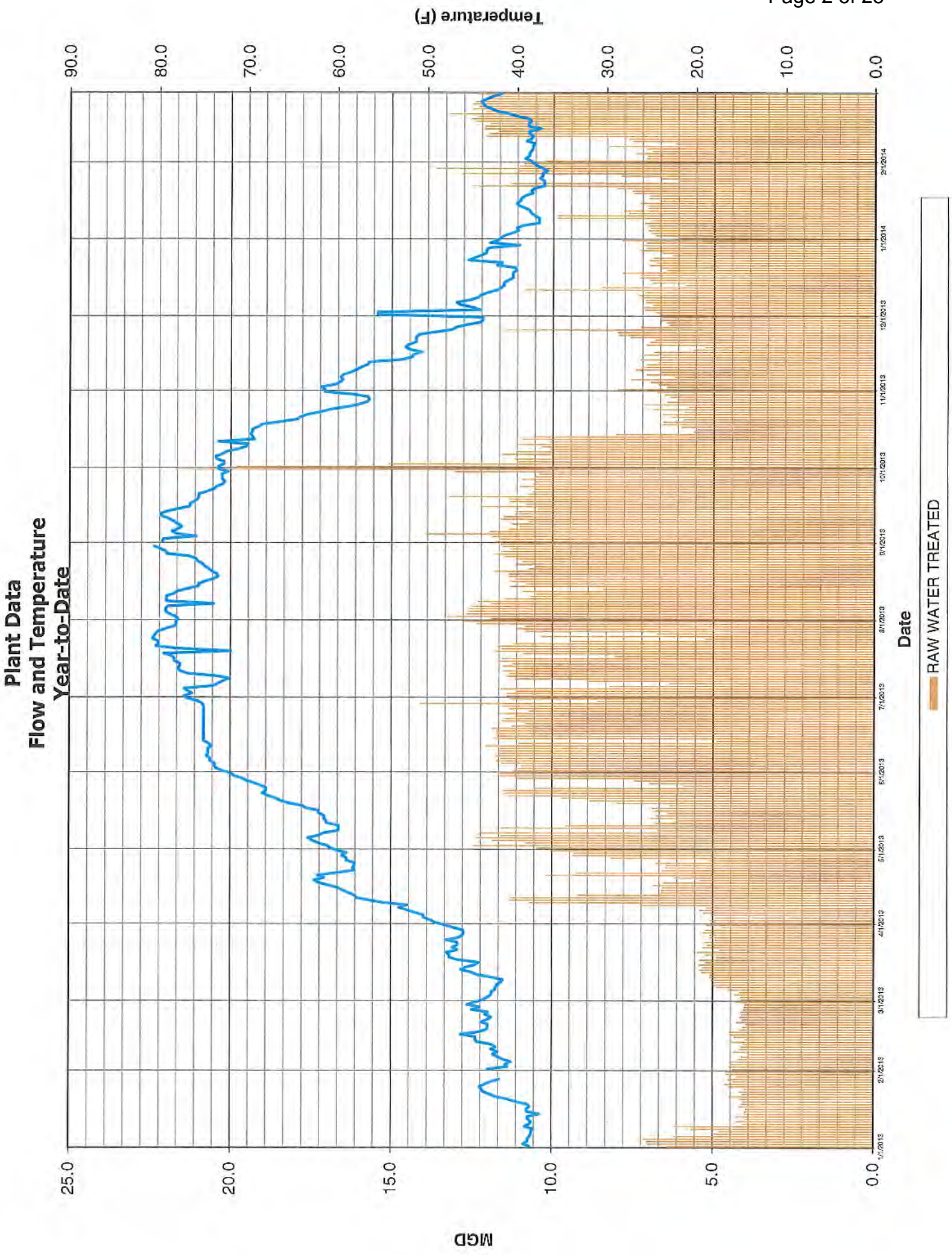
MEETING WITH KDOW
Kentucky American Water
Richmond Road Station WTP – Filter Building Replacement
Lexington, KY
June 12, 2014 – 10:00 AM

Attendance: **Mark Rasche KDOW**
Julie Roney KDOW
Mortaza Tabayeh, KDOW
Zach Dukes KAW
Bret Casey H&S

- Prior to the meeting, H&S provided a summary of the plant operating data that was used to determine the sizing criteria for the CT contactor. The graph of this data is attached to the meeting minutes.
- H&S explained that the sizing was based on a low temperature of 7.2°C in March and a maximum flow in March of 18 mgd. This flow in significantly higher than the historic flows in March and therefore is conservative and allows for future increases in demand. H&S also explained that the raw water chlorination point would be kept as a backup. The construction of the CT basin will allow for the primary chlorination point to be moved downstream of the filters. In the event that additional CT would be needed, KAW would have the ability to feed chlorine to the raw water to gain additional CT. KDOW agreed with the sizing criteria and the revised chlorine feed approach.
- H&S walked through the drawings that were submitted to KDOW for approval. KDOW did not have any other questions or comments regarding the drawings that were submitted.
- KDOW indicated that they would expedite the review and approval of the drawings.


Plant Data
Flow and Temperature
Year-to-Date
Temperature (F)
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
MGD
25.0
20.0
15.0
10.0
5.0
0.0
Date
RAW WATER TREATED

RE: Plan Approval Letter 796.rtf

Tabayeh, Mortaza (EEC) to: Zachery.Dukes@amwater.com 06/30/2014 03:01 PM

History: This message has been replied to and forwarded.

This is a general statement in the approval and you cover by this statement.

-----Original Message-----
From: Zachery.Dukes@amwater.com [mailto:Zachery.Dukes@amwater.com]
Sent: Monday, June 30, 2014 1:39 PM
To: Tabayeh, Mortaza (EEC)
Subject: Re: Plan Approval Letter796.rtf

Mortaza,
What is the reason behind stipulation (g)? We don't currently meet that requirement at the RRS Plant as we previously stated during our meetings....

Zach

Zachery B. Dukes, P.E.
Project Manager Engineer
Kentucky American Water
2300 Richmond Road
Lexington, KY 40502

Office (859) 268-6352
Cell (859) 537-0750
zachery.dukes@amwater.com
www.amwater.com

From: "Tabayeh, Mortaza (EEC)" <Mortaza.Tabayeh@ky.gov>
To: "Hulette, Lisa (PPC)" <Lisa.Hulette@ky.gov>, "Wakim, George W (PSC)" <GeorgeW.Wakim@ky.gov>,
Cc: "Zachery.Dukes@amwater.com" <Zachery.Dukes@amwater.com>
Date: 06/30/2014 11:52 AM
Subject: Plan Approval Letter796.rtf

[attachment "Plan Approval Letter796.rtf" deleted by Zachery B. Dukes/KAWC/AWWSC]

Plan Approval Letter 796.rtf

Tabayeh, Mortaza (EEC) to: Hulette, Lisa (PPC), Wakim, George W (PSC) 06/30/2014 11:52 AM

Cc: "Zachery.Dukes@amwater.com"

History: This message has been replied to and forwarded.

Plan Approval Letter796.rtf

RE: AI#1063-KY American Water Co .-Richmond Road Station WTP Improvements -Project Assigned

Tabayeh, Mortaza (EEC) to: Zachery.Dukes@amwater.com 06/23/2014 09:28 AM

History: This message has been forwarded.

It is waiting for approval signature.

-----Original Message-----
From: Zachery.Dukes@amwater.com [mailto:Zachery.Dukes@amwater.com]
Sent: Monday, June 23, 2014 9:16 AM
To: Tabayeh, Mortaza (EEC)
Subject: RE: AI#1063-KY American Water Co.-Richmond Road Station WTP Improvements-Project Assigned

Mortaza,
Any updates on this permit?

Thanks,
Zach

Zachery B. Dukes, P.E.
Project Manager Engineer
Kentucky American Water
2300 Richmond Road
Lexington, KY 40502

Office (859) 268-6352
Cell (859) 537-0750
zachery.dukes@amwater.com
www.amwater.com

From: "Tabayeh, Mortaza (EEC)" <Mortaza.Tabayeh@ky.gov>
To: "Zachery.Dukes@amwater.com" <Zachery.Dukes@amwater.com>,
Date: 06/17/2014 03:10 PM
Subject: RE: AI#1063-KY American Water Co.-Richmond Road Station WTP Improvements-Project Assigned

The project is under review and will be finished by next week.

-----Original Message-----
From: Zachery.Dukes@amwater.com [mailto:Zachery.Dukes@amwater.com]
Sent: Tuesday, June 17, 2014 3:00 PM
To: Doss, Lissa (EEC)
Cc: 'BCasey@hazenandsawyer.com'; Tabayeh, Mortaza (EEC)
Subject: Re: AI#1063-KY American Water Co.-Richmond Road Station WTP Improvements-Project Assigned

Mortaza,
I just wanted to check in on the status of your review for our Richmond Road Station Filter Building project. I appreciate you taking the time to meet with us last week to discuss the project.

Thanks,
Zach

Zachery B. Dukes, P.E.
Project Manager Engineer
Kentucky American Water
2300 Richmond Road
Lexington, KY 40502

Office (859) 268-6352
Cell (859) 537-0750
zachery.dukes@amwater.com
www.amwater.com

From: "Doss, Lissa (EEC)" <Lissa.Doss@ky.gov>
To: "'BCasey@hazenandsawyer.com'" <BCasey@hazenandsawyer.com>,
Cc: "'Zachery.Dukes@amwater.com'" <Zachery.Dukes@amwater.com>, "Tabayeh, Mortaza (EEC)" <Mortaza.Tabayeh@ky.gov>
Date: 05/20/2014 09:49 AM
Subject: AI#1063-KY American Water Co.-Richmond Road Station WTP Improvements-Project Assigned

Good Morning Mr. Casey,

We received your submittal for the Richmond Road Station WTP Improvements and it has been assigned today to Mortaza Tabayeh at extension 4826 or email Mortaza.Tabayeh@ky.gov . If you have any questions please call or email us anytime.

Thank you and have a nice day.
Lissa

Lissa Doss
Lissa Doss
Engineering Section
Water Infrastructure Branch
Division of Water
200 Fair Oaks Lane
4th Floor
Frankfort, KY 40601
502-564-3410 ext. 4801
Lissa.Doss@ky.gov

RE: AI#1063-KY American Water Co .-Richmond Road Station WTP Improvements -Project Assigned

Doss, Lissa (EEC) to: 'Zachery.Dukes@amwater.com' 06/17/2014 04:08 PM
Cc: "Tabayeh, Mortaza (EEC)"

History: This message has been replied to.

Good Afternoon Zachery,
Mortaza has already left for the day. I will have to let him update you on the status because once the projects are assigned to the engineers I have to talk with them to see where in line the project is for review. He should be here tomorrow so he can call or email you then hopefully. Sorry I couldn't be more helpful tonight.
Thanks,
Lissa

-----Original Message-----
From: Zachery.Dukes@amwater.com [mailto:Zachery.Dukes@amwater.com]
Sent: Tuesday, June 17, 2014 3:00 PM
To: Doss, Lissa (EEC)
Cc: 'BCasey@hazenandsawyer.com'; Tabayeh, Mortaza (EEC)
Subject: Re: AI#1063-KY American Water Co.-Richmond Road Station WTP Improvements-Project Assigned

Mortaza,
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Thanks,
Zach

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Project Manager Engineer
Kentucky American Water
2300 Richmond Road
Lexington, KY 40502

Office (859) 268-6352
Cell (859) 537-0750
zachery.dukes@amwater.com
www.amwater.com

From: "Doss, Lissa (EEC)" <Lissa.Doss@ky.gov>
To: "'BCasey@hazenandsawyer.com'" <BCasey@hazenandsawyer.com>,
Cc: "'Zachery.Dukes@amwater.com'" <Zachery.Dukes@amwater.com>,
"Tabayeh, Mortaza (EEC)" <Mortaza.Tabayeh@ky.gov>
Date: 05/20/2014 09:49 AM
Subject: AI#1063-KY American Water Co.-Richmond Road Station WTP Improvements-Project Assigned

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Mortaza.Tabayeh@ky.gov . If you have any questions please call or email us anytime.

Thank you and have a nice day.
Lissa

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200 Fair Oaks Lane
4th Floor
Frankfort, KY 40601
502-564-3410 ext. 4801
Lissa.Doss@ky.gov

RE: AI#1063-KY American Water Co .-Richmond Road Station WTP Improvements -Project Assigned

Tabayeh, Mortaza (EEC) to: Zachery.Dukes@amwater.com 06/17/2014 03:10 PM

History: This message has been replied to.

The project is under review and will be finished by next week.

-----Original Message-----
From: Zachery.Dukes@amwater.com [mailto:Zachery.Dukes@amwater.com]
Sent: Tuesday, June 17, 2014 3:00 PM
To: Doss, Lissa (EEC)
Cc: 'BCasey@hazenandsawyer.com'; Tabayeh, Mortaza (EEC)
Subject: Re: AI#1063-KY American Water Co.-Richmond Road Station WTP Improvements-Project Assigned

Mortaza,
I just wanted to check in on the status of your review for our Richmond Road Station Filter Building project. I appreciate you taking the time to meet with us last week to discuss the project.

Thanks,
Zach

Zachery B. Dukes, P.E.
Project Manager Engineer
Kentucky American Water
2300 Richmond Road
Lexington, KY 40502

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Cell (859) 537-0750
zachery.dukes@amwater.com
www.amwater.com

From: "Doss, Lissa (EEC)" <Lissa.Doss@ky.gov>
To: "'BCasey@hazenandsawyer.com'" <BCasey@hazenandsawyer.com>,
Cc: "'Zachery.Dukes@amwater.com'" <Zachery.Dukes@amwater.com>,
"Tabayeh, Mortaza (EEC)" <Mortaza.Tabayeh@ky.gov>
Date: 05/20/2014 09:49 AM
Subject: AI#1063-KY American Water Co.-Richmond Road Station WTP Improvements-Project Assigned

Good Morning Mr. Casey,

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Thank you and have a nice day.
Lissa

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Lissa Doss
Engineering Section
Water Infrastructure Branch
Division of Water
200 Fair Oaks Lane
4th Floor
Frankfort, KY 40601
502-564-3410 ext. 4801
Lissa.Doss@ky.gov

RE: Richmond Rd. WTP
Casey, Bret to: Tabayeh, Mortaza (EEC) 06/03/2014 09:03 AM
Cc: "Zachery.Dukes@amwater.com"
History: This message has been replied to.

Attached is the data that we based our CT calculations on (blue line on graph is temperature). We based our calculations on a spring time temperature in March of 7.2 C. The future max flow in March is estimated to be 18 mgd. This is significantly higher than the historic flows in March. So the design condition of 18 mgd at 7.2 C is conservative and provides for a future increase in demand.

Please let me know if you have any other questions or need additional information to complete your review. Thank you.

From: Tabayeh, Mortaza (EEC) [mailto:Mortaza.Tabayeh@ky.gov]
Sent: Monday, June 02, 2014 9:52 AM
To: Casey, Bret
Subject: Richmond Rd. WTP

Good Morning,

Would you please send me documents to support design capacity in the different temperatures in order to finish my review.

Mortaza Tabayeh

MOR Summary_CT Data.xlsx

AI#1063-KY American Water Co .-Richmond Road Station WTP Improvements -Project Assigned

Doss, Lissa (EEC) to: 'BCasey@hazenandsawyer.com' 05/20/2014 09:49 AM
Cc: "'Zachery.Dukes@amwater.com'", "Tabayeh, Mortaza (EEC)"

History: This message has been replied to.

Good Morning Mr. Casey,

We received your submittal for the Richmond Road Station WTP Improvements and it has been assigned today to Mortaza Tabayeh at extension 4826 or email Mortaza.Tabayeh@ky.gov . If you have any questions please call or email us anytime.

Thank you and have a nice day.
Lissa

Lissa Doss

LISSA DOSS
ENGINEERING SECTION
WATER INFRASTRUCTURE BRANCH
DIVISION OF WATER
200 FAIR OAKS LANE
4TH FLOOR
FRANKFORT, KY 40601
502-564-3410 EXT. 4801
LISSA.DOSS@KY.GOV

RE: KDOW Drawings
Melton, Lisa to: Zachery.Dukes@amwater.com 05/09/2014 01:51 PM
Cc: "Green, Robert", "Casey, Bret"

Zach,

Attached is the compiled construction application for KDOW. The drawings are large, so I will post them and the spec on the FTP site. The hard copies I send will also have a cd with this same information.

Thank You,

Lisa

From: Melton, Lisa
Sent: Thursday, May 08, 2014 6:15 PM
To: 'Zachery.Dukes@amwater.com'
Cc: Green, Robert; Casey, Bret
Subject: KDOW Drawings

Zach,

Attached are the regulatory drawings and specifications for reference. We will be sending hard copies in the mail (5 sets 11x17 drawings, 2 specs). Please advise if you need additional copies.

One final piece of information noted for the construction application is number of connections for your service areas. Please advise if you have this available.

Thanks in advance,
Lisa

Lisa Melton

Assistant Engineer | Hazen and Sawyer
7870 E. Kemper Road, Suite 300, Cincinnati, OH 45249
513 469-2750 (main) | 513 469-5158 (direct)
lmelton@hazenandawyer.com | hazenandsawyer.com

KDOW_RRS Construction Application_2014-05-09.pdf

HAZEN AND SAWYER
Environmental Engineers & Scientists

444 Lewis Hargett Circle
Suite 260
Lexington, KY 40503

859-219-1126
hazenandsawyer.com

May 9, 2014

Mr. Mark Rasche, Engineering Manager
Water Infrastructure Branch
DEP Division of Water
200 Fair Oaks Lane, Fourth Floor
Frankfort, KY 40601

Re: Kentucky American Water (KAW) – Richmond Road Station – Application for Construction Permit

Dear Mr. Rasche:

On behalf of Kentucky American Water, Hazen and Sawyer is submitting this permit application package for construction of a new filtration building and a chlorine contact/washwater supply basin to replace the existing filter building and the clearwell beneath the existing filter building at their Richmond Road Station, located at 2300 Richmond Road, Lexington, KY 40502. We appreciate the time you took to meet and discuss this project. As a member of KDOW's Excel program, Kentucky American Water would like to exercise the expedited review privileges that accompany their membership. Our submittal includes the following documents:

- Letter from the facility owner approving of the submitted information
- Construction permit application
- Check for the application review fee
- Engineering plans for general, civil and process mechanical
- Specifications for process equipment and instrumentation
- Basis of design information on the CT contactor

The Richmond Road Station filter complex was originally constructed in 1924, with additions in 1937, 1938 and 1953. The current rated capacity of the filter complex is 25 mgd. Beneath the original and the 1937 and 1938 filters a clearwell was constructed with a total capacity of 600,000 gallons. Under this proposed project the filter building and clearwell will be demolished. In replacement, this project proposes a new filter building with a firm capacity (one filter out of service) of 25 mgd. The Richmond Roads Station also has a second clearwell with a volume of approximately 450,000 gallons, which will remain in service after the completion of this project.

To replace the lost capacity of the demolished clearwell under the filter complex, this project proposes a new structure, which will serve as a chlorine contact basin and filter washwater supply storage facility. The entire new structure will be approximately 425,000 gallons in volume. The chlorine contact basin, or CT contactor, will be approximately 275,000 gallons, will be highly baffled, will be divided into two cells, and will be fitted with a weir at the effluent of each cell to maintain the contactor full of water at all times. The basis of design information submitted in this package stipulates the parameters on how disinfection requirements of the Surface Water Treatment Rule (SWTR) will be achieved in this CT contactor. Under the proposed plan of operation with these new facilities, the plant will no longer rely on the remaining

HAZEN AND SAWYER
Environmental Engineers & Scientists

finished water clearwell to provide CT credit for satisfying the requirements of the SWTR. In addition and attached to the CT contactor a compartment of approximately 150,000 gallons will be provided for filter washwater supply. The volume contained in this filter washwater supply compartment is solely for washing filters and is not considered as part of the disinfection strategy. The washwater supply compartment is configured to be filled from either the CT contactor or from the high service discharge piping, providing a level of redundancy. Two pumps (one duty, one stand-by) taking suction from this compartment will be used for the filter backwash process.

In summary, the existing plant facilities provide a total volume of approximately 1,100,000 gallons used for: 1) plant storage, 2) disinfection contact time, and 3) filter washing. Under the proposed plan, the total volume to perform these exact same functions will be reduced to 875,000 gallons. Having said that, the ability to achieve chlorine contact in compliance with the SWTR will be markedly enhanced with the dedicated, highly baffled CT contactor. Other factors to be noted by KDOW in their consideration of this minor reduction in storage volume are the following:

- KAW proposes to operate this plant as a base load station, reducing the daily fluctuations in finished water flow rate and reducing the burden on the finished water storage to dampen those fluctuations.
- KAW's average daily demand in the system is approximately 41 mgd, and recent maximum daily demand of approximately 68 mgd.
- KAW maintains three water plants in the Lexington service area with a total rated capacity of 85 mgd (Kentucky River Station 1 – 40 mgd, Kentucky River Station 2 – 20 mgd, Richmond Road Station – 25 mgd), which adequately satisfies the recent maximum daily demand.
- The three plants combined have approximately 5 mg of plant storage and 27.5 mg of distribution system storage.
- Emergency generator capabilities include 20 mgd capacity at Richmond Road Station and 10 mgd at Kentucky River Station 2.

In closing, we will appreciate your expedited review of this submittal package for permitting the construction of this project. Additionally, we believe that the proposed filter building and CT contactor/washwater supply basin will enhance the overall treatment process and this plant's ability to continue to comply with the requirements of the SWTR and the Safe Drinking Water Act in total. Please feel free to contact me at (614) 781-9655 should you have any questions or require additional information.

Very Truly Yours,
HAZEN AND SAWYER, P.S.C.

Bret M. Casey, P.E., BCEE
Senior Associate

Enclosure

KENTUCKY
AMERICAN WATER

Mr. Mark Rasche, Engineering Manager
Water Infrastructure Branch
DEP Division of Water
200 Fair Oaks Lane, Fourth Floor
Frankfort, KY 40601

Re: **Kentucky American Water (KAW) – Richmond Road Station** – Application for Construction Permit

Dear Mr. Rasche:

Kentucky American Water approves of the permit application package submitted by Hazen and Sawyer on our behalf for construction of a new filtration building and a chlorine contact/washwater supply basin to replace the existing filter building and the clearwell beneath the existing filter building at our Richmond Road Station, located at 2300 Richmond Road, Lexington, KY 40502.

Should you have any questions, comments or concerns please feel free to contact me at (859) 537-0750.

Cordially,

Zachery B. Dukes, PE
Project Manager Engineer
Kentucky American Water Company

Form DW-2

Commonwealth of Kentucky
Energy and Environment Cabinet
Division of Water

Construction Application
For Drinking Water Treatment

See the instructions for more information about selected portions of this application.
Questions on completing this application? Contact the Water Infrastructure Branch at 502/564-3410, by e-mail at WIBEngineering@ky.gov or visit our website at http://water.ky.gov for more information.

I. Treatment Project Information

Project Name: Richmond Road Station Water Treatment Plant Improvements

Project County: Lexington-Fayette Urban Co Estimated Project Cost: $11,482,000.00

Project Latitude/Longitude (DMS): N38-00-50, W84-27-50

Is this a federally funded project:

- ☐ DWSRF
- ☐ SPAP
- ☐ Other: _____

If yes, has an Environmental Information Document (EID) been reviewed and approved? _____

If the project has been submitted to the State Clearinghouse for review, provide the SAI number: _____

Identify all other funding sources: Privately funded

Does this project modify an existing water treatment plant? Yes

Provide a DETAILED description of work to be performed for this project. Attach additional sheets as necessary:

Improvements include new filter building, with eight (8) dual-media filters; new chlorine contact basin; relocation of chemical feed points; new backwash tank with backwash pumps; new yard piping; and associated civil, electrical, HVAC changes to support the proposed process improvements.

Identify how the sanitary wastewater produced as a result of this project will be handled:

- ☒ Sanitary Sewer WWTP: _____
- ☐ Septic Tank
- ☐ Other: _____

II. Utility Information

Utility Name: Kentucky American Water PWSID: KY0340250

Street Address: 2300 Richmond Rd County: Lexington-Fayette Urban Co

City, State, Zip: Lexington, KY 40502

Phone #: 859-268-6352 Fax #: 859-268-6327 Email: Zachery.Dukes@amwater.com

Is the system currently under any type of waterline sanctions or Agreed Orders? No

If yes, will this project satisfy the terms of or alleviate an agreed order, water budget or any other form of sanction? _____

If yes, describe: _____

III. Design Considerations

A. Plans and Specifications

Plans and specifications shall comply with **401 KAR 8:100** and **"Recommended Standards for Water Works" 2007 Edition (Ten States' Standards)**. All plans must contain a P.E. seal, signature and date of signature with at least one set having an original seal and signature. Provide detailed plans **(no larger than 24" X 36")** which must comply with **401 KAR 8:100**. See the instructions for additional details.

B. Design Engineer

Name: Bret Casey, P.E. Firm: Hazen and Sawyer

Street Address: 444 Lewis Hargett Circle, Suite 260

City, State, Zip: Lexington, KY 40503

Phone #: 614-781-9655 Fax #: 859-217-1134 Email: BCasey@hazenandsawyer.com

C. Design Capacities

Communities Served: Bourbon, Clark, Fayette, Harrison, Jessamine, Scott, Woodford

Identify the number of connections in the service area: 121,260

Current Treatment Plant Design Capacity: 25 MGD Proposed Treatment Plant Design Capacity: 25 MGD

Has a Preliminary Engineering Report been submitted and approved? No

Have Water Withdrawal and KPDES permits been updated? No

KPDES Permit # _____ Water Withdrawal Permit # _____

What type of treatment is/will be used:

- ☐ Conventional
- ☐ Ballasted Flocculation
- ☐ Membrane
- ☐ Dissolved Air Flotation
- ☐ Other: _____

Is pilot study data provided? No

D. Other Information to be Submitted with Project

1. Site

☒ *Provide a copy of the U.S.G.S. 7 ½ minute topographic map with the location(s) of the proposed project.*

What is the 100 year flood elevation for the project site? 973.6

What is the 500 year flood elevation or flood of record for the project site? 974.2

2. Intake and Raw Water Transmission

Provide the Latitude and Longitude (DMS) of the intake and River Mile Index if known:

Latitude: _____ Longitude: _____ River Mile Index: _____

What is the raw water source? _____

Provide water level elevations for surface water sources:

Low Level: _____

Normal Level: _____

Flood Level: _____

For surface water sources, what type of intake will be used?

☐ Floating

☐ Screened

☐ Wet Well

☐ Other: _____

Does the intake have the capability to draw from multiple levels? _____ If yes, explain: _____

_____

Is the intake screened? _____

Is a method for cleaning provided? _____ If yes, describe: _____

_____

Where is the raw water sample tap located? _____

Are any chemicals fed at the intake? _____ If yes, list: _____

_____

Is the intake more than 5 miles downstream or 1,000 ft upstream of any sewage outfall? _____

What is the flow rate into the intake? _____

If a groundwater source is used:

Number of Wells: _____ Well Capacities: _____

☐ *Provide water quality and quantity data for test wells.*

Raw Water Pump Data:

Number of Pumps	Capacity (GPM)	TDH	Power (HP)

Are variable frequency drives (VFD) to be used? _____

☐ *Provide proposed pump's characteristic curve along with the efficiency, horsepower and NPSHR data.*

Raw Water Transmission Main Data:

Waterline Material	Waterline Size	Linear Feet

Are any chemicals fed in the raw water transmission main or wet-well? _____

If yes, list: _____

3. Pretreatment/Equalization

Basin Volume: _____ Dimensions: _____

Purpose: _____

Are any chemicals fed here? _____ List the chemicals fed along with the feed locations: _____

_____

Is aeration used? _____ If yes, purpose and type: _____

_____

Are provisions to feed carbon provided? _____ Rate: _____

4. Rapid Mix

Type of Rapid Mix:

- ☐ Static Mixer
- ☐ Conventional Rapid Mix
- ☐ Other: _____

Number of Mixing Basins: _____ Volume: _____ Dimension: _____

Retention Time: _____ Velocity Gradient (G): _____

5. Flocculation

Number of trains: _____ Number of Stages: _____

Basin Volume: _____ Dimensions: _____

Detention Time: _____ Flow through Rate: _____

Mixer Speed (sec): _____ Is the flocculation speed tapered through the process? _____

6. Sedimentation

Flow Velocity from Flocculation to Sedimentation: _____

Volume: _____ Dimensions: _____

Flow Through Velocity: _____ Detention Time: _____

Overflow Rate (gpm/ft^2): _____ Weir Loading Rate (gpd/ft): _____

Are tube settlers to be used? _____ Dimensions: _____

Are Plate Settlers Used? _____ Dimensions: _____

What percentage of the projected horizontal plate area is the overflow rate for plate settlers based? _____

Is a sludge collection system provided? _____ Describe: _____

_____

Is Ballasted Flocculation used? _____

If yes, provide the following:

Number of trains: _____ Capacity: _____ Basin Volumes: _____

Basin Dimensions: _____ Retention Time: _____

Number of Hydrocyclones: _____ Hydrocyclone Capacity (GPM): _____

Number of Recycle Pumps: _____ Recycle Pump Capacity (GPM): _____

Overflow Rate (GPM/ft^2): _____ Number of Contact Basins: _____

Contact Basin Volume: _____ Contact Basin Dimensions: _____

Contact Time: _____

7. Filtration

Granular Media

Type of Filtration: Rapid - Dual Media Number of Filters: Eight

Filter Area: 496 sq ft Total Filter Box Depth: 17 feet

Media	Depth	Effective Size	Uniformity Coefficient
Sand	12 inches	0.45 to 0.55 mm	<1.4
GAC	24 inches	1.0 to 1.1 mm	< 1.5

Filtration Rate at Design Capacity: 5 gpm/sf

Number of Backwash Pumps	Capacity	TDH	Power (HP)
Two (2)	10,000 gpm	32 ft	140

Backwash Rate: 20 gpm/sf

What is the source of the wash water supply? Filtered Water

Is air scouring or surface wash utilized? Yes Which? Air Scour

Number of Backwash Troughs: Four / filter Dimensions: 21-in (w) x 21-in (d)

Design Flow (gpm): 2,480 Distance from media surface to bottom of backwash trough: 4'-9"

Are rate of flow controllers provided for backwashing? Yes

Is filter-to-waste capability provided? Yes

Turbidimeter Locations:

- ☐ Raw Water
- ☐ Top of Filter
- ☒ Individual Filter Effluent (prior to filter-to-waste)
- ☒ Combined Filter Effluent
- ☐ Other: _____

Membranes

Type of membrane: _____ Capacity: _____ # of Skids: _____

Water Flux Rate (gpd/ft^2): _____ Permeate Recovery (%): _____

Operating Pressure (psi): _____ Design Temperature (^{o}F): _____

What cleaning agent will be used? _____ Cleaning Frequency: _____

☐ *Provide capacity calculations used to size membrane filters.*

8. Clearwell

Number of Clearwells	Capacity	Dimensions	Baffled (yes/no)
CT Basin (Two tanks)	275,000 gal	88 x 65 x 7.3ft (swd)	Yes
Backwash Supply (One Tank)	150,000 gal	36 x 65 x 8.75ft (swd)	No

If an offsite tank is used as a clearwell, provide location, coordinates and capacity: _____

_____

☒ *Provide Contact Time (CT) Calculations.*

9. High Service Pumps

Number of Pumps	Capacity (GPM)	TDH	Power (HP)

Are variable frequency drives (VFD) to be used? _____

☐ *Provide proposed pump's characteristic curve along with the efficiency, horsepower and NPSHR data.*

10. Disinfection

Check all forms of disinfection to be used:

- ☐ Chlorine Gas
- ☐ Hypochlorite
- ☐ Chloramines
- ☐ UV
- ☐ Other: _____

List the locations of all disinfectant injection points: _____

_____

_____

Chlorine Room Information:

Exhaust Fan Capacity (cfm): _____ Air Exchange Rate: _____

Are air inlet louvers near the ceiling? _____ Do ventilation fans take suction near the floor? _____

Is the chlorine room equipped with panic hardware and alarms? _____

Is a bottle of Ammonium Hydroxide provided? _____

Does the chlorine room have a shatterproof inspection window? _____

Is SCBA equipment meeting NIOSH requirements located outside of the chlorine room? _____

Are separate switches for fans and lights provided outside of the chlorine room? _____

Is a gas scrubber provided? _____

UV Information:

UV Wavelength: _____ Dosage (MJ/cm^2): _____

Are the bulbs protected? _____

Is the UV assembly accessible for cleaning and replacement of the bulbs, jackets, etc? _____

Is a sensor provided to ensure UV light is being delivered at the appropriate wavelength and dosage? _____

Ammonia Information:

Exhaust Fan Motor Capacity (cfm): _____ Air Exchange Rate: _____

Is ammonia room equipped with panic hardware and alarms? _____

Does the ammonia room have a shatterproof inspection window? _____

Are separate switches for fans and lights provided outside of the room? _____

Is a gas scrubber provided? _____

11. Other Chemicals

Provide information about chemicals to be used in the treatment process below:

Chemical	Purpose	Feed Location	Bulk Tank (gal)	Day Tank (gal)	Feed Rate at Design Capacity

Will Carbon be added as a premixed slurry or dry feed? _____

If dry feed, what is the hopper capacity? _____

Are fireproof/explosion proof precautions provided? _____ Describe: _____

_____

Are floor drains and containment provided? _____

Chemical	Containment Capacity

12. Treatment Wastewater

Disposal Method for Treatment Wastewater:

☐ Lagoons

☐ Dewatering

☐ Other: _____

How much treatment wastewater does the water treatment plant produce? _____

Lagoon capacity: _____

Where does the decant water discharge? _____

13. General

☒ *Provide a process flow schematic.*

☒ *Provide a signed letter of acceptance from the utility, which states that the utility has reviewed and approved the plans and specifications.*

☐ *If the project is funded by a State Revolving Fund Loan (SRF) provide a completed SRF Plans and Specifications Checklist along with 1 complete printed copy of the project specifications.*

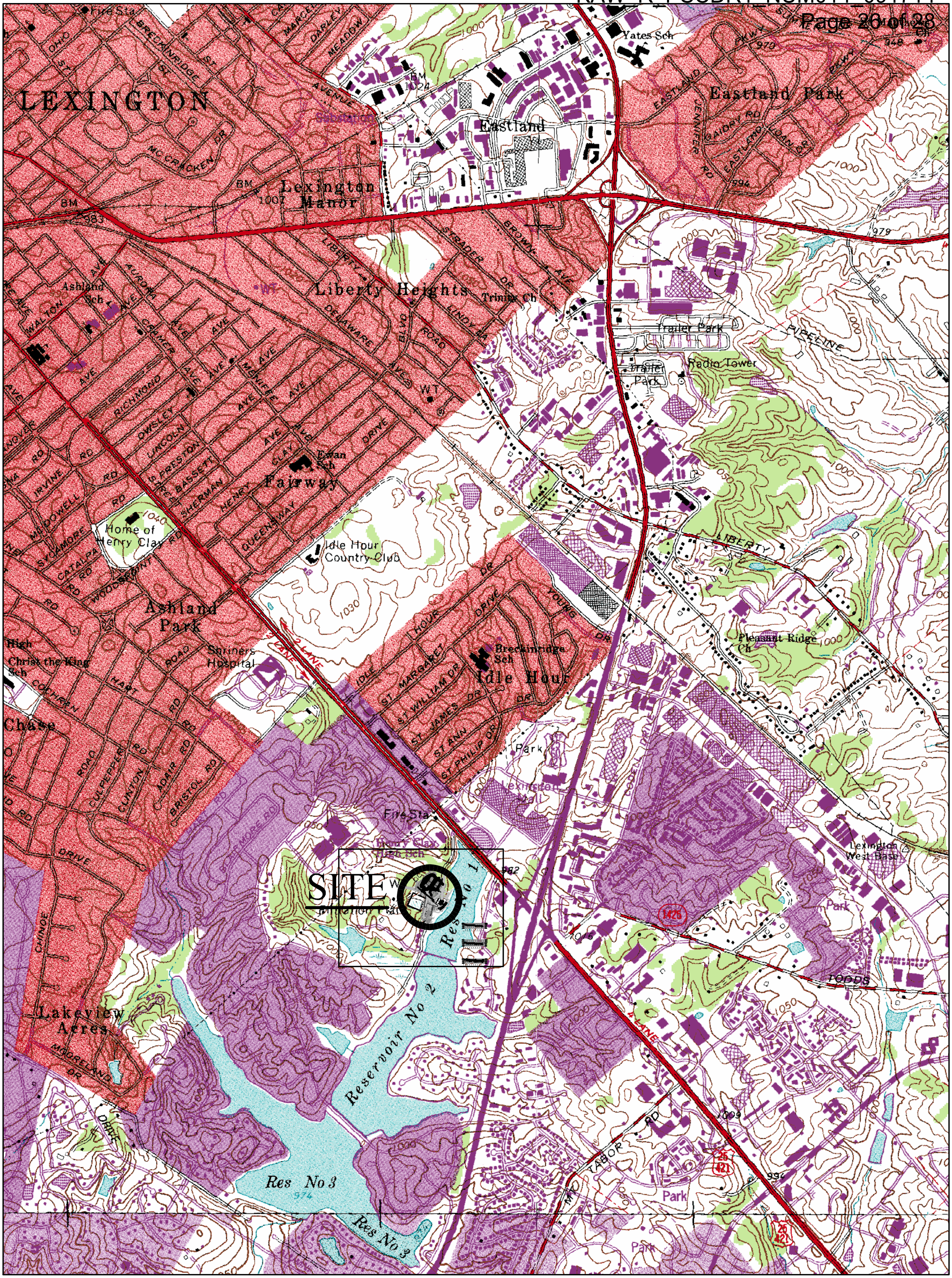
IV. Fees

Check or money order must be made payable to "Kentucky State Treasurer" for the total amount. Fees do not apply to projects FUNDED by a municipality, water district, or other publicly owned utility.

Project Category: Partial Treatment Upgrade Total Amount: $ 525.00

Site Information

U.S.G.S. Map


LEXINGTON
Eastland
Eastland Park
Yates Sch
Lexington Manor
Liberty Heights
Trinity Ch
Trailer Park
Radio Tower
PIPELINE
Ewan Sch
Fairway
Home of Henry Clay
Idle Hour Country Club
Ashland Park
Shriners Hospital
Christ the King Sch
Chase
Breckinridge Sch
Idle Hour
LIBERTY
Pleasant Ridge Ch
Park
Fire Sta
SITE
Lexington West Base
TODDS
Reservoir No 2
Res No 3
Lakeview Acres
MT TABOR RD

0' 2000' 4000'

Clearwell Information

CT CALCULATIONS

C-T CALCULATION FORM

DATE: 5/7/2014

PWS Name: Kentucky American Water
Plant: Richmond Road Station
PWSID#: 15800

Disinfectant: Chlorine

Highest pH : 7.60

Lowest Annual Water Temperature (C): 7

Column:		A	B	C	D	E	F
	Unit **Giardia Cysts**	Capacity (gal)	Flowrate (gpm)	Detention Time (min) =A / B	Baffling Factor	Concentration of Disinfectant (mg/L)	Calculated CT Value = C x D x E
1	CT Basin-Cell 1	139,486	12497.94	11.161	0.7	2.00	15.625
2	CT Basin-Cell 2	139,486	12497.94	11.161	0.7	2.00	15.625
3							
4							
5							
6							
7							
8							
9							
10							
	TOTAL						31.250 mg-min/L

Basins are to be listed as individual units if they are in series or as one unit if they are parallel to each other and not in a different train or flow path.

Column A: Volume will be the lowest level under normal operating conditions.
Column B: This is the highest flow rate for each plant in gallons per minute. Divide the rated design capacity in gallons by 1440 to get gallons per minute.
Column D: Assign the baffling factor that best fits the unit using the Baffling Factor Table.
If no baffle wall present 0.1
If one baffle wall present 0.3
If serpentine baffle wall present 0.7
Column E. Insert the lowest concentration of the disinfectant.