereafter until the loan is repaid.
6. The loan shall be repaid over a period not to exceed 20 years from the date of initiation of operation for the project.
7. A loan servicing fee of 0.30% of the outstanding loan balance shall be payable to the Authority as a part of each interest payment.
8. Loan funds will only be disbursed after execution of the Assistance Agreement as project costs are incurred.
9. The Authority loan funds must be expended within six months of the official date of initiation of operation.

10. Fund "F" loan funds may be considered to be federal funds. If more than \$1,000,000 of federal funds is disbursed during any one of Borrower's fiscal years, the Borrower is required to have a single or program-specific audit conducted for that year in accordance with 2 CFR 200 Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards.
11. The Authority requires that an annual financial audit be provided for the life of the loan.
12. The final Assistance Agreement must be approved by ordinance or resolution, as applicable, of the city council or appropriate governing board.
13. The Borrower must maintain a 1.1 debt coverage ratio throughout the life of the KIA loan. All borrowers are subject to at least an annual financial review for compliance.

The following is a list of the standard conditions to be satisfied prior to execution of the Assistance Agreement or incorporated in the Assistance Agreement. Any required documentation must be submitted to the party designated.

1. The Authority to Award (bid) package must be submitted to the Division of Water for approval within 14 days of bid opening.
2. The Assistance Agreement must be executed within six (6) months from bid opening.
3. Documentation of final funding commitments from all parties other than the Authority as reflected in the credit analysis shall be provided prior to preparation of the Assistance Agreement and disbursement of the loan monies. Rejections of any anticipated project funding shall be immediately reported and may cause this loan to be subject to further consideration.
4. The loan must undergo review by the Capital Projects and Bond Oversight Committee of the Kentucky Legislature prior to the State's execution of the Assistance Agreement. The committee meets monthly. Any special conditions listed in Attachment B must be satisfied before the project is presented before the Committee.
5. Any required adjustment in utility service rates shall be adopted by ordinance, municipal order or resolution by the appropriate governing body of the Borrower. Public hearings as required by law shall be held prior to the adoption of the service rate ordinance, order, or resolution. Any required approvals by the Kentucky Public Service Commission shall be obtained.

6. The Borrower must complete and return the "Authorization for Electronic Deposit of Borrower Payment" form in Attachment C of this letter to U.S. Bank.
7. The Borrower must provide documentation of Eclearinghouse Endorsement and Eclearinghouse Comments.
8. Prior to the project bid, an environmental review shall be conducted by the Division of Water for all construction projects receiving State Revolving Funds ("SRF") money.
9. Technical plans and specifications and a complete SRF specifications checklist shall be approved by the Division of Water prior to project bid.
10. All easements or purchases of land shall be completed prior to commencement of construction. Clear Site Certification of all land or easement acquisitions shall be provided to the Division of Water. DOW representatives shall be notified for attendance of the pre-construction conference.
11. Project changes or additions deviating from the original scope of work described in the Project Profile may require a new or amended environmental review and change order review before they can be included in the SRF loan project.
12. The Borrower must provide certification from their legal counsel stating that they have prepared construction specifications in accordance with all applicable state or federal wage rate laws, and that the procurement procedures, including those for construction, land, equipment and professional services that are a part of the project, are in compliance with applicable federal, state and local procurement laws.
13. The Borrower shall implement the Kentucky Uniform System of Accounting (KUSoA), or an alternative approved by the Authority and assure that rates and charges for services are based upon the cost of providing such service.
14. The Borrower shall comply with all Davis Bacon related monitoring and reporting and require all contractors to pay wages pursuant to applicable prevailing wage rates for all work relating to the subject Project.
15. The project shall comply with the reporting requirements of the Transparency Act, and shall complete the Transparency Act Reporting Information Form in Attachment C of this letter and provide to the Authority no later than 30 days after the KIA Board approval date of your loan.

16. Based on the final “as-bid” project budget, the Borrower must provide satisfactory proof, based on then existing conditions, that the revenue projections in the attached descriptions are still obtainable and that the projections of operating expenses have not materially changed. The “as bid” project budget shall be reviewed and approved by the consulting engineer.
17. The Project shall comply with all federal requirements applicable to the Loan (including those imposed by P.L. 113-76, Consolidated Appropriations Act, 2014 (the “2014 Appropriations Act”) and / or the Build America, Buy America Act (“BABA”)) and related Program policy guidelines). The Borrower understands that, among other requirements, (a) all of the iron and steel products used in the Project are to be produced in the United States (“American Iron and Steel Requirement”) unless (i) the Borrower has requested and obtained a waiver from the Authority and the United States Environmental Protection Agency pertaining to the Project or (ii) the Authority has otherwise advised the Borrower in writing that the American Iron and Steel Requirement is not applicable to the Project; and / or (b) (i) all iron and steel items used in projects must be produced in the United States pursuant to BABA, (ii) all manufactured products must be produced in the United States, and (iii) all construction materials must be manufactured in the United States (“BABA Requirements”); unless (y) the Borrower has requested and obtained a waiver from the Authority and the United States Environmental Protection Agency pertaining to the Project or (z) the Authority has otherwise advised the Borrower in writing that the BABA Requirements are not applicable to the Project.
18. If the Project includes a private-side lead pipe replacement component, the Borrower must obtain a final inspection from the Division of Plumbing of the Department of Housing, Building and Construction.



ATTACHMENT B

Executive Summary and Credit Analysis

Northern Kentucky Water District  
F25-009S

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                  |                                                   |                                                    |                        |                                                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---------------------------------------------------|----------------------------------------------------|------------------------|--------------------------------------------------------|
| EXECUTIVE SUMMARY<br>KENTUCKY INFRASTRUCTURE AUTHORITY<br>FUND F, FEDERALLY ASSISTED DRINKING WATER<br>REVOLVING LOAN FUND                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                  |                                                   | Reviewer<br>Date<br>KIA Loan Number<br>WRIS Number |                        | John Brady<br>August 7, 2025<br>F25-009S<br>WX21117018 |
| BORROWER                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                  | NORTHERN KENTUCKY WATER DISTRICT<br>KENTON COUNTY |                                                    |                        |                                                        |
| BRIEF DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                  |                                                   |                                                    |                        |                                                        |
| The Northern Kentucky Water District is requesting a Fund F loan in the amount of \$4,000,000 for the Taylor Mill Treatment Plant Powdered Activated Carbon (PAC) System project. The proposed project involves the construction of a PAC storage and feed system to replace the temporary feed system as well as the original non-functioning feed system. It will also allow for the replacement of the ultraviolet light disinfection system which is at the end of its useful life. The project will aid in the removal of organic compounds including those in stormwater runoff such as pesticides, taste and odor causing compounds, river spills, and emerging contaminants such as PFAS. In 2021 testing conducted by the Energy and Environment Cabinet detected the presence of two PFAS compounds in the Licking River, which is the water source for the Taylor Mill Treatment Plant. The Water District conducted similar testing in 2023 and also found the presence of PFAS above detectable levels. |                                  |                                                   |                                                    |                        |                                                        |
| PROJECT FINANCING                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                  |                                                   | PROJECT BUDGET                                     |                        |                                                        |
| Fund F Loan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | \$4,000,000                      | Construction                                      | \$3,700,000                                        |                        |                                                        |
| Local                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 350,000                          | Administrative Expenses                           | 5,000                                              |                        |                                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                  | Eng - Design / Const                              | 225,000                                            |                        |                                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                  | Eng - Insp                                        | 20,000                                             |                        |                                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                  | Contingency                                       | 400,000                                            |                        |                                                        |
| TOTAL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | \$4,350,000                      | TOTAL                                             | \$4,350,000                                        |                        |                                                        |
| REPAYMENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Rate                             | 2.75%                                             | Est. Annual Payment                                | \$273,354              |                                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Term                             | 20 Years                                          | 1st Payment                                        | 6 Mo. after first draw |                                                        |
| PROFESSIONAL SERVICES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                  |                                                   |                                                    |                        |                                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Bond Counsel                     | Dinsmore & Shohl, LLP                             |                                                    |                        |                                                        |
| PROJECT SCHEDULE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Bid Opening                      | Jan-26                                            |                                                    |                        |                                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Construction Start               | Apr-26                                            |                                                    |                        |                                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Construction Stop                | Jul-27                                            |                                                    |                        |                                                        |
| DEBT PER CUSTOMER                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Existing                         | \$1,802                                           |                                                    |                        |                                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Proposed                         | \$1,476                                           |                                                    |                        |                                                        |
| OTHER DEBT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                  | See Attached                                      |                                                    |                        |                                                        |
| RESIDENTIAL RATES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                  | Users                                             | Avg. Bill                                          |                        |                                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Current                          | 87,111                                            | \$49.97                                            | (for 4,000 gallons)    |                                                        |
| REGIONAL COORDINATION This project is consistent with regional planning recommendations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                  |                                                   |                                                    |                        |                                                        |
| CASHFLOW                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Cash Flow Before<br>Debt Service | Debt Service                                      | Cash Flow After Debt Service                       | Coverage Ratio         |                                                        |
| Audited 2022                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 29,465,300                       | 18,105,595                                        | 11,359,705                                         | 1.6                    |                                                        |
| Audited 2023                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 35,267,137                       | 19,098,148                                        | 16,168,989                                         | 1.8                    |                                                        |
| Audited 2024                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 38,491,643                       | 20,247,150                                        | 18,244,493                                         | 1.9                    |                                                        |
| Projected 2025                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 37,627,741                       | 20,516,450                                        | 17,111,291                                         | 1.8                    |                                                        |
| Projected 2026                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 35,982,778                       | 21,204,194                                        | 14,778,584                                         | 1.7                    |                                                        |
| Projected 2027                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 34,272,017                       | 20,260,879                                        | 14,011,138                                         | 1.7                    |                                                        |
| Projected 2028                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 32,492,825                       | 16,822,322                                        | 15,670,503                                         | 1.9                    |                                                        |
| Projected 2029                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 30,642,465                       | 14,916,403                                        | 15,726,062                                         | 2.1                    |                                                        |

**NORTHERN KENTUCKY WATER DISTRICT**  
**FINANCIAL SUMMARY (DECEMBER YEAR END)**

|                                                | <b>Audited</b>     | <b>Audited</b>     | <b>Audited</b>     | <b>Projected</b>   | <b>Projected</b>   | <b>Projected</b>   | <b>Projected</b>   | <b>Projected</b>   |
|------------------------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
|                                                | <b><u>2022</u></b> | <b><u>2023</u></b> | <b><u>2024</u></b> | <b><u>2025</u></b> | <b><u>2026</u></b> | <b><u>2027</u></b> | <b><u>2028</u></b> | <b><u>2029</u></b> |
| <b>Balance Sheet</b>                           |                    |                    |                    |                    |                    |                    |                    |                    |
| <b>Assets</b>                                  |                    |                    |                    |                    |                    |                    |                    |                    |
| Current Assets                                 | 68,729,645         | 72,920,524         | 74,151,685         | 77,573,927         | 80,529,644         | 83,331,871         | 86,465,972         | 89,218,884         |
| Other Assets                                   | 423,363,253        | 422,113,186        | 435,179,020        | 432,582,647        | 450,111,761        | 461,321,917        | 464,701,919        | 477,282,769        |
| Total                                          | <u>492,092,898</u> | <u>495,033,710</u> | <u>509,330,705</u> | <u>510,156,575</u> | <u>530,641,405</u> | <u>544,653,788</u> | <u>551,167,891</u> | <u>566,501,653</u> |
| <b>Liabilities &amp; Equity</b>                |                    |                    |                    |                    |                    |                    |                    |                    |
| Current Liabilities                            | 44,657,384         | 22,709,271         | 21,958,995         | 21,522,694         | 21,259,051         | 18,147,840         | 16,844,441         | 16,601,141         |
| Long Term Liabilities                          | 191,646,526        | 194,547,047        | 181,236,212        | 170,092,097        | 168,119,892        | 164,695,139        | 157,616,398        | 146,447,156        |
| Total Liabilities                              | <u>236,303,910</u> | <u>217,256,318</u> | <u>203,195,207</u> | <u>191,614,791</u> | <u>189,378,943</u> | <u>182,842,979</u> | <u>174,460,838</u> | <u>163,048,297</u> |
| Net Assets                                     | <u>255,788,988</u> | <u>277,777,392</u> | <u>306,135,498</u> | <u>318,541,784</u> | <u>341,262,462</u> | <u>361,810,809</u> | <u>376,707,053</u> | <u>403,453,357</u> |
| <b>Cash Flow</b>                               |                    |                    |                    |                    |                    |                    |                    |                    |
| Revenues                                       | 61,141,655         | 67,401,630         | 73,504,661         | 74,222,454         | 74,222,454         | 74,222,454         | 74,222,454         | 74,222,454         |
| Operating Expenses                             | 33,683,678         | 36,646,138         | 39,542,377         | 41,124,072         | 42,769,035         | 44,479,796         | 46,258,988         | 48,109,348         |
| Other Income                                   | 2,007,323          | 4,511,645          | 4,529,359          | 4,529,359          | 4,529,359          | 4,529,359          | 4,529,359          | 4,529,359          |
| Cash Flow Before Debt Service                  | <u>29,465,300</u>  | <u>35,267,137</u>  | <u>38,491,643</u>  | <u>37,627,741</u>  | <u>35,982,778</u>  | <u>34,272,017</u>  | <u>32,492,825</u>  | <u>30,642,465</u>  |
| <b>Debt Service</b>                            |                    |                    |                    |                    |                    |                    |                    |                    |
| Existing Debt Service                          | 18,105,595         | 19,098,148         | 20,247,150         | 20,516,450         | 21,204,194         | 20,260,879         | 16,548,968         | 14,916,403         |
| Proposed KIA Loan                              | 0                  | 0                  | 0                  | 0                  | 0                  | 0                  | 273,354            | 273,354            |
| Total Debt Service                             | <u>18,105,595</u>  | <u>19,098,148</u>  | <u>20,247,150</u>  | <u>20,516,450</u>  | <u>21,204,194</u>  | <u>20,260,879</u>  | <u>16,822,322</u>  | <u>15,189,757</u>  |
| Cash Flow After Debt Service                   | <u>11,359,705</u>  | <u>16,168,989</u>  | <u>18,244,493</u>  | <u>17,111,291</u>  | <u>14,778,584</u>  | <u>14,011,138</u>  | <u>15,670,503</u>  | <u>15,726,062</u>  |
| <b>Ratios</b>                                  |                    |                    |                    |                    |                    |                    |                    |                    |
| Current Ratio                                  | 1.5                | 3.2                | 3.4                | 3.6                | 3.8                | 4.6                | 5.1                | 5.4                |
| Debt to Equity                                 | 0.9                | 0.8                | 0.7                | 0.6                | 0.6                | 0.5                | 0.5                | 0.4                |
| Days Sales in Accounts Receivable              | 95.7               | 94.3               | 108.8              | 108.8              | 108.8              | 108.8              | 108.8              | 108.8              |
| Months Operating Expenses in Unrestricted Cash | 15.0               | 13.8               | 13.1               | 13.9               | 14.6               | 15.1               | 15.7               | 16.7               |
| Debt Coverage Ratio                            | 1.6                | 1.8                | 1.9                | 1.8                | 1.7                | 1.7                | 1.9                | 2.1                |

Reviewer: John Brady  
Date: August 7, 2025  
Loan Number: F25-009S

**KENTUCKY INFRASTRUCTURE AUTHORITY  
DRINKING WATER STATE REVOLVING FUND (FUND F)  
NORTHERN KENTUCKY WATER DISTRICT, KENTON COUNTY  
PROJECT REVIEW  
WX21117018**

**I. PROJECT DESCRIPTION**

The Northern Kentucky Water District (NKWD) is requesting a Fund F loan in the amount of \$4,000,000 for the Taylor Mill Treatment Plant Powdered Activated Carbon (PAC) System project. The proposed project involves the construction of a PAC storage and feed system to replace the temporary feed system as well as the original non-functioning feed system. It will also allow for the replacement of the ultraviolet light disinfection system which is at the end of its useful life. The project will aid in the removal of organic compounds including those in stormwater runoff such as pesticides, taste and odor causing compounds, river spills, and emerging contaminants such as PFAS. In 2021 testing conducted by the Energy and Environment Cabinet detected the presence of two PFAS compounds in the Licking River, which is the water source for the Taylor Mill Treatment Plant. The NKWD conducted similar testing in 2023 and also found the presence of PFAS above detectable levels.

The NKWD currently serves 79,473 residential customers and 7,632 commercial and industrial customers. They provide wholesale service for six different systems.

**II. PROJECT BUDGET**

|                                 | <b>Total</b>        |
|---------------------------------|---------------------|
| Construction                    | \$ 3,700,000        |
| Administrative Expenses         | 5,000               |
| Engineering Fees - Design       | 185,000             |
| Engineering Fees - Construction | 40,000              |
| Engineering Fees - Inspection   | 20,000              |
| Contingency                     | 400,000             |
| <b>Total</b>                    | <b>\$ 4,350,000</b> |

### III. PROJECT FUNDING

|              | <b>Amount</b>       | <b>%</b>    |
|--------------|---------------------|-------------|
| Fund F Loan  | \$ 4,000,000        | 92%         |
| Local        | 350,000             | 8%          |
| <b>Total</b> | <b>\$ 4,350,000</b> | <b>100%</b> |

### IV. KIA DEBT SERVICE

|                                            |                   |
|--------------------------------------------|-------------------|
| Construction Loan                          | \$ 4,000,000      |
| Less: Principal Forgiveness                | 0                 |
| Amortized Loan Amount                      | \$ 4,000,000      |
| Interest Rate                              | 2.75%             |
| Loan Term (Years)                          | 20                |
| Estimated Annual Debt Service              | \$ 261,354        |
| Administrative Fee (0.30%)                 | 12,000            |
| <b>Total Estimated Annual Debt Service</b> | <b>\$ 273,354</b> |

### V. PROJECT SCHEDULE

|                     |              |
|---------------------|--------------|
| Bid Opening:        | January 2026 |
| Construction Start: | April 2026   |
| Construction Stop:  | July 2027    |

### VI. CUSTOMER COMPOSITION AND RATE STRUCTURE

#### A) Customers

| <u>Customers</u> | <u>Current</u> |
|------------------|----------------|
| Residential      | 79,473         |
| Commercial/Other | 7,632          |
| Wholesale        | 6              |
| <b>Total</b>     | <b>87,111</b>  |

## B) Rates

|                                    | Current  | Prior    | Prior    |
|------------------------------------|----------|----------|----------|
| Date of Last Rate Increase         | 02/08/24 | 02/08/23 | 03/27/20 |
| Monthly Service Charge             | \$20.45  | \$19.50  | \$18.50  |
| Quarterly Service Charge           | 45.20    | 42.85    | 40.50    |
| First 1,500 CF (Per 100 CF)        | 5.52     | 5.15     | 4.77     |
| Cost for 4,000 gallons (monthly)   | \$49.97  | \$47.04  | \$44.01  |
| Cost for 4,000 gallons (quarterly) | \$133.75 | \$125.46 | \$117.02 |
| Increase %                         | 6.6%     | 7.2%     |          |
| Affordability Index (Rate/MHI)     | 0.8%     | 0.7%     | 0.7%     |

| Wholesale                  | Current  | Prior    | Prior    |
|----------------------------|----------|----------|----------|
| Date of Last Rate Increase | 02/08/24 | 02/08/23 | 03/26/20 |
| Per 100 Cubic Feet         | \$3.43   | \$3.21   | \$2.98   |
| Increase %                 | 6.9%     | 7.7%     |          |

## VII. DEMOGRAPHICS

Based on current Census data from the American Community Survey 5-Year Estimate 2019-2023, the Utility's service area population is 252,858 with a Median Household Income (MHI) of \$79,887. The MHI for the Commonwealth is \$62,417. The loan will qualify for a 2.75% interest rate.

## VIII. 2024 CAPITALIZATION GRANT EQUIVALENCIES

- 1) Green Project Reserve - The Drinking Water capitalization grant does not contain a "green" requirement.
- 2) Additional Subsidization – This project does not qualify for additional subsidization.

## IX. FINANCIAL ANALYSIS

Financial information was obtained from the audited financial statements for the years ended December 31, 2022 through December 31, 2024. The non-cash impacts of GASB 68 – Accounting and Financial Reporting for Pensions and GASB 75 – Accounting and Financial Reporting for Other Postemployment Benefit have been removed from the operating expenses. Percentage references in the History section below are based on whole dollar amounts and not the rounded amounts presented.

## HISTORY

Total revenues increased 20.2% from \$61.14 million in 2022 to \$73.50 million in 2024 due mostly to two separate rate increases. Operating expenses increased 17.4% from \$33.68 million to \$39.54 million during the same period due to salary increases and higher costs for chemicals and contractual services. The debt coverage ratio was 1.6, 1.8, and 1.9 in 2022, 2023, and 2024.

The balance sheet reflects a current ratio of 5.3, a debt-to-equity ratio of 0.4, and 16.5 months of operating expenses in unrestricted cash.

## PROJECTIONS

Projections are based on the following assumptions:

- 1) Revenues will increase 1% in 2025 due to a rate increase that went into effect in February 2024.
- 2) Operating expenses will increase 4% annually due to inflation and general expenses.
- 3) Debt service coverage is 1.9 in 2028 when principal and interest repayments begin.

Based on the pro forma assumptions, the utility shows adequate cash flow to repay the KIA Fund F loan.

The NKWD is regulated by the Public Service Commission (PSC) and will need to apply to the PSC, pursuant to KRS 278.300, for debt authorization for the \$4,000,000 loan and must receive a Certificate of Public Convenience and Necessity, pursuant to KRS 278.020.

## REPLACEMENT RESERVE

The replacement reserve will be 5% (\$200,000 total) of the final amount borrowed to be funded annually (\$10,000 yearly) each December 1 for 20 years and maintained for the life of the loan.

## **X. DEBT OBLIGATIONS**

|                     | <b>Outstanding</b> | <b>Maturity</b> |
|---------------------|--------------------|-----------------|
| 2013A Revenue Bonds | \$ 18,250,000      | 2038            |
| 2013B Revenue Bonds | 6,985,000          | 2028            |
| 2014B Revenue Bonds | 2,765,000          | 2029            |
| 2016A Revenue Bonds | 22,980,000         | 2031            |
| 2019 Revenue Bonds  | 15,395,000         | 2044            |

|                                        |                      |      |
|----------------------------------------|----------------------|------|
| 2020 Revenue Bonds                     | 17,555,000           | 2035 |
| 2021B Revenue Bonds                    | 13,755,000           | 2027 |
| 2023 Revenue Bonds                     | 17,230,000           | 2049 |
| RD Loan 91-03                          | 1,593,500            | 2057 |
| KIA Loan B15-003                       | 929,478              | 2038 |
| KIA Loan F08-07                        | 1,696,321            | 2032 |
| KIA Loan F09-02                        | 11,374,983           | 2033 |
| KIA Loan F13-012                       | 7,832,098            | 2044 |
| KIA Loan F14-015                       | 2,892,956            | 2038 |
| KIA Loan F15-011                       | 2,518,276            | 2038 |
| KIA Loan F16-027 (i.a.o. \$4,000,000)  |                      | TBD  |
| KIA Loan F20-044 (i.a.o. \$8,000,000)  |                      | TBD  |
| KIA Loan F23-007S (i.a.o. \$4,000,000) |                      | TBD  |
| KIA Loan F24-008L (i.a.o. \$5,000,000) |                      | TBD  |
| KIA Loan F24-008S (i.a.o. \$3,305,825) |                      | TBD  |
| <b>Total</b>                           | <b>\$143,752,612</b> |      |

## **XI. CONTACTS**

### **Legal Applicant**

|                     |                                    |
|---------------------|------------------------------------|
| Entity Name         | Northern Kentucky Water District   |
| Authorized Official | Lindsey Rehtin (President/CEO)     |
| County              | Kenton                             |
| Email               | lrehtin@nkywater.org               |
| Phone               | (859) 426-2758                     |
| Address             | PO Box 18640<br>Erlanger, KY 41018 |

### **Applicant Contact**

|              |                                    |
|--------------|------------------------------------|
| Name         | Stacey Kampsen                     |
| Organization | Northern Kentucky Water District   |
| Email        | skampsen@nkywater.org              |
| Phone        | (859) 426-2715                     |
| Address      | PO Box 18640<br>Erlanger, KY 41018 |



**Project Administrator**

|              |                                                |
|--------------|------------------------------------------------|
| Name         | Amy Stoffer                                    |
| Organization | Northern Kentucky Water District               |
| Email        | astoffer@nkywater.org                          |
| Phone        | (859) 426-2734                                 |
| Address      | 2835 Crescent Springs Rd<br>Erlanger, KY 41018 |

**XII. RECOMMENDATIONS**

KIA staff recommends approval of the loan with the standard conditions.

ATTACHMENT C

Forms

Northern Kentucky Water District  
F25-009S

## SRF LOAN CONDITIONS CHECKLIST

Congratulations on receiving a conditional commitment of funding from the State Revolving Fund (SRF) Program. Borrowers will now be assigned a Compliance Analyst to help guide them through the rest of the loan process based on which Area Development District (ADD) they are located. Please submit all documents to one of the following contacts:

- Julie Bickers ([Julie.Bickers@ky.gov](mailto:Julie.Bickers@ky.gov), 502-892-3455): Purchase, Pennyrite, Green River, Barren River, Lake Cumberland.
- Debbie Landrum ([Debbie.Landrum@ky.gov](mailto:Debbie.Landrum@ky.gov), 502-892-3454): Lincoln Trail, KIPDA, Northern KY, Bluegrass.
- Robert Aldridge ([RobertV.Aldridge@ky.gov](mailto:RobertV.Aldridge@ky.gov), 502-892-3170): Buffalo Trace, Gateway, FIVCO, Big Sandy, KY River, Cumberland Valley

After all of the conditions of the Conditional Commitment Letter have been fulfilled, KIA will initiate the Assistance Agreement with the borrower. The Assistance Agreement must be fully executed before any funds may be disbursed. The following is a list of items needed to process your loan (forms can be found here <https://kia.ky.gov/FinancialAssistance/Pages/Forms.aspx>):

**Before bid opening**, submit the following items to the designated Compliance Analyst/DOW Contact:

| Submit To: |                          |                                                                                                                                                                                                                                                                |
|------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| KIA        | <input type="checkbox"/> | <b>Conditional Commitment Letter</b> (this letter is sent to the borrower via email shortly following KIA board approval and is to be signed by the authorizing official);                                                                                     |
| USBANK     | <input type="checkbox"/> | <b>Authorization for Electronic Deposit/Debit of Borrower Disbursements/ Payment</b> (these forms are attached to the loan commitment letter sent after KIA board approval and are to be signed by the authorizing official and forwarded directly to US Bank) |
| KIA        | <input type="checkbox"/> | <b>Transparency Form</b> (this form is attached to the loan commitment letter sent after KIA board approval)                                                                                                                                                   |
| DOW        | <input type="checkbox"/> | <b>Fiscal Sustainability Plan Certification and Cost and Effectiveness Certification</b> (required for "A" loans only, prior to plans approval)                                                                                                                |
| DOW        | <input type="checkbox"/> | <b>Environmental review</b> (Kentucky Division of Water will review and is required prior to plans approval. KIA will need copy of approval letter)                                                                                                            |
| DOW        | <input type="checkbox"/> | <b>Plans and specifications</b> (Kentucky Division of Water will review and KIA will need copy of approval letter)                                                                                                                                             |
| KIA        | <input type="checkbox"/> | <b>Proof of compliance with any special condition identified in the Conditional Commitment Letter</b> (e.g. adopted ordinance)                                                                                                                                 |

**After the project has opened bids**, please submit the following items to the designated Compliance Analyst/DOW Contact. It is imperative that the remaining standard conditions are fulfilled by the deadlines set forth in the Conditional Commitment Letter.

| Submit To: |                          |                                                                                                                    |
|------------|--------------------------|--------------------------------------------------------------------------------------------------------------------|
| DOW        | <input type="checkbox"/> | <b>Authority to Award (ATA) Package</b> , the Kentucky Division of Water will review and forward approval to KIA.  |
| DOW        | <input type="checkbox"/> | <b>Davis-Bacon prevailing wage rates</b> , the Kentucky Division of Water will review and forward approval to KIA. |
| KIA        | <input type="checkbox"/> | <b>Procurement and Wage Certification</b> (KIA sends to borrower after bid opening.)                               |
| KIA        | <input type="checkbox"/> | <b>Certification of obtainable revenue projections</b> (KIA sends to borrower after bid opening.)                  |
| DOW        | <input type="checkbox"/> | <b>Certification of clear site</b> (DOW will forward to KIA.)                                                      |
|            | <input type="checkbox"/> | <b>Plans and specifications approval</b> from the Kentucky Division of Water (DOW will send approval to KIA.)      |
| KIA        | <input type="checkbox"/> | <b>Public Service Commission (PSC) approval</b> , (CPCN and Authorization to Incur Debt) if applicable.            |

## TRANSPARENCY ACT REPORTING INFORMATION FORM

### CLEAN WATER STATE REVOLVING FUND AND DRINKING WATER STATE REVOLVING FUND

This form is required for projects funded in whole or in part from the Clean Water State Revolving Fund or the Drinking Water State Revolving Fund. This form is to be completed and returned with the signed Conditional Commitment Letter from the Kentucky Infrastructure Authority.

#### Borrower Information:

|                                                                     |  |
|---------------------------------------------------------------------|--|
| Name:                                                               |  |
| Unique Entity ID (generated by SAM.gov)*:                           |  |
| KIA Loan Number:                                                    |  |
| Street Address                                                      |  |
| City, State and Zip<br>(Zip must include 4 digit extension)         |  |
| Federal Congressional District(s) of Borrower Utility Service Area: |  |

\*If the Unique Entity ID provided above is registered under a different name than the recipient of funding, please provide the registration name below:

|                       |  |
|-----------------------|--|
| Unique Entity ID Name |  |
|-----------------------|--|

\*If the recipient has not yet obtained a Unique Entity ID, please do so no later than 30 days after the KIA Board approval date of your loan request and provide notification to KIA of the number once issued.

#### Physical Location of Project (Primary Place of Performance)

|                                                             |  |
|-------------------------------------------------------------|--|
| Street Address                                              |  |
| City, State and Zip<br>(Zip must include 4 digit extension) |  |
| Federal Congressional District(s) of Project Location       |  |

#### Reliance upon Federal Assistance (please answer the below questions Yes or No):

|                                                                                                                                                                                                                                                                      |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Did recipient receive 80% or more of its annual gross revenues from Federal procurement contracts (and subcontracts) and Federal financial assistance subject to the Transparency Act, as defined at 2 CFR 170.320 (and subawards) during the last fiscal year?      |  |
| Did recipient receive \$25 million or more in annual gross revenues from Federal procurement contracts (and subcontracts) and Federal financial assistance subject to the Transparency Act, as defined at 2 CFR 170.320 (and subawards) during the last fiscal year? |  |
| Does the public have access to compensation of senior executives of the recipient through periodic reports filed under Section 13A or 15D of the Securities Exchange Act of 1934 or Section 6104 of the Internal Revenue Code of 1986?                               |  |

Unique Entity ID Registration Information: <https://sam.gov>

KIA Loan # \_\_\_\_\_

**ACH DEBIT AUTHORIZATION FORM**

**AUTHORIZATION AGREEMENT FOR PRE-ARRANGED PAYMENTS  
(DEBITS)**

The undersigned hereby authorizes U.S. Bank National Association Corporate Trust Department (“U.S. Bank”) to initiate debit entries to the Checking ☐ Savings ☐ (specify type) account indicated below at the bank named below:

BANK NAME \_\_\_\_\_ BRANCH \_\_\_\_\_  
CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_  
BANK TRANSIT/ABA NO. \_\_\_\_\_ ACCOUNT NO. \_\_\_\_\_

This authority is to remain in full force and effect until U.S. Bank has received written notification from the undersigned of its termination in such time and in such manner as to afford U.S. Bank a reasonable opportunity to act. The undersigned has the right to stop payment of a debit entry by reasonable prior written notification to U.S. Bank. After the above account has been charged, the undersigned has the right to have the amount of any erroneous debit immediately credited to its account by U.S. Bank up to 30 days following issuance of a statement.

NAME OF ENTITY: \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
TAX IDENTIFICATION NUMBER: \_\_\_\_\_

By \_\_\_\_\_ Dated \_\_\_\_\_  
Authorized Signer

Send to: U.S. Bank via Email

[KentuckyInfrastructureAuth@usbank.com](mailto:KentuckyInfrastructureAuth@usbank.com)

**AUTHORIZATION FOR ELECTRONIC DEPOSIT  
OF BORROWER PAYMENT  
KENTUCKY INFRASTRUCTURE AUTHORITY  
KIA Loan # \_\_\_\_\_**

**Borrower Information:**

**Name:** \_\_\_\_\_

**Address:** \_\_\_\_\_

**City:** \_\_\_\_\_ **State:** KY **Zip:** \_\_\_\_\_

**Federal I.D. #:** \_\_\_\_\_ **Telephone:** \_\_\_\_\_

**Contact Name:** \_\_\_\_\_

**Email:** \_\_\_\_\_

**Financial Institution Information:**

**Bank Name:** \_\_\_\_\_

**Branch:** \_\_\_\_\_ **Telephone:** \_\_\_\_\_

**City:** \_\_\_\_\_ **State:** KY **Zip:** \_\_\_\_\_

**Transit / ABA No:** \_\_\_\_\_

**Account Name:** \_\_\_\_\_

**Account Number:** \_\_\_\_\_

I, the undersigned, authorize payments directly to the account indicated above and to correct any errors which may occur from the transactions. I also authorize the Financial Institution to post these transactions to that account.

**Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Name Printed:** \_\_\_\_\_ **Job Title:** \_\_\_\_\_

**Send to: U.S. Bank via Email**

[KentuckyInfrastructureAuth@usbank.com](mailto:KentuckyInfrastructureAuth@usbank.com)

**COMPLETE AFTER BID OPENING**

**STATEMENT OF APPROVAL  
OF PROJECTIONS OF REVENUE AND EXPENSES**

Borrower Name: \_\_\_\_\_

Loan No.: \_\_\_\_\_

I hereby certify that the revenue projections in the attached descriptions are still obtainable and that projections of operating expenses have not materially changed based on the “as-bid” budget submitted for the Project.

**Signed:** \_\_\_\_\_

\_\_\_\_\_  
**Borrower**

\_\_\_\_\_  
**Date**

# SAMPLE LETTER

[Letterhead of Counsel for Water Utility]

[Date]

Kentucky Infrastructure Authority  
1024 Capital Center Drive, Suite 340  
Frankfort, Kentucky 40601

RE: SRF Loan#  
City of xxxxx

Ladies and Gentlemen:

The undersigned is an attorney at law duly admitted to the practice of law in the Commonwealth of Kentucky and is legal counsel to the XXXXXXXXXXXXX, hereinafter referred to as the "Water Utility ". I am familiar with the organization and existence of the Water Utility and the laws of the Commonwealth applicable thereto. Additionally I am familiar with the water project (the "Project") with respect to which the funding commitment by and between the Kentucky Infrastructure Authority ("Authority") and the Water Utility.

I have reviewed the commitment letter by and between the Authority and the Water Utility and the documentation regarding wage rates and procurement with respect to the Project.

Based upon my review I am of the opinion that:

The Water Utility has prepared construction specifications in accordance with all applicable federal wage rate laws and that the procurement procedures including those for construction, land, equipment and professional services that are a part of the project are in compliance with all applicable federal, state and local procurement laws.

Respectfully,



## EZ VENDOR REGISTRATION APPLICATION

**A Vendor Number must be obtained on-line through the Kentucky Cabinet for Finance and Administration. This Vendor Number is *required for Grantee to receive payments from the Authority.***

[Vendor Registration Guide](#)

[Link to the Vendor Self Service Site](#)

**The Grantee's Vendor Number is \_\_\_\_\_.**

**Project Administrator: \_\_\_\_\_**

**Grant/Loan Number: \_\_\_\_\_**



**EXHIBIT E-3**

**NOTICE TO STATE LOCAL DEBT OFFICER**



August 20, 2026

Mr. Dennis Keene  
Commissioner and State Local Debt Officer  
100 Airport Road, 3rd Floor  
Frankfort, KY 40601

Re: Northern Kentucky Water District, PSC Case No. 2026-00223  
Notice of Intent to Issue Securities

Dear Mr. Keene:

Pursuant to the regulations of the Kentucky Public Service Commission, specifically 807 KAR 5:001: Section 18(1)(g), please be advised that the Northern Kentucky Water District (the "District") hereby notifies the State Local Debt Officer that the District may issue securities in the form of a bond anticipation note (a "BAN") for the purpose of funding several projects necessary for the District, including for Taylor Mill Treatment Plant Improvements with a \$3,500,000 estimated total budget, \$551,548 of which would be issued as part of the BAN.

Moreover, the District also notifies the State Local Debt Officer that the District intends on issuing securities in the form of a state revolving loan from the Kentucky Infrastructure Authority ("KIA") for the same purpose in the amount not to exceed \$2,948,452 through KIA Drinking Water Revolving Loan F25-009S.

We will file the appropriate documents with your office in accordance with the requirements of KRS 65.117 once the securities are issued.

Very truly yours,

The Northern Kentucky Water District

A handwritten signature in black ink that reads "Stacey Kampsen".

By: Stacey Kampsen  
Vice President of Finance & Support Services



## **EXHIBIT F**

### **FINANCIAL STATEMENTS (Balance Sheet and Income Statement)**

**NORTHERN KENTUCKY WATER DISTRICT**  
**STATEMENT OF NET POSITION**  
**JULY 31, 2026**

**ASSETS AND DEFERRED OUTFLOWS OF RESOURCES**

**Current Assets**

|                                                                     |               |
|---------------------------------------------------------------------|---------------|
| Cash and Cash Equivalents                                           | \$ 42,729,259 |
| Investments                                                         | 5,264,668     |
| Accounts Receivable                                                 |               |
| Customers, Net                                                      | 5,657,063     |
| Unbilled Customers                                                  | 11,000,000    |
| Others                                                              | 2,733,220     |
| Lease Receivable - Current                                          | 152,444       |
| Inventory Supplies for New Installation<br>and Maintenance, at Cost | 3,814,325     |
| Prepaid Items                                                       | 1,897,405     |
| Restricted Assets - Cash and Cash Equivalents                       |               |
| Bond Proceeds Fund                                                  |               |
| Debt Service Account                                                | 1,777,187     |
| Improvement, Repair & Replacement                                   | 16,597        |
|                                                                     | <hr/>         |
| Total Current Assets                                                | 75,042,168    |

**Noncurrent Assets**

|                                                       |             |
|-------------------------------------------------------|-------------|
| Lease Receivable                                      | 4,718,741   |
| Restricted Assets - Cash and Cash Equivalents         |             |
| Bond Proceeds Fund                                    | 2,193,816   |
| Debt Service Account                                  | 14,336,371  |
| Improvement, Repair and Replacement                   | 10,806,623  |
| Restricted Assets - Investments                       |             |
| Debt Service Reserve Account                          | 20,073,943  |
| Net Other Postemployment Benefits Asset               |             |
| Miscellaneous Deferred Charges                        | 9,295,545   |
| Subscription Assets, Net of Amortization              | 1,602,725   |
|                                                       | <hr/>       |
| Capital Assets                                        |             |
| Land, System, Buildings and Equipment                 | 584,157,325 |
| Construction in Progress                              | 46,442,907  |
|                                                       | <hr/>       |
| Total Capital Assets                                  | 630,600,232 |
| Less Accumulated Depreciation                         | 243,516,423 |
|                                                       | <hr/>       |
| Total Capital Assets, Net of Accumulated Depreciation | 387,083,809 |
|                                                       | <hr/>       |
| Total Noncurrent Assets                               | 450,111,573 |
|                                                       | <hr/>       |
| Total Assets                                          | 525,153,741 |

**Deferred Outflows of Resources**

|                                      |           |
|--------------------------------------|-----------|
| Deferred Outflows Related to Pension | 1,952,596 |
| Deferred Outflows Related to OPEB    | 1,751,301 |
| Deferred Loss on Refundings          | 1,308,001 |
|                                      | <hr/>     |
| Total Deferred Outflows of Resources | 5,011,898 |

**Total Assets and Deferred Outflows of Resources**      \$ 530,165,639

**NORTHERN KENTUCKY WATER DISTRICT**  
**STATEMENT OF NET POSITION**  
**JULY 31, 2026**

**LIABILITIES, DEFERRED INFLOWS OF RESOURCES, AND NET POSITION**

**Liabilities and Deferred Inflows of Resources**

**Current Liabilities**

|                                       |               |
|---------------------------------------|---------------|
| Bond Indebtedness                     | \$ 14,193,333 |
| Notes Payable                         | 2,663,361     |
| Subscription Liability - Current      | 57,997        |
| Accounts Payable                      | 337,536       |
| Accrued Payroll and Taxes             | 612,011       |
| Accrued Subscription Interest         | 47,073        |
| Compensated Absences                  | 280,756       |
| Arbitrage Liability                   |               |
| Other Accrued Liabilities             | 268,820       |
| Liabilities Payable-Restricted Assets |               |
| Accrued Interest Payable              | 1,777,187     |
| Accounts Payable                      | 16,597        |
|                                       | <hr/>         |
| Total Current Liabilities             | 20,254,671    |

**Long-Term Liabilities (Net of Current Portion)**

|                                       |             |
|---------------------------------------|-------------|
| Liabilities Payable-Restricted Assets |             |
| Accounts Payable                      | 1,466,236   |
| Compensated Absences                  | 2,130,048   |
| Arbitrage Liability                   | 1,236,217   |
| Bond Indebtedness                     | 81,507,891  |
| Notes Payable                         | 29,942,588  |
| Subscription Liability - Noncurrent   | 1,686,738   |
| Net Pension Liability                 | 19,901,919  |
| Net Unfunded OPEB Liability           | 343,712     |
|                                       | <hr/>       |
| Total Long-Term Liabilities           | 138,215,349 |
|                                       | <hr/>       |
| Total Liabilities                     | 158,470,020 |

**Deferred Inflows of Resources**

|                                                     |             |
|-----------------------------------------------------|-------------|
| Deferred Inflows Related to Pension                 | 2,134,489   |
| Deferred Inflows Related to OPEB                    | 4,303,180   |
| Deferred Inflows Related to Leases                  | 4,329,874   |
| Deferred Gain on Refundings                         | 277,439     |
|                                                     | <hr/>       |
| Total Deferred Inflows of Resources                 | 11,044,982  |
|                                                     | <hr/>       |
| Total Liabilities and Deferred Inflows of Resources | 169,515,002 |

**Net Position**

|                                  |             |
|----------------------------------|-------------|
| Net Investment in Capital Assets | 259,807,198 |
| Restricted For                   |             |
| Debt Service Funds               | 34,410,314  |
| Capital Improvement Projects     | 11,534,203  |
| Unrestricted                     | 54,898,922  |
|                                  | <hr/>       |
| Total Net Position               | 360,650,637 |

|                                                                               |                              |
|-------------------------------------------------------------------------------|------------------------------|
| <b>Total Liabilities, Deferred Inflows<br/>of Resources, and Net Position</b> | <b>\$ <u>530,165,639</u></b> |
|-------------------------------------------------------------------------------|------------------------------|

**NORTHERN KENTUCKY WATER DISTRICT**  
**STATEMENT OF REVENUES, EXPENSES AND CHANGES IN NET POSITION**  
**12 MONTH PERIOD ENDED JULY 31, 2026**

**Operating Revenues**

|                      |                |
|----------------------|----------------|
| Water Sales          | \$ 70,345,921  |
| Forfeited Discounts  | 968,511        |
| Rents From Property  | 280,646        |
| Other Water Revenues | <u>304,562</u> |

|                          |                   |
|--------------------------|-------------------|
| Total Operating Revenues | <u>71,899,640</u> |
|--------------------------|-------------------|

**Operating Expenses**

|                                   |                   |
|-----------------------------------|-------------------|
| Operating and Maintenance Expense | 42,807,832        |
| Depreciation Expense              | <u>14,307,721</u> |

|                          |                   |
|--------------------------|-------------------|
| Total Operating Expenses | <u>57,115,553</u> |
|--------------------------|-------------------|

|                      |                   |
|----------------------|-------------------|
| Net Operating Income | <u>14,784,087</u> |
|----------------------|-------------------|

**Non-Operating Income (Expense)**

|                                                    |             |
|----------------------------------------------------|-------------|
| Investment Income                                  | 3,610,301   |
| Miscellaneous Non-Operating Income/(Expense)       | 95,522      |
| Grant Revenue                                      | 12,371,462  |
| Settlement Proceeds                                | 8,630,526   |
| Loss on Abandonment of Mains                       | (306,725)   |
| Gain/(Loss) on Disposal of Fixed Assets            | 105,656     |
| Interest on Long Term Debt                         | (3,750,313) |
| Pension Expense                                    | 1,114,392   |
| Other Post Employment Benefit Expense              | 1,323,183   |
| Arbitrage Expense                                  | (431,800)   |
| Amortization of Debt Premiums and Defeasance Costs | 1,570,787   |
| Bond Issuance Costs                                | <u>-</u>    |

|                                       |                   |
|---------------------------------------|-------------------|
| Total Non-Operating Income (Expenses) | <u>24,332,991</u> |
|---------------------------------------|-------------------|

|                                                     |            |
|-----------------------------------------------------|------------|
| Change in Net Position Before Capital Contributions | 39,117,078 |
|-----------------------------------------------------|------------|

**Capital Contributions**

|  |                  |
|--|------------------|
|  | <u>1,845,641</u> |
|--|------------------|

|                        |            |
|------------------------|------------|
| Change in Net Position | 40,962,719 |
|------------------------|------------|

**Net Position - Beginning of Year**

|  |                    |
|--|--------------------|
|  | <u>319,687,918</u> |
|--|--------------------|

**Net Position - End of Year**

|  |                              |
|--|------------------------------|
|  | <u><u>\$ 360,650,637</u></u> |
|--|------------------------------|



## **EXHIBIT G**

## **AFFIDAVIT**





### AFFIDAVIT

Comes now the affiant, STACEY KAMPSEN, after first being duly sworn and cautioned, states as follows:

1. That she is the Vice President of Finance and Support Services;
2. That she is authorized to submit this Application on behalf of the Northern Kentucky Water District;
3. That the information contained in the Application and its Exhibits are true and correct to the best of her knowledge and belief except as to those matters that are based on information provided to her and as to those she believes to be true and correct.

Further Affiant sayeth naught.

8/20/26  
Date

*Stacey Kampsen*  
**Stacey Kampsen**

COMMONWEALTH OF KENTUCKY :  
: SS  
COUNTY OF KENTON :

The foregoing instrument was subscribed and sworn before me by Stacey Kampsen this 20th day of August, 2026

*[Signature]*  
Notary Public, Kentucky at Large  
Notary ID Number: KYNP107891  
My Commission Expires: 01/08/2030