Source Water Protection Plan

Follansbee Hooverson Heights Water System

PWSID WV3300512

Brooke County

June 2016

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In cooperation with Follansbee Hooverson Heights Water System

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I certify the information in the source water protection plan is complete and accurate to the best of my knowledge.

R.P. Orsini

Signature of responsible party or designee authorized to sign for water utility:

R.P. Orsini

Print Name of Authorizing Signatory:

Chief Operator

Title of Authorizing Signatory:

6/24/2016

Date of Submission:

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SOURCE WATER PROGRAM ACRONYMS

AST	Aboveground Storage Tank
BMP	Best Management Practices
ERP	Emergency Response Plan
GWUDI	Ground Water Under the Direct Influence of Surface Water
LEPC	Local Emergency Planning Committee
OEHS/EED	Office of Environmental Health Services/Environmental Engineering Division
PE	Professional Engineer
PSSCs	Potential Source of Significant Contamination
PWSU	Public Water System Utility
RAIN	River Alert Information Network
RPDC	Regional Planning and Development Council
SDWA	Safe Drinking Water Act
SWAP	Source Water Assessment and Protection
SWAPP	Source Water Assessment and Protection Program
SWP	Source Water Protection
SWPA	Source Water Protection Area
SWPP	Source Water Protection Plan
WARN	Water/Wastewater Agency Response Network
WHPA	Wellhead Protection Area
WHPP	Wellhead Protection Program
WSDA	Watershed Delineation Area
WVBPH	West Virginia Bureau for Public Health
WVDEP	West Virginia Department of Environmental Protection
WVDHHR	West Virginia Department of Health and Human Resources
WVDHSEM	West Virginia Division of Homeland Security and Emergency Management
ZCC	Zone of Critical Concern
ZPC	Zone of Peripheral Concern

1.0 PURPOSE

The goal of the West Virginia Bureau of Public Health (WVBPH) source water assessment and protection (SWAP) program is to prevent degradation of source waters which may preclude present and future uses of drinking water supplies to provide safe water in sufficient quantity to users. The most efficient way to accomplish this goal is to encourage and oversee source water protection on a local level. Many aspects of source water protection may be best addressed by engaging local stakeholders.

The intent of this document is to describe what Follansbee Hooverson Heights Water System has done, is currently doing, and plans to do to protect its source of drinking water. Although this water system treats the water to meet federal and state drinking water standards, conventional treatment does not fully eradicate all potential contaminants, and treatment that goes beyond conventional methods is often very expensive. By completing this plan, Follansbee Hooverson Heights Water System acknowledges that implementing measures to minimize and mitigate contamination can be a relatively economical way to help ensure the safety of the drinking water.

1.1 WHAT ARE THE BENEFITS OF PREPARING A SOURCE WATER PROTECTION PLAN?

- Fulfilling the requirement for the public water utilities to complete or update their source water protection plan.
- Identifying and prioritizing potential threats to the source of drinking water; and establishing strategies to minimize the threats.
- Planning for emergency response to incidents that compromise the water supply by contamination or depletion, including how the public, state, and local agencies will be informed.
- Planning for future expansion and development, including establishing secondary sources of water.
- Ensuring conditions to provide the safest and highest quality drinking water to customers at the lowest possible cost.
- Providing more opportunities for funding to improve infrastructure, purchase land in the protection area, and other improvements to the intake or source water protection areas.

2.0 BACKGROUND: WV SOURCE WATER ASSESSMENT AND PROTECTION PROGRAM

Since 1974, the federal Safe Drinking Water Act (SDWA) has set minimum standards on the construction, operation, and quality of water provided by public water systems. In 1986, Congress amended the SDWA. A portion of those amendments were designed to protect the source water contribution areas around ground water supply wells. This program eventually became known as the Wellhead Protection Program (WHPP). The purpose of the WHPP is to prevent pollution of the source water supplying the wells.

The Safe Drinking Water Act Amendments of 1996 expanded the concept of wellhead protection to include surface water sources under the umbrella term of Source Water Protection. The amendments encourage states to establish SWAP programs to protect all public drinking water supplies. As part of this initiative states must explain how protection areas for each public water system will be delineated, how potential contaminant sources will be inventoried, and how susceptibility ratings will be established.

In 1999, the WVBPH published the West Virginia Source Water Assessment and Protection Program, which was endorsed by the United States Environmental Protection Agency. Over the next few years, WVBPH staff completed an assessment (i.e., delineation, inventory and susceptibility analysis) for all of West Virginia's public water systems. Each public water system was sent a copy of its assessment report. Information regarding assessment reports for Follansbee Hooverson Heights Water System can be found in **Table 1**.

3.0 STATE REGULATORY REQUIREMENTS

On June 6, 2014, §16 1 2 and §16 1 9a of the Code of West Virginia, 1931,was reenacted and amended by adding three new sections, designated §16 1 9c, §16 1 9d and §16-1-9e. The changes to the code outlines specific requirements for public water utilities that draw water from a surface water source or a surface water influenced groundwater source.

Under the amended and new codes each existing public water utility using surface water or ground water influenced by surface water as a source must have completed or updated a source water protection plan by July 1, 2016, and must continue to update their plan every three years. Existing source water protection plans have been developed for many public water utilities in the past. If available, these plans were reviewed and considered in the development of this updated plan. Any new water system established after July 1, 2016 must submit a source water protection plan before they start to operate. A new plan is also required when there is a significant change in the potential sources of significant contamination (PSSC) within the zone of critical concern (ZCC).

The code also requires that public water utilities include details regarding PSSCs, protection measures, system capacities, contingency plans, and communication plans. Before a plan can be approved, the local health department and public will be invited to contribute information for consideration. In some instances, public water utilities may be asked to conduct independent studies of the source water protection area and specific threats to gain additional information.

4.0 SYSTEM INFORMATION

Follansbee Hooverson Heights Water System is classified as a state regulated public utility and operates a community public water system. A community public water system is a system that regularly supplies drinking water from its own sources to at least 15 service connections used by year round residents of the area or regularly serves 25 or more people throughout the entire year. For purposes of this source water protection plan, community public water systems are also referred to as public water utilities. Information on the population served by this utility is presented in **Table 1** below.

Table 1. Population Served by Follansbee Hooverson Heights Water System

Administrative office location:	807 Lee Road Follansbee, West Virginia 26037		
Is the system a public utility, according to the Public Service Commission rule?	Yes		
Date of Most Recent Source Water Assessment Report:	June 2003		
Date of Most Recent Source Water Protection Plan:	April 2011		
Population served directly:	Follansbee Hooverson Heights Water System directly serves 2,133 customers.		
Bulk Water Purchaser Systems:	**System Name**	**PWSID Number**	**Population**
	N/A	N/A	N/A
Total Population Served by the Utility:	The water system serves a total population of approximately 2,590 people.		
Does the utility have multiple source water protection areas (SWPAs)?	Yes		
How many SWPAs does the utility have?	5 (1 watershed protection area, 4 wellhead protection areas)		

5.0 WATER TREATMENT AND STORAGE

As required, Follansbee Hooverson Heights Water System has assessed their system (e.g., treatment capacity, storage capacity, unaccounted for water, contingency plans) to evaluate their ability to provide drinking water and protect public health. **Table 2** contains information on the water treatment methods and capacity of the utility. Information about the surface sources from which Follansbee Hooverson Heights Water System draws water can be found in **Table 3**. If the utility draws water from any groundwater sources to blend with the surface water the information about these ground water sources can be found in **Table 4**.

Table 2. Follansbee Hooverson Heights Water Treatment Information*

Water Treatment Processes (List All Processes in Order)	Raw Water Intake ↓ Pre Sedimentation Basin ↓ Contact Units ↓ Flocculation Settlers ↓ Mix Media Filters ↓ Clear Well ↓ High Service Pumps
Current Treatment Capacity (gal/day)	The water treatment plant has a capacity of 1,440,000 gallons/day.
Current Average Production (gal/day)	On average, the plant produces 395,000 gallons/day.
Maximum Quantity Treated and Produced (gal)	The maximum quantity of water produced in a single day in the last year was 953,400 gallons.
Minimum Quantity Treated and Produced (gal)	The minimum quantity of water produced in a single day in the last year was 253,100 gallons.
Average Hours of Operation	On average, the plant is staffed and operated an average of 9 hours/day.
Maximum Hours of Operation in One Day	The maximum hours of operation in a single day in the last year was 22 hours.
Minimum Hours of Operation in One Day	The minimum hours of operation in a single day in the last year was 5 hours.
Number of Storage Tanks Maintained	The water system maintains 5 treated water storage tanks.
Total Gallons of Treated Water Storage (gal)	Follansbee Hooverson Heights Water System has a total treated water storage capacity of 2,096,000 gallons in 5 tanks.
Total Gallons of Raw Water Storage (gal)	The water system does not have any raw water storage.

*This information is from the 2016 Source Water Protection Contingency Plan for Follansbee Hooverson Heights Water System by The Thrasher Group, Inc. This document is attached in **Appendix D**.

Table 3. Follansbee Hooverson Heights Surface Water Sources*

Intake Name	SDWIS #	Local Name	Describe Intake	Name of Water Source	Date Constructed / Modified	Frequency of Use (Primary/ Backup/ Emergency)	Activity Status (Active/ Inactive)
River Intake	-	Raw water intake	18'' diameter T-screens	Ohio River	1994 (C)	Primary	Active

*This information is from the 2016 Source Water Protection Contingency Plan for Follansbee Hooverson Heights Water System by The Thrasher Group, Inc. This document is attached in **Appendix D.**

Table 4. Follansbee Hooverson Heights Groundwater Sources*

Does the utility blend with groundwater?					Yes				
Well/Spring Name	SDWIS #	Local Name	Date Constructed/ Modified	Completion Report Available (Yes/No)	Well Depth (ft.)	Casing Depth (ft.)	Grout (Yes/No)	Frequency of Use (Primary/ Backup/ Emergency)	Activity Status (Active/ Inactive)
1	N/A	1	N/A	N/A	70	N/A	No	Backup	Active
2	N/A	2	N/A	N/A	70	N/A	No	Backup	Inactive
3	N/A	3	N/A	N/A	70	N/A	No	Backup	Active
4	N/A	4	N/A	N/A	70	N/A	No	Backup	Inactive

*This information is from the 2016 Source Water Protection Contingency Plan for Follansbee Hooverson Heights Water System by The Thrasher Group, Inc. This document is attached in **Appendix D.**

6.0 DELINEATIONS

For surface water systems, delineation is the process used to identify and map the drainage basin that supplies water to a surface water intake. This area is generally referred to as the source water protection area (SWPA). All surface waters are susceptible to contamination because they are exposed at the surface and lack a protective barrier from contamination. Accidental spills, releases, sudden precipitation events that result in overland runoff, or storm sewer discharges can allow pollutants to readily enter the source water and potentially contaminate the drinking water at the intake. The SWPA for surface water is distinguished as a Watershed Delineation Area (WSDA) for planning purposes; and the Zone of Peripheral Concern (ZPC) and Zone of Critical Concern (ZCC) are defined for regulatory purposes.

The WSDA includes the entire watershed area upstream of the intake to the boundary of the State of West Virginia border or a topographic boundary. The ZCC for a public surface water supply is a corridor along streams within the watershed that warrants more detailed scrutiny due to its proximity to the surface water intake and the intake's susceptibility to potential contaminants within that corridor. The ZCC is determined using a mathematical model that accounts for stream flows, gradient and area topography. The length of the ZCC is based on a five-hour time-of-travel of water in the streams to the water intake, plus an additional one-quarter mile below the water intake. Ohio River ZCC delineations are based on ORSANCO guidance and extend 25 miles above the intake. The width of the zone of critical concern is 1,000 feet measured horizontally from each bank of the principal stream and five hundred feet measured horizontally from each bank of the tributaries draining into the principal stream. Ohio River ZCC delineations are based on ORSANCO guidance and extend 25 miles above the intake and one-quarter mile below the intake. The Ohio River ZCC delineations include 1,320 feet (one-quarter mile) measured from the bank of the main stem of the Ohio River and 500 feet on tributary.

The ZPC for a public surface water supply source and for a public surface water influenced groundwater supply source is a corridor along streams within a watershed that warrants scrutiny due to its proximity to the surface water intake and the intake's susceptibility to potential contaminants within that corridor. The ZPC is determined using a mathematical model that accounts for stream flows, gradient and area topography. The length of the zone of peripheral concern is based on an additional five-hour time-of-travel of water in the streams beyond the perimeter of the zone of critical concern, which creates a protection zone of ten hours above the water intake. The width of the zone of peripheral concern is one thousand feet measured horizontally from each bank of the principal stream and five hundred feet measured horizontally from each bank of the tributaries draining into the principal stream.

For groundwater supplies there are two types of SWPA delineations: 1) wellhead delineations and 2) conjunctive delineations, which are developed for supplies identified as groundwater under the direct influence of surface water, or GWUDIs. A wellhead protection area is determined to be the area contributing to the recharge of the groundwater source (well or spring), within a five year time of travel. A conjunctive delineation combines a wellhead protection area for the hydrogeologic recharge and a connected surface area contributing to the wellhead.

Information and maps of the WSDA, ZCC, ZPC and Wellhead Protection Area for this public water supply were provided to the utility and are attached to this report. See **Appendix A. Figures**. Other information about the WSDA is shown in **Table 5**.

Table 5. Watershed Delineation Information

Size of WSDA (Indicate units)	The watershed delineation area covers 24,028 square miles.
River Watershed Name (8-digit HUC)	Upper Ohio South – HUC 05030106
Size of Zone of Critical Concern (Acres)	The ZCC covers approximately 54,860 acres.
Size of Zone of Peripheral Concern (Acres) (Include ZCC area)	The ZPC covers approximately 167,382 acres.
Method of Delineation for Groundwater Sources	N/A
Area of Wellhead Protection Area (Acres)	N/A

7.0 PROTECTION TEAM

One important step in preparing a source water protection plan is to organize a source water protection team who will help develop and implement the plan. The legislative rule requires that water utilities make every effort to inform and engage the public, local government, local emergency planners, the local health department and affected residents at all levels of the development of the protection plan. WVBPH recommends that the water utility invite representatives from these organizations to join the protection team, which will ensure that they are given an opportunity to contribute in all aspects of source water protection plan development. Public water utilities should document their efforts to engage representatives and provide an explanation if any local stakeholder is unable to participate. In addition, other local stakeholders may be invited to participate on the team or contribute information to be considered. These individuals may be emergency response personnel, local decision makers, business and industry representatives, land owners (of land in the protection area), and additional concerned citizens.

The administrative contact for Follansbee Hooverson Heights Water System is responsible for assembling the protection team and ensuring that members are provided the opportunity to contribute to the development of the plan. The acting members of the Protection Team are listed in **Table 6.**

The role of the protection team members will be to contribute information to the development of the source water protection plan, review draft plans and make recommendations to ensure accuracy and completeness, and when possible contribute to implementation and maintenance of the protection plan. The protection team members are chosen as trusted representatives of the community served by the water utility and may be designated to access confidential data that contains details about the local PSSCs. The input of the protection team will be carefully considered by the water utility when making final decisions relative to the documentation and implementation of the source water protection plan.

Follansbee Hooverson Heights Water System will be responsible for updating the source water protection plan and rely upon input from the protection team and the public to better inform their decisions. To find out how you can become involved as a participant or contributor, visit the utility website or call the utility phone number, which are provided in **Table 6.**

Table 6. Protection Team Member and Contact Information

Name	Representing	Title	Phone Number	Email
Ron Orsini	Follansbee Hooverson Heights Water System	**Chief Operator**	[redacted]	ronorsini1130@gmail.com
David Velegol	City of Follansbee	**Mayor**	[redacted]	mayorvelegol@comcast.net
Michael Bolen	Brooke County Health Department	**Administrator**	304-737-3665	michael.s.bolen@wv.gov
Britney Hervey Farris	Brooke County Health Department	**Sanitarian**	304-737-3665	britney.l.hervey@wv.gov
Robert Fowler	Brooke Co. EMA	**EMA Director**	304-479-5003	bfowler@brookecountyema.com
Daniel E. Keener	Brooke County Emergency Management Agency	**Deputy Director**	304-559-7995	dkeener@brookecountyema.com
John R. Williams III	Brooke County Emergency Management Agency	**Deputy Director**	304-559-8323	jwilliams@brookecountyema.com
Bill Secrest	Follansbee Hooverson Heights Water System	**Water and Sewer Field Supervisor**	[redacted]	bswater69@gmail.com

Date of first protection team meeting	6/16/2016
Efforts made to inform and engage local stakeholders (public, local government, local emergency planners, local health department, and affected residents) and explain absence of recommended stakeholders:	The first protection team for Follansbee Hooverson Heights Water System was held on 6/16/2016 at Follansbee City Hall. The meeting was arranged by Ron Orsini, who also contacted the recommended team members. Mayor Velegol and Fobert Fowler were unable to attend the first meeting but will participate on the protection team in the future. Notes from this meeting are attached in **Appendix E. Supporting Documentation**. Follansbee Hooverson Heights Water System also held a public meeting on 6/16/2016 at City Hall. The meeting took place during the regularly scheduled water board meeting. More information about this public meeting is provided in **Table 10. Education and Outreach Implementation Plan**.

8.0 POTENTIAL SOURCES OF SIGNIFICANT CONTAMINATION

Source water protection plans should provide a complete and comprehensive list of the PSSCs contained within the ZCC based upon information obtained from the WVBPH, working in cooperation with the West Virginia Department of Environmental Protection (WVDEP) and the West Virginia Division of Homeland Security and Emergency Management (WVDHSEM). A facility or activity is listed as a PSSC if it has the potential to release a contaminant that could potentially impact a nearby public water supply, and it does not necessarily indicate that any release has occurred.

The list of PSSCs located in the SWPA is organized into two types: 1) SWAP PSSCs, and 2) Regulated Data. SWAP PSSCs are those that have been collected and verified by the WVBPH SWAP program during previous field investigations to form the source water assessment reports and source water protection plans. Regulated PSSCs are derived from federal and state regulated databases, and may include data from WVDEP, US Environmental Protection Agency, WVDHSEM, and out-of-state data sources.

8.1 CONFIDENTIALITY OF PSSCS

A list of the PSSCs contained within the ZCC should be included in the source water protection plan. However, the exact location, characteristics and approximate quantities of contaminants shall only be made known to one or more designees of the public water utility and maintained in a confidential manner. In the event of a chemical spill, release or other related emergency, information pertaining to the contaminant shall be immediately disseminated to any emergency responders reporting to the site. The designees for Follansbee Hooverson Heights Water System are identified in the communication planning section of the source water protection plan.

PSSC data from some agencies (ex. WVDHSEM, WVDEP, etc.) may be restricted due to the sensitive nature of the data. Locational data will be provided to the public water utility. However, to obtain specific details regarding contaminants, (such as information included in Tier II reports), water utilities should contact the local emergency planning commission (LEPC) or agencies, directly. While the maps and lists of the PSSCs and regulated sites are to be maintained in a confidential manner, these data are provided in **Appendix A. Figures** for internal review and planning uses only.

8.2 LOCAL AND REGIONAL PSSCS

For the purposes of this source water protection plan, local PSSCs are those that are identified by the water utility and local stakeholders and are not already identified in the PSSCs lists distributed by the WVBPH and other agencies. Local stakeholders may identify local PSSCs for two main reasons. The first is that it is possible that threats exist from unregulated sources and land uses that have not already been inventoried and do not appear in regulated databases. For this reason each public water utility should investigate their protection area for local PSSCs. A PSSC inventory should identify all contaminant sources and land uses in the delineated ZCC. The second reason local PSSCs are identified is because public water utilities may consider expanding the PSSC inventory effort outside of the ZCC into the ZPC and WSDA if necessary to properly identify all threats that could impact the drinking water source. As the utility considers threats in the watershed they may consider collaborating with upstream communities to identify and manage regional PSSCs.

When conducting local and regional PSSC inventories, utilities should consider that some sources may be obvious like above ground storage tanks, landfills, livestock confinement areas, highway or railroad right of ways, and sewage treatment facilities. Others are harder to locate like abandoned cesspools, underground tanks, French drains, dry wells, or old dumps and mines.

Follansbee Hooverson Heights Water System reviewed intake locations and the delineated SWPAs to verify the existence of PSSCs provided by the WVBPH and identify new PSSCs. If possible, locations of regulated sites within the SWPA were confirmed. Information on any new or updated PSSCs identified by Follansbee Hooverson Heights Water System and not already appearing in datasets from the WVBPH can be found in Table 7.

Table 7. Locally Identified Potential Sources of Significant Contamination

PSSC Number	Map Code	Site Name	Site Description	Relative Risk Score	Comments
-	-	-	-	-	-

8.3 PRIORITIZATION OF THREATS AND MANAGEMENT STRATEGIES

Once the utility has identified local concerns, they must develop a management plan that identifies specific activities that will be pursued by the public water utility in cooperation and concert with the WVBPH, local health departments, local emergency responders, LEPC and other agencies and organizations to protect the source water from contamination threats.

Depending on the number identified, it may not be feasible to develop management strategies for all of the PSSCs in the SWPA. The identified PSSCs can be prioritized by potential threat to water quality, proximity to the intake(s), and local concern. The highest priority PSSCs can be addressed first in the initial management plan. Lower ranked PSSCs can be addressed in the future as time and resources allow. To assess the threat to the source water, water systems should consider confidential information about each PSSC. This information may be obtained from state or local emergency planning agencies, Tier II reports, facility owner, facility groundwater protection plans, spill prevention response plans, results of field investigations, etc.

In addition to identifying and prioritizing PSSCs within the SWPA, local source water concerns may also focus on critical areas. For the purposes of this source water protection plan, a critical area is defined as an area that is identified by local stakeholders and can lie within or outside of the ZCC. Critical areas may contain one or more PSSCs which would require immediate response to address a potential incident that could impact the source water.

A list of priority PSSCs was selected and ranked by the Follansbee Hooverson Heights Water System Protection Team. This list reflects the concerns of this specific utility and may contain PSSCs not previously identified and not within the ZCC or ZPC. **Table 8** contains a description of why each critical area or PSSC is considered a threat and what management strategies the utility is either currently using or could use in the future to address each threat.

9.0 IMPLEMENTATION PLAN FOR MANAGEMENT STRATEGIES

Follansbee Hooverson Heights Water System reviewed the recommended strategies listed in their previous source water protection plan, to consider if any of them should be adopted and incorporated in this updated plan. **Table 9** provides a brief statement summarizing the status of the recommended strategies. **Table 9** also lists strategies from a previous plan that are being incorporated in this plan update

When considering source management strategies and education and outreach strategies, this utility has considered how and when the strategies will be implemented. The initial step in implementation is to establish responsible parties and timelines to implement the strategies. The water utility, working in conjunction with the Protection Team members, can determine the best process for completing activities within the projected time periods. Additional meetings may be needed during the initial effort to complete activities, after which the Protection Team should consider meeting annually to review and update the Source Water Protection Plan. A system of regular updates should be included in every implementation plan.

Proposed commitments and schedules may change but should be well documented and reported to the local stakeholders. If possible, utilities should include cost estimates for strategies to better plan for implementation and possible funding opportunities. Follansbee Hooverson Heights Water System has developed an implementation plan for priority concerns listed in **Table 8**. The responsible team member, timeline, and potential cost of each strategy are presented in **Table 9**. Note: Because timelines may change, future plan updates should describe the status of each strategy and explain the lack of progress. The responsible team member, timeline, and potential cost of each strategy was estimated and is presented in **Table 9**.

Table 8. Priority PSSCs or Critical Areas

PSSC or Critical Area	Priority Number	Reason for Concern
Barge Traffic on the Ohio River	1	Barges routinely transport coal, chemicals, and other materials up the Ohio River upstream of the raw water intake. If a spill or leak were to occur from one of these barges, the water system could be impacted or contaminated.
Railroad Tracks	2	A section of railroad passes through the SWPA on both sides of the Ohio River and potential spills or leaks are a concern. A spill from a railroad impacted a water supply well and water treatment plant production at another PWS in the same county.
Roadways, Including State Route 2 and US Route 7	3	Sections of major roadway pass through the SWPA on both sides of river, and potential spills are a concern given the impact of a railroad spill in the past.
Sanitary Septic Systems, Home Aeration Units, Wastewater Treatment Systems and Overflows from Larger Sanitary Sewer Systems	4	Discharge from smaller, failing sanitary systems, as well as overflows from larger sanitary sewer systems located upstream of intake, can pose a possible contamination threat, including the introduction of fecal coliform into source water. E. coli testing has been problematic in the past.
Oil and Gas Wells	5	Drilling of gas wells within the SWPA and areas upstream is increasing, including drilling of Marcellus Shale wells. Drilling of some Marcellus Shale wells can produce large volumes of brine water, and can produce water with chemical additives used for fracturing and constituents such as benzene and certain radioactive elements. Uncontrolled spills and releases could introduce contaminants into source water. Some constituents in brine, including bromides, have the potential to increase total trihalomethane formation. In addition, it should be noted that a nearby PWS has expressed concern about a brine treatment facility. Construction of such a treatment facility could encourage additional oil and gas industry development.
Industry	6	Areas upstream of intake, such us Steubenville, Weirton, New Cumberland and others, are heavily industrialized. Surface water protection practices for local industries may not be known.
Future Development	7	Extent and type of future development, including potential impacts on source water, are not known at this time.
Vandalism	8	Vandals could damage facilities, including raw water system.

Table 9. Priority PSSC Management Strategies

PSSC or Critical Area	Management Activity	Responsible Protection Team Member	Status/ Schedule	Comments	Estimated Cost
Previous Plan Status	There were 7 management strategies recommended in the existing plan. All of these strategies address concerns that are ongoing or continue to be priorities for the water system. These are incorporated in this plan update and listed below.	-	-	-	-
Barge Traffic	Water utility staff regularly receives notifications from upstream industrial facilities and barge operators. Staff will continue to communicate with these groups on a regular basis regarding and potential spills or accidents. Utility staff will also continue to coordinate with local emergency responders to ensure they are as prepared as possible to deal with an accident or spill from a barge.	Water utility staff, emergency responders	Ongoing	Brook County EMA has conducted a commodity flow study in the past and will update this information in 2016. The updated report will be shared with the water operators when it is completed.	Minimal cost associated with staff time, and cost to conduct commodity flow study
Railroad Tracks	Better coordination of emergency response with local first responders, including raising awareness for the need to protect drinking water supplies. Meet with local public water system within SWPA that suffered impact from previous spill to obtain input on their experience with addressing railroad spill, addressing media, emergency procedures, etc. Evaluate installing signage just off railroad right-of-way with emergency contact numbers. This would also help raise awareness of railroad personnel that they are traveling through a source water protection zone while providing them with a call number in an emergency.	Utility staff	By 2019 Plan Update	Contact fire department and other first responders on boom availability. If none (or if unsuitable), evaluate purchase of booms for in-stream spill containment. Work with local fire department and transportation department with spill response planning. Local PWS suffered impact from spill from railroad.	Minimal cost associated with staff time
Roadways, Including State Route 2 and US Route 7	Better coordination of emergency response with local first responders, including raising awareness for the need to protect drinking water supplies. Consider installing signage along State Route 2 and targeted city streets with emergency contact numbers. This would also help raise awareness with motorists and truckers that they are traveling through a source	PWS Chief Operator / Town Council Member	Ongoing Efforts	Contact fire department and other first responders on boom availability. If none (or if unsuitable), evaluate purchase of booms for in-stream spill containment.	Minimal cost associated with staff time to coordinate with emergency responders.

PSSC or Critical Area	Management Activity	Responsible Protection Team Member	Status/ Schedule	Comments	Estimated Cost
	water protection zone while providing them with a call number in an emergency. Regular inspections of the roadways to identify if spillage is occurring. Maintain records of identified leaks and spills.				
Sanitary Septic Systems, Home Aeration Units, Wastewater Treatment Systems and Overflows from Larger Sanitary Sewer Systems	Support study and planning of sanitary sewer system extensions and upgrades along Ohio River and tributaries upstream of intake to extend service to these areas and eliminate failing septic systems, home aeration units and wastewater treatment systems, and overflows from larger sanitary sewer systems. Raise awareness at city government and/or county commissions for need for source water protection to increase support for proposed sanitary sewer system extensions and upgrades.	Utility staff / Town Council Member	If necessary	Evaluate enhanced fecal coliform testing of surface water to better identify sources of fecal coliform contamination, including coordinating efforts with towns upstream of intake.	Supporting extensions and upgrades may not involve direct cost. Enhanced testing costs can range from $1,000 and up depending on program. WVDHHR grant funds may be available.
Oil and Gas Wells	Review public information on surface water protection practices for oil and gas industry to raise PWS staff awareness of surface water protection practices of oil and gas industry. Evaluate increased sampling of water quality for parameters (e.g., chlorides, bromides, TDS [conductivity]) associated with oil and gas industry to better assess whether source water quality is being impacted by oil and gas industry, and help develop baseline data of water quality. Evaluate installing into source water, at or upstream of intake, monitoring equipment to provide early warning of possible brine or other spills into source water and help develop water quality data of source water. If parameters associated with oil and gas industry become problematic to water quality, consider symposium for local oil and gas industry to raise awareness of source water protection and review regulatory requirements.	Utility staff	Ongoing efforts	Maintain contact with neighboring public water systems to receive input on effects of anticipated Marcellus Shale and gas well drilling, and track status of regulations through such organizations as WVDHHR, West Virginia Rural Water Association (WVRWA), West Virginia Public Service Commission (WVPSC), and West Virginia Department of Environmental Protection (WVDEP).	No cost associated with reviewing public information on oil/gas BMPs. See Appendix B for approximate costs of early warning monitoring systems.

PSSC or Critical Area	Management Activity	Responsible Protection Team Member	Status/ Schedule	Comments	Estimated Cost
Industry	Review public information on ground and surface water protection practices, including Ground Water Protection Plans (GPP) results of sampling required by NPDES permit for industry to raise PWS staff awareness of ground and surface water protection plan practices of industries on the watershed. Contact fire department and other first responders on boom availability. If none (or if unsuitable), evaluate purchase of booms for in-stream spill containment. Evaluate what authority exists at city or county government regarding approval over development that could be a higher risk to surface water resources. Continue use of ORSANCO early warning system.	Utility Superintendent/ Water Board Member	Ongoing Efforts	The West Virginia Department of Environmental Protection retains copies of protection plans that can be obtained through Freedom of Information Act requests.	Minimal (Freedom of Information Act charges, mileage).
Vandalism	Evaluate improving security, including adding security cameras at WTP, water supply wells and intake.	PWS Chief Operator	By 2019 SWPP Update	-	Cost for cameras will vary but is expected to range from $5,000 to $15,000. WVDHHR grant funds may be available. Cost for security fencing could be $30 to $45/ft. WVDHHR grant funds may be available.
Source Water Protection Plan	Update this Source Water Protection Plan at least every 3 years as required by the State Code of West Virginia.	Source Water Protection Team	Every 3 years. Next update in 2019	The Protection Plan should also be updated any time there is a significant change within the protection area or in utility staff. Yearly meetings of the protection team are recommended to ensure all members are up to date and informed about any developments within the protection area.	Minimal costs associated with team members' time

PSSC or Critical Area	Management Activity	Responsible Protection Team Member	Status/ Schedule	Comments	Estimated Cost
Future Development and Other Activities Within the Watershed	Water utility staff will perform a yearly "windshield survey" of the zone of critical concern. They will note changes in land use, water quality, and other developments that may have occurred since the previous year's survey. These changes will be documented and reflected in future source water protection plan updates.	Water utility staff	Yearly, next survey in 2017	Document the date of the survey and any changes that may have occurred within the ZCC that could impact water quality.	Minimal cost associated with staff time
Yearly Source Water Protection Team Meetings	The Protection Team for Follansbee Hooverson Heights will meet on a yearly basis to discuss any changes that might have occurred within the watershed or to find replacements for members who can no longer participate on the team.	Source Water Protection Team	Yearly, next meeting in 2017	-	Minimal cost associated with staff time
Regular Coordination with Emergency Managers	Local emergency planners have access to confidential chemical contaminant information in Tier II reports from facilities in the SWPA. The utility should coordinate with the local emergency planners to gain an understanding of potential contaminants to better prepare for a spill event. Utility staff will continue to communicate with these emergency services groups on a regular basis, especially when there is not an ongoing emergency. They will invite the local emergency planners to meet yearly as part of the Source Water Protection Team.	Water utility staff and emergency response personnel.	Engage local emergency planners immediately and communicate on a regular basis.	-	Minimal cost associated with staff time

10.0 EDUCATION AND OUTREACH STRATEGIES

The goal of education and outreach is to raise awareness of the need to protect drinking water supplies and build support for implementation strategies. Education and outreach activities will also ensure that affected citizens and other local stakeholders are kept informed and provided an opportunity to contribute to the development of the source water protection plan. Follansbee Hooverson Heights Water System has created an Education and Outreach plan that describes activities it has either already implemented or could implement in the future to keep the local community involved in protecting their source of drinking water. This information can be found in **Table 10**.

Table 10. Education and Outreach Implementation Plan

Education and Outreach Strategy	Description of Activity	Responsible Protection Team Member	Status/ Schedule	Comments	Estimated Cost
Public Meeting	Follansbee Hooverson Heights held an informational meeting with local residents about source water protection efforts on June 16, 2016 during the regularly scheduled city council meeting. The meeting was held to increase awareness of the connection between land use and drinking water quality. A representative from Tetra Tech gave a presentation about the plan and was available to answer questions and take comments. Utility staff from Follansbee were also present to answer any questions. This meeting fulfilled a required part of the source water protection planning process.	Utility Staff/ Protection Team	June 16, 2016	The meeting was advertised for several weeks prior to the meeting by posting an announcement flyer around Follansbee on bulletin boards. The flyer was also posted in the Wheeling Intelligencer and Steubenville Herald Star. Water system staff also sent out a recorded robo-call message using the automatic phone notification system. The flyer that was used is attached in **Appendix E. Supporting Documentation**. The meeting sign-in sheet is also attached in **Appendix E**. A few members of the public attended the meeting, as well as the water board members and a representative from the local television news.	Minimal cost related to operator time
Consumer Confidence Report	The water system publishes a Consumer Confidence Report (CCR) annually, as required by the Safe Drinking Water Act, which is sent to all water customers. Information concerning the Source Water Assessment is included in the CCR. In the future, the system will include a reference to this source water protection plan and how customers can access a copy.	Utility Staff	Yearly	This would be in addition to required Source Water Assessment information, including source of water and susceptibility to contamination.	CCR required by SDWA, included in annual budget
Brochures, pamphlets, and letters	Send a letter and/or brochure providing educational information to residences and businesses. These will alert the recipients of the need for source water protection and conservation. Businesses that use greater-than-household quantities of regulated substances may receive a different letter.	Utility Staff	Within a year	The Source Water Collaborative has released an educational brochure building tool to assist with creating custom brochures targeting local decision makers. This tool is available at: http://www.yourwateryourdecision.org	Cost in brochure printing and mailing

Education and Outreach Strategy	Description of Activity	Responsible Protection Team Member	Status/ Schedule	Comments	Estimated Cost
				and may assist in community planning and development. There is also an example brochure attached in **Appendix E**.	
Plant Tours	Provide tours of the water plant to interested organizations such as watershed groups, schools, and civic organizations. Tours will continue to be offered as requested.	Operator	Regularly, as requested	Organize a tour with local Emergency Responders to make them familiar with the facilities in the event of an emergency.	Minimal cost associated with operator's time
School Curricula	Work with the school system to incorporate source water activities into the school curricula. Visit school or invite students for a plant tour to tie in with school curricula. Ask the school to include message in school newsletter to raise awareness about source water protection and conservation.	Utility Staff	Yearly, as requested by local schools.	Operator can initiate effort, locate the appropriate individuals in school and/or on local school board. Can provide websites with free education materials to promote source water protection and conservation. Also operator may visit school or invite students for a plant tour to tie in with classroom materials.	Minimal costs. Would require time to coordinate, visit classroom and provide tour

11.0 CONTINGENCY PLAN

The goal of contingency planning is to identify and document how the utility will prepare for and respond to any drinking water shortages or emergencies that may occur due to short and long term water interruption, or incidents of spill or contamination. During contingency planning, utilities should examine their capacity to protect their intake, treatment, and distribution system from contamination. They should also review their ability to use alternative sources and minimize water loss, as well as their ability to operate during power outages. In addition, utilities should report the feasibility of establishing an early warning monitoring system and meeting future water demands.

Isolating or diverting any possible contaminant from the intake for a public water system is an important strategy in the event of an emergency. One commonly used method of diverting contaminants from an intake is establishing booms around the intake. This can be effective, but only for contaminants that float on the surface of the water. Alternatively, utilities can choose to pump floating contaminants from the water or chemically neutralize the contaminant before it enters the treatment facility.

Public utilities using surface sources should be able to close the intake by one means or another. However, depending upon the system, methods for doing so could vary greatly and include closing valves, lowering hatches or gates, raising the intake piping out of the water, or shutting down pumps. Systems should have plans in place in advance as to the best method to protect the intake and treatment facility. Utilities may benefit from turning off pumps and, if possible, closing the intake opening to prevent contaminants from entering the piping leading to the pumps. Utilities should also have a plan in place to sample raw water to identify the movement of a contaminant plume and allow for maximum pumping time before shutting down an intake (See Early Warning Monitoring System). The amount of time that an intake can remain closed depends on the water infrastructure and should be determined by the utility before an emergency occurs. The longer an intake can remain closed in such a case, the better.

Raw and treated water storage capacity also becomes extremely important in the event of such an emergency. Storage capacity can directly determine how effectively a water system can respond to a contamination event and how long an intake can remain closed. Information regarding the water shortage response capability of Follansbee Hooverson Heights Water System is provided in **Table 11**.

11.1 RESPONSE NETWORKS AND COMMUNICATION

Statewide initiatives for emergency response, including source water related incidents, are being developed. These include the West Virginia Water/Wastewater Agency Response Network (WV WARN, see http://www.wvwarn.org/) and the Rural Water Association Emergency Response Team (see http://www.wvrwa.org/). Follansbee Hooverson Heights Water System has analyzed its ability to effectively respond to emergencies and this information is also provided in **Table 11**.

Table 11. Follansbee Hooverson Heights Water Shortage Response Capability*

Can the utility isolate or divert contamination from the intake or groundwater supply?	Yes
Describe the utility's capability to isolate or divert potential contaminants:	If notified of a contamination the operators can shut off the raw water intake on the Ohio River and close the valve.
Can the utility switch to an alternative water source or intake that can supply full capacity at any time?	Yes, the water system could use the one operational well and Follansbee Municipal Water (700 GPM capacity) to sustain some of the demand. Water utility staff are in the process of securing funding to repair the remaining 3 wells. If these become operational the system should be able to produce enough water to supply average demand.

Describe in detail the utility's capability to switch to an alternative source:	The surface water intake can be shut off with a valve. The intake pumps can then be switched to the Hooverson Heights wells.
Can the utility close the water intake to prevent contamination from entering the water supply?	Yes
How long can the intake stay closed?	If the tanks were full when the intake was closed, the system could sustain itself for approximately 5.3 days at average demand or approximately 1.5 days at maximum production.
Describe the process to close the intake:	The surface water intake can be shut off with a valve. The pumps would then be used for the groundwater wells.
Describe the treated water storage capacity of the water system:	The current treated water storage amount for the system consists of five (5) water storage tanks totaling 2,096,000 gallons of treated water.
Is the utility a member of WVRWA Emergency Response Team?	No
Is the utility a member of WV-WARN?	No
List any other mutual aid agreements to provide or receive assistance in the event of an emergency:	Follansbee Municipal

*This information is from the 2016 Source Water Protection Contingency Plan for Follansbee Hooverson Heights Water System by The Thrasher Group, Inc. This document is attached in **Appendix D**.

11.2 OPERATION DURING LOSS OF POWER

Follansbee Hooverson Heights Water System analyzed its ability to operate effectively during a loss of power. This involved ensuring a means to supply water through treatment, storage, and distribution without creating a public health emergency. Information regarding the utility's capacity for operation during power outages is summarized in **Table 12**.

Table 12. Generator Capacity*

What is the type and capacity of the generator needed to operate during a loss of power?	According to the WV DHHR, the emergency generator capacity for the treatment facility requires 300 kW and the largest booster station (Cooks Hill) requires 70 kW. The intake pump station has a generator capacity requirement of 250 kW.
Can the utility connect to generator at intake/wellhead? If yes, select a scenario that best describes system.	No, the intake is currently not wired to use backup power during an outage.
Can the utility connect to generator at treatment facility? If yes, select a scenario that best describes system.	No, the water treatment plant is currently not wired to use backup power during an outage.

Can the utility connect to a generator in distribution system? If yes, select a scenario that best describes system.		No, the Cooks Hill pump station is currently not wired to use backup power during an outage.	
Does the utility have adequate fuel on hand for the generator?		No	
What is your on-hand fuel storage and how long will it last operating at full capacity?		**Gallons**	**Hours**
		N/A	N/A
Provide a list of suppliers that could provide generators and fuel in the event of an emergency:		**Supplier**	**Phone Number**
	Generator	Brooke County EMA	304-737-5002
	Generator	Beckwith Equipment Company	-
	Fuel	Brooke County EMA	304-737-5002
	Fuel	Tri State Petroleum	304-455-2070
Does the utility test the generator(s) periodically?		N/A	
Does the utility routinely maintain the generator?		N/A	
If no scenario describing the ability to connect to generator matches the utility's system or if utility does not have ability to connect to a generator, describe plans to respond to power outages:		During a power outage the utility does not have a backup source of power. The utility has inquired about procuring an emergency generator for Follansbee Municipal and Hooverson Heights to share during power outages. In addition, Brooke County EMA has 3 generators (240 kW, 180 kW, and 160 kW, each with 150 gal. fuel tanks) available for use by the water system if needed. This would be their primary option during a power outage.	

*This information is from the 2016 Source Water Protection Contingency Plan for Follansbee Hooverson Heights Water System by The Thrasher Group, Inc. This document is attached in **Appendix D.**

11.3 FUTURE WATER SUPPLY NEEDS

When planning for potential emergencies and developing contingency plans, a utility needs to not only consider their current demands for treated water but also account for likely future needs. This could mean expanding current intake sources or developing new ones in the near future. This can be an expensive and time consuming process, and any water utility should take this into account when determining emergency preparedness. Follansbee Hooverson Heights Water System has analyzed its ability to meet future water demands at current capacity, and this information is included in **Table 13**.

Table 13. Future Water Supply Needs*

Is the utility able to meet water demands with the current production capacity over the next 5 years? If so, explain how you plan to do so.	There is little to no increase expected in the customer demand within the next five (5) years for Hooverson Heights. If any increase is experienced, it is expected to be minimal and the plant is expected to remain under the maximum treatment capacity. If a significant increase is experienced, the treatment plant would need to be upgraded at that time.
If not, describe the circumstances and plans to increase production capacity:	N/A

*This information is from the 2016 Source Water Protection Contingency Plan for Follansbee Hooverson Heights Water System by The Thrasher Group, Inc. This document is attached in **Appendix D.**

11.4 WATER LOSS CALCULATION

In any public water system there is a certain percentage of the total treated water that does not reach the customer. Some of this water is used in treatment plant processes such as back washing filters or flushing piping, but there is usually at least a small percentage that goes unaccounted for. To measure and report on this unaccounted for water, a public utility must use the method described in the Public Service Commission's rule, *Rules for the Government of Water Utilities*, 150CSR7, section 5.6. The rule defines unaccounted for water as the volume of water introduced into the distribution system less all metered usage and all known non-metered usage which can be estimated with reasonable accuracy.

To further clarify, metered usages are most often those that are distributed to customers. Non-metered usages that are being estimated include usage by fire departments for fires or training, un-metered bulk sells, flushing to maintain the distribution system, and water used for backwashing filters and cleaning settling basins. By totaling the known metered and non-metered uses the utility calculates unaccounted for water. Note: To complete annual reports submitted to the PSC, utilities typically account for known water main breaks by estimating the amount of water lost. However, for the purposes of the source water protection plan, any water lost due to leaks, even if the system is aware of how much water is lost at a main break, is not considered a use. Water lost through leaks and main breaks cannot be controlled during a water shortages or other emergencies and should be included in the calculation of percentage of water loss for purposes of the source water protection plan. The data in **Table 14** is taken from the most recently submitted Follansbee Hooverson Heights Water System PSC Annual Report.

Table 14. Water Loss Information*

Total Water Pumped (gal)		473,659,000
Total Water Purchased (gal)		0
Total Water Pumped and Purchased (gal)		473,659,000
Water Loss Accounted for Except Main Leaks (gal)	**Mains, Plants, Filters, Flushing, etc.**	0
	Fire Department	0
	Back Washing	5,283,000

	Blowing Settling Basins	0
Total Water Loss Accounted For Except Main Leaks		5,283,000
Water Sold- Total Gallons (gal)		343,930,000
Unaccounted For Lost Water (gal)		0
Water lost from main leaks (gal)		124,446,000
Total gallons of Unaccounted for Lost Water and Water Lost from Main Leaks (gal)		124,446,000
Total Percent Unaccounted For Water and Water Lost from Main Leaks (gal)		26%
If total percentage of Unaccounted for Water is greater than 15%, please describe any measures that could be taken to correct this problem:		Increased inspection and leak detection, and making necessary repairs.

*This information was taken from the 2015 Public Service Commission Annual Report for Follansbee Municipal Water. Water loss information for both Follansbee Municipal Water and Follansbee Hooverson Heights Water System are combined in this report because both system file together. The two systems are interconnected as well, so water loss information in one system would likely correlate directly with water loss for the other.

11.5 EARLY WARNING MONITORING SYSTEM

Public water utilities are required to provide an examination of the technical and economic feasibility of implementing an early warning monitoring system. Implementing an early warning monitoring system may be approached in different ways depending upon the water utility's resources and threats to the source water. A utility may install a continuous monitoring system that will provide real time information regarding water quality conditions. This would require utilities to analyze the data to establish what condition is indicative of a contamination event. Continuous monitoring will provide results for a predetermined set of parameters. The more parameters that are being monitored, the more sophisticated the monitoring equipment will need to be. When establishing a continuous monitoring system, the utility should consider the logistics of placing and maintaining the equipment, and receiving output data from the equipment.

Alternately, or in addition, a utility may also pull periodic grab samples on a regular basis, or in case of a reported incident. The grab samples may be analyzed for specific contaminants. A utility should examine their PSSCs to determine what chemical contaminants could pose a threat to the water source. If possible, the utility should plan in advance how those contaminants will be detected. Consideration should be given to where samples will be collected, the preservations and hold times for samples, available laboratories to analyze samples, and costs associated with the sampling event. Regardless of the type of monitoring (continuous or grab), utilities should collect samples for their source throughout the year to better understand the baseline water quality conditions and natural seasonal fluctuations. Establishing a baseline will help determine if changes in the water quality are indicative of a contamination event and inform the needed response.

Every utility should establish a system or process for receiving or detecting chemical threats with sufficient time to respond to protect the treatment facility and public health. All approaches to receiving and responding to an early warning should incorporate communication with facility owners and operators that pose a threat to the water quality, with state and local emergency response agencies, with surrounding water utilities, and with the public. Communication plays an important role in knowing how to interpret data and how to respond.

Follansbee Hooverson Heights Water System has analyzed its ability to monitor for and detect potential contaminants that could impact its source water. Information regarding this utility's early warning monitoring system capabilities is provided in **Table 15** and in **Appendix B.**

Table 15. Early Warning Monitoring System Capabilities

<table>
<tr><td colspan="2">Does your system currently receive spill notifications from a state agency, neighboring water system, local emergency responders, or other facilities? If yes, from whom do you receive notices?</td><td colspan="2">The utility receives spill notifications from the WV Health Department and the Ohio River Sanitation Commission (ORSANCO).</td></tr>
<tr><td colspan="2">Are you aware of any facilities, land uses, or critical areas within your protection areas where chemical contaminants could be released or spilled?</td><td colspan="2">No</td></tr>
<tr><td colspan="2">Are you prepared to detect potential contaminants if notified of a spill?</td><td colspan="2">No</td></tr>
<tr><td rowspan="4">List laboratories (and contact information) on whom you would rely to analyze water samples in case of a reported spill.</td><td colspan="2">Laboratories</td></tr>
<tr><td>Name</td><td>Contact</td></tr>
<tr><td>Tradet Laboratories – Wheeling, WV</td><td>304-233-9060</td></tr>
<tr><td>REI Consultants</td><td>304-255-2500</td></tr>
<tr><td colspan="2">WV Office of Lab Services</td><td>304-558-3530</td></tr>
<tr><td colspan="2">Do you have an understanding of baseline or normal conditions for your source water quality that accounts for seasonal fluctuations?</td><td colspan="2">Yes</td></tr>
<tr><td colspan="2">Does your utility currently monitor raw water (through continuous monitoring or periodic grab samples) at the surface water intake or from a groundwater source on a regular basis?</td><td colspan="2">Yes</td></tr>
<tr><td rowspan="3">Provide or estimate the capital and O&M costs for your current or proposed early warning system or upgraded system.</td><td>Monitoring System</td><td colspan="2">Hach sc1000 (B-2)</td></tr>
<tr><td>Capital</td><td colspan="2">$50,000</td></tr>
<tr><td>Yearly O & M</td><td colspan="2">$750</td></tr>
<tr><td colspan="2">Do you serve more than 100,000 customers? If so, please describe the methods you use to monitor at the same technical levels utilized by ORSANCO.</td><td colspan="2">N/A</td></tr>
</table>

*This information is from the 2016 Source Water Protection Contingency Plan for Follansbee Hooverson Heights Water System by The Thrasher Group, Inc. This document is attached in **Appendix D.**

12.0 SINGLE SOURCE FEASIBILITY STUDY

If a public water utility's water supply plant is served by a single–source intake to a surface water source of supply or a surface water influenced source of supply, the submitted source water protection plan must also include an examination and analysis of the technical and economic feasibility of alternative sources of water to provide continued safe and reliable public water service in the event that its primary source of supply is detrimentally affected by contamination, release, spill event or other reason. These alternatives may include a secondary intake, two days of additional raw or treated water storage, an interconnection with neighboring systems, or other options identified on a local level. Note: a suitable secondary intake would draw water supplies from a substantially different location or water source.

To accomplish this requirement, utilities should examine all existing or possible alternatives and rank them by their technical, economic, and environmental feasibility. To have a consistent and complete method for ranking alternatives, WVBPH has developed a feasibility study guide. This guide provides several criteria to consider for each category, organized in a Feasibility Study Matrix. By completing the Feasibility Study Matrix, utilities will demonstrate the process used to examine the feasibility of each alternative and document scores that compare the alternatives. The Feasibility Study matrix and summary of the results are presented in an alternatives feasibility study attached as **Appendix D**.

13.0 COMMUNICATION PLAN

Follansbee Hooverson Heights Water System has also developed a Communication Plan that documents the manner in which the public water utility, working in concert with state and local emergency response agencies, shall notify the local health agencies and the public of the initial spill or contamination event and provide updated information related to any contamination or impairment of the system's drinking water supply. The initial notification to the public will occur in any event no later than thirty minutes after the public water system becomes aware of the spill, release, or potential contamination of the public water system. A copy of the source water protection plan and the Communication Plan has been provided to the local fire department. Follansbee Hooverson Heights Water System will update the Communication Plan as needed to ensure contact information is up to date.

Procedures should be in place to effectively react to the kinds of catastrophic spills that can reasonably be predicted at the source location or within the SWPA. The chain-of-command, notification procedures and response actions should be known by all water system employees.

The WVBPH has developed a recommended communication plan template that provides a tiered incident communication process to provide a universal system of alert levels to utilities and water system managers. The comprehensive Communication Plan for Follansbee Hooverson Heights Water System is attached as **Appendix C** for internal review and planning purposes only.

The West Virginia Department of Environmental Protection is capable of providing expertise and assistance related to prevention, containment, and clean-up of chemical spills. The West Virginia Department of Environmental Protection Emergency Response 24-hour Phone is 1-800-642-3074. The West Virginia Department of Environmental Protection also operates an upstream distance estimator that can be used to determine the distance from a spill site to the closest public water supply surface water intake.

14.0 EMERGENCY RESPONSE SHORT FORM

A public water utility must be prepared for any number of emergency scenarios and events that would require immediate response. It is imperative that information about key contacts, emergency services, and downstream water systems be posted and readily available in the event of an emergency. Elements of this source water protection plan, such as the contingency planning and communication plan, may contain similar information to the utility's emergency response plan. However, the emergency response plan is to be kept confidential and is not included in this source water protection plan. An Emergency Short Form is included in **Appendix C** to support the Communicate Plan by providing quick access to important information about emergency response and are to be used for internal review and planning purposes only.

15.0 CONCLUSION

This report represents a detailed explanation of the required elements of Follansbee Hooverson Heights Water System' Source Water Protection Plan. Any supporting documentation or other materials that the utility considers relevant to their plan can be found in **Appendix E**.

This source water protection plan is intended to help prepare community public water systems all over West Virginia to properly handle any emergencies that might compromise the quality of the system's source water supply. It is imperative that this plan is updated as often as necessary to reflect the changing circumstances within the water system. The protection team should continue to meet regularly and continue to engage the public whenever possible. Communities taking local responsibility for the quality of their source water is the most effective way to prevent contamination and protect a water system against contaminated drinking water. Community cooperation, sufficient preparation, and accurate monitoring are all critical components of this source water protection plan, and a multi-faceted approach is the only way to ensure that a system is as protected as possible against source water degradation.

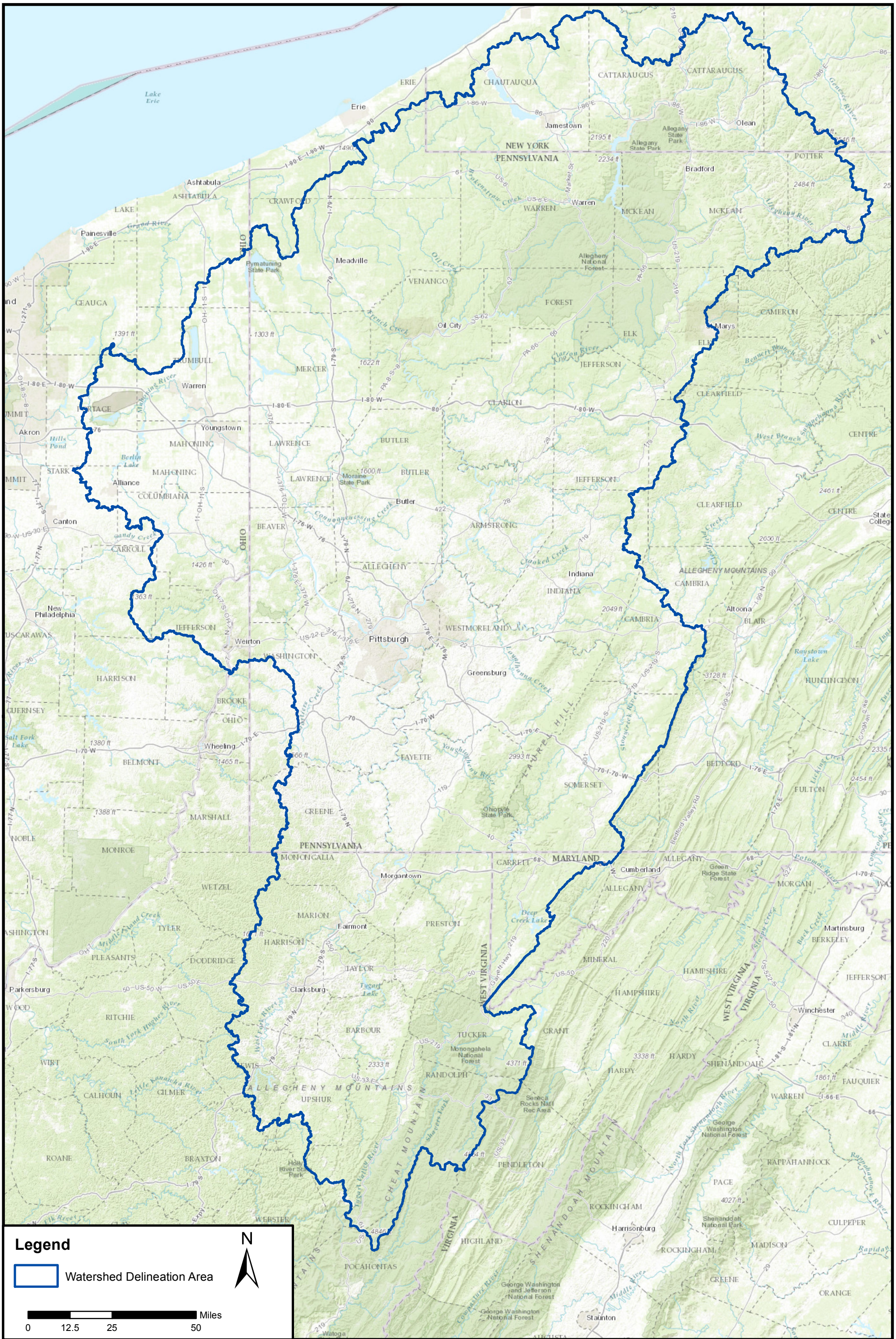
APPENDIX A. FIGURES

Lists of Potential Sources of Significant Contamination

Note: The database of PSSCs for Follansbee Hooverson Heights contained points from various sources that were too numerous to identify and label individually. Maps of the points are attached, but the sites themselves are not labeled. Detailed information about each point has been provided to the water utility staff and are available for reference during emergencies. A summary of the types and counts for each type of PSSC is provided below.

Follansbee Hooverson Heights PSSC Summary

Source Type	IN ZCC	AROUND ZCC	IN ZPC	Watershed	Total
Abandoned Mine Lands	21	7	7	2740	**2775**
Aboveground Storage	458	75	1	11191	**11725**
Oil/Gas	77	144	17	25059	**25297**
Mining Permits	10	6	0	3431	**3447**
LCAP Sites	0	0	0	8	**8**
LUST	11	5	2	185	**203**
MD Border PCS	0	0	0	377	**377**
Ohio CDD Landfills	1	0	0	6	**7**
Ohio Historic Hazardous Waste Sites	3	9	5	29	**46**
Ohio PCSI Site Visits	156	54	180	1272	**1662**
Ohio Solid Waste Facilities	0	2	0	6	**8**
Ohio Border PCS	135	133	83	568	**919**
NPDES	53	38	14	7648	**7753**
Pennsylvania Border PCS	0	1	42	1862	**1905**
RCRA	170	156	40	4167	**4533**
SPREC	0	1	0	430	**431**
SWAPPCS	533	154	136	1509	**2332**
Volunteer Remediation	6	3	2	37	**48**
Total	**1634**	**788**	**529**	**60525**	**63476**



TETRA TECH
803 Quarrier Street, Suite 400
Charleston, WV 25301

Follansbee Hooverson Heights
PWSID: WV3300512
Source Water Protection Plan

Figure A-1. Watershed Delineation Area

CREATED BY: CEM

DATE: 05/22/16

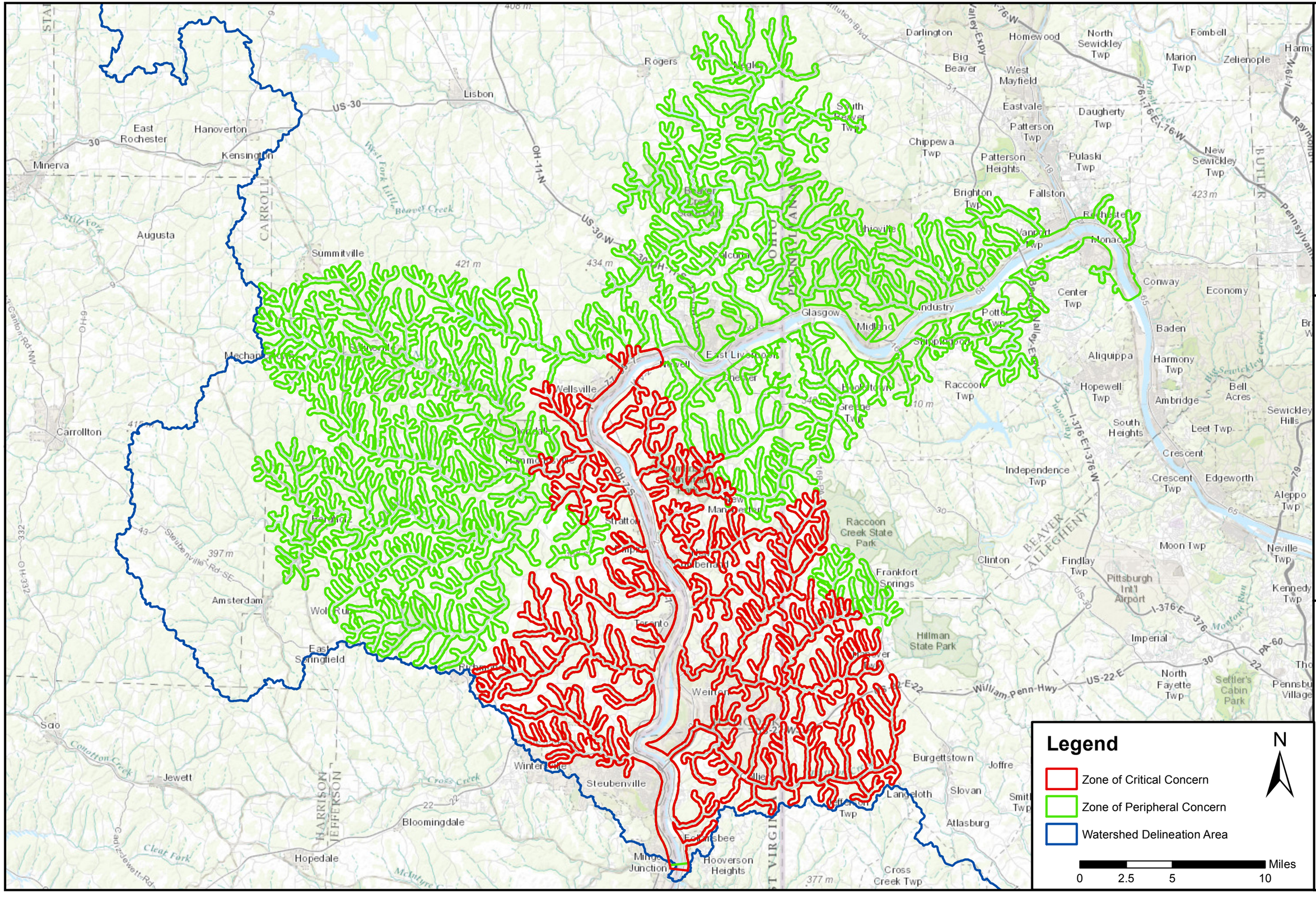


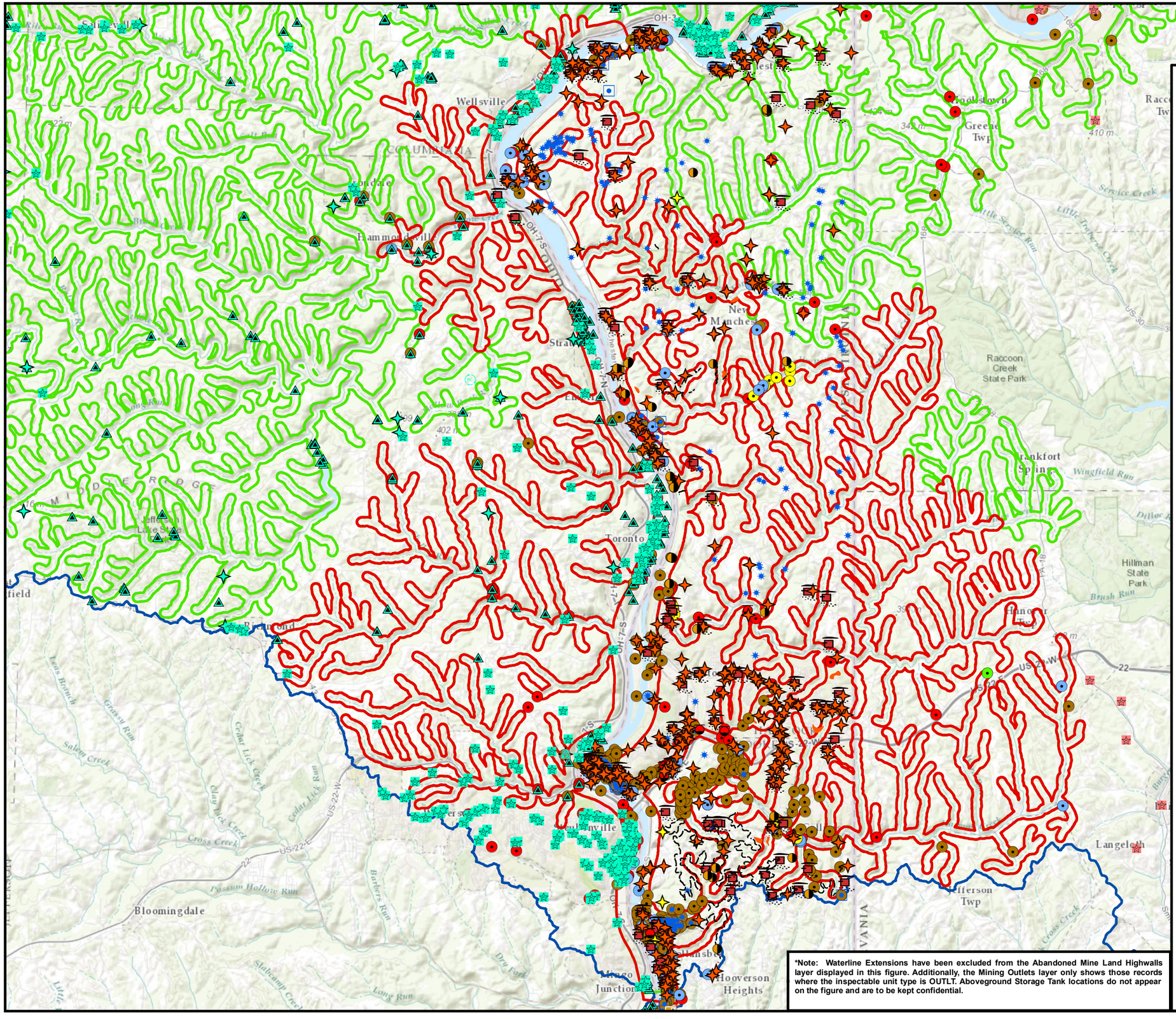
Figure A-2. Zone of Critical Concern/ Zone of Peripheral Concern

DATE:05/22/16

CREATED BY: CEM

Follansbee Hooverson Heights
PWSID: WV3300512
Source Water Protection Plan

TETRA TECH
803 Quarrier Street, Suite 400
Charleston, WV 25301



Legend

N

- Abandoned Mine Land Points
- Abandoned Mine Land Highwalls
- Bond Forfeiture Sites
- EPA FRS Data for Maryland
- EPA FRS Data for Ohio
- EPA FRS Data for Pennsylvania
- EPA Regulated Sites
- Landfill Closure Assistance Program Sites
- Leaking Underground Storage Tanks
- Mining Outlets
- NPDES Outlets
- Ohio CDD Landfills
- Ohio Historic Hazardous Waste Sites
- Ohio PCSI Site Visit
- Ohio Solid Waste Facilities
- Oil and Gas Wells
- Volunteer Remediation

Field Verified PSSCs

- Agriculture
- Commercial
- Industrial
- Municipal
- Residential
- Abandoned Mine Land Areas
- Coal Refuse Sites
- Zone of Critical Concern
- Zone of Peripheral Concern
- Watershed Delineation Area

Miles
0 1 2 4

***Note:** Waterline Extensions have been excluded from the Abandoned Mine Land Highwalls layer displayed in this figure. Additionally, the Mining Outlets layer only shows those records where the inspectable unit type is OUTLT. Aboveground Storage Tank locations do not appear on the figure and are to be kept confidential.

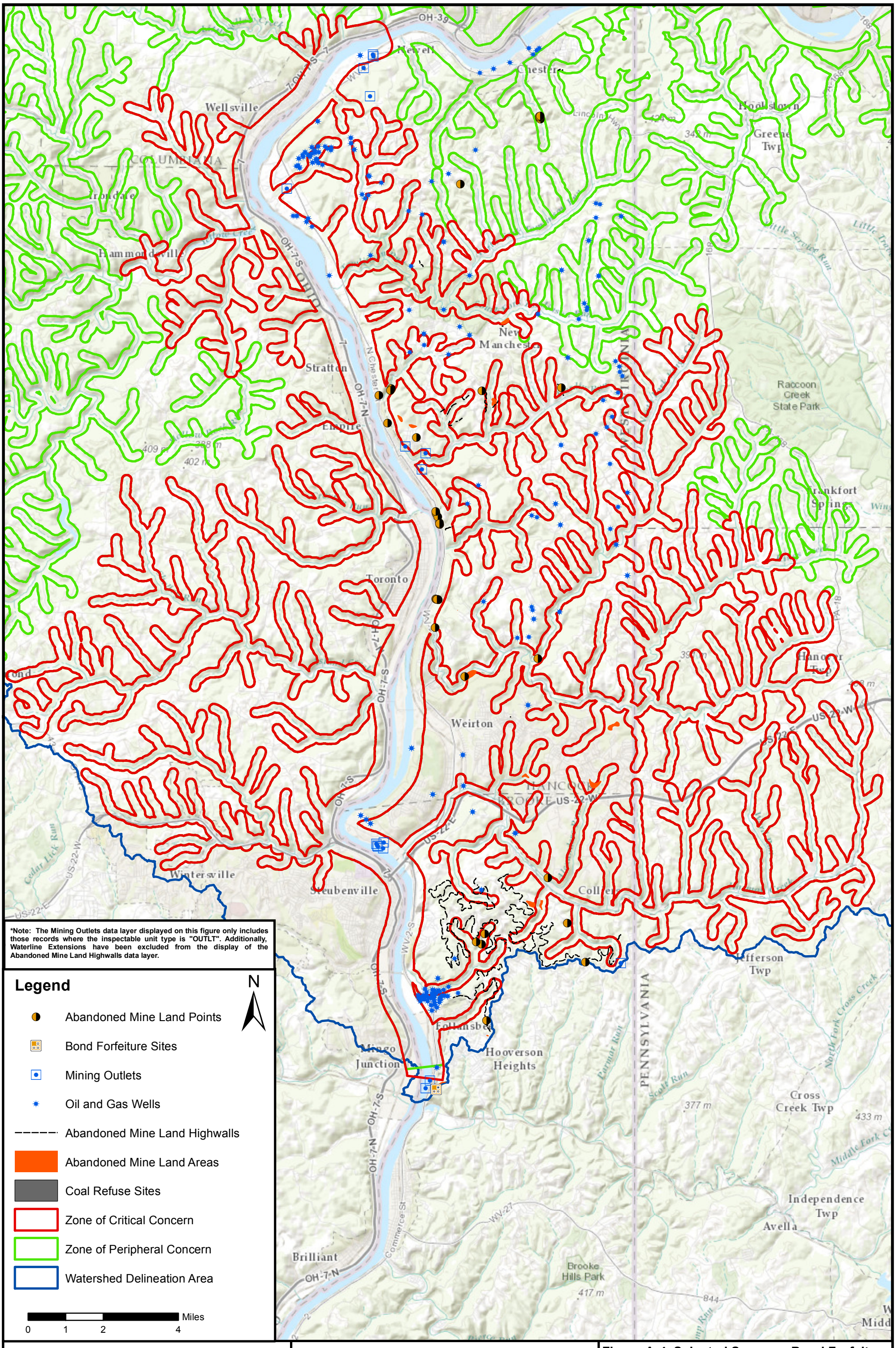
Figure A-3. PSSCs in the Zone of Critical Concern

DATE:05/28/16

CREATED BY: CEM

Follansbee Hooverson Heights
PWSID: WV3300512
Source Water Protection Plan

TETRA TECH
803 Quarrier Street, Suite 400
Charleston, WV 25301



*Note: The Mining Outlets data layer displayed on this figure only includes those records where the inspectable unit type is "OUTLT". Additionally, Waterline Extensions have been excluded from the display of the Abandoned Mine Land Highwalls data layer.

Legend

N

- Abandoned Mine Land Points
- Bond Forfeiture Sites
- Mining Outlets
- Oil and Gas Wells
- Abandoned Mine Land Highwalls
- Abandoned Mine Land Areas
- Coal Refuse Sites
- Zone of Critical Concern
- Zone of Peripheral Concern
- Watershed Delineation Area

0 1 2 4 Miles

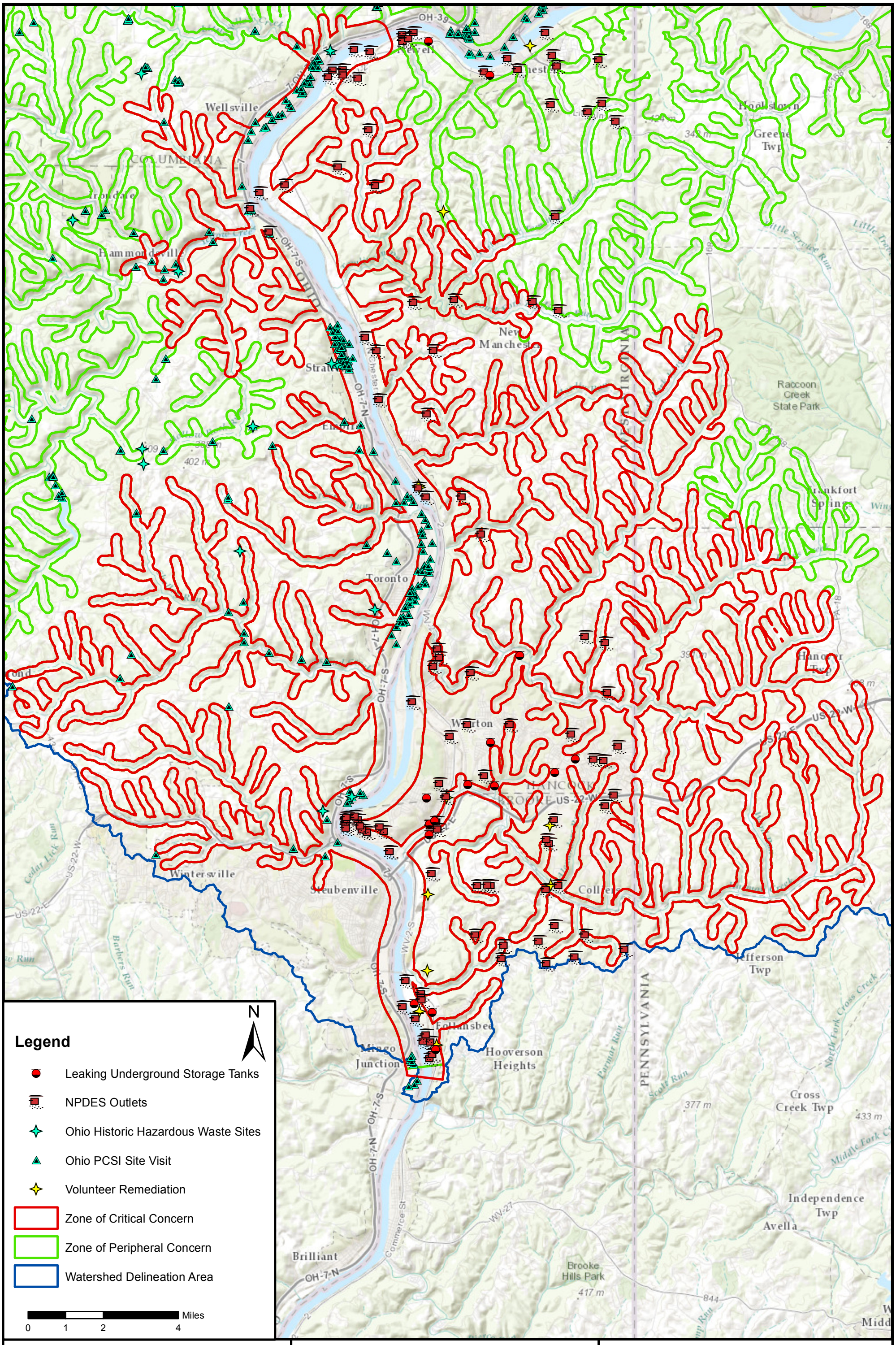
TETRA TECH
803 Quarrier Street, Suite 400
Charleston, WV 25301

Follansbee Hooverson Heights
PWSID: WV3300512
Source Water Protection Plan

Figure A-4. Selected Sources: Bond Forfeiture Sites, Mining Outlets, Oil and Gas Wells, Abandoned Mine Land Points, Highwalls, and Areas, and Coal Refuse Sites

CREATED BY: CEM

DATE: 05/28/16

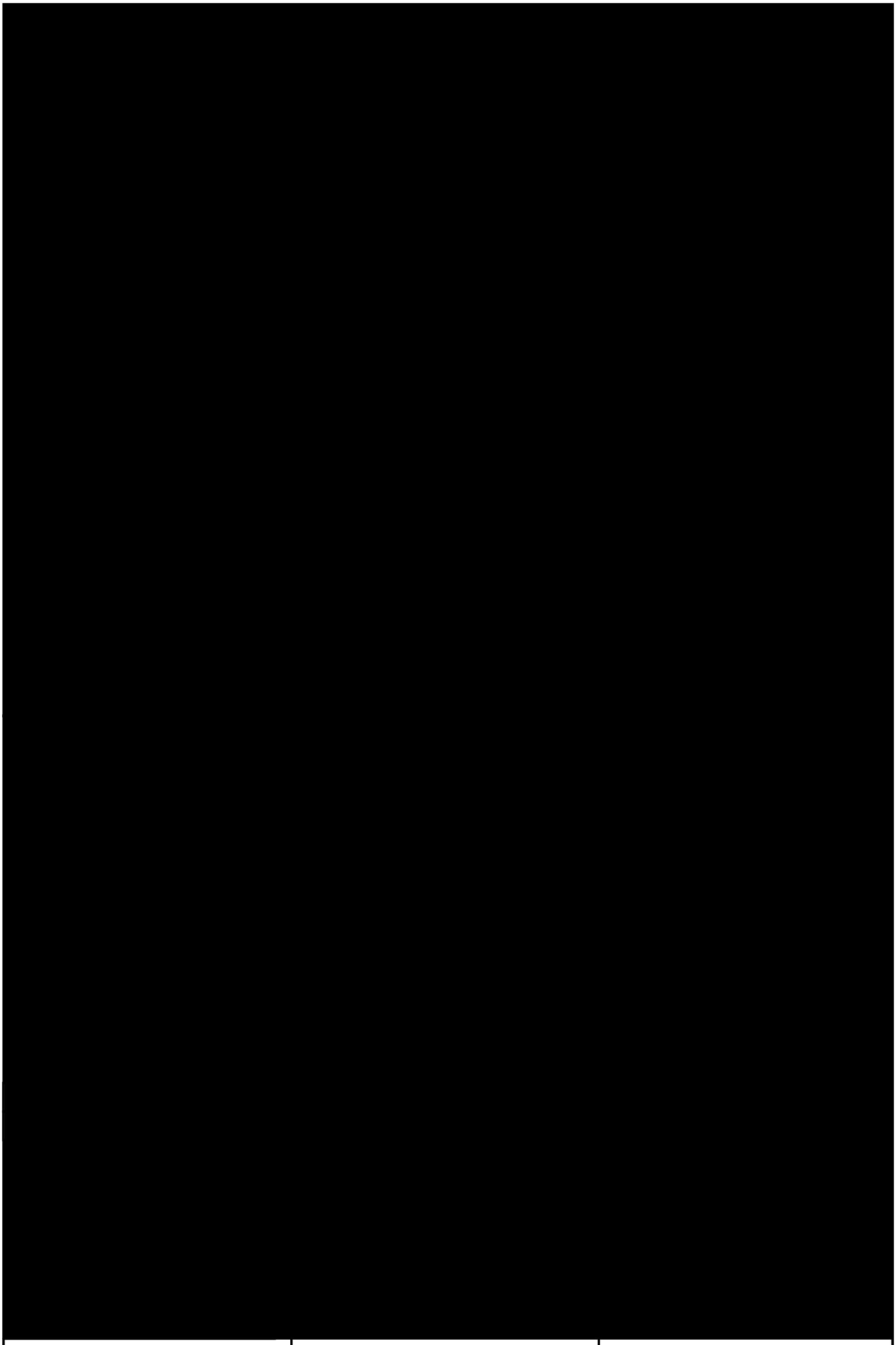


TETRA TECH
803 Quarrier Street, Suite 400
Charleston, WV 25301

Follansbee Hooverson Heights
PWSID: WV3300512
Source Water Protection Plan

Figure A-5. Selected Sources: Volunteer Remediation, NPDES Outlets, Leaking Underground Storage Tanks, Ohio Historic Hazardous Waste Sites, and Ohio PCSI Site Visit

CREATED BY: CEM | DATE: 05/28/16



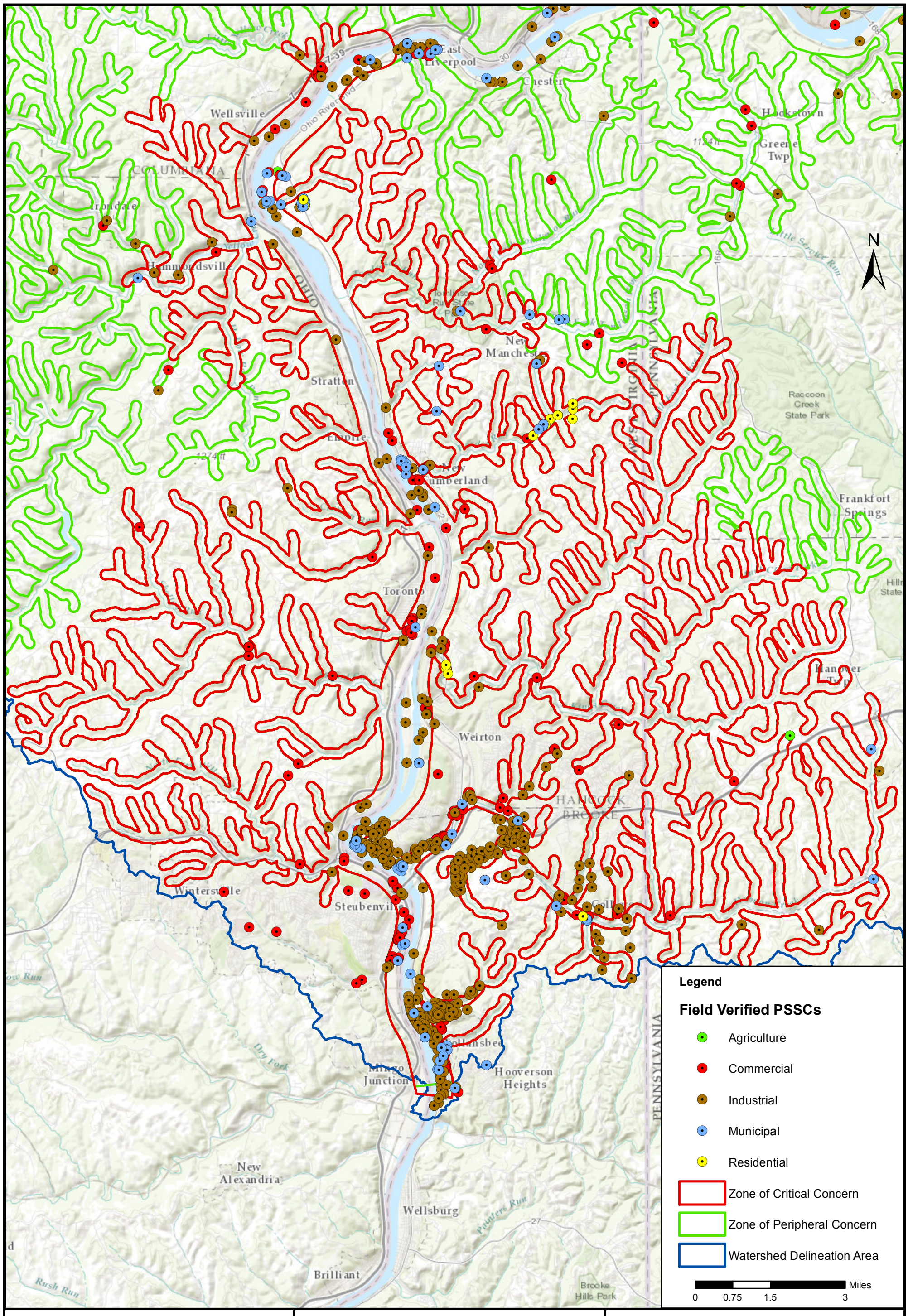
TETRA TECH
803 Quarrier Street, Suite 400
Charleston, WV 25301

Follansbee Hooverson Heights
PWSID: WV3300512
Source Water Protection Plan

Figure A-6. Selected Sources: Aboveground Storage Tanks

CREATED BY: CEM

DATE: 06/20/16



TETRA TECH
803 Quarrier Street, Suite 400
Charleston, WV 25301

Follansbee Hooverson Heights
PWSID: WV3300512
Source Water Protection Plan

Figure A-7. Field Verified PSSCs

CREATED BY: RWM

DATE: 6/22/2016

APPENDIX B. EARLY WARNING MONITORING SYSTEM FORMS

Appendix B- Form A

<u>Proposed</u> Early Warning Monitoring System Worksheet- Surface Water Source*

Describe the type of early warning detection equipment that could be installed, including the design.
The early warning detection equipment that could be installed includes a level controller, display module, back panel, level & trough (see cost estimate by Hach Company in Appendix D, "Supporting Documentation") along with conductivity, oil-in-water, ORP, and pH sensors.
Where would the equipment be located?
Early warning monitoring systems would be located upstream of the raw water intake on the Ohio River.
What would the maintenance plan for the monitoring equipment entail?
The proposed maintenance plan for the monitoring equipment shall consist of annual cleaning and/or exchanging of the probe(s) for the controller. Periodic calibration of the unit may also be required.
Describe the proposed sampling plan at the monitoring site.
Sampling of water quality data occurs every fifteen (15) minutes. Hooverson Heights would need to retrieve data from the "History" of the controller data collector twice per month.
Describe the proposed procedures for data management and analysis.
Data management for the early warning monitoring system consists of data points (up to 500 points or approximately six months per probe) being recorded in the "History" of the controller data collector. To access the "History", the probe has to be plugged into the controller. Data is able to be removed via USB or through a local SCADA system.

*This information is from the 2016 Source Water Protection Contingency Plan for Follansbee Hooverson Heights Water System by The Thrasher Group, Inc. This document is attached in **Appendix D.**

APPENDIX C. COMMUNICATION PLAN TEMPLATE

Follansbee Hooverson Heights Water System

PWSID: WV3300512

Administrative Contact: Ron Orsini

Contact Phone Number: [redacted]

Contact Email Address: ronorsini1130@gmail.com

Plan Developed: June 2016

ACKNOWLEDGMENTS:

This plan was developed by Follansbee Hooverson Heights Water System to meet certain requirements of the Source Water and Assessment Protection Program (SWAPP) and the State of West Virginia, as directed by state laws and regulations.

TABLE OF CONTENTS

INTRODUCTION

Legislative Rule 64CSR3 requires public water systems to develop a Communication Plan that documents how public water suppliers, working in concert with state and local emergency response agencies, shall notify state and local health agencies and the public in the event of a spill or contamination event that poses a potential threat to public health and safety. The plan must indicate how the public water supplier will provide updated information, with an initial notification to the public to occur no later than thirty minutes after the supplier becomes aware that the spill, release or potential contamination of the public water system poses a potential threat to public health and safety.

The public water system has responsibility to communicate to the public, as well as to state and local health agencies. This plan is intended to comply with the requirements of Legislative Rule 64CSR3, and other state and federal regulations.

TIERS REPORTING SYSTEM

This water system has elected to use the *Tiered Incident / Event Reporting System* (TIERS) for communicating with the public, agencies, the media, and other entities in the event of a spill or other incident that may threaten water quality. TIERS provides a multi-level notification framework, which escalates the communicated threat level commensurate with the drinking water system risks associated with a particular contamination incident or event. TIERS also includes a procedural flow chart illustrating key incident response communication functions and how they interface with overall event response / incident management actions. Finally, TIERS identifies the roles and responsibilities for key people involved in risk response, public notification, news media and other communication.

TIERS provides an easy-to-remember five-tiered **A-B-C-D-E** risk-based incident response communication format, as described below. Table 1 provides also associated risk levels.

A = **A**nnouncement. The water system is issuing an announcement to the public and public agencies about an incident or event that may pose a threat to water quality. Additional information will be provided as it becomes available. As always, if water system customers notice anything unusual about their water, they should contact the water system

B = **B**oil Water Advisory. A boil water advisory has been issued by the water system. Customers may use the water for showering, bathing, and other non-potable uses, but should boil water used for drinking or cooking.

C = **C**annot Drink. The water system asks that users not drink or cook with the water at this time. Non-potable uses, such as showering, bathing, cleaning, and outdoor uses are not affected.

D = **D**o Not Use. An incident or event has occurred affecting nearly all uses of the water. Do not use the water for drinking, cooking, showering, bathing, cleaning, or other tasks where water can come in contact with your skin. Water can be used for flushing commodes and fire protection.

E = **E**mergency. Water cannot be used for any reason.

Tier	Tier Category	Risk Level	Tier Summary
A	**A**nnouncement	Low	The water system is issuing an announcement to the public and public agencies about an incident or event that could pose a threat to public health and safety. Additional information will be provided as it becomes available.
B	**B**oil Water Advisory	Moderate	Water system users are advised to boil any water to be used for drinking or cooking, due to possible microbial contamination. The system operator will notify users when the boil water advisory is lifted.

C	**C**annot Drink	High	System users should not drink or cook with the water until further notice. The water can still be used for showering, bathing, cleaning, and other tasks.
D	**D**o Not Use	Very High	The water should only be used for flushing commodes and fire protection until further notice. More information on this notice will be provided as soon as it is available.
E	**E**mergency	Extremely High	The water should not be used for any purpose until further notice. More information on this notice will be provided as soon as it is available.

COMMUNICATION TEAM

The Communication Team for the water system is listed in the table below, along with key roles. In the event of a spill or other incident that may affect water quality, the water system spokesperson will provide initial information, until the team assembles (if necessary) to provide follow-up communication.

Water system communication team members, organizations, and roles.

Team Member Name	Organization	Phone	Email	Role
Ron Orsini	Follansbee Hooverson Heights	[redacted]	ronorsini1130@gmail.com	Primary Spokesperson
David Velegol	City of Follansbee	[redacted]	mayorvelegol@comcast.net	Secondary Spokesperson
Robert Fowler	Brooke Co. EMA	304-479-5003	bfowler@brookecountyema.com	Member

In the event of a spill, release, or other incident that may threaten water quality, members of the team who are available will coordinate with the management staff of the local water supplier to:

- Collect information needed to investigate, analyze, and characterize the incident/event
- Provide information to the management staff, so they can decide how to respond
- Assist the management staff in handling event response and communication duties
- Coordinate fully and seamlessly with the management staff to ensure response effectiveness

COMMUNICATION TEAM DUTIES

The communication team will be responsible for working cooperatively with the management staff and state and local emergency response agencies to notify local health agencies and the public of the initial spill or contamination event. The team will also provide updated information related to any contamination or impairment of the source water supply or the system's drinking water supply.

According to Legislative Rule 64CSR3, the initial notification to the public will occur no later than thirty minutes after the public water system becomes aware that the spill, release or potential contamination of the public water system poses a potential threat to public health and safety.

As part of the group implementing the Source Water Protection Plan, team members are expected to be familiar with the plan, including incident/event response and communication tasks. Specifically, team members should:

- Be knowledgeable on elements of the Source Water Protection Plan and Communication Plan
- Attend team meetings to ensure up-to-date knowledge of the system and its functions
- Participate in periodic exercises that “game out” incident response and communication tasks
- Help to educate local officials, the media, and others on source water protection
- Cooperate with water supplier efforts to coordinate incident response communication
- Be prepared to respond to requests for field investigations of reported incidents

- Not speak on behalf of the water supplier unless designated as the system's spokesperson

The primary spokesperson will be responsible for speaking on behalf of the water system to local agencies, the public, and the news media. The spokesperson should work with the management staff and the team to ensure that all communication is clear, accurate, timely, and consistent. The spokesperson may authorize and/or direct others to issue news releases or other information that has been approved by the system's management staff. The spokesperson is expected to be on call immediately when an incident or event which may threaten water quality occurs. The spokesperson will perform the following tasks in the event of a spill, release, or other event that threatens water quality:

- Announce which risk level (A, B, C, D, or E) will apply to the public notifications that are issued
- Issue news releases, updates, and other information regarding the incident/event
- Use the news media, email, social media, and other appropriate information venues
- Ensure that news releases are sent to local health agencies and the public
- Respond to questions from the news media and others regarding the incident/event
- Appear at news conferences and interviews to explain incident response, etc.

INCIDENT / EVENT COMMUNICATION PROCEDURE

The flow chart in this section illustrates how the water system will respond when it receives a report that a spill, release, or other contamination event may have occurred. Key elements of the flow chart are described below.

Communication with agencies, the public, and the media during threat incidents

Upon initial notification of the incident/event, system managers and staff will collect information and verify the need for further investigation. Only properly trained personnel will perform onsite investigations if permitted by emergency responders. If further investigation is warranted, and the initial facts support it, the water system spokesperson will issue a public communication statement consistent with the threat level. In addition, water system personnel and partners will be dispatched to conduct reconnaissance, a threat assessment, and a threat characterization, if present. This work may include:

- Verification of the incident/event type (spill, release, etc.)
- Location of incident/event
- Type of material(s) involved in spill, release, etc.
- Quantity of material involved
- Potential of the material to move, migrate, or be transported
- Relevant time factor(s) in the risk assessment (e.g., downstream movement rate)
- Overall level of risk to water system, whether low, moderate, high, or very high
- Development of the initial risk characterization

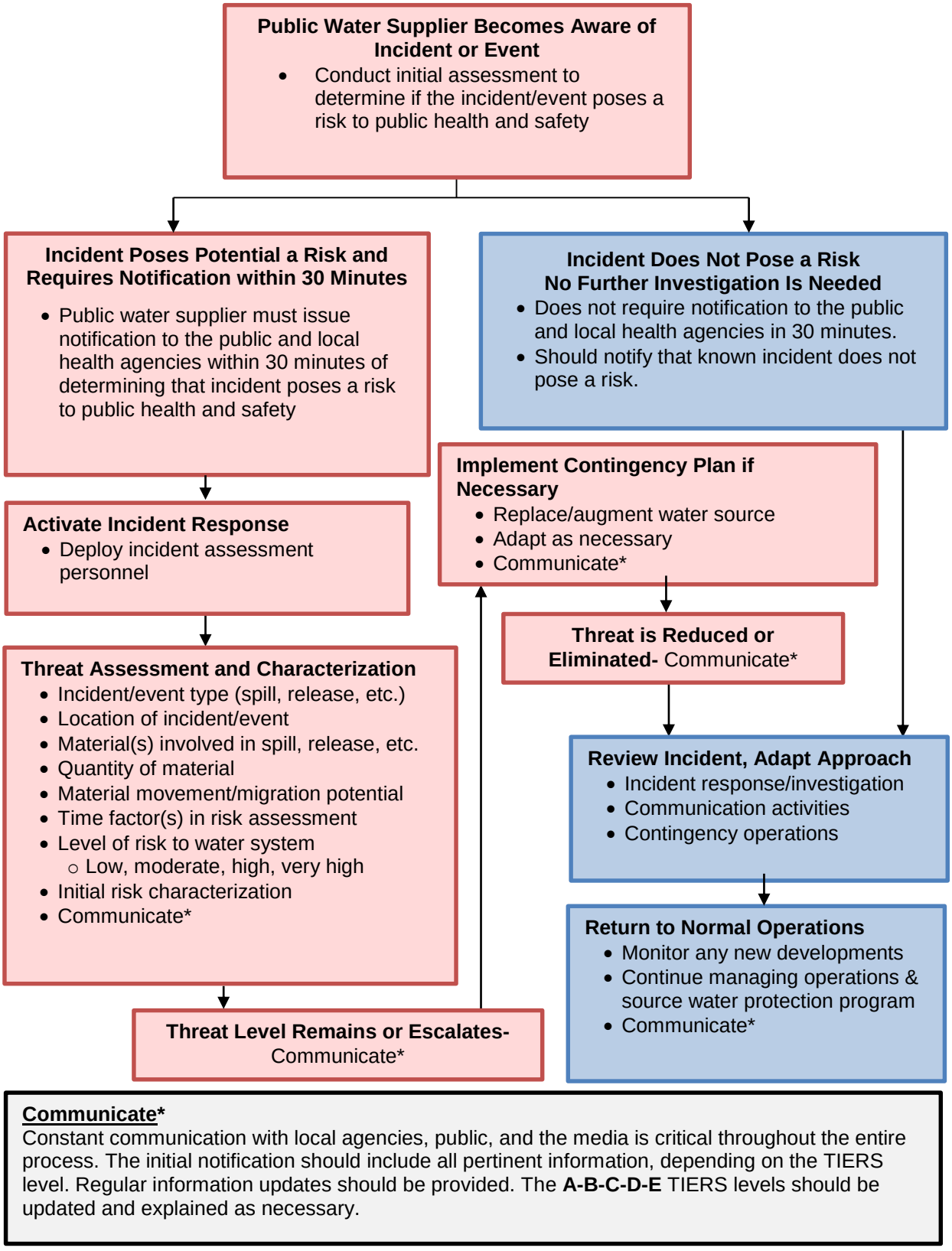
As the flow chart indicates, several iterative cycles will occur after the initial threat assessment, including communication with local agencies and the public, further investigation of the incident, possible implementation of the water system's contingency plan, and eventual elimination of the threat and a return to normal operations. Communication activities during this period will include:

- The initial release (i.e., **A**nnouncement, **B**oil Water Advisory, **C**annot Drink, **D**o Not Use, or **E**mergency)
  - Sent to local health agencies, the public, and the news media within 30 minutes
- Notification of the local water system's source water protection and communication teams
  - If warranted by initial findings regarding the spill, release, or incident
- Notification of the WV Bureau of Public Health
  - As required
- Periodic information updates, as incident response information is received
- Updates to the applicable A-B-C-D-E advisory tier, as necessary

After the threat level is reduced and operations return to normal, the water system staff, as well as the communication and source water protection teams and their partners, will conduct a post-event review and assessment. The purpose of the review is to examine the response to the incident, relevant communication

activities, and overall outcomes. Plans and procedures may be updated, altered, or adapted based on lessons learned through this process.

TIERS FLOW CHART



EMERGENCY SHORT FORMS

Emergency Communication Information

	Name	Phone Number	Email
Designated spokesperson:	Ron Orsini	[redacted]	ronorsini1130@gmail.com
Alternate spokesperson:	David Velegol	[redacted]	mayorvelegol@comcast.net
Designated location to disseminate information to media:	Follansbee Municipal Building		
Methods of contacting affected residents:	Follansbee Hooverson Heights primarily uses an automatic phone notification system to provide important information to customers. They also use radio and television.		

Media contacts:	**Name**	**Title**	**Phone Number**	**Email**
	WTOV Channel 9	NBC and FOX Affiliate	740-282-9999	newsdesk@wtov.com

Emergency Services Contacts

	Name	Emergency Phone	Alternate Phone	Email
Local Police	Follansbee Police Department	911	304-527-1211	-
Local Fire Department	Hooverson Heights Volunteer Fire Department	911	304-527-4339	-
	Follansbee Fire Department	911	304-527-2345	-
Local Ambulance Service	Brooke County Ambulance Services	911	304-527-3701	-
Hazardous Material Response Service	Hooverson Heights Volunteer Fire Department	911	304-527-4339	-

Sensitive Populations

Other communities that are served by the utility:	Washington Pike PSD		
Major user/sensitive population notification:	**Name**	**Emergency Phone**	**Alternate Phone**
	Hooverson Heights Primary School	304-527-0870	-
	Brooke High School	304-527-1410	-
	Follansbee Middle School	304-527-1942	-
	Brightwood Center Nursing Home	304-527-1100	-
	Mary Ann Manor	304-527-0940	-
	Golden Oaks Residential Board	304-527-2466	-
EED District Office Contact:	**Name**	**Phone**	**Email**
	Bob Smith	304-238-1145	robert.l.smith@wv.gov
OEHS Readiness Coordinator	Warren Von Dollen	304-356-4290 (main) 304-550-5607 (cell)	warren.r.vondollen@wv.gov

Downstream Water Contacts:	**Water System Name**	**Contact Name**	**Emergency Phone**	**Alternate Phone**
	Wellsburg	-	304-737-2104	-
	Wheeling	Dave Nickerson	304-234-3835	-
Are you planning on implementing the TIER system?	Yes			

Key Personnel

	Name	Title	Phone	Email
Key staff responsible for coordinating emergency response procedures?	Ron Orsini	Chief Operator	[redacted]	ronorsini1130@gmail.com
	David Velegol	Mayor	[redacted]	mayorvelegol@comcast.net
Staff responsible for keeping confidential PSSC information and releasing to emergency responders:	Ron Orsini	Chief Operator	[redacted]	ronorsini1130@gmail.com
	David Velegol	Mayor	[redacted]	mayorvelegol@comcast.net

Emergency Response Information

	Name	Phone
List laboratories available to perform sample analysis in case of emergency:	Tradet Laboratories – Wheeling, WV	304-233-9060
	REI Consultants	304-255-2500
	WV Office of Lab Services	304-558-3530
Has the utility developed a detailed Emergency Response Plan in accordance with the Public Health Security Bioterrorism Preparedness and Response Pan Act of 2002?	Yes	
When was the Emergency Response Plan developed or last updated?	2016	

EMERGENCY CONTACT INFORMATION

State Emergency Spill Notification
1-800-642-3074

Office of Emergency Services
http://www.wvdhsem.gov/
Charleston, WV- (304) 558-5380

WV Bureau for Public Health Office of Environmental Health Services (OEHS)
www.wvdhhr.org/oehs

Readiness Coordinator- Warren Von Dollen
Phone; 304-356-4290
Cell; 304-550-5607
E-mail: warren.r.vondollen@wv.gov

Environmental Engineering Division Staff
Charleston, Central Office (304) 558-2981
Beckley, District 1 (304) 256-6666
St. Albans, District 2 (304) 722-0611
Kearneysville, District 4 (304) 725-9453
Wheeling, District 5 (304) 238-1145
Fairmont, District 6 (304) 368-2530

National Response Center - Chemical, Oil, & Chemical/Biological Terrorism
1-800-424-8802

WV State Fire Marshal's Office
1-800-233-3473

West Virginia State Police
1-304-746-2100

WV Watch – Report Suspicious Activity
1-866-989-2824

DEP Distance Calculator

http://tagis.dep.wv.gov/pswicheck/

PRESS RELEASE ATTACHMENTS

TIERS Levels A, B, C, D, and E

UTILITY ISSUED NOTICE – LEVEL A

PUBLIC WATER SYSTEM ANNOUNCEMENT

A WATER SYSTEM INVESTIGATION IS UNDERWAY

On _____ at ___:____ AM/PM, the _____ Water System began investigating an incident that may affect local water quality.

The incident involves the following situation at this location:

_____

_____

_____

There are no restrictions on water use at this time. As always, if water system customers notice anything unusual about their water – such as abnormal odors, colors, sheen, etc. – they should contact the water system at _____.

At this time there is no need for concern if you have consumed or used the water.

Regular updates will be provided about this Announcement as water system staff continue their investigation. Again, there are no restrictions on water use at this time.

State Water System ID# _____ Date Distributed: _____

UTILITY ISSUED NOTICE – LEVEL B

BOIL WATER ADVISORY

A BOIL WATER ADVISORY IS IN EFFECT

On _____ at ___:____ am/pm, a water problem occurred causing contamination of your water. The areas that are affected are as follows:

□ Entire Water System or □ Other: _____

_____

CONDITIONS INDICATE THERE IS A HIGH PROBABILITY THAT YOUR WATER IS CONTAMINATED. TESTING HAS NOT OCCURRED TO CONFIRM OR DENY THE PRESENCE OF CONTAMINATION IN YOUR WATER.

What should I do?

- **DO NOT DRINK THE WATER WITHOUT BOILING IT FIRST.** Bring all water to a boil, let it boil for one minute, and let it cool before using, or use bottled water. Boiled or bottled water should be used for drinking, making ice, brushing teeth, washing dishes, bathing, and food preparation **until further notice**. Boiling kills bacteria and other organisms in the water.

What happened?

- **The problem is related to** _____

What is being done?

- **The water system is taking the following action:** _____

  _____

What should a customer do if they have consumed or used the water?

- _____

We will inform you when you no longer need to boil your water. We anticipate resolving the problem within _____ hours/days. For more information, please contact _____ at _____ or _____ at _____.

General guidelines on ways to lessen the health risk are available from the EPA Safe Drinking Water Hotline at 1 (800) 426-4791.

Please share this information others who use this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice was distributed by _____

State Water System ID# _____ Date Distributed: _____

UTILITY ISSUED NOTICE – LEVEL C
"CANNOT DRINK" WATER NOTIFICATION
A LEVEL C WATER ADVISORY IS IN EFFECT

On _____ at ___:____ am/pm, a water problem occurred causing contamination of your water. The areas that are affected are as follows:

□ Entire Water System or □ Other: _____

_____

CONDITIONS INDICATE THERE IS A HIGH PROBABILITY THAT YOUR WATER IS CONTAMINATED. TESTING HAS NOT OCCURRED TO CONFIRM OR DENY THE PRESENCE OF CONTAMINATION IN YOUR WATER.

What should I do?

- **DO NOT DRINK THE WATER.** You can't drink the water, but you can use it for showering, bathing, toilet-flushing, and other non-potable purposes.
- **BOILING WILL NOT PURIFY THE WATER.** Do not drink the water, even if it is boiled. The type of contamination suspected is not removed by boiling.

What happened?

- **The problem is related to** _____

What is being done?

- **The water system is taking the following action:** _____

  _____

What should a customer do if they have consumed or used the water?

- _____

We will inform you when the water is safe to drink. We anticipate resolving the problem within _____ hours/days. For more information – or to report unusual water conditions such as abnormal odors, colors, sheen, etc. – please contact _____ at _____ or _____ at _____.

Please share this information others who use this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice was distributed by _____

State Water System ID# _____ Date Distributed: _____

UTILITY ISSUED NOTICE – LEVEL D
"DO NOT USE" WATER NOTIFICATION
A LEVEL D WATER ADVISORY IS IN EFFECT

On _____ at ___:____ am/pm, a water problem occurred causing contamination of your water. The areas that are affected are as follows:

□ Entire Water System or □ Other: _____

_____

CONDITIONS INDICATE THERE IS A HIGH PROBABILITY THAT YOUR WATER IS CONTAMINATED. TESTING HAS NOT OCCURRED TO CONFIRM OR DENY THE PRESENCE OF CONTAMINATION IN YOUR WATER.

What should I do?

- **DO NOT DRINK THE WATER.** The water is contaminated.
- **DO NOT SHOWER OR BATHE IN THE WATER.** You can't use the water for drinking, showering, or bathing. It can be used for toilet flushing and firefighting.
- **BOILING WILL NOT PURIFY THE WATER.** Do not use the water, even if it is boiled. The type of contamination suspected is not removed by boiling.

What happened?

- **The problem is related to** _____

What is being done?

- **The water system is taking the following action:** _____

What should a customer do if they have consumed or used the water?

- _____

We will inform you when the water is safe to drink. We anticipate resolving the problem within _____ hours/days. For more information – or to report unusual water conditions such as abnormal odors, colors, sheen, etc. – please contact _____ at _____ or _____ at _____.

Please share this information others who use this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice was distributed by _____

State Water System ID# _____ Date Distributed: _____

UTILITY ISSUED NOTICE – LEVEL E
EMERGENCY WATER NOTIFICATION
A LEVEL E WATER ADVISORY IS IN EFFECT

On _____ at ___:____ am/pm, a water problem occurred causing contamination of your water. The areas that are affected are as follows:

□ Entire Water System or □ Other: _____

_____

CONDITIONS INDICATE THERE IS A HIGH PROBABILITY THAT YOUR WATER IS CONTAMINATED. TESTING HAS NOT OCCURRED TO CONFIRM OR DENY THE PRESENCE OF CONTAMINATION IN YOUR WATER.

What should I do?

- **DO NOT DRINK THE WATER.** The water is contaminated.
- **DO NOT USE THE WATER FOR ANY PURPOSE!** You can't use the water for drinking, showering, or bathing, or any other use – not even for toilet flushing.
- **BOILING WILL NOT PURIFY THE WATER.** Do not use the water, even if it is boiled. The type of contamination suspected is not removed by boiling.

What happened?

- **The problem is related to** _____

What is being done?

- **The water system is taking the following action:** _____

What should a customer do if they have consumed or used the water?

- _____

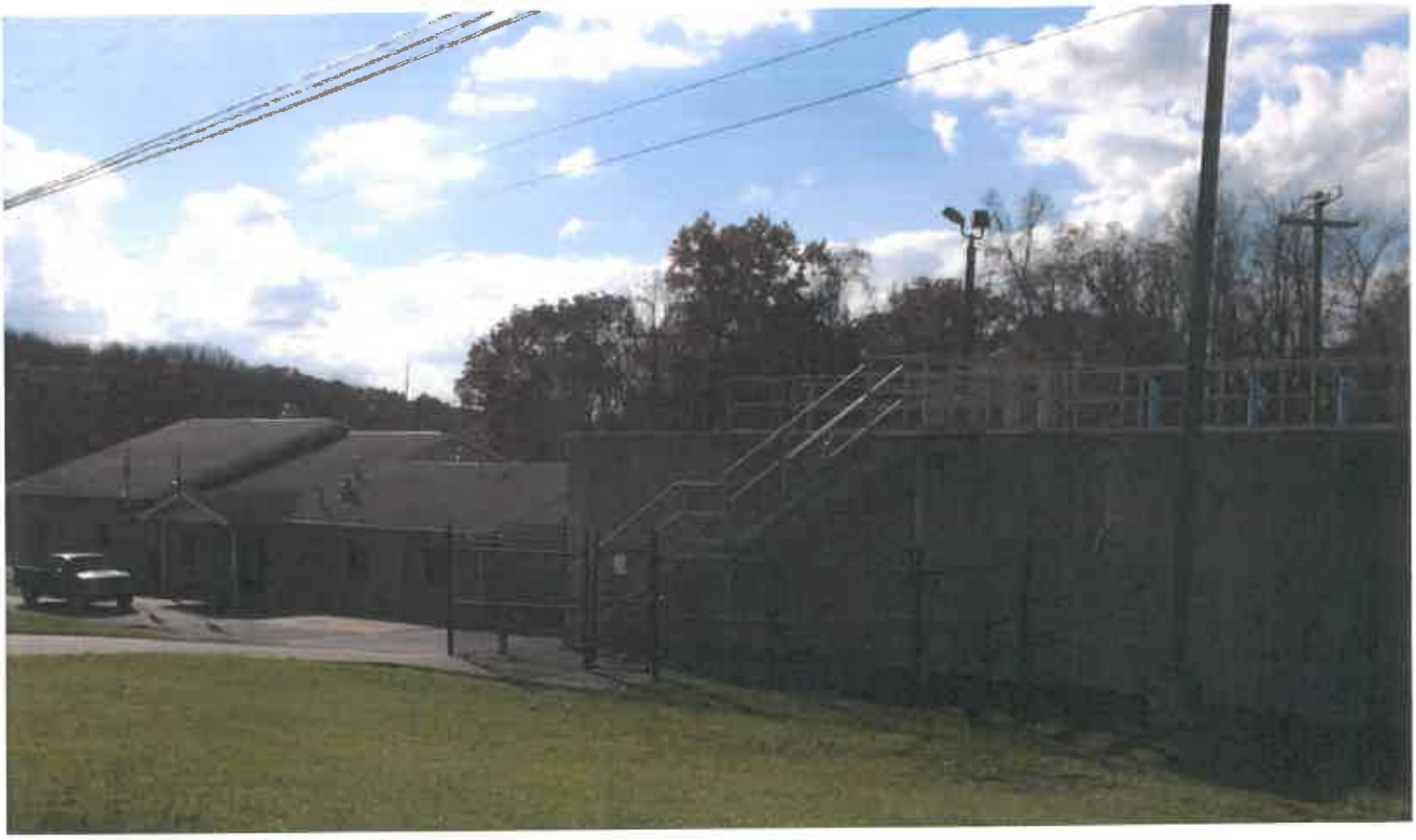
We will inform you when the water is safe to drink. We anticipate resolving the problem within _____ hours/days. For more information – or to report unusual water conditions such as abnormal odors, colors, sheen, etc. – please contact _____ at _____ or _____ at _____.

Please share this information others who use this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice was distributed by _____

State Water System ID# _____ Date Distributed: _____

APPENDIX D. SINGLE SOURCE FEASIBILITY STUDY



Source Water Protection Contingency Plan
Follansbee Municipal Water Works
Hooverson Heights
PWSID 3300512

Brooke County, West Virginia
Feburary 2016

Follansbee
WV

THRASHER

CLAY P. RILEY
REGISTERED
15634
STATE OF
WEST VIRGINIA
PROFESSIONAL ENGINEER

Title of Preparer
Project Engineer

Name of Contractor(s)/Consultant(s) (if used):
The Thrasher Group, Inc.

I certify the information in the source water protection plan is complete and accurate to the best of my knowledge.

Signature of responsible party or designee authorized to sign for water utility:

Print Name of Authorizing Signatory (see instructions):

Title of Authorizing Signatory:

Date of Submission
6/30/2016

EXECUTIVE SUMMARY

This Source Water Protection Contingency Plan is being developed for Follansbee Municipal Water Works Hooverson Heights system (Hooverson Heights), and is to be included as a portion of the complete Source Water Protection Plan being completed by other parties (per the West Virginia Bureau for Public Health).

Hooverson Heights is a state regulated public utility and operates a public water system serving areas of Brooke County West Virginia. The utility serves 2,123 residential customers. Hooverson Heights does not provide water to any other system.

The Hooverson Heights water system is one of two separate systems operated by Follansbee Municipal Water Works (Follansbee Municipal). The second system is considered the main, Downtown water system and utilizes source water from ground wells. Both the Hooverson Heights and Follansbee Municipal treatment plants are operated by the same staff.

The water treatment facility for Hooverson Heights obtains surface water from one (1) raw water intake located on the east shore of the Ohio River. Additionally, Hooverson Heights can obtain raw water from four (4) groundwater wells for treatment and distribution. Currently, wells 2 and 4 are not operational; however Hooverson Heights is making plans for repairs to be completed in 2016. The Hooverson Heights and Follansbee system have an interconnection which allows water to be conveyed to the Hooverson Heights system to supplement water demands.

The plant has a treatment capacity of 1,440,000 gallons per day and pumps approximately nine (9) hours per day on average. The facility currently produces an average of 395,000 gallons per day (GPD) of water based on the past years monthly operational reports. Hooverson Heights maintains five (5) treated water storage tanks totaling 2,096,000 gallons of treated water and does not have any raw water storage tanks.

Currently, the Follansbee Municipal and Hooverson Heights water systems are experiencing 26.27% unaccounted for water; however, the utility is conducting leak detection and making necessary repairs to reduce unaccounted for water.

Hooverson Heights currently does not have a generator. Follansbee Municipal is planning to purchase a portable generator to share between the two (2) water treatment plants during power outages.

Five (5) alternatives were evaluated in this source water protection contingency plan (SWPCP). Hooverson Heights currently has two (2) alternative source(s) of water in the event that the primary water source is contaminated.

Backup Intake

Hooverson Heights currently draws raw water from the Ohio River for treatment and distribution. Additionally, the system maintains four (4) groundwater wells (HH 1-4) that can be operated with or without the river intake. Currently, Well HH-2 and HH-4 are out of service; however Hooverson Heights is planning to repair the wells this year. If the Ohio River became contaminated, Hooverson Heights could isolate the intake from the River and pull water only from

the wells. After discussions with the treatment plant operator, it was determined the wells can sustain 600 GPM of the 750 GPM average demand needed by Hooverson Heights if all wells are operational. To provide the full demand, Hooverson Heights can utilize the existing interconnection with Follansbee Municipal to supplement the supply of their wells. The use of the backup wells in wasconsidered during the feasibility analysis.

Interconnection

An interconnection with Weirton Area Water Works (Weirton) was initially analyzed for the Hooverson Heights system. Weirton currently blends water from the Ohio River and their "Collector Well" to satisfy water demand. The Weirton system has adequate plant capacity to supply the Hooverson Heights system; however the utility uses the same surface water source as Hooverson Heights. If the Ohio River were to become contaminated the interconnection would not be usable to sustain demand. Hooverson Heights is currently interconnected with Follansbee Municipal. During normal operation, water from the Follansbee's municipal system is conveyed into the Hooverson Heights system as needed. After analysis of treatment capacities and average production amounts of both systems, it was concluded that the Follansbee Municipal treatment facility would be able to provide only a portion of the Hooverson Heights demand. Currently, Hooverson Heights uses an average of approximately 75,000 gallons of water per day from the Follansbee Municipal system. Follansbee Municipal operates both systems therefore Hooverson Heights does not purchase the water conveyed to their system. Average demand could be sustained using the four (4) groundwater wells and the interconnection with Follansbee Municipal. Utilizing the existing interconnection with Follansbee Municipal was analyzed in the feasibility analysis.

Treated Water Storage

Hooverson Heights currently has 2,096,000 gallons of treated water storage available. To satisfy the minimum required storage capacity for Senate Bill 373, the utility two (2) days' worth of storage based on the maximum production experienced within the past year. Hooverson Heights peak water production was 953,400 gallons in March of 2015. Therefore, 1,906,800 gallons of storage is needed to satisfy the Senate Bill. The Hooverson Heights system currently has sufficient treated water storage capacity to comply with the requirements of the Senate Bill. This alternative was considered during the feasibility analysis.

Raw Water Storage

Hooverson Heights currently has no raw water storage available. To satisfy the minimum required storage capacity, the system needs 1,906,800 gallons of storage. The system does not meet the minimum required raw water storage capacity. The construction of a 2,026,000 gallon raw water storage tank was considered in the feasibility analysis.

Groundwater Wells and Interconnection

Follansbee's Hooverson Heights system's backup groundwater wells can be used in conjunction with the interconnection to Follansbee Municipal. As stated above the in the interconnection portion of this report, Follansbee Municipal can provide Hooverson Heights with approximately 75,000 gallons of water per day. Additionally, Hooverson Height's four (4) groundwater wells

(HH 1-4) can be utilized to meet the daily average demand of 395,000 gallons per day. If the interconnection with Follansbee Municipal and the four (4) groundwater wells are used together the average daily demand can be sustained if the Ohio River intake were to be compromised. This alternative was considered during the feasibility analysis.

This SWPP describes in detail the aforementioned aspects of the Hooverson Heights public water system, analyzes alternatives for sources of water supply, and compares alternatives in a feasibility matrix to determine the most suitable and feasible alternative for the system. The recommended alternative for Hooverson Heights is as follows: utilize the existing treated water storage capacity to provide water temporarily in the event of contamination. Additionally Hooverson Heights should repair wells HH-2 and HH-4 so that the existing interconnection with Follansbee Municipal can supplement their wells' supply and sustain the average demand of Hooverson Heights. It is further recommended that Hooverson Heights install an early warning monitoring system to prevent the surface water from contaminating the system as well as backup generators to allow operation during loss of power. Additional detail of the selection of this alternative is discussed in the "Conclusion and Recommendations" section of this report. The feasibility study and supporting documentation is included in the Appendices.

PURPOSE

The goal of the West Virginia Bureau for Public Health (WV BPH) source water assessment and protection (SWAP) program is to prevent degradation of source waters which may preclude present and future uses of drinking water supplies to provide safe water in sufficient quantity to users. The most efficient way to accomplish this goal is to encourage and oversee source water protection on a local level. Every aspect of source water protection is best addressed by engaging local stakeholders.

The intent of this document is to describe what Hooverson Heights has done, is currently doing, and plans to do to protect its source of drinking water. Although this water system treats the water to meet federal and state drinking water standards, conventional treatment does not fully eradicate all potential contaminants, and treatment that goes beyond conventional methods is often very expensive. By completing this plan, Hooverson Heights acknowledges that implementing measures to prevent contamination can be a relatively economical way to help ensure the safety of the drinking water.

What are the benefits of preparing a Source Water Protection Plan?

- Fulfills the requirement for the public water utilities to complete or update their source water protection plan.
- Identifies and prioritizes potential threats to the source of drinking water; and establishes strategies to minimize the threats.
- Plans for emergency responses to incidents that compromise the water supply by contamination or depletion, including how the public, state, and local agencies will be informed.
- Plans for future expansion and development, including establishing secondary sources of water.
- Ensures conditions to provide the safest and highest quality drinking water to customers at the lowest possible cost.

- Provides more opportunities for funding to improve infrastructure, purchase land in the protection area, and other improvements to the intake or source water protection areas.

BACKGROUND: WV SOURCE WATER ASSESSMENT AND PROTECTION PROGRAM

Since 1974, the federal Safe Drinking Water Act (SDWA) has set minimum standards on the construction, operation, and quality of water provided by public water systems. In 1986, Congress amended the SDWA. A portion of those amendments was designed to protect the source water contribution areas around groundwater supply wells. This program eventually became known as the Wellhead Protection Program (WHPP). The purpose of the WHPP is to prevent pollution of the source water supplying the wells.

The Safe Drinking Water Act Amendments of 1996 expanded the concept of wellhead protection to include surface water sources under the umbrella term of "Source Water Protection". The amendments encourage states to establish SWAP programs to protect all public drinking water supplies. As part of this initiative, states must explain how protection areas for each public water system will be delineated, how potential contaminant sources will be inventoried, and how susceptibility ratings will be established.

In 1999, the WVBPH published the West Virginia Source Water Assessment and Protection Program, which was endorsed by the United States Environmental Protection Agency. Over the next few years, WVBPH staff completed an assessment (i.e., delineation, inventory and susceptibility analysis) for all of West Virginia's public water systems. Each public water system was sent a copy of its assessment report. Information regarding assessment reports for Hooverson Heights can be found in **Table 1**.

STATE REGULATORY REQUIREMENTS

On June 6, 2014, §16.1.2 and §16.1.9a of the Code of West Virginia (1931) was reenacted and amended by adding three new sections designated §16.1.9c, §16.1.9d and §16.1.9e. The changes to the code outline specific requirements for public water utilities that draw water from a surface water source or a groundwater source influenced by surface water (GUIDI).

Under the amended and new codes, each existing public water utility using surface water or ground water influenced by surface water as a source must have completed or updated a source water protection plan by July 1, 2016, and must continue to update their plan every three years. Existing source water protection plans have been developed for many public water utilities in the past. If available, these plans were reviewed and considered in the development of this updated contingency plan. Any new water system established after July 1, 2016 must submit a Source Water Contingency Protection Plan before they begin operation. A new plan is also required when there is a significant change in the potential sources of significant contamination (PSSC) within the zone of critical concern (ZCC).

The code also requires that public water utilities include details regarding PSSCs, protection measures, system capacities, contingency plans, and communication plans. Before a plan can be approved, the local health department and public will be invited to contribute information for

consideration. In some instances, public water utilities may be asked to conduct independent studies of the source water protection area and specific threats to gain additional information.

SYSTEM INFORMATION

Hooverson Heights is classified as a state regulated public utility and operates a public water system serving the areas of Brooke County. A public water system is defined as "any water supply or system which regularly supplies or offers to supply water for human consumption through pipes or other constructed conveyance, if serving at least an average of twenty-five individuals per day for at least sixty days per year, or which has at least fifteen service connections, and shall include i) any collection, treatment, storage and distribution facilities under the control of the owner or operator of the system and used primarily in connection with the system; and ii) any collection or pretreatment storage facilities not under such control which are used primarily in connection with the system." A public water utility is defined as "a public water system which is regulated by the West Virginia Public Service Commission." For purposes of this source water protection plan, public water systems are also referred to as public water utilities. Information on the population served by this utility is presented in **Table 1** below.

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Table 1 – Population Served by the Hooverson Heights

Administrative office location:	807 Lee Road Follansbee, West Virginia 26037		
Is the system a public utility, according to the Public Service Commission rule?	Municipality		
Date of Most Recent Source Water Assessment Report:	June 2003 By Bureau for Public Health		
Date of Most Recent Source Water Protection Plan:	April 2011		
Population served directly:	2,123 Residential **2,123 Total Customers** **4,970 Total Population**		
Bulk Water Purchaser Systems:	**System Name**	**PWSID Number**	**Population**
	N/A	N/A	N/A
Total Population Served by the Utility:	**4,970**		
Does the utility have multiple source water protection areas (SWPAs)?	Yes		
How many SWPAs does the utility have?	1 Water Source Protection Area 4 Well Head Protection Areas		

WATER TREATMENT AND STORAGE

As required, Hooverson Heights has assessed their system (e.g., treatment capacity, storage capacity, unaccounted for water, contingency plans) to evaluate their ability to provide drinking water and protect public health.

Table 2 contains information on the water treatment methods and capacity of the utility. Information about the surface water sources from which Hooverson Heights draws water can be found in **Table 3**. If the utility draws water from any groundwater sources to blend with the surface water, the information about these ground water sources can be found in **Table 4**.

Table 2 – Hooverson Heights Water Treatment Information

Water Treatment Process (List in order)	Raw Water Intake ↓ Pre Sedimentation Basin ↓ Contact Units ↓ Flocculation Settlers ↓ Mix Media Filters ↓ Clear Well ↓ High Service Pumps
Current Treatment Capacity (gal/day)	1,440,000
Current Average Production (gal/day)	395,000
Maximum Quantity Treated and Produced (gal)	953,400
Minimum Quantity Treated and Produced (gal)	253,100
Average Hours of Operation	9
Maximum Hours of Operation in One Day	22
Minimum Hours of Operation in One Day	5
Number of Storage Tanks Maintained	5
Total Gallons of Treated Water Storage (gal)	2,096,000
Total Gallons of Raw Water Storage (gal)	0

Table 3 – Hooverson Heights Surface Water Sources

Intake Name	SDWIS #	Local Name	Describe Intake	Name of Water Source	Date Constructed/ Modified	Frequency of Use (Primary/ Backup/ Emergency)	Activity Status (Active/ Inactive)
River Intake	N/A	N/A	18'' diameter tee screens,	Ohio River	1994 (C)	Primary	Active

Table 4 – Hooverson Heights Groundwater Sources

Does the utility blend with groundwater?					Yes				
Well/Spring Name	SDWIS #	Local Name	Date Constructed/ Modified	Completion Report Available (Yes/No)	Well Depth (ft.)	Casing Depth (ft.)	Grout (Yes/No)	Frequency of Use (Primary/ Backup/ Emergency)	Activity Status (Active/ Inactive)
1	N/A	1	N/A	N/A	70	N/A	No	Backup	Active
2	N/A	2	N/A	N/A	70	N/A	No	Backup	Inactive
3	N/A	3	N/A	N/A	70	N/A	No	Backup	Active
4	N/A	4	N/A	N/A	70	N/A	No	Backup	Inactive

(C) – Constructed
(M) - Modified

Response Networks and Communication

Statewide initiatives for emergency response, including source water related incidents, are being developed. These include the West Virginia Water/Wastewater Agency Response Network (WV WARN, see http://www.wvwarn.org/) and the Rural Water Association Emergency Response Team (see http://www.wvrwa.org/). Hooverson Heights has analyzed its ability to effectively respond to emergencies and this information is provided in **Table 5**.

Table 5 – Hooverson Heights Water Shortage Response Capability

Can the utility isolate or divert contamination from the intake or groundwater supply?	Yes
Describe the utility's capability to isolate or divert potential contaminants:	If notified of a contamination the Hooverson Heights can shut off the raw water intake on the Ohio River and close the valve.
Can the utility switch to an alternative water source or intake that can supply full capacity at any time?	Yes, Hooverson Heights could use the two operational wells and Follansbee Municipal to sustain some of the demand. If wells 2 and 4 are repaired the average demand can be produced.
Describe in detail the utility's capability to switch to an alternative source:	The surface water intake can be shut off with a valve. The intake pumps can then be switched to the Hooverson Heights wells.
Can the utility close the water intake to prevent contamination from entering the water supply?	Yes
How long can the intake stay closed?	If Hooverson Heights has all four (4) groundwater wells operational and utilizes the existing interconnection with Follansbee Municipal the average production can be sustained.
Describe the process to close the intake:	The surface water intake can be shut off with a valve. The pumps would then be used for the groundwater wells.
Describe the treated water storage capacity of the water system:	The current treated water storage amount for the system consists of five (5) water storage tanks totaling 2,096,000 gallons of treated water.
Is the utility a member of WVRWA Emergency Response Team?	No
Is the utility a member of WV-WARN?	No
List any other mutual aid agreements to provide or receive assistance in the event of an emergency:	Follansbee Municipal

It is suggested that, if the utility does not have the capability to divert contamination from the surface water intake, pre-cast concrete bases are constructed around the raw water intake to drop booms into the water and physically divert surface contaminants from entering the raw water intake.

Operation during Loss of Power

This utility analyzed and examined its ability to operate effectively during a loss of power. This involved ensuring a means to supply water through treatment, storage, and distribution without creating a public health emergency. Information regarding the utility's capacity for operation during power outages is shown in **Table 6**. The utility's standby capacity would have the capability to provide power to the system as if normal power conditions existed. The utility's emergency capacity would have the capability to provide power to only the essential equipment and treatment processes to provide water to the system. Information regarding the emergency generator capacity for each utility was calculated by the WV BPH and can be found in Appendix D, "Supporting Documentation".

Table 6 – Generator Capacity

What is the type and capacity of the generator needed to operate during a loss of power?	The emergency generator capacity for the treatment facility is 300 kW and the largest booster station Cooks Hill is 70 kW. The intake pump station has a generator capacity of 250 kW.	
Can the utility connect to generator at intake/wellhead? If yes, select a scenario that best describes system.	No, the intake is currently not wired to use backup power during an outage.	
Can the utility connect to generator at treatment facility? If yes, select a scenario that best describes system.	No, the water treatment plant is currently not wired to use backup power during an outage.	
Can the utility connect to a generator in distribution system? If yes, select a scenario that best describes system.	No, the Cooks Hill pump station is currently not wired to use backup power during an outage.	
Does the utility have adequate fuel on hand for the generator?	N/A	
What is your on-hand fuel storage and how long will it last operating at full capacity?	**Gallons**	**Hours**
	N/A	N/A

Provide a list of suppliers that could provide generators and fuel in the event of an emergency:	**Supplier**		**Contact Name**	**Phone Number**
	Generator	Cummins	Crosspoint	(304) 769-1012
	Fuel			
Does the utility test the generator(s) periodically?		N/A		
Does the utility routinely maintain the generator?		N/A		
If no scenario describing the ability to connect to generator matches the utility's system or if utility does not have ability to connect to a generator, describe plans to respond to power outages:		During a power outage the utility does not have a backup source of power. The utility has inquired about procuring an emergency generator for Follansbee Municipal and Hooverson Heights to share during power outages.		

If a portable generator is available through the respective county's 911 or Emergency Center, it is assumed the generator is available **only** for the utility for which this source water protection contingency plan is prepared. If more than one utility in the county uses the portable generator during power outages, it is suggested that each utility procure a generator specifically to protect their system during a power outage.

Future Water Supply Needs

When planning for potential emergencies and developing contingency plans, a utility needs to not only consider their current demands for treated water but also account for likely future needs. This could mean expanding current intake sources or developing new ones in the near future. This can be an expensive and time consuming process, and any water utility should take this into account when determining emergency preparedness. Hooverson Heights has analyzed its ability to meet future water demands at current capacity and this information is included in **Table 7**.

Table 7 – Future Water Supply Needs for the Hooverson Heights

Is the utility able to meet water demands with the current production capacity over the next 5 years? If so, explain how you plan to do so.	There is little to no increase expected in the customer demand within the next five (5) years for Hooverson Heights. If any increase is experienced, it is expected to be minimal and the plant is expected to remain under the maximum treatment capacity. If a significant increase is experienced, the treatment plant would need to be upgraded at that time.
If not, describe the circumstances and plans to increase production capacity:	N/A

Water Loss Calculation

In any public water system, there is a certain percentage of the total treated water that does not reach the customer distribution system. Some of this water is used in treatment plant processes such as backwashing filters or flushing piping, but there is usually at least a small percentage unaccounted. To measure and report on this unaccounted for water, a public utility must use the same method used in the Public Service Commission's rule, *Rules for the Government of Water Utilities*, 150CSR7, Section 5.6. The rule defines unaccounted for water as "the volume of water introduced into the distribution system less all metered usage and all known non-metered usage which can be estimated with reasonable accuracy."

To further clarify, metered usages are most often those that are distributed to customers. Non-metered usages estimated include water used by fire departments for fires or training, un-metered bulk sales, flushing to maintain the distribution system, backwashing filters, and cleaning settling basins. By totaling the metered and non-metered uses, the utility calculates unaccounted for water. Note: To complete annual reports submitted to the PSC, utilities typically account for known water main breaks by estimating the amount of water lost. However, for the purposes of the source water protection contingency plan, any water lost due to leaks – even if the system is aware of how much water is lost at a main break – is not considered a use. Water lost through leaks and main breaks cannot be controlled during water shortages or other emergencies and should be included in the calculation of percentage of water loss for purposes of the source water protection contingency plan. The data in **Table 8** is taken from the most recently submitted Hooverson Heights PSC Annual Report.

Table 8 – Water Loss Information

Total Water Pumped (gal)		473,659,000
Total Water Purchased (gal)		0
Total Water Pumped and Purchased (gal)		473,659,000
Water Loss Accounted for Except Main Leaks (gal)	**Mains, Plants, Filters, Flushing, etc.**	0
	Fire Department	0
	Back Washing	5,283,000
	Blowing Settling Basins	0
Total Water Loss Accounted For Except Main Leaks		5,283,000
Water Sold- Total Gallons (gal)		343,930,000
Unaccounted For Lost Water (gal)		124,446,000
Water lost from main leaks (gal)		0
Total Percent Unaccounted For Water and Water Lost from Main Leaks (%)		**26.27 %**
If total percentage of Unaccounted for Water is greater than 15%, please describe any measures that could be taken to correct this problem:		Increased inspection and leak detection, and making necessary repairs.

**The water loss in the above table is for Follansbee Municipal Water Works and Hooverson Heights. The data above is from the 2015 PSC Annual Report.*

Early Warning Monitoring System

Public water utilities are required to provide an examination of the technical and economic feasibility of implementing an early warning monitoring system. Implementing an early warning monitoring system may be approached in different ways depending upon the water utility's resources and threats to the source water. A utility may install a continuous monitoring system that will provide real-time information regarding water quality conditions. This would require utilities to analyze the data in order to establish what condition is indicative of a contamination event. Continuous monitoring will provide results for a predetermined set of parameters. The more parameters being monitored, the more sophisticated the monitoring equipment will be. When establishing a continuous monitoring system, the utility should consider the logistics of placing and maintaining the equipment and receiving output data from the equipment.

Alternately, or in addition, a utility may also pull periodic grab samples on a regular basis or in case of a reported incident. The grab samples may be analyzed for specific contaminants. A utility should examine their PSSCs to determine what chemical contaminants could pose a threat to the water source. If possible, the utility should plan in advance how those contaminants will be detected. Consideration should be given for where samples will be collected, the preservations and hold times for samples, available laboratories to analyze samples, and costs associated with the sampling event. Regardless of the type of monitoring (continuous or grab), utilities should collect samples for their source throughout the year to better understand the baseline water quality conditions and natural seasonal fluctuations. Having a baseline will help determine if changes in the water quality are indicative of a contamination event and inform the needed response.

Every utility should establish a system or process for receiving or detecting chemical threats with sufficient time to respond to protect the treatment facility and public health. All approaches to receiving and responding to an early warning should incorporate communication with facility owners and operators that pose a threat to the water quality, state and local emergency response agencies, surrounding water utilities, and the public. Communication plays an important role in knowing how to interpret data and how to respond.

Hooverson Heights has analyzed its ability to monitor for and detect potential contaminants that could impact its source water. Information regarding this utility's early warning monitoring system capabilities can be found in **Table 9** and in **Appendix A**.

Table 9 – Early Warning Monitoring System Capabilities

Does your system currently receive spill notifications from a state agency, neighboring water system, local emergency responders, or other facilities? If yes, from whom do you receive notices?	The utility receives spill notifications from the WV Health Department and the Ohio River Sanitation Commission (ORSANCO).		
Are you aware of any facilities, land uses, or critical areas within your protection areas where chemical contaminants could be released or spilled?	No		
Are you prepared to detect potential contaminants if notified of a spill?	No		
List laboratories (and contact information) on which you would rely to analyze water samples in case of a reported spill.	**Laboratories**		
	Name	**Contact**	
	REI Consultants	(304) 255-2500	
	WV Office of Lab Services	(304) 558-3530	
Do you have an understanding of baseline or normal conditions for your source water quality that accounts for seasonal fluctuations?	Yes		
Does your utility currently monitor raw water (through continuous monitoring or periodic grab samples) at the surface water intake or from a groundwater source on a regular basis?	Yes		
Provide or estimate the capital and O&M costs for your current or proposed early warning system or upgraded system.	**Capital**	\$50,000	
	Yearly O&M	\$750	
Do you serve more than 100,000 customers? If so, please describe the methods you use to monitor at the same technical levels utilized by ORSANCO.	N/A		
Note: Complete appropriate Early Warning Monitoring form for your system in Appendix A (Line 71).			

SINGLE SOURCE FEASIBILITY STUDY

If a public water utility's water supply plant is served by a single-source intake to a surface water source of supply or a surface water influenced source of supply, the submitted source water protection plan must also include an examination and analysis of the technical and economic feasibility of alternative sources of water to provide continued safe and reliable public water service in the event its primary source of supply is detrimentally affected by contamination, release, spill event or other reason. These alternatives may include a secondary intake, two days of raw or treated water storage, interconnections with neighboring systems, or other options identified on a local level. Note: a secondary intake would draw water supply from a substantially different location or water source.

In order to accomplish this requirement, utilities should examine all existing or possible alternatives and rank them by their technical, economic, and environmental feasibility. In order to have a consistent method for ranking alternatives, WV BPH has developed a feasibility study guide. This guide provides several criteria to consider for each category, organized in a scoring matrix. By completing the Feasibility Study, utilities will demonstrate the process used to examine the feasibility of each alternative. The Feasibility Study matrix is attached as **Appendix B**. Those alternatives that are ranked highest and deemed to be most feasible will then be the subject of a second, more in-depth, study to analyze the comparative costs, risks, and benefits of implementing each of the described alternatives. An alternatives analysis report providing these details is attached as **Appendix C**.

CONCLUSION & RECOMMENDATION

This report represents a detailed explanation of the required elements of the Hooverson Height's Source Water Protection Plan. Any supporting documentation or other materials that the utility considers relevant to their plan can be found in **Appendix D**.

This source water protection plan is intended to help prepare community public water systems all over West Virginia to properly handle any emergencies that might compromise the quality of the system's source water supply. It is imperative that this plan is updated as often as necessary to reflect the changing circumstances within the water system. The protection team should continue to meet regularly and continue to engage the public whenever possible. Communities taking local responsibility for the quality of their source water is the most effective way to prevent contamination and protect a water system against contaminated drinking water. Community cooperation, sufficient preparation, and accurate monitoring are all critical components of this source water protection plan, and a multi-faceted approach is the only way to ensure that a system is as protected as possible against source water degradation.

As shown in the Feasibility Matrix in Appendix B, the alternative with the highest final score of feasibility is the use of available treated water storage. Hooverson Heights has sufficient treated water storage if an emergency or contamination event were to occur temporarily. Additionally, it is recommended that for extended periods of contamination Hooverson Height utilize the existing interconnection with Follansbee Municipal and the four (HH 1-4) ground water wells that are in place. The combination of the interconnection and wells will allow Hooverson

Heights to maintain average demand for longer periods of time. During power outages the utility currently cannot operate. It is recommended that Hooverson Heights install a 350 kW stationary generator at the treatment plant and a 300 kW stationary generator at the intake pump station. The size of the stationary generator was based upon the following assumptions: three (3) phase power was needed, 480v power service, additional kW would be needed for miscellaneous power such as lighting and heaters, and the connection of the current controls to an automatic transfer switch.

The recommendation that would allow the utility to be more prepared in the event of an emergency or contamination event would be as follows: the installation of an early warning monitoring system upstream of the surface water intake on the Ohio River as detailed in Appendix A. An early warning monitoring system shall allow the treatment facility to detect potential contaminants in the event a contamination event was to occur. A cost estimate is provided below. Further explanations of the costs are provided in Appendix D, "Supporting Documentation".

RECOMMENDED ALTERNATIVE COST ESTIMATE

Qty.	Unit	Description	Unit Cost	Total Cost
1	LS	350 kW Stationary Generator (Treatment Plant)	$115,000	$115,000
1	LS	300 kW Stationary Generator (Intake Pump Station)	$95,000	$95,000
1	LS	Early Warning Detection Equipment	$50,000	$50,000
1	LS	Operation & Maintenance for Early Warning System (Per Year)	$750	$750
			TOTAL =	**$ 260,750.00**

APPENDIX A – EARLY WARNING MONITORING SYSTEM FORMS

Select and Attach the Appropriate Form for Your System.

Form A – Complete if you currently have an early warning monitoring system installed for a surface water source.

Form B – If you do not currently have an early warning monitoring system installed for a surface water intake or plan to upgrade or replace your current system, complete this form.

Form C – Complete if you currently have an early warning monitoring system for a groundwater source.

Form D – If you do not currently have an early warning monitoring system installed for a groundwater source or plan to upgrade or replace your current system, complete this form.

Note: You may need to fill out and attach more than one form to your Protection Plan, depending on your current situation.

Appendix A – Form B

Proposed Early Warning Monitoring System Worksheet- Surface

Describe the type of early warning detection equipment that could be installed, including the design.
The early warning detection equipment that could be installed includes a level controller, display module, back panel, level & trough (see cost estimate by Hach Company in Appendix D, "Supporting Documentation") along with conductivity, oil-in-water, ORP, and pH sensors.
Where would the equipment be located?
Early warning monitoring systems would be located upstream of the raw water intake on the Ohio River.
What would the maintenance plan for the monitoring equipment entail?
The proposed maintenance plan for the monitoring equipment shall consist of annual cleaning and/or exchanging of the probe(s) for the controller. Periodic calibration of the unit may also be required.
Describe the proposed sampling plan at the monitoring site.
Sampling of water quality data occurs every fifteen (15) minutes. Hooverson Heights would need to retrieve data from the "History" of the controller data collector twice per month.
Describe the proposed procedures for data management and analysis.
Data management for the early warning monitoring system consists of data points (up to 500 points or approximately six months per probe) being recorded in the "History" of the controller data collector. To access the "History", the probe has to be plugged into the controller. Data is able to be removed via USB or through a local SCADA system.

Literature related to the development and design of early warning systems is provided on the following pages. Courtesy of the American Water Works Association.

APPENDIX B – FEASIBILITY STUDY MATRIX

Feasibility Matrix **Follansbee Hooverson Heights** **PWSID:** **3300512** **Date:** **1/27/2016** **Completed by:** **Project Engineer - The Thrasher Group, Inc.**

Alternative Strategy Description	Economic Criteria					Technical Criteria							Environmental Criteria						Final Score	Total Capital Cost	Comments
	Operation & Maintenance Costs	Capital Costs	Total	Total %	Weighted Total	Permitting	Flexibility	Resilience	Institutional Requirements	Total	Total %	Weighted Total	Environmental Impacts	Aesthetic Impacts	Stakeholder Issues	Total	Total %	Weighted Total			
Backup Wells	3.0	3.0	6.0	100.0%	40.0%	3.0	2.5	2.0	3.0	10.5	87.5%	35.0%	3.0	3.0	3.0	9.0	100.0%	20.0%	95.0%	$0.00	This alternative has already been constructed, however the four (4) ground water wells can only supply the Hooverson Heights demand intermittently.
Interconnect	3.0	3.0	6.0	100.0%	40.0%	3.0	2.5	1.7	3.0	10.2	84.7%	33.9%	3.0	3.0	3.0	9.0	100.0%	20.0%	93.9%	$0.00	This alternative has already been constructed, however the interconnection with Follansbee Municipal can not supply adequate demand to the Hooverson Height's system.
Treated Water Storage	3.0	3.0	6.0	100.0%	40.0%	3.0	3.0	3.0	3.0	12.0	100.0%	40.0%	3.0	3.0	3.0	9.0	100.0%	20.0%	100.0%	$0.00	Hooverson Heights currently has 2,096,000 gallons of treated water storage; therefore, no additional treated water storage is needed to meet the minimum requirements of Senate Bill 373.
Raw Water Storage	3.0	2.3	5.3	88.9%	35.6%	2.0	2.0	2.3	2.0	8.3	69.4%	27.8%	3.0	2.0	0.0	5.0	55.6%	11.1%	74.4%	$1,726,700.00	No comment
Groundwater Wells and Interconnection	3.0	3.0	6.0	100.0%	40.0%	3.0	3.0	2.3	3.0	11.3	94.4%	37.8%	3.0	3.0	3.0	9.0	100.0%	20.0%	97.8%	$0.00	Hooverson Heights plans to repair wells two (2) and four (4) this year. With all four (4) wells operational and the existing interconnection with Follansbee Municipal the Hooverson Heights demand can be sustained.

Scoring:

0 - Not feasible. Criterion cannot be met by this alternative and removes the alternative from further consideration.
1 - Feasible but difficult. Criterion represents a significant barrier to successful implementation but does not eliminate it from consideration.
2 - Feasible. Criterion can be met by the alternative.
3 - Very Feasible. Criterion can be easily met by the alternative.

APPENDIX C – ALTERNATIVES ANALYSIS

ANALYSIS OF ALTERNATIVES

Follansbee's Hooverson Heights system currently has two (2) alternative sources of water supply in the event that the primary water source becomes contaminated. The system currently has three (3) operational wells and an interconnection with Follansbee Municipal.

1. **Backup Intake**

   Follansbee's Hooverson Heights surface water intake located on the Ohio River is currently the primary source of water supply. There is no source of water supply large enough to supply sufficient capacity in close proximity to the water treatment facility; however the utility currently has four (4) groundwater wells. At the time of this report wells 2 and 4 were not operational. In discussions with the plant operator the wells will be repaired this year (2016). The operator also stated that in the past the average demand has been sustained by using the four (4) groundwater wells and the interconnection with Follansbee Municipal. The groundwater wells can produce 500 GPM and if the plant were to remain operating 13.5 hours per day the plant could produce:

$$500\frac{gallons}{min}\ x\ 60\ \frac{min}{hour} = 30{,}000\ gallons\ per\ hour$$

$$30{,}000\ \frac{gallons}{hour} x\ 13.5\ \frac{hours}{day} = 405{,}000\ GPD$$

   Thus, this alternative was considered in the feasibility analysis.

2. **Interconnection**

   Hooverson Heights is currently interconnected with the Follansbee Municipal's system. Currently Follansbee provides Hooverson Heights with approximately 75,000 gallons per day on average. Hooverson Heights does not purchase the water because they are a branch of Follansbee Municipal's system. In discussions with the Hooverson Heights operator, Follansbee cannot produce more than the average daily demand stated above. The interconnection could sustain the some of Hooverson Heights production. Another alternative such as the groundwater wells at Hooverson Heights would need to be used in addition to the interconnection to maintain the average demand. Thus, this alternative was considered in the feasibility analysis.

3. **Treated Water Storage**

   Hooverson Heights treated water storage capacity for the system consists of five (5) water storage tanks totaling 2,096,000 gallons. On average, the water treatment facility produces 395,000 gallons per day of water. The maximum produced by the water treatment facility from March 2015 was 953,400 gallons per day, according to monthly operating reports provided by the utility.

The minimum required treated storage capacity, according to Senate Bill 373, is equal to two (2) days of system storage based on the plant's maximum level of production experienced within the past year, and the maximum required is equal to five (5) days of the average production, according to WV BPH standards requiring 20% turnover per day.

The minimum required treated water storage capacity for the system would be:

$$953{,}400 \text{ gallons per day} * 2 \text{ days} = 1{,}906{,}800 \text{ gallons}$$

Therefore, the system currently meets the minimum required treated water storage capacity. Thus, this alternative will not be considered in the feasibility analysis.

4. **Raw Water Storage**

Hooverson Heights does not have any raw water storage capacity for the system.

As mentioned in Section #3, the water treatment facility produces 395,000 gallons per day on average and has a maximum production of 953,400 gallons per day.

The minimum required raw storage capacity, according to Senate Bill 373, is equal to two (2) days of system storage based on the plant's maximum level of production experienced within the past year, and the maximum required is equal to five (5) days of the average production, according to WV BPH standards requiring 20% turnover per day.

The minimum required raw water storage capacity for the system would be:

$$953{,}400 \text{ gallons per day} * 2 \text{ days} = 1{,}906{,}800 \text{ gallons}$$

Therefore, the system currently does not meet the minimum required raw water storage capacity. Thus, the construction of a 2,026,000 gallon raw water storage tank will be considered in the feasibility analysis. A cost analysis is provided in Appendix D, "Supporting Documentation".

5. Groundwater Wells and Interconnection

Hooverson Heights has a secondary source of four (4) groundwater wells and an interconnection with Follansbee Municipal. Both secondary sources could be used together to meet the average demand of 395,000 gallons per day. As stated above Hooverson Heights can attain approximately 75,000 gallons of water from Follansbee Municipal daily. After wells 2 and 4 are repaired the backup groundwater source can produce 30,000 gallons per hour as calculated above in the Intake section of this report. The wells would need to operate 11 hours a day to maintain the average demand of Hooverson Heights in a time that the Ohio River was contaminated as seen in the calculation below.

From groundwater wells,

$$30{,}000\ \frac{gallons}{hour}\ x\ 11\ hours = 330{,}000\ \frac{gallons}{day}$$

With the additional raw water from Follansbee Municipal,

$$330{,}000\frac{gallons}{day} + 75{,}000\frac{gallons}{day} = 405{,}000\frac{gallons}{day}$$

Therefore the average demand of Hooverson Heights could be sustained by combining the production of the existing interconnection with Follansbee Municipal and the four (4) existing groundwater wells. This alternative was considered during the feasibility analysis.

Feasibility Matrix **Follansbee Hooverson Heights** **PWSID: 3300512** **Date: 1/27/2016** **Completed by: Project Engineer - The Thrasher Group, Inc.**

Criteria	Question	Backup Wells	Feasibility	Interconnect	Feasibility	Treated Water Storage	Feasibility	Raw Water Storage	Feasibility	Groundwater Wells and Interconnection	Feasibility
What is the total current budget year cost to operate and maintain the PWSU (current budget year)?		$1,268,781.00		$1,268,781.00		$1,268,781.00		$1,268,781.00		$1,268,781.00	
O and M Costs	Describe the major O&M cost requirements for the alternative?	Labor, power and materials for maintenance	3	Labor, power and materials for maintenance	3	Labor and materials for maintenance	3	Labor and materials for maintenance	3	Labor and materials for maintenance	3
	What is the incremental cost ($/gal) to operate and maintain the alternative?	$0.00	3	$0.00	3	$0.00	3	$0.00	3	$0.00	3
	Cost comparison of the incremental O&M cost to the current budgeted costs (%)	0.00%	3	0.00%	3	0.00%	3	0.00%	3	0.00%	3
O and M-Feasibility Score			*3.0*		*3.0*		*3.0*		*3.0*		*3.0*
Describe the capital improvements required to implement the alternative		N/A		N/A		N/A		Construction of a new 2,026,000 gallon raw water storage tank.		N/A	
Capital Costs	What is the total capital cost for the alternative?	$0.00	3	$0.00	3	$0.00	3	$3,725,700.00	1	$0.00	3
	What is the annualized capital cost to implement the alternative, including land and easement costs, convenience tap fees, etc. ($/gal)	$0.00	3	$0.00	3	$0.00	3	$0.00	3	$0.00	3
	Cost comparison of the alternatives annualized capital cost to the current budgeted costs (%)	$0.00	3	$0.00	3	$0.00	3	0.00%	3	$0.00	3
Capital Cost Feasibility Score			*3.0*		*3.0*		*3.0*		*2.3*		*3.0*
Permitting	Provide a listing of the expected permits required and the permitting agencies involved in their approval	N/A	3	N/A	3	N/A	3	WV DEP, WV DNR, ACOE, WV SHPO, US FWS, WV DOH and County Floodplain	2	N/A	3
	What is the timeframe for permit approval for each permit?	N/A	3	N/A	3	N/A	3	WV DEP (90 days), WV DNR (60 days), ACOE (90 days), WV SHPO (60 days), US FWS (60 days), WV DOH (90 days) and County Floodplain (90 days)	2	N/A	3
	Describe the major requirements in obtaining the permits (environmental impact studies, public hearings, etc.)	N/A	3	N/A	3	N/A	3	Environmental impact studies.	2	N/A	3
	What is the likelihood of successfully obtaining the permits?	N/A	3	N/A	3	N/A	3	Good	2	N/A	3
	Does the implementation of the alternative require regulatory exceptions or variances?	N/A	3	N/A	3	N/A	3	No	2	N/A	3
Permitting-Feasibility Score			*3.0*		*3.0*		*3.0*		*2.0*		*3.0*
Flexibility	Will the alternative be needed on a regular basis or only used intermittently?	Intermittently	2	Intermittently	2	N/A	3	Intermittently	2	The alternative can fully sustain water demand.	3
	How will implementing the alternative affect the PWSU's current method of treating and delivering potable water including meeting Safe Drinking Water Act regulations? (ex. in the case of storage, will the alternative increase the likelihood of disinfection byproducts?)	N/A	3	N/A	3	N/A	3	The alternative will add 2,026,000 gallons of raw water storage to the system, and will not have any other impact.	2	N/A	3
Flexibility-Feasibility Score			*2.5*		*2.5*		*3.0*		*2.0*		*3.0*
Resilience	Will the alternative provide any advantages or disadvantages to meeting seasonal changes in demand?	Drought could limit water available.	2	Drought could limit water available.	2	N/A	3	Yes	3	Drought may limit the availability of water.	2
	How resistant will the alternative be to extreme weather conditions such as drought and flooding?	Drought may limit the availability of water.	2	Drought may limit the availability of water.	2	N/A	3	Drought may limit the availability of water.	2	Drought may limit the availability of water.	2
	Will the alternative be expandable to meet the growing needs of the service area?	Yes	2	Yes	1	N/A	3	Yes	2	Yes	3
Resilience-Feasibility Score			*2.0*		*1.7*		*3.0*		*2.3*		*2.3*
Institutional Requirements	Identify any agreements or other legal instruments with governmental entities, private institutions or other PWSU required to implement the alternative.	N/A	3	N/A	3	N/A	3	None	2	N/A	3
	Are any development/planning restrictions in place that can act as a barrier to the implementation of the alternative	N/A	3	N/A	3	N/A	3	No	2	N/A	3
	Identify potential land acquisitions and easements requirements	N/A	3	N/A	3	N/A	3	Property acquisition would be required for the tank.	2	N/A	3
Institutional Requirements-Feasibility Score			*3.0*		*3.0*		*3.0*		*2.0*		*3.0*
Environmental Impacts	Identify any environmentally protected areas or habitats that might be impacted by the alternative.	N/A	3	N/A	3	N/A	3	None are known.	3	N/A	3
Environmental Impacts-Feasibility Score			*3.0*		*3.0*		*3.0*		*3.0*		*3.0*

Criteria	Question	Backup Wells	Feasibility	Interconnect	Feasibility	Treated Water Storage	Feasibility	Raw Water Storage	Feasibility	Groundwater Wells and Interconnection	Feasibility
Aesthetic Impacts	Identify any visual or noise issues caused by the alternative that may affect local land uses?	N/A	3	N/A	3	N/A	3	Construction would cause temporary noise issues, and some visual impact would be made by the tank.	2	N/A	3
	Identify any mitigation measures that will be required to address aesthetic impacts?	N/A	3	N/A	3	N/A	3	The construction would need to be as quick as possible.	2	N/A	3
Aesthetic Impacts-Feasibility Score			*3.0*		*3.0*		*3.0*		*2.0*		*3.0*
Stakeholder Issues	Identify the potential stakeholders affected by the alternative	N/A	3	N/A	3	N/A	3	Water customers and land owners.	0	N/A	3
	Identify the potential issues with stakeholders for and against the alternative	N/A	3	N/A	3	N/A	3	A rate increase may be required to implement construction, and possible land ownership issues may arise.	0	N/A	3
	Will stakeholder concerns represent a significant barrier to implementation (or assistance) of the alternative?	N/A	3	N/A	3	N/A	3	No	0	N/A	3
Stakeholder Issues-Feasibility Score			*3.0*		*3.0*		*3.0*		*0.0*		*3.0*
Comments		This alternative has already been constructed, however the four (4) ground water wells can only supply the Hooverson Heights demand intermittently.		This alternative has already been constructed, however the interconnection with Follansbee Municipal can not supply adequate demand to the Hooverson Height's system.		Hooverson Heights currently has 2,096,000 gallons of treated water storage; therefore, no additional treated water storage is needed to meet the minimum requirements of Senate Bill 373.		No comment		Hooverson Heights plans to repair wells two (2) and four (4) this year. With all four (4) wells operational and the existing interconnection with Follansbee Municipal the Hooverson Heights demand can be sustained.	

APPENDIX D – SUPPORTING DOCUMENTATION

RAW WATER TANK COST				
Gallons	Tank Dimension	Model Number	Cost	Cost Per Gallon
105,000	25.17'dia. x 28.43' sidewall height	AQUASTORE tank Model 25 28 - SSWT	$ 155,000	$ 1.48
209,000	30.77'dia. x 37.59' sidewall height	AQUASTORE tank Model 31 38 - SSWT	$ 225,000	$ 1.08
297,000	39.16'dia. x 33.01' sidewall height	AQUASTORE tank Model 39 33 - SSWT	$ 285,000	$ 0.96
438,000	47.55'dia. x 33.01' sidewall height	AQUASTORE tank Model 48 33 - SSWT	$ 345,000	$ 0.79
491,000	50.35'dia. x 33.01' sidewall height	AQUASTORE tank Model 50 33 - SSWT	$ 365,000	$ 0.74
607,000	55.95'dia. x 33.01' sidewall height	AQUASTORE tank Model 56 33 - SSWT	$ 425,000	$ 0.70
691,000	64.34'dia. x 28.43' sidewall height	AQUASTORE tank Model 64 28 - SSWT	$ 470,000	$ 0.68
816,000	69.93'dia. x 28.43' sidewall height	AQUASTORE tank Model 70 28 - SSWT	$ 510,000	$ 0.63
948,000	69.93'dia. x 33.01' sidewall height	AQUASTORE tank Model 70 33 - SSWT	$ 555,000	$ 0.59
1,025,000	72.73'dia. x 33.01' sidewall height	AQUASTORE tank Model 73 33 - SSWT	$ 595,000	$ 0.58
1,260,000	72.73'dia. x 33.01' sidewall height	AQUASTORE tank Model 73 33 - SSWT	$ 695,000	$ 0.55
1,453,000	97.91'dia. x 28.43' sidewall height	AQUASTORE tank Model 98 28- SSWT	$ 790,000	$ 0.54
1,601,000	97.91'dia. x 28.43' sidewall height	AQUASTORE tank Model 98 28- SSWT	$ 870,000	$ 0.54
1,789,000	103.5'dia. x 28.43' sidewall height	AQUASTORE tank Model 104 28- SSWT	$ 945,000	$ 0.53
2,026,000	120.29'dia. x 23.84' sidewall height	AQUASTORE tank Model 120 24- SSWT	$ 1,052,000	$ 0.52

COSTS OF ADDITIONAL ITEMS AND ASSUMPTIONS	
Access Road and Site Preparation	$ 75,000
Yard Piping and Vault	13%
Bonds/Permits	$ 20,000
Fencings	$ 35,000
Engineering/Accounting/Legal Fees	25%
Level-Sensing and Measuring Equipment	$ 10,000
Rock Excavation of Foundation (if encountered)	5%

ASSUMPTIONS: Cost are based on a standpipe glass lined tank. Price includes access roads and site preparation (assuming land would need to be purchased for the tank site), telemetry, excavation in rock (% of Tank Cost), valve vault and piping (% of tank Cost), fencing. Price does not include additional waterline from site to water system. Fees for engineering, legal and accounting services will be 25% of the overall project cost.

TOTAL COST (INCLUDING ADDITIONAL ITEMS) OF RAW WATER STORAGE				
Gallons	Tank Dimension	Model Number	Cost	Cost Per Gallon
105,000	25.17'dia. x 28.43' sidewall height	AQUASTORE tank Model 25 28 - SSWT	$ 403,625	$ 3.84
209,000	30.77'dia. x 37.59' sidewall height	AQUASTORE tank Model 31 38 - SSWT	$ 506,875	$ 2.43
297,000	39.16'dia. x 33.01' sidewall height	AQUASTORE tank Model 39 33 - SSWT	$ 595,375	$ 2.00
438,000	47.55'dia. x 33.01' sidewall height	AQUASTORE tank Model 48 33 - SSWT	$ 683,875	$ 1.56
491,000	50.35'dia. x 33.01' sidewall height	AQUASTORE tank Model 50 33 - SSWT	$ 713,375	$ 1.45
607,000	55.95'dia. x 33.01' sidewall height	AQUASTORE tank Model 56 33 - SSWT	$ 801,875	$ 1.32
691,000	64.34'dia. x 28.43' sidewall height	AQUASTORE tank Model 64 28 - SSWT	$ 868,250	$ 1.26
816,000	69.93'dia. x 28.43' sidewall height	AQUASTORE tank Model 70 28 - SSWT	$ 927,250	$ 1.14
948,000	69.93'dia. x 33.01' sidewall height	AQUASTORE tank Model 70 33 - SSWT	$ 993,625	$ 1.05
1,025,000	72.73'dia. x 33.01' sidewall height	AQUASTORE tank Model 73 33 - SSWT	$ 1,052,625	$ 1.03
1,260,000	72.73'dia. x 33.01' sidewall height	AQUASTORE tank Model 73 33 - SSWT	$ 1,200,125	$ 0.95
1,453,000	97.91'dia. x 28.43' sidewall height	AQUASTORE tank Model 98 28- SSWT	$ 1,340,250	$ 0.92
1,601,000	97.91'dia. x 28.43' sidewall height	AQUASTORE tank Model 98 28- SSWT	$ 1,458,250	$ 0.91
1,789,000	103.5'dia. x 28.43' sidewall height	AQUASTORE tank Model 104 28- SSWT	$ 1,568,875	$ 0.88
2,026,000	120.29'dia. x 23.84' sidewall height	AQUASTORE tank Model 120 24- SSWT	$ 1,726,700	$ 0.85

APPENDIX E. SUPPORTING DOCUMENTATION

E-1. Protection Team Meeting

Date: 6/16/2016

Location: Follansbee City Hall, Follansbee, WV

Participants: Ron Orsini, Michael Bolen, Britney Hervey Farris, Daniel E. Keener, John Williams III, Bill Secrest, and TT Representative Russell Myers

- On Thursday June 16, 2016, the Source Water Protection Team for Follansbee Hooverson Heights Water System met to review and update the draft of the SWPP. Chief Operator Ron Orsini contacted the team members and arranged the meeting, but a few of the protection team members were unable to attend including the EMA Director and the mayor. These members will be active on the team in the future, and will be provided a copy of the draft to review.
- Russell reviewed the SWPP draft and accepted comments from the group.
    - The water system advertised the public meeting in the Wheeling Intelligencer and the Steubenville Herald Star newspapers.
    - The population served by the water system is 2,590 people, or 2,133 customers.
    - Only 1 of the 4 wells owned by the water system is operational. The operator is trying to repair and utilize the other wells in the future if funding becomes available.
    - Industry should be ranked #4 and Oil/Gas wells should be ranked #5. Barge Traffic would be the primary concern for the water system, chemicals being transported up and down the river. Brooke County EMA does have a commodity flow study that they will make available to the water operators. This study is from 2009 but will be updated soon.
    - All other priorities from the old plan are still a concern and should be left in the plan, as well as the management strategies.
    - The Follansbee Municipal Water system has a treatment capacity of around 700 GPM.
    - The generator capacities suggested in the Contingency Plan are too large for the treatment plant and intake pumps. They are unsure what size generators they would require, but do not think a 300 kW system would be required.
    - Brooke County EMA has 3 generators (240 kW, 180 kW, and 160 kW) that could be used by Follansbee Hooverson Heights during a power outage. Each one has a 150 gal. fuel tank. This would be the primary generator supplier for the system, Beckwith Equipment would be their secondary option. They would purchase fuel from Belmont and Tristate Petroleum.
    - TraDet Laboratories would be the primary lab to be used for water samples. 304-233-9060

E-2. List of Regulated Databases

In addition to PSSC that have been identified by the WVBPH and local efforts, water systems should consider data available from regulatory agencies, such as the US Environmental Protection Agency (USEPA) and the WV Department of Environmental Protection (WVDEP). The follow presents examples of regulatory program databases that should be considered.

USEPA

CERCLIS:

The Superfund program was created by the Comprehensive Environmental Response, Compensation, and Liability Act, amended by the Superfund Amendments and Reauthorization Act. The acts established authority for the government to respond to the release/threat of release of hazardous wastes, including cleanup and enforcement actions. Long-term cleanups at National Priority List sites last more than a year while short term /emergency cleanups are usually completed in less than a year. CERCLIS is a database used by the USEPA to track activities conducted under its Superfund program. CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA. Sites are investigated because of a potential for releasing hazardous substances into the environment are added to the CERCLIS inventory. USEPA learns of these sites through notification by the owner, citizen complaints, state and local government identification, and investigations by USEPA programs other than Superfund. Specific information is tracked for each individual site.

NPDES:

The National Pollutant Discharge Elimination System (NPDES) database identifies facilities permitted for the operation of point source discharges to surface waters in accordance with the requirements of Section 402 of the Federal Water Pollution Control Act. Point sources are discrete conveyances such as pipes or man-made ditches. Industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters. The NPDES permit program controls water pollution by regulating point sources that discharge pollutants into public waters.

RCRA:

This database has records for all hazardous waste, generators, and transporters as defined by the Resource Conservation Recovery Act (RCRA). Hazardous waste as defined by RCRA is waste material that exhibits ignitability, corrosivity, reactivity, or toxicity. Hazardous waste comes in many shapes and forms. Chemical, metal, and furniture manufacturing are some examples of processes that create hazardous waste. RCRA tightly regulates all hazardous waste from "cradle to grave" (i.e., from manufacture to disposal).

TRI:

The Toxics Release Inventory (TRI) is a publicly available USEPA database that contains information on toxic chemical releases and other waste management activities reported annually by certain covered industry groups as well as federal facilities. This inventory was established under the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) and expanded by the Pollution Prevention Act of 1990.

WVDEP

Abandoned Mine Sites:

Abandoned mine features compiled by the Office of Abandoned Mine Lands and Reclamation (AMLR) of the WVDEP. The AMLR eliminates damage that occurred from mining operations prior to August 3, 1977 and is funded by the AML fund. It corrects hazardous conditions and reclaims abandoned and forfeited mine sites. Typical AML features include high walls, portals, refuse piles, and mining structures such as tipples.

AST:

Above Ground Storage Tanks are regulated by the WVDEP and are subject to specific standards. Any facility using an AST should contact the WVDEP Water and Waste Management office for current requirements and further advice at 304-926-0495 or http://www.dep.wv.gov/WWE/abovegroundstoragetanks/Pages/default.aspx .

Coal Dams:

Point and polygonal mining related impoundments regulated by the WVDEP Division of Mining and Reclamation (DMR).

LUST:

The WVDEP became the lead agency for administering the Leaking Underground Storage Tank (LUST) Program with the USEPA's authorization in September 1997. Since then, the WVDEP has overseen the cleanup of released regulated substances, primarily petroleum products. Such releases can originate from overfilling, spilling, or leaking tanks and piping. To report a release from an underground storage tank system, contact the Office of Environmental Remediation at 304-238-1220, ext. 3506. After hours releases should be reported to the statewide emergency spill line at 800-642-3074.

Solid Waste Facilities:

Municipal and non-municipal waste landfills and waste transfers stations are regulated by the WVDEP Division of Waste Management.

Oil and Gas Wells:

The Office of Oil and Gas maintains records on active and inactive oil and gas wells. It also manages the Abandoned Well Plugging and Reclamation Program.

UIC:

The Underground Injection Control (UIC) program is designed to ensure that fluids injected underground will not endanger drinking water sources. The Division of Water and Waste Management regulates Class 5 wells. These wells include agriculture drainage wells, improved sinkholes, industrial disposal wells, storm water wells and septic systems that have the capacity to serve 20 or more people. The following state codes address UIC regulations; 47CSR9, 47CSR13 and 47CSR55. The Division of Mining and Reclamation oversees all mining UIC permits.

UST:

The purpose of the Underground Storage Tank (UST) Section is to regulate underground storage tanks that contain petroleum or hazardous substances to determine compliance with state rules and federal regulations. West Virginia has had full program approval from USEPA since February 1988.

Confidentiality Statement

I have reviewed and understand the requirements to maintain PSSC data in a confidential manner (64CSR3). While I may discuss PSSCs in general terms, I understand that I am not permitted to release exact locations, characteristics or quantities of contaminants to the general public.

Follansbee Hooverson Heights Water System Designees:

Name	Title	Phone	Email	Signature	Date
Michael Bolen	Administrator	304-737-3665	Michael.S.bolen@wv.gov		6/15/16
Britney Hervey Farris	Sanitarian	304-737-3665	britney.l.hervey@wv.gov		6/15/16
Daniel E Keener	BCEMA Deputy Director	304 559 7995	dkeenera@brookecountyema.com		6/16/16
John R Williams III	BCEMA Deputy Director	3045598323	JWILLIAMS@Brookecountyema.com		06/16/2016
BILL SECRIST	WATER & SEWER FIELD SUPERVISOR	304-374-3326	BSWATER69@GMAIL.com		6-16-16

Tetra Tech, Inc.
803 Quarrier Street, Suite 400, Charleston, WV 25301
Tel 304-414-0054 Fax 304-720-2334 tetratech.com

Follansbee Hooverson Heights Water System

Source Water Protection Plan - Public Meeting

Date 6/16/2016

Attendees:

Name	Organization	Email	Phone
Mark E. Schwertfeger	Water Board		[redacted]
John Bullock	Water Board		
David Heaton	Water Board		
James E Elliott	Water Board		
Dan Plumis	Water Board		
Bill Secrist			
Anthony Conn	WTOV 9		
[illegible]	Sewer Board		

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GET INVOLVED IN SOURCE WATER PROTECTION

Follansbee Hooverson Heights Water System has developed a Source Water Protection Plan to comply with recent state legislation regarding drinking water. All public water utilities that use surface water sources must complete and submit a plan by July 1, 2016.

Source Water Protection Plans are valuable tools to help any public water system plan for and manage water emergencies. Development of these plans relies on the involvement of water utility personnel, local government officials, emergency managers, health department representatives, and local community leaders.

Your water system is committed to informing and engaging the public during development and implementation of this plan. Follansbee Hooverson Heights Water will hold a public meeting to give customers an opportunity to review and comment on the plan. Now is your chance to provide your input.

The public meeting will be held at the Follansbee City Building at 6:00 PM on Thursday June 16, 2016, during the regularly scheduled water board meeting. For more information please contact:

Phone: 304-527-3670
Email: ronorsini1130@gmail.com

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Do your part to keep contaminants out of our children's source water!

Contaminants

Cleaning Products

Automotive Products

Fuel Oil

Furniture Strippers

Oil-based Paints

Sewage

Lawn and Garden Products

Sediments

Pharmaceuticals

Source Water Links

www.wvdhhr.org/oehs/eed/swap/
www.epa.gov/safewater/index.html
www.epa.gov/watersense/
http://orsanco.org

For Kids

www.epa.gov/safewater/kids/index.html
www.epa.gov/watersense/kids/index.html
www.groundwater.org/kids/

Contacts

WV Department of Health and Human Resources
Source Water Assessment and Protection Program
350 Capitol Street, Room 313
Charleston, WV 25301-3713
phone: (304) 558-2981
fax: (304) 558-4322
e-mail: EEDSourceWaterProtection@wv.gov

Follansbee Hooverson Heights Water System
807 Lee Road
Follansbee, WV 26037
Phone: 304-527-3670

Do Your Part

Protect Your Source Water

Protect Your Health

TETRA TECH

Prepared by Tetra Tech
In cooperation with the WVDHHR Source Water Assessment and Protection Program

Drinking water is essential for life. Learn what you can do to protect your drinking water sources.

Follansbee Hooverson Heights Water System treats water from the Ohio River using conventional treatment methods. The primary concerns for the water system are railroad tracks, roads, oil/gas wells and wastewater treatment facilities. There are many ways you can help minimize impacts from these and other activities on your source of drinking water.

Making choices to protect and conserve the source of your drinking water will help keep you, your family, and neighbors safe and healthy now and in the future.

Do Your Part to Protect Source Water

- ✓ Recycle used oil and other automotive products at a service center. Don't pour them on the ground or down storm drains. Storm drains can lead directly to your source water.

Fix leaks from your automobile and clean up spills.

Apply fertilizers and pesticides as directed. Consider natural alternatives to chemicals.

Don't flush pharmaceuticals. Dispose by mixing with coffee grounds or kitty litter, sealing in a container, and placing in the trash. Organize a collection day with a pharmacy and local police department.

Take unwanted household chemical waste, such as cleaners, oils, and paints to proper waste collection sites. Don't dump down your sink, toilet, or storm drains. Consider organizing a collection day in your community.

Check for leaks at heating fuel tanks and install pads to catch accidental leaks or spills.

Report unused water wells to your utility or WVDHHR.

Inspect your septic system regularly and pump every 5-10 years.

Do Your Part to Conserve Source Water

- ✓ Turn off the water when you brush your teeth and take shorter showers.

Wash full loads of clothes and dishes.

Don't use your toilet to flush trash.

- ✓ Fix leaking faucets, toilets, and lines. Consider installing toilets, faucets, and appliances designed to save water.

Water your lawn and garden in the morning. Consider installing a rain barrel at your downspouts to collect rain to water your lawn and garden, instead of using treated water.

Use native plants in landscape that don't need extra watering. Use mulch to hold moisture.

Don't let your garden hose run when washing your car.

Don't panic if you are asked to conserve during a drought. Your utility will respond to water shortages based on your normal water use. Running extra water in your home during a drought will make it more difficult to respond to the water shortage.

Conserving water saves on your monthly bill now. Protecting your source water will save on treatment costs later.