

ENERGY AND ENVIRONMENT CABINET

DEPARTMENT FOR ENVIRONMENTAL PROTECTION

300 Sower Boulevard Frankfort, Kentucky 406 01 Phone: (502) 564 -2150 Fax: 502-564 -4245

# KENTUCKY DIVISION OF WATER WELLHEAD PROTECTION PLAN 5-YEAR UPDATE FORM

#### **Update Requirements:**

This form should be used for the 5-year update submittal requirements of the Kentucky Wellhead Protection Program (WHPP) in compliance with 401 KAR 4:220 and SDWA Section 1428. Once the form is complete, please sign and send to:

Kentucky Division of Water Watershed Management Branch Attention: Chip Zimmer 300 Sower Boulevard, 3<sup>rd</sup> Floor Frankfort, Kentucky 40601 or <u>edward.zimmer@ky.gov</u>

For assistance, contact Chip Zimmer at (502) 782-7141 or edward.zimmer@ky.gov

#### **System Information:**

PWS Name: Hawesville Water Wor	ks
PWS ID Number: KY0460182	Al Number: 1628
Contact Person/Title: Brian Patters	on, Assistant Superintendent
Mailing Address: P.O. Box 157, City	<sup>r</sup> Hall, Hawesville, KY 42348
Telephone: 270-927-8707 Er	nail: bpatterson@hawesville.us
System Type: Community *Commu	inity; Non-Transient/Non-Community; Transient/Non-Community
Source*: 3 active wells *Well(s) or	Spring(s) and total number of each
AKGWA #(s): Well#5/0004-9371, W	/ell #6 0006-1858, Well #7 0006-1880
County: Hancock AD	D: GRADD
WWD Permit #: 0120 Permitted Ar	nount (MGD): 0.576 MGD or 576,000 GPD
Population Served: 3225	
Overall Susceptibility Rating*: M	ledium *High, Medium or Low



Rebecca Goodman

Anthony R. Hatton



WHPP Changes Summary: Hawesville Water Works withdraws its source water from the Quaternary alluvium deposits of the Ohio River Valley via two (2) wells drilled to just over 100 feet deep. Water withdrawals are permitted for up to 0.576 million gallons per day (MGD), with current average monthly water withdrawals of 0.300 MGD under Permit #0120 (2018-2022). In 2016, four (4) inactive wells (Well#1/0004-2962, Well #2/0004-2963, Well #3/0000-4466, and Well #4/0000-9242) were plugged using grants funds from the state. There is one (1) inactive well (Well#5/0004-9371) that still needs to be plugged. The WHPA delineation has been modified to account for the active wellfield which includes 1,195 acres of mostly cultivated crops and over 20 potential contaminants including major roadways and railway lines. The overall susceptibility rating is medium. Hawesville Water Works has developed management strategies including exploring options for funding to plug their inactive well (Well#5/0004-9371), coordinating efforts with the local Division of Conservation and landowners or operators within the wellhead protection regarding best management practices for controlling nitrate, and interconnecting with Lewisport Municipal Water Works based on their proposed new regional plant and emergency interconnection projects.

# **Update Form Instructions:**

Please complete each section that applies to any system or WHPP updates and submit the supporting documentation. Please indicate if a section is not applicable to this update. **Sections 4 and 6 through 11 are required for every 5-year update**.

Please sign certification on the last page upon completion.

# Section Updates:

# Section 1: Treatment Plant

If the treatment plant location has changed then provide a new location map below. This can be a county roadmap or a GIS-produced map. Please use the area below to provide relevant details, or to indicate that no change has occurred.

Hawesville Water Works is still located at 247 River Street, Hawesville, KY 42348. It is located behind the flood wall.

# Section 2: Water Withdrawal and Water Quality

If there have been changes in water withdrawal rates or water quality since the last submittal, provide a discussion of the relevant details in the space below (include new Water Withdrawal Permit Number if applicable). Include supporting documentation as an attachment.

Hawesville Water Works withdrawals from a wellfield under Permit #0120 which was last revised in 2001 and an application for amendment to the permit will be submitted to account for the active wellfield. Over the last 5 years (2018-2022), average monthly water withdrawals have varied from 0.300 to 0.345 MGD with maximum monthly withdrawals varying from 0.338 to 0.393 MGD. The 1999 Phase I Report reported 0.288 MGD as the average monthly water withdrawals. The same report referenced peak production in 1991 with average monthly withdrawals of 0.315 MGD and maximum monthly

withdrawals 0.471 MGD. In May of 2022, Well #7 was serviced by National Water Services, LLC, (NWS) which included acidizing and a new shaft, pump, and some new electrical components on the electrical panel. The same service is also needed for Well #6. A new metering system was also installed at the same time. The system also takes quarterly samples of finished treated water and results from the spring quarterly sampling period (January 1- March 31) have higher average nitrate concentrations when compared to the averages of the other quarterly sampling periods. As provided in Table 1, the average nitrate concentration of the spring samples is 3.57 mg/L, ranging from a minimum of 1.81 to a maximum of 7.2 mg/L. This impact on water quality is more than likely due to agricultural cropping practices such as nutrient application within the wellhead protection area. The two public water system wells are shallow (approximately 100+ ft deep) and withdrawal from unconsolidated sand, gravel, silt, and clay deposits of the Ohio River Alluvium. Steps to contact and coordinate with Hancock County Conservation District regarding agriculture water quality plans and Best Management Practices for agriculture and buffer zones from the wellheads should be taken. Hawesville Water Works must report nitrates concentrations of 5.0 mg/L or higher in their finished water samples per their quarterly sampling requirements in accordance with the Safe Drinking Water Act in their Consumer Confidence Reports (CCRs). The Maximum Contaminant Level (MCL) for nitrate is 10.0 mg/L. So based on monitoring reports, Hawesville reports the following language in their CCR when more than half of the MCL is exceeded with the following health effects language:

"Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome."

Sampling Quarter	Collection Period	Average Nitrate (mg/L)
Quarter 1	January 1- March 31	3.57
Quarter 2	April 1- June 30	3.01
Quarter 3	July 1- September 30	2.54
Quarter 4	October 1- December 31	2.77

#### Table 1: Average nitrate concentration per sampling quarter (2010-2023)

Well #6 (0006-1858) is sampled quarterly as part of the statewide Ambient Groundwater Monitoring Program which provides baseline groundwater data on aquifer characterization, ambient groundwater quality and nonpoint source pollution. Groundwater, including public water supplies and private-sector wells and springs, are sampled quarterly, and analyzed for hundreds of parameters, including metals, nutrients, pesticides, and volatile organic compounds. Sampling began April 1, 2013. Ohio River Alluvium physiographic region is showing significantly increasing trends for conductivity, barium, and potassium, significantly decreasing trend for orthophosphate, and detections of Atrazine (Report on the Condition of Ambient Groundwater in Kentucky 2018). Atrazine is the common name for an herbicide that is widely used to kill weeds.

# Section 3: Change or Modification to Groundwater Source

If the system has changed or modified the wells or springs being used, provide the following: 1) a description of changes/modifications; 2) copies of the relevant form(s) (Kentucky Water Well Record, Well Maintenance & Plugging Record, Well Inspection Form or Spring Inventory

Record); and 3) any other information relating to well construction (i.e., installation logs, driller's logs, lithological or geophysical logs), below.

The active delineated wellfield is composed of two (2) wells, including Well #7 which has been in operation since 2011 and Well #6 which has been in operation since 2008. Well #5 is inactive. In 2016, the system was awarded Source Water Protection and Assistance Program (SWPAP) funds to plug four inactive drinking water supply wells (Well#1/0004-2962, Well #2/0004-2963, Well #3/0000-4466, and Well #4/0000-9242) within their Wellhead Protection Area to eliminate potential sources of contamination to the aquifer. Records are available through the Kentucky Geological Survey and should be on file at the Division of Water.

# Section 4 (REQUIRED): Planning Team

Effective water supply protection requires community involvement and public awareness. Identify the planning team consisting of a leader and at least two team members, with their respective titles, below.

Leader: Rob McCormmick, Mayor Todd Adkins, Superintendent

# Team Members:

Brian Patterson, Assistant Superintendent John Ogle, Operator Lora Basham, City Clerk

# Section 5: WHPA Delineation

If the system is revising a Wellhead Protection Area (WHPA) delineation, or if a new groundwater source has been added since the last submittal, provide a site-specific description of the local geology and aquifer. Include references for published literature. Provide a summary of any aquifer tests (i.e., pumping tests, slug tests, tracer tests), including data gathering and evaluation methods. Show calculations and supporting data for each WHPA delineated or revised. Include the detailed hydrogeologic report as an attachment.

The original delineation for Hawesville's WHPA was completed in 2010 by WHPP staff using public domain Wellhead Protection Area (WHPA) Model software referred to as WhAEM (Wellhead Analytical Element Model) version 3.1.2 or MWCAP. WhAEM is a semi-analytical groundwater flow simulation program used for delineating capture zones in a WHPA. The WHPA for Hawesville Water was updated in 2022 as provided in Table 2:

Zone	Time of Travel (TOT)	Acres	2023 Update Notes:
1	180-day	27.517	
2	10-year	303.808	Updated in 2022 and now extends further southwest
3	Hydrologic boundary	863.625	Revised in 2022 to account for Zone 2 updates
Total		1194.95	

# Table 2: WHPA Delineation Updates

#### Section 6 (REQUIRED): WHPA Map

Provide a WHPA map that shows each groundwater source labeled with the appropriate AKGWA #, all protection zones identified and the Contaminant Source Inventory (CSI) point locations. If no changes have occurred since the last submittal, then a copy of the most recent WHPA/CSI map can be resubmitted. To view the most recent delineations for your system, please visit the <u>Source Water</u> <u>Protection Viewer</u>. Please contact program staff for assistance.

See attached WHPA Map. The wellhead protection area for the two (2) active public water system wells is further delineated into three (3) zones based on time of travel (TOT) and the hydrological boundary for potential contaminants, including:

Zone 1: 180-day time of travel Zone 2: 10-year time of travel Zone 3: Hydrologic boundary

#### Section 7 (REQUIRED): Contaminant Source Inventory

Provide an updated CSI in table format. This can be created using the spreadsheet template provided and copied into the space below. If no changes occurred since the last update, the table can be pulled from previous WHPP documents. Each contaminant source listed should have a Contaminant Source ID # that corresponds to the WHPA map in Section 6. The CSI table must show the susceptibility determination ranking for each contaminant source. Include a brief narrative discussion of the overall system susceptibility. For more information on potential sources of contamination, please visit the DOW's <u>Web Tools for SWP Planning</u> <u>website</u>. Please contact program staff for assistance.

See attached CSI. Hawesville Water Works currently withdraws from two (2) shallow wells drilled into unconsolidated sand, gravel, silt, and clay deposits of Ohio River Alluvium. The wellhead protection area lies within the Ohio River Alluvium physiographic province which is comprised of unconsolidated sand, gravel, silt, and clay deposits adjacent to the Ohio River. These deposits consist of glacial outwash and modern alluvial sediments. The sediments form a broad flood plain that is relatively flat and has only minor dissection by tributary streams. Coarse sand and gravel beds in these deposits supply large volumes of groundwater to municipal, agricultural, industrial, and private wells.

The delineated wellhead protection area is predominately agricultural land use and is cropped with corn and soybeans on a rotational basis. It also lies in the middle of several major roadways and railroad transportation routes. The contaminant source inventory indicates 21 potential contaminant sources including major transportation routes, on-site septic systems, underground and aboveground storage tanks, but predominantly cultivated crops.

#### Section 8 (REQUIRED): Management Strategies

Provide a discussion of the previous and newly proposed management strategies to prevent source water contamination. This discussion must include the previous management strategies that were implemented as well as the goals that were met. Next, include any NEWLY proposed management strategies, associated goals, implementation plans and the party responsible for

implementation. For information about wellhead protection strategies please visit the DOW's <u>Source Water Protection Strategies website</u>.

# Previous Management Strategy Update:

The last WHPP update outlined strategies including water supply protection area road signs, development of groundwater protection plans (GPPs), referencing the WHPP in the Consumer Confidence Report (CCR), promotion of the WHPP, proper waste disposal to customers, and exploration of options to plug improperly abandoned wells. Hawesville Water Works was successful at managing to be awarded grant funding from the state to plug four inactive drinking water supply wells within their Wellhead Protection Area which eliminated potential sources of contamination to the aquifer.

#### Newly Proposed Management Strategies:

Collaborating with the local landowners/lessees regarding notification of the WHPA, associated CSI, nitrate impacts on water quality, and awareness of pollution prevention and Best Management Practices (BMPs), especially regarding agriculture and on-site septic systems. Efforts to notify Hancock County Conservation district and discuss Agriculture Water Quality Plans and BMPs like buffer zones within new wellfield should be pursued. Development of GPPs under 401 KAR 5:037 within the WHPA and extending wastewater service to unserved or underserved residents is also key. The system is part of the local Emergency Operations Center and Hancock County Dispatch for emergency response notification and assistance.

# Section 9 (REQUIRED): Contingency and WHP Planning

Provide a description of Contingency and WHP Planning. Complete the Emergency Response Phone List, Procedures for Public Notification, identification of Potential Future Problems and the procedures to establish Alternative Water Supplies. This section must also address how often the WHPP will be reviewed and updated.

#### **Emergency Response Phone List**

Fill in all Blanks and Phone Numbers with appropriate information.

Local Emergency Response	Phone Number
Plant Operator	270-927-8707
Hawesville Volunteer Fire Department	270-927-8498
Chief of Police (Cody Axton)	270-922-5994
Hancock Judge Exec. (Johnny Roberts)	270-927-8137
Local Emergency Dispatch Emergency Operations Center	270-927-1311

State and Federal Assistance	Phone Number
Kentucky DOW (Frankfort)	502-564-7815
Kentucky DOW Regional Field Office (FO)- Madisonville	270-824-7529
Kentucky Environmental Response Team	(502) 564-2380
24-hour response line	(800) 928-2380
Kentucky State Fire Marshall	(502) 573-0382

Any Other Pertinent Contacts	Any Other Pertinent Numbers
Operator (John Ogle)	270-315-6946
Operator (Todd Duncan)	270-315-1376
Operator (Brandon Jarboe)	812-455-4130

# **Procedures for Public Notification:**

In the event of a water system emergency that would threaten the health or life of the public, use the following procedure. Prepare and broadcast an advisory, including directions for the public. Describe the public notification process and provide contacts for those media outlets. If the system uses methods other than traditional media, please list them.

Notification procedures for boiled water advisories use radio and there is a local alert system via dispatch that people can join to receive notifications. This same procedure would be used for another water system emergency.

Newspaper, Television, and Radio Stations	Phone Numbers
Hancock Clarion (Newspaper)	270-927-6945
WBKR (Radio)	800-844-9257
ABC 25 WEHT/CW 7 WTVW/TriStateHomepage.com	800-879-8542

#### **Potential Future Problems:**

Describe the *most likely* scenarios that could threaten the water supply.

Most of the land use with the delineated wellhead protection area is agricultural crops so that would be the largest threat in terms of nutrients, herbicides, and pesticides impacting the drinking water supply wells. Additionally, roadways, railways, and septic systems also pose a risk.

# Alternative Water Supply (Short and Long Term):

Describe the short term and long-term water supply alternatives that address each of the potential future problems identified above. List all current interconnections with other water

systems. Discuss the capacity of each potential alternative water supply to sustain normal operations.

Water supply emergencies can require both short and long-term responses depending on the nature and extent of the contaminant or event. Hawesville Water Works currently has no interconnections with other neighboring systems so in an emergency either a boiled water advisory would be issued and/or hauled/bottled water would have to be provided. The neighboring system including the City of Lewisport has proposed the construction of a new 0.5 million gallon per day (MGD) regional Water Treatment Plant in addition to the Hawesville/Lewisport Emergency Interconnection project, so there could be a future interconnect between the systems.

#### Schedule for Update and Review:

The Wellhead Protection Plan will be reviewed regularly and updated every five years as required by regulation.

# Section 10 (REQUIRED): Copies of Public Notices and Education Materials

Provide copies of wellhead protection public notices and education materials distributed.

A copy of this wellhead protection plan will be posted on the City of Hawesville webpage and the link to plan will be printed on customer bills for public notice.

# Section 11 (REQUIRED): Public Meeting Documentation\*\*\*

Provide the record of WHPP public meeting attendance, minutes, and comments.

A copy of this wellhead protection plan will be posted on the City of Hawesville webpage and the link to plan will be printed on customer bills for public review. A copy will be provided in the attachments for documentation.

\*\*\*Non-Community Water Systems are not required to have public meetings for 5-year updates but must post a public notice in a conspicuous place. A public notice template is provided as a separate document. However, public input and associated documentation are encouraged. Please contact program staff if you have any questions.

# Table 1: Source Inventory

Well Identification	AKGWA	Status	Coordinates
	ID#		
Well #1	00042962	Plugged	
Well #2	00042963	Plugged	
Well #3	00004466	Plugged	
Well #4	00009242	Plugged	
Well #5	00049371	Inactive	37.902028, -86.747181
Well #6	00061858	Active	37.914835, -86.762168
Well #7	00061880	Active	37.913540, -86.761172
TW#2	00062976	Plugged	

# Table 2: Water Withdrawal Permits & Permitted Sources

WWD Permit #	Permitted Amount (MGD)	Permitted Sources
0120	0.576	Well #3 (00004466), Well #4 (00009242), Well #5 (00049371) *Water withdrawal application to amendment Permit #0120 will be submitted to DOW
Total	0.576	3 (2-active; 1- inactive)

# **Certification Signature (TO BE COMPLETED BY PLANNING REPRESENTATIVE):**

"I certify that this document and all attachments were prepared under my direction or supervision. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete."

Signature: Brail Date: (7ckHer 2.3 enter text.

Printed Name/Title: Britan Patterson Assistant superentendent

# Assistance:

For any assistance, please contact Wellhead Protection Staff:

Chip Zimmer (502) 782-7141

# Edward.Zimmer@ky.gov

Dale Booth (502) 782-6895 Dale.Booth@ky.gov

Please sign and return completed form to:

Kentucky Division of Water Watershed Management Branch Attention: Chip Zimmer 300 Sower Boulevard, 3<sup>rd</sup> Floor Frankfort, Kentucky 40601 or Edward.Zimmer@ky.gov

WHPP 5-Year Update Form Version: 01/12/2023



Section 6: WHPA Map



# Hawesville Water WHPA



Zone 1: 180 day time of travel • Zone 2: 10 year time of travel

PWS well

Zone 3: Hydrologic boundary



N

**Section 7: Contaminant Source Inventory** 

WHPP 5-Year Update Form Version: 01/12/2023



# **Hawesville Water Works WHPA**

Zone 1: 180 Day time of travel for potential contaminant

Zone 2: 5 year time of travel

Zone 3: Hydrologic Boundary

- Potential Contaminants
- Water Wells (PWS)

0.5

1 Miles

N

# **Contaminant Source Inventory and Susceptibility Analysis for**

Hawesville Water Works

CSI Map ID #	Site ID	Contaminant Source Type	CS CODE	Name	Address
1		Other Industrial Sources	I-16	Wroe Pallet and Skid	Wroe Pallet and Skid, 287 Nugent Ln., Hawesville
2		Railroad Lines	C-32	CSX Railroad	
3		Major Roadways	M-7	US 60	Hawesville, KY
4		Major Roadways	M-7	River Road	Hawesville, KY
5		Municipal Sewer Lines	M-8		Hawesville, KY
6		Wastewater Treatment Plant	M-15	Hawesville STP KPDES	Hawesville, KY
7		Crops : Corn, Soybean, Wheat	A-5	Steve Wink property	Steve Wink Property, River Road
8		Crops : Corn, Soybean, Wheat	A-5	Arthur Meuhier	Arthur Meuhier, 1765 River Rd., Hawesville, KY
9		Crops : Corn, Soybean, Wheat	A-5	Daniel Hagmann	Daniel Hagmann, 1202 US 60 West, Hawesville, KY
10		Aboveground Storage Tank	R-1	Daniel Hagmann	Daniel Hagman Property, Hawesville, KY
11		Other Residential	R-3	Daniel Hagmann	Daniel Hagman Property, Hawesville, KY
12		Crops : Corn, Soybean, Wheat	A-5	Daniel Hagman property	1760 US 60 West, Hawesville, KY
13		Other Agricultural Sources	A-13	Daniel Hagman property	1760 US 60 West, Hawesville, KY
14		Crops : Corn, Soybean, Wheat	A-5	Horrell Rentals	Horrell Rentals, River Road, Hawesviille, KY
15		Crops : Corn, Soybean, Wheat	A-5	Tom Ogle	Tom Ogle, 1255 River Rd., Hawesville, KY
16		Crops : Corn, Soybean, Wheat	A-5	Emmick Property	Emmick Property, 271 US 60, Hawesville, KY
17		Crops : Corn, Soybean, Wheat	A-5	Don Nelson	Don Nelson, 1548 US 60 W, Hawesville, KY
18		Other Residential	R-3	Don Nelson	Don Nelson, 1548 US 60 W, Hawesville, KY
19		Other Residential	R-3	Don Nelson Don Nelson, 1548 US 60 W, Hawesville, KY	
20		Crops : Corn, Soybean, Wheat	A-5		Hawesville, KY
21	0006-9425	Domestic Wells	G-7	Daniel Hagman property	

Lat	Lon	Quantity	Zone	Proximity Value	Contaminant Value	Hydrologic Sensitivity	Numeric Rating	Susceptibility Ranking	Contaminant Notes
37.907874	-86.764022	1	3	1	2	4	12	MED	Septic Tank
37.908805	-86.769343	1	2	2	3	4	17	HIGH	Railroad
37.907475	-86.769033	1	3	1	3	4	15	MED	US 60
37.912885	-86.760253	1	1	3	3	4	19	HIGH	River Road
37.907076	-86.766284	1	3	1	3	4	15	MED	Municipal Sewer Line
37.908174	-86.763909	2	3	1	3	4	15	MED	Hawesville STP KPDES
37.919815	-86.787194	1	3	1	2	4	12	MED	Cultivated Crops
37.92038	-86.780145	1	3	1	2	4	12	MED	Cultivated Crops
37.911136	-86.770972	1	2	2	2	4	14	MED	Cultivated Crops
37.910302	-86.77162	1	2	2	3	4	17	HIGH	AST 500 gallons diesel
37.910306	-86.771279	1	2	2	2	4	14	MED	Septic System
37.916107	-86.781895	1	3	1	2	4	12	MED	Cultivated Crops
37.91466	-86.782123	1	3	1	1	4	9	LOW	Surface Impoundment
37.916716	-86.76718	1	3	1	2	4	12	MED	Cultivated Crops
37.917592	-86.769941	1	3	1	2	4	12	MED	Cultivated Crops
37.921577	-86.792024	1	3	1	2	4	12	MED	Cultivated Crops
37.913654	-86.778676	1	3	1	2	4	12	MED	Cultivated Crops
37.913392	-86.776986	1	3	1	2	4	12	MED	UST
37.91313	-86.77651	1	3	1	2	4	12	MED	Septic System
37.919055	-86.774916	1	3	1	2	4	12	MED	Cultivated Crops
37.909833	-86.770333	1	2	2	2	2	12	MED	DOW Groundwater Water Wells layer (2/14/2023)

# Section 10 & 11: Public Notice Documentation

This space is being save for HCWD#2 Documentation HCWD#2 to provide webpage link and copy of redacted customer bill for public notification.