Source Water Protection Plan
Hammond Public Service District

PWSID WV3300508

Brooke County

June 2016

Prepared by:

Tetra Tech, Inc.

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In cooperation with Hammond PSD

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Consultant

Title of Preparer

Tetra Tech

Name of Contractor/Consultant

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

Robert E Hildebrand

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

Robert Hildebrand

Print Name of Authorizing Signatory:

GEN. MANAGER

Title of Authorizing Signatory:

6/24/2016

Date of Submission:

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APPENDICES

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 Hammond Public Service District (PSD) 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, Hammond PSD 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 Hammond PSD 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

Hammond PSD 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 Hammond PSD*

<table>
<tr><td colspan="2">Administrative office location:</td><td colspan="3">736 Charles Street
Wellsburg, West Virginia 26070</td></tr>
<tr><td colspan="2">Is the system a public utility, according to the Public Service Commission rule?</td><td colspan="3">Yes</td></tr>
<tr><td colspan="2">Date of Most Recent Source Water Assessment Report:</td><td colspan="3">April 2004</td></tr>
<tr><td colspan="2">Date of Most Recent Source Water Protection Plan:</td><td colspan="3">March 2011</td></tr>
<tr><td colspan="2">Population served directly:</td><td>Customers
Residential - 907
Commercial - 5
Industrial - 5</td><td colspan="2">Total Customers
917</td></tr>
<tr><td rowspan="2">Bulk Water Purchaser Systems:</td><td>System Name</td><td colspan="2">PWSID Number</td><td>Population</td></tr>
<tr><td>N/A</td><td colspan="2">N/A</td><td>N/A</td></tr>
<tr><td colspan="2">Total Population Served by the Utility:</td><td colspan="3">The water system serves a total population of 2,200 people.</td></tr>
<tr><td colspan="2">Does the utility have multiple source water protection areas (SWPAs)?</td><td colspan="3">No</td></tr>
<tr><td colspan="2">How many SWPAs does the utility have?</td><td colspan="3">1</td></tr>
</table>

*This information is from the *2016 Source Water Protection Contingency Plan for Hammond PSD* by The Thrasher Group, Inc. This document is attached in **Appendix D**. Estimated based on West Virginia's 2.43 persons per household as reported by the U.S. Census Bureau

5.0 WATER TREATMENT AND STORAGE

As required, Hammond PSD 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 Hammond PSD 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. Hammond PSD Water Treatment Information*

Water Treatment Processes (List All Processes in Order)	Water is pulled from Buffalo Creek into the holding basin. From the basin it is pumped in the water treatment plant, then the clear well, then pumped into system.
Current Treatment Capacity (gal/day)	The current treatment capacity of the plant is around 634,000 gallons/day.
Current Average Production (gal/day)	On average, the treatment plant produces 200,116 gallons per day.
Maximum Quantity Treated and Produced (gal)	The maximum quantity of water produced in a single day in the last year was 634,000 gallons.
Minimum Quantity Treated and Produced (gal)	The minimum quantity of water produced in a single day in the last year was 211,333 gallons.
Average Hours of Operation	On average, the treatment plant is staffed and operated 8 hour/day.
Maximum Hours of Operation in One Day	The maximum hours of operation in a single day in the last year was 24 hours.
Minimum Hours of Operation in One Day	The minimum hours of operation in a single day in the last year was 8 hours.
Number of Storage Tanks Maintained	Hammond PSD maintains 5 treated water storage tanks.
Total Gallons of Treated Water Storage (gal)	The water system has a total of 686,000 gallons of treated water storage.
Total Gallons of Raw Water Storage (gal)	Hammond PSD also has 100,000 gallons of raw water storage.

*This information was provided by utility staff in June 2016.

Table 3. Hammond PSD 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)
Buffalo Creek Intake	–	Raw Water Intake	Four (4) 50', 10" PVC SDR 35 intake lines with media cover	Buffalo Creek	1995 *(C)*	Primary	Active

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

Table 4. Hammond PSD Groundwater Sources

Does the utility blend with groundwater?					No				
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)
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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 approximately 148 square miles.
River Watershed Name (8-digit HUC)	Upper Ohio-Wheeling Watershed – HUC 05030106
Size of Zone of Critical Concern (Acres)	The ZCC covers 6,803 acres.
Size of Zone of Peripheral Concern (Acres) (Include ZCC area)	The ZPC covers 24,565 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 Hammond PSD 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.

Hammond PSD 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
Bob Hildebrand	Hammond Public Service District	Chief Operator	304-312-1119	hampsd1@hotmail.com
Frank Ainscough	Hammond Public Service District	System Supervisor	724-747-8467	-
Zack Massie	Hammond Public Service District	Class I Operator	304-919-9519	-
Kelly Willilams	Hammond Public Service District	Operator in Training	712-899-6687	hampsd1@hotmail.com
Jack Krzywdik	Hammond Public Service District	Board Member	[redacted]	jkrywdik90@comcast.net
Lloyd VanHorn	Hammond Public Service District	Board Member	[redacted]	-
Robert Fowler	Brooke Co. EMA	EMA Director	304-479-5003	bfowler@brookecountyema.com
Andy Nickerson	Brooke Co. EMA	EMA 2 Assistant	-	-
Cody Morris	Hammond Public Service District	-	-	-

Date of first protection team meeting	6/15/2016
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 protection team for Hammond PSD met at the PSD office on 6/15/2016 before the regularly scheduled utility board meeting. Kelly Williams contacted the team members and arranged the meeting. Many of the protection team members were unable to attend the meeting, but will be involved in future meetings. The EMA Director is still considered the alternate spokesperson for the PSD and will be provided a copy of the SWPP. In addition, the water system advertised and arranged to hold a public meeting the same day at the PSD board meeting. Details about this meeting are 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 Hammond PSD 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.

Hammond PSD 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 Hammond PSD 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 Hammond PSD 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

Hammond PSD 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. Hammond PSD 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
State Route 67	1	Sections of the road pass through the SWPA, and potential spills from vehicles are a concern. A recent brine fluid spill affected a nearby wastewater treatment plant.
Sanitary Septic Systems, Sewage Lagoon Treatment Facility for Bethany College, Home Aeration Units, Wastewater Treatment and Overflows from Larger Sanitary Sewer Systems Located Upstream of Intake	2	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. A sewage lagoon treatment facility located upstream of the intake is a concern. E. coil has been problematic in the past.
Oil and Gas Wells	3	While no regulated oil and gas wells were identified in the SWPA, drilling of gas wells within the SWPA 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. There is a project to build a brine treatment plant in a nearby community along State Route 2.
Vandalism	4	Vandals could damage facilities, including raw water system.
Coal Mining	5	Some regulated mining activities upstream of intake were identified. Surface water protection practices for local mining industry may not be known.

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 5 management strategies recommended in the existing plan, and these priorities are ongoing or continue to be a concern for the water system. These are incorporated in this plan update and listed below.	-	-	-	-
State Route 67	Better coordination of emergency response with local first responders, including raising awareness for the need to protect drinking water supplies. Regular inspections of the roadways to identify if spillage is occurring. Maintain records of identified leaks and spills. Confirm boom availability at fire department and other first responders. If none (or if unsuitable), evaluate purchase of booms for in-stream spill containment.	PWS Chief Operator/Town Council Member	Ongoing efforts	Consider installing signage along State Route 67 with emergency contact numbers. This would also help raise awareness with motorists and trucks that they are traveling through a source water protection zone while providing them with a call number in an emergency.	Minimal cost associated with staff time to coordinate with emergency responders.
Sanitary Septic Systems, Sewage Lagoon Treatment Facility for Bethany College, Home Aeration Units, Wastewater Treatment and Overflows from Larger Sanitary Sewer Systems Located Upstream of Intake	Support study and planning of sanitary sewer system extensions and upgrades along Buffalo Creek and tributaries upstream of intake to extend service to these areas and eliminate failing wastewater treatment systems. Raise awareness at Brooke County Commission and applicable sanitary sewer utilities for need for source water protection to increase support for proposed sanitary sewer system extensions and upgrades. Evaluate enhanced fecal coliform testing on surface water to better identify sources of fecal coliform contamination.	Water utility staff/protection team	Evaluate by 2019 plan update	Review public information on sewage lagoon treatment facility to better understand compliance status of facility. If concerns remain, meet with officials from Bethany College to begin establishing a relationship to provide conduit to express concerns. If concerns remain regarding sewage lagoon treatment facility, consider contacting WVDEP officials.	Minimal cost associated with staff time. Enhanced testing efforts would incur additional costs.

PSSC or Critical Area	Management Activity	Responsible Protection Team Member	Status/ Schedule	Comments	Estimated Cost
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) 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. Consider installing monitoring equipment into source water at or upstream of the intake to provide early warning of possible brine or other spills into source water and help develop water quality data of source water. Maintain contact with other neighboring public water systems, to receive input on effects of anticipated Marcellus Shale and gas well drillings, and track status of regulations through such organizations as WVDHHR, West Virginia Rural Water Association (WVRWA), West Virginia Department of Environmental Protection (WVDEP), and West Virginia Public Service Commission (WVPSC). 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.	PWS Chief Operator / Water Board Member	Complete by 2019 SWPP Update	Evaluate establishing a joint effort with officials from surrounding jurisdictions who may have concern about drilling of oil and gas wells to learn about additional practices being developed by others and how to implement applicable practices within SWPA.	Enhanced testing costs can range from $1,000 and up depending on program. WVDHHR grant funds may be available.
Vandalism	Maintain ongoing efforts of improving security by adding security cameras at WTP and intake.	PWS Chief Operator/ PSD Utility Manager/ Water Board	Ongoing efforts.	PWS has applied for funds to install security cameras.	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

PSSC or Critical Area	Management Activity	Responsible Protection Team Member	Status/ Schedule	Comments	Estimated Cost
					$45/ft. WVDHHR grant funds may be available.
Coal Mining	Review public information at WVDEP on existing and proposed coal mining development, including results of NPDES sampling, probable hydrologist consequences (PHCs), subsidence control plans, etc. Maintain contact with WVDEP inspectors and notify WVDEP of noted adverse impacts to source water. Establish/maintain relationship with local coal industry officials.	PWS Chief Operator / PSD Utility Manager / Water Board Member	Ongoing efforts.	The WVDEP retains copies of protection plans that can be obtained through Freedom of Information Act requests.	Minimal associated with staff time and FOIA charges
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
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

PSSC or Critical Area	Management Activity	Responsible Protection Team Member	Status/ Schedule	Comments	Estimated Cost
Yearly Source Water Protection Team Meetings	The Protection Team for Hammond PSD 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. Hammond PSD 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	Hammond PSD arranged an informational meeting with local residents to educate the public about source water protection efforts. The meeting was scheduled to be held during the regularly scheduled board meeting in June. The meeting was intended to provide information to the public about the SWPP and how they can get involved in source water protection. A Tetra Tech representative was on hand to give a presentation about the source water protection plan and accept questions and comments from the public.	Utility Staff, protection team	Public meeting held June 15, 2016	The meeting was advertised by posting announcement flyers at the PSD office and around town for several weeks. There were no public representatives at the office when the meeting started, so the protection team spent the time discussing the plan and how they could engage the public in the future. Utility staff agreed to post another informational flyer at the office and around town to inform their customers about the SWPP and their ability to review and comment on the plan. The utility left these notices up for several weeks. These announcement flyers are attached in **Appendix E**.	Minimal cost related to protection team time to arrange and hold meeting.
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.
Educational Brochure	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 and may assist in community planning and development. There is also an	Cost in brochure printing and mailing

Education and Outreach Strategy	Description of Activity	Responsible Protection Team Member	Status/ Schedule	Comments	Estimated Cost
				example brochure attached in **Appendix E. Supporting Documentation**.	
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 will 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.
Signage	Erecting Drinking Water Protection Signs along highways is a common awareness strategy in some states and recommended by the USEPA. Signs are placed to alert the public to the SWPA and about what to do in case of accidental spills.	Utility and City Staff	As needed	-	Cost associated with participation in activities.

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 Hammond PSD 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/). Hammond PSD has analyzed its ability to effectively respond to emergencies and this information is also provided in **Table 11**.

Table 11. Hammond PSD Water Shortage Response Capability*

Can the utility isolate or divert contamination from the intake or groundwater supply?	No
Describe the utility's capability to isolate or divert potential contaminants:	N/A
Can the utility switch to an alternative water source or intake that can supply full capacity at any time?	Yes
Describe in detail the utility's capability to switch to an alternative source:	The interconnection with the City of Wellsburg is capable of fully supplying Hammond's service area. In addition, Ohio County PSD could serve the southern end of the distribution system.

Can the utility close the water intake to prevent contamination from entering the water supply?	Yes
How long can the intake stay closed?	Approx. 3.9 days based on average production
Describe the process to close the intake:	Manually shut down raw water intake pumps
Describe the treated water storage capacity of the water system:	Five (5) treated water storage tanks totaling 686,000 gallons, operating at 100% capacity
Is the utility a member of WVRWA Emergency Response Team?	Yes
Is the utility a member of WV-WARN?	Yes
List any other mutual aid agreements to provide or receive assistance in the event of an emergency:	None

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

11.2 OPERATION DURING LOSS OF POWER

Hammond PSD 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?	The emergency generator capacity for the treatment facility is 60 kW and the largest booster station is 60 kW.
Can the utility connect to generator at intake/wellhead? If yes, select a scenario that best describes system.	No, the utility does not have a generator and would require electrical work to connect.
Can the utility connect to generator at treatment facility? If yes, select a scenario that best describes system.	No, the utility does not have a generator and would require electrical work to connect.
Can the utility connect to a generator in distribution system? If yes, select a scenario that best describes system.	No, the utility does not have a generator and would require electrical work to connect.
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**		**Phone Number**
	Generator	Brooke County EMA	-
	Generator	Brooke County PSD	304-737-4077
	Fuel	Brooke County Board of Education – School Bus Yard	304-737-3481
	Fuel	Exxon, Wellsburg, WV	304-737-2767
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 emergency generators for the pump station and treatment facility, but plans to borrow one in the meantime if needed.	

*This information is from the 2016 Source Water Protection Contingency Plan for Hammond PSD 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. Hammond PSD 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 for Hammond PSD*

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.	Yes, based on population trends there is no need for an increase in capacity to meet water demands. If population trends change, an upgrade to the plant would be needed 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 Hammond PSD 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 Hammond PSD PSC Annual Report.

Table 14. Water Loss Information

Total Water Pumped (gal)		75,691,000
Total Water Purchased (gal)		476,000
Total Water Pumped and Purchased (gal)		76,167,000
Water Loss Accounted for Except Main Leaks (gal)	**Mains, Plants, Filters, Flushing, etc.**	238,000
	Fire Department	190,000
	Back Washing	2,230,000
	Blowing Settling Basins	–
Total Water Loss Accounted For Except Main Leaks		2,658,000
Water Sold- Total Gallons (gal)		40,326,000
Unaccounted For Lost Water (gal)		18,392,000
Water lost from main leaks (gal)		14,791,000
Total gallons of Unaccounted for Lost Water and Water Lost from Main Leaks (gal)		33,183,000
Total Percent Unaccounted For Water and Water Lost from Main Leaks (gal)		43.57
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 Hammond PSD

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.

Hammond PSD 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>The utility receives spill notifications from the WV Health Department and the WV Spill Hotline.</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>No</td></tr>
<tr><td colspan="2">Are you prepared to detect potential contaminants if notified of a spill?</td><td>No</td></tr>
<tr><td rowspan="3">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>Alloway Labs- Marion, OH</td><td>740-389-5991</td></tr>
<tr><td></td><td>WV Office of Lab Services</td><td>304-558-3530</td></tr>
</table>

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.	**Monitoring System**	**Hach sc1000**
	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.		No

*This information is from the 2016 Source Water Protection Contingency Plan for Hammond PSD 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

Hammond PSD 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. Hammond PSD 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 Hammond PSD 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 Hammond PSD's 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

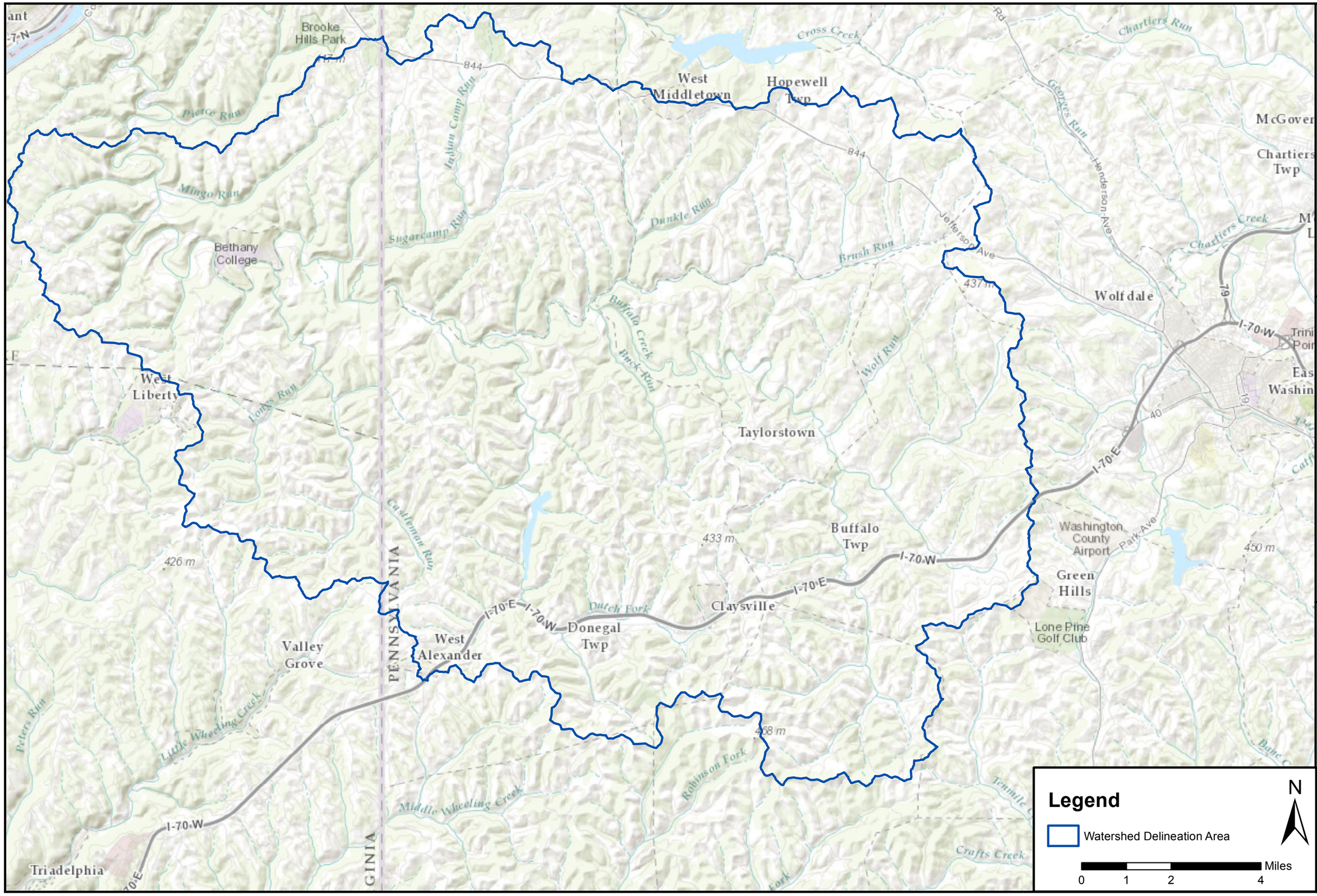


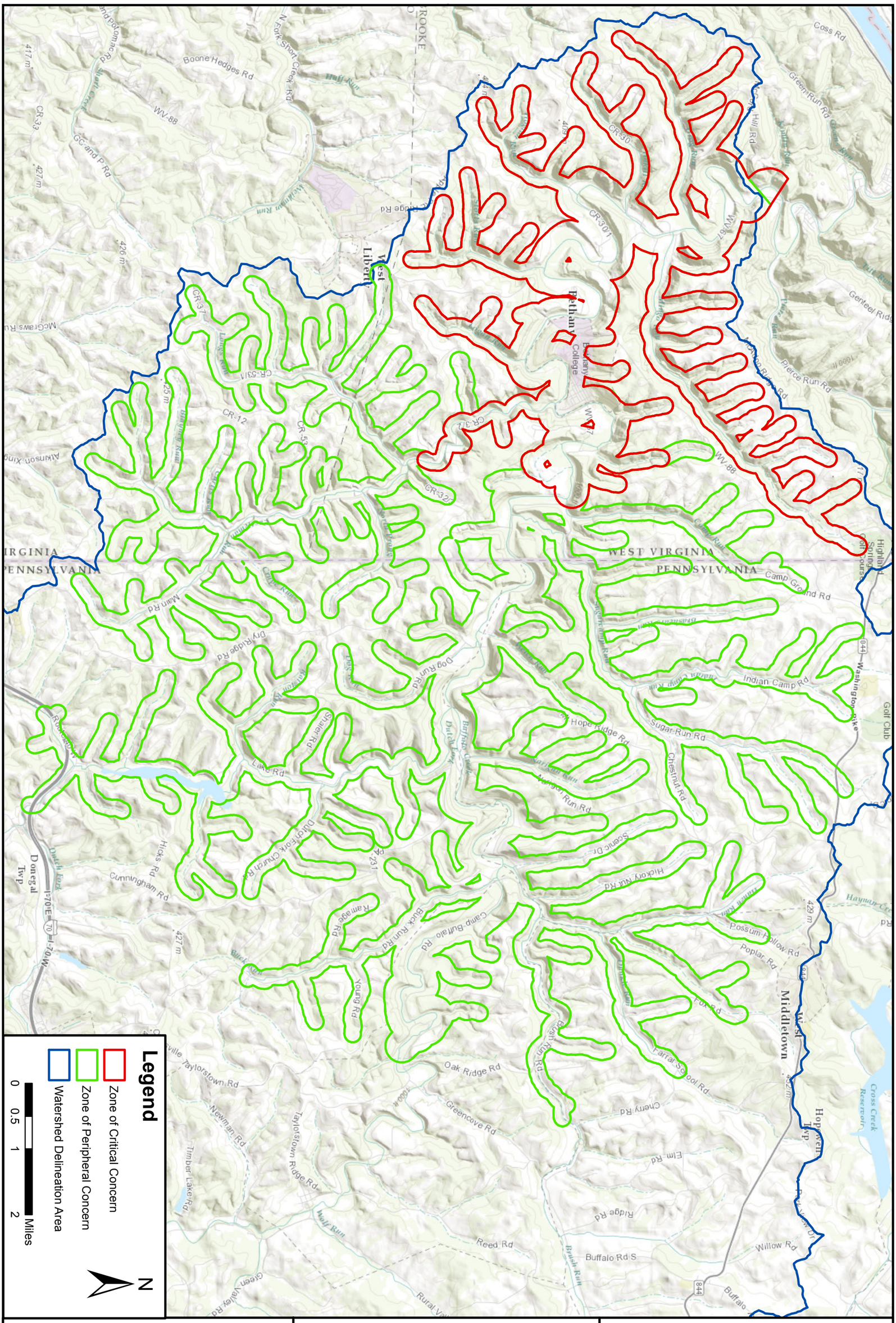
Figure A-1. Watershed Delineation Area

CREATED BY: CEM

DATE:05/22/16

Hammond PSD
PWSID: WV3300508
Source Water Protection Plan

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



TETRA TECH
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Charleston, WV 25301

Hammond PSD
PWSID: WV3300508
Source Water Protection Plan

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

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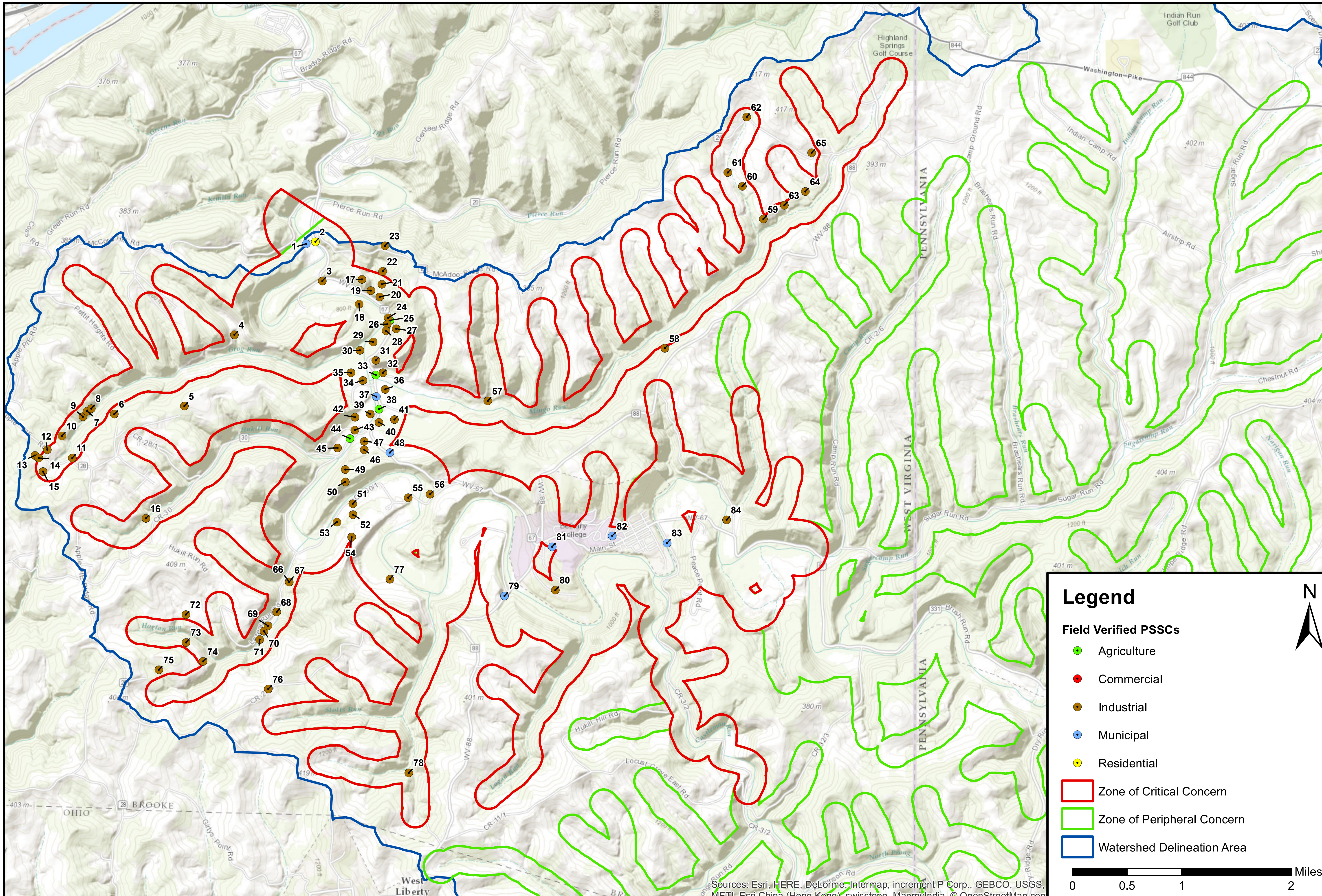
Figure A-3. Selected Sources: Field Verified PSSCs

DATE:06/01/16

CREATED BY: CEM



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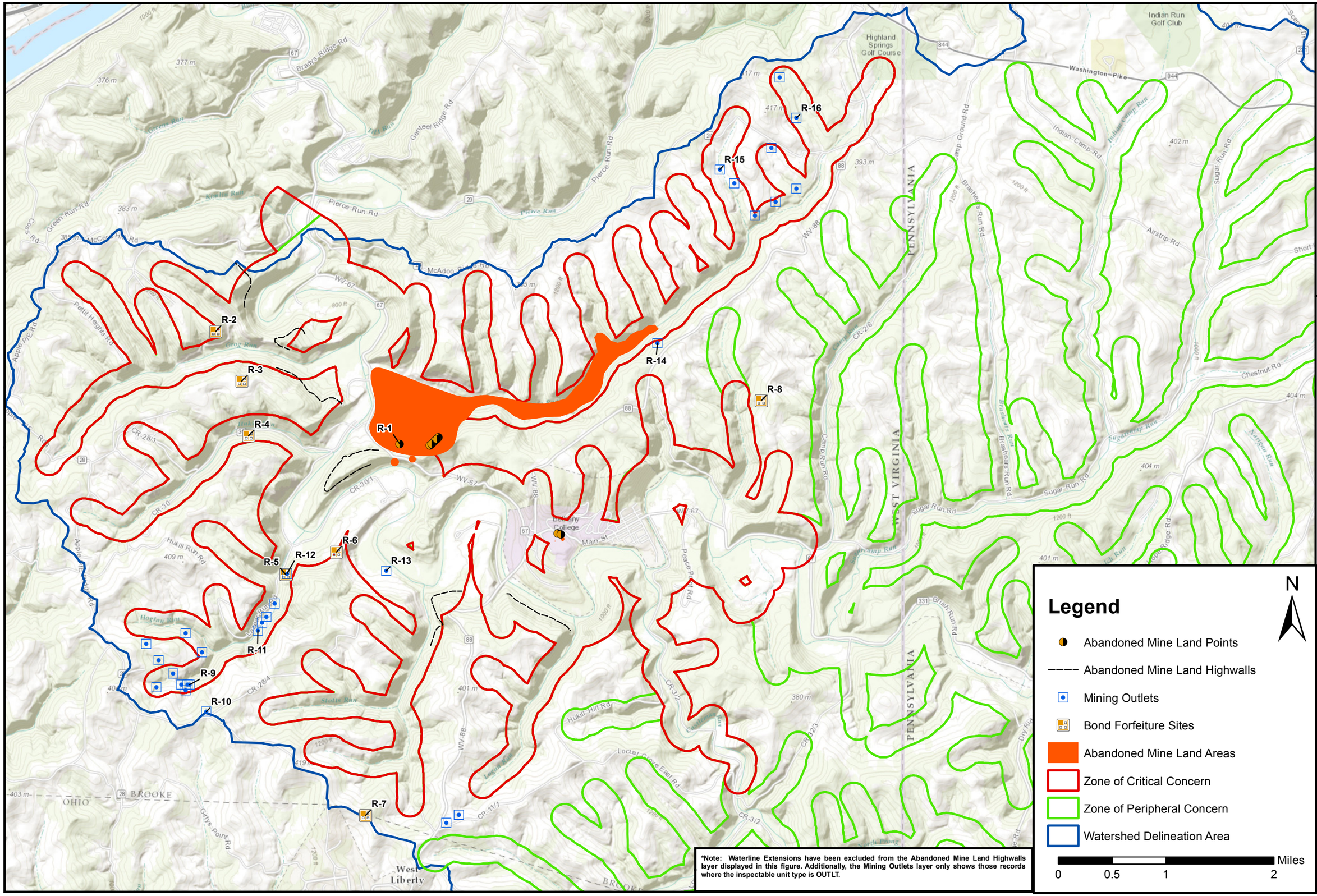

Figure A-4. Selected Sources: Abandoned Mine Land Points, Highwalls, and Areas, Bond Forfeiture Sites, and Mining Outlets

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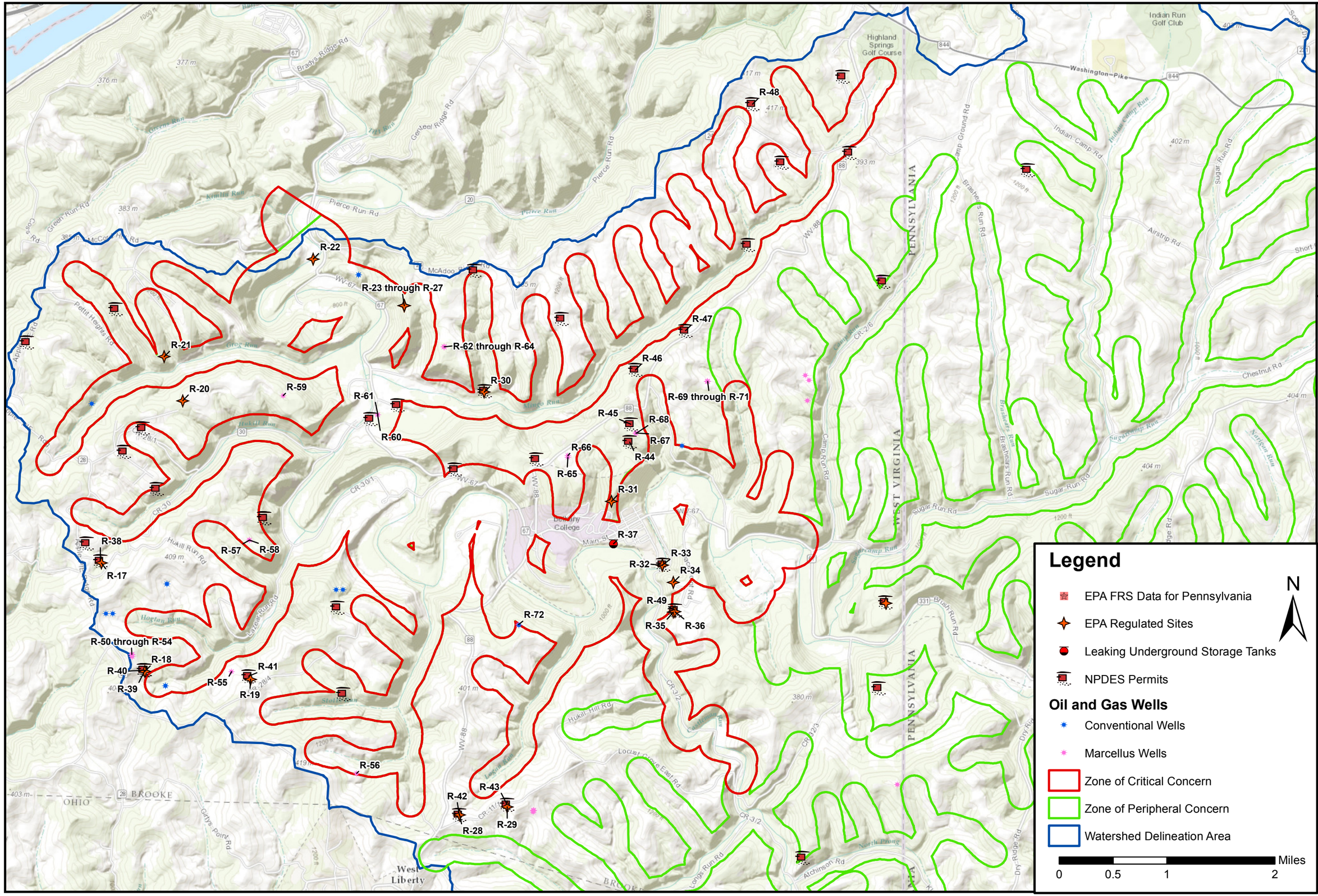

Figure A-5. Selected Sources: EPA Regulated Sites, EPA FRS Data for Pennsylvania, Leaking Underground Storage Tanks, and NPDES Permits

CREATED BY: CEM

DATE:06/02/16

Hammond PSD
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Source Water Protection Plan

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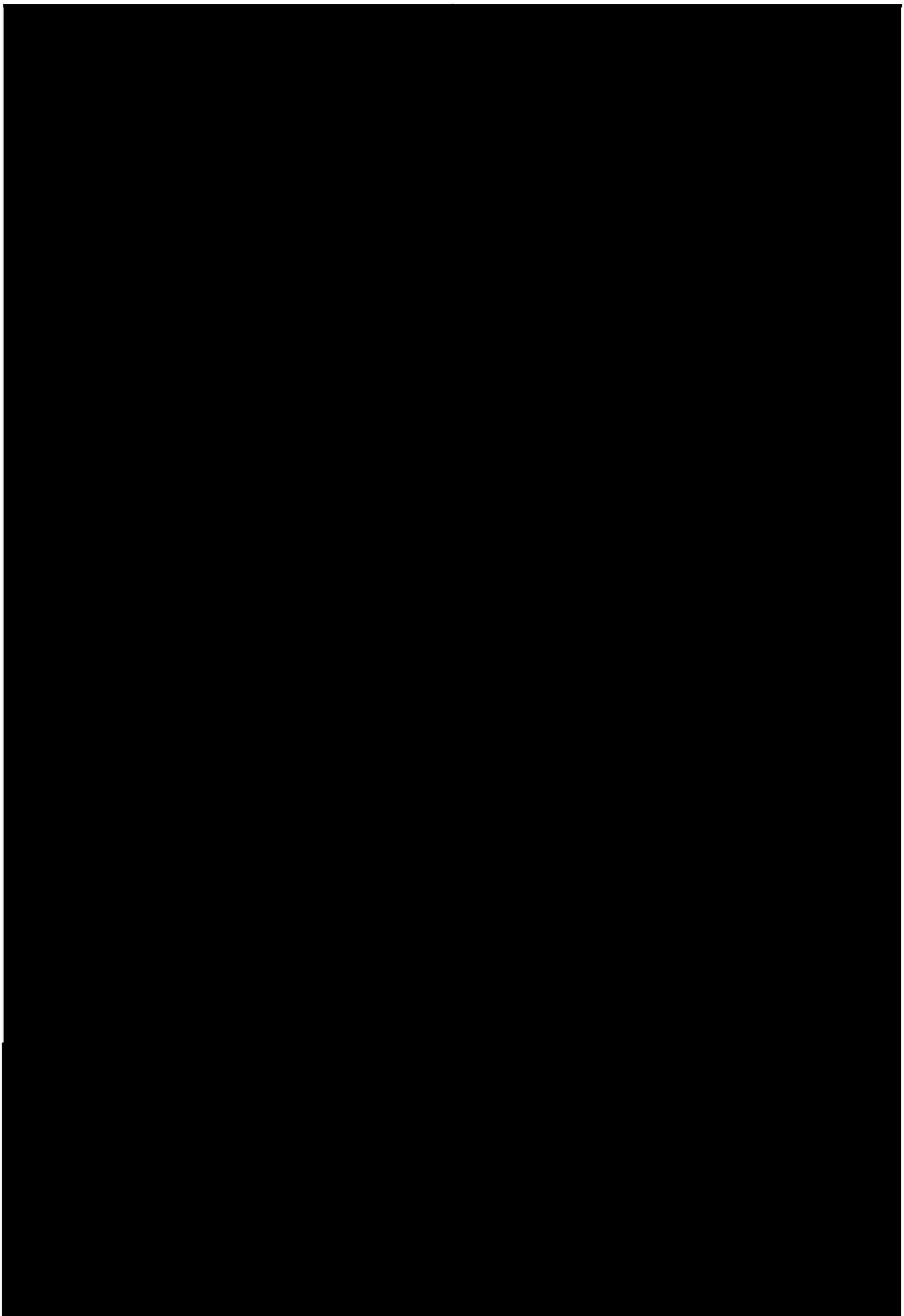

TETRA TECH
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Charleston, WV 25301

Hammond PSD
PWSID: WV3300508
Source Water Protection Plan

Figure A-6. Selected Sources: Aboveground Storage Tanks

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Lists of Potential Sources of Significant Contamination

Hammond PSD PSSC Summary

Source Type	IN ZCC	AROUND ZCC	IN ZPC	AROUND ZPC	Watershed	Total
Abandoned Mine Lands	3	6	0	0	0	**9**
Aboveground Storage Tanks	0	63	0	62	0	**125**
Oil/Gas Wells	8	27	2	35	0	**72**
Mining Outlets	22	6	1	1	0	**30**
Leaking Underground Storage Tank	1	0	0	0	0	**1**
NPDES Permits	13	21	1	7	0	**42**
Pennsylvania Border PCS	0	0	2	6	4	**12**
Bond Forfeiture Sites	2	5	0	0	0	**7**
USEPA Regulated Sites	11	9	1	1	0	**22**
Field Verified PSSCs	73	10	0	1	0	**84**
Total	**133**	**147**	**7**	**113**	**4**	**404**

Field Verified PSSCs – Figure A-4

PSSC Number	Site Name	Site Description	Map Code	Relative Risk
1	Hammond Public Service District	Drinking Water Treatment Plants	M-5	1.50
2	residential development	Residential (single family homes)	R-4	2.34
3	Mazzella Welding and Fabrication, Inc.	Foundries and metal fabricators	I-11	3.32
4	WEST VIRGINIA ENERGY INC	Mining: Surface	I-24	5.22
5	WEST VIRGINIA ENERGY INC	Mining: Surface	I-24	5.22
6	Oil/Gas Well	Wells: oil and gas	I-40	2.79
7	Oil/Gas Well	Wells: oil and gas	I-40	2.79
8	WHEELING STEEL CORP.	Wells: oil and gas	I-40	2.79
9	Oil/Gas Well	Wells: oil and gas	I-40	2.79
10	Oil/Gas Well	Wells: oil and gas	I-40	2.79

PSSC Number	Site Name	Site Description	Map Code	Relative Risk
11	Oil/Gas Well	Wells: oil and gas	I-40	2.79
12	Oil/Gas Well	Wells: oil and gas	I-40	2.79
13	WINDSOR COAL COMPANY	Mining: Surface	I-24	5.22
14	Oil/Gas Well	Wells: oil and gas	I-40	2.79
15	Oil/Gas Well	Wells: oil and gas	I-40	2.79
16	HUKIL RUN OIL & GAS	Wells: oil and gas	I-40	2.79
17	OPERATOR UNKNOWN	Wells: oil and gas	I-40	2.79
18	Oil/Gas Well	Wells: oil and gas	I-40	2.79
19	Oil/Gas Well	Wells: oil and gas	I-40	2.79
20	Oil/Gas Well	Wells: oil and gas	I-40	2.79
21	Oil/Gas Well	Wells: oil and gas	I-40	2.79
22	Oil/Gas Well	Wells: oil and gas	I-40	2.79
23	Oil/Gas Well	Wells: oil and gas	I-40	2.79
24	Oil/Gas Well	Wells: oil and gas	I-40	2.79
25	open field	Crops, corn, soybean, wheat	A-5	2.88
26	Oil/Gas Well	Wells: oil and gas	I-40	2.79
27	Oil/Gas Well	Wells: oil and gas	I-40	2.79
28	Oil/Gas Well	Wells: oil and gas	I-40	2.79
29	Oil/Gas Well	Wells: oil and gas	I-40	2.79
30	Oil/Gas Well	Wells: oil and gas	I-40	2.79
31	Oil/Gas Well	Wells: oil and gas	I-40	2.79
32	Oil/Gas Well	Wells: oil and gas	I-40	2.79
33	open field	Pasture*	A-18	2.00
34	Oil/Gas Well	Wells: oil and gas	I-40	2.79
35	Oil/Gas Well	Wells: oil and gas	I-40	2.79
36	Oil/Gas Well	Wells: oil and gas	I-40	2.79
37	State Route 67	Highway	M-7	6.15
38	unnamed farm land	Other animal facilities	A-17	2.80
39	Oil/Gas Well	Wells: oil and gas	I-40	2.79
40	Oil/Gas Well	Wells: oil and gas	I-40	2.79

PSSC Number	Site Name	Site Description	Map Code	Relative Risk
41	Oil/Gas Well	Wells: oil and gas	I-40	2.79
42	Oil/Gas Well	Wells: oil and gas	I-40	2.79
43	Oil/Gas Well	Wells: oil and gas	I-40	2.79
44	open field	Pasture*	A-18	2.00
45	Oil/Gas Well	Wells: oil and gas	I-40	2.79
46	Oil/Gas Well	Wells: oil and gas	I-40	2.79
47	Oil/Gas Well	Wells: oil and gas	I-40	2.79
48	MINGO RUN	Wastewater Treatment Plant	M-29	4.03
49	Oil/Gas Well	Wells: oil and gas	I-40	2.79
50	Oil/Gas Well	Wells: oil and gas	I-40	2.79
51	Oil/Gas Well	Wells: oil and gas	I-40	2.79
52	Oil/Gas Well	Wells: oil and gas	I-40	2.79
53	Oil/Gas Well	Wells: oil and gas	I-40	2.79
54	Oil/Gas Well	Wells: oil and gas	I-40	2.79
55	Oil/Gas Well	Wells: oil and gas	I-40	2.79
56	WEST VIRGINIA ENERGY INC	Mining: Surface	I-24	5.22
57	Oil/Gas Well	Wells: oil and gas	I-40	2.79
58	WEST VIRGINIA ENERGY, INC.	Mining: Surface	I-24	5.22
59	WEST VIRGINIA ENERGY, INC.	Mining: Surface	I-24	5.22
60	WEST VIRGINIA ENERGY, INC.	Mining: Surface	I-24	5.22
61	WEST VIRGINIA ENERGY, INC.	Mining: Surface	I-24	5.22
62	WEST VIRGINIA ENERGY INC	Mining: Surface	I-24	5.22
63	WEST VIRGINIA ENERGY, INC.	Mining: Surface	I-24	5.22
64	WEST VIRGINIA ENERGY, INC.	Mining: Surface	I-24	5.22
65	WEST VIRGINIA ENERGY INC	Mining: Surface	I-24	5.22
66	WEST VIRGINIA ENERGY, INC.	Mining: Surface	I-24	5.22
67	WEST VIRGINIA ENERGY INC	Mining: Surface	I-24	5.22
68	WINDSOR COAL COMPANY	Mining: Surface	I-24	5.22
69	WINDSOR COAL COMPANY	Mining: Surface	I-24	5.22
70	WINDSOR COAL COMPANY	Mining: Surface	I-24	5.22

PSSC Number	Site Name	Site Description	Map Code	Relative Risk
71	WINDSOR COAL COMPANY	Mining: Surface	I-24	5.22
72	Oil/Gas Well	Wells: oil and gas	I-40	2.79
73	RAYLE COAL COMPANY	Mining: Surface	I-24	5.22
74	RAYLE COAL COMPANY	Mining: Surface	I-24	5.22
75	RAYLE COAL COMPANY	Mining: Surface	I-24	5.22
76	WHEELING ENERGY CO	Mining: Surface	I-24	5.22
77	WEST VIRGINIA ENERGY, INC.	Mining: Surface	I-24	5.22
78	Oil/Gas Well	Wells: oil and gas	I-40	2.79
79	Bethany Volunteer Fire Dept	Fire Stations	M-6	1.19
80	WEST VIRGINIA ENERGY INC	Mining: Surface	I-24	5.22
81	Bethany College	Schools	M-21	1.47
82	Bethany College	Schools	M-21	1.47
83	Bethany Sewer	Wastewater Treatment Plant	M-29	4.03
84	Oil/Gas Well	Wells: oil and gas	I-40	2.79

Abandoned Mine Lands – Figure A-5

R-Value	Pad Name	Pad Number	Prob Key
R-1	MINGO RUN	WV000039	HEF

*1 of 9 sites were prioritized and labeled due to their proximity to the intake or level of potential threat. The remaining points in the watershed should be considered by the water system but were not prioritized in this analysis.

Bond Forfeiture Sites – Figure A-5

R-Value	Company	Permit Number
R-2	WEST VIRGINIA ENERGY, INC.	S-41-84
R-3	WEST VIRGINIA ENERGY, INC.	S-55-85
R-4	BARNHART, LAWRENCE	112-75P
R-5	WEST VIRGINIA ENERGY, INC.	S-1072-86

R-Value	Company	Permit Number
R-6	WEST VIRGINIA ENERGY, INC.	52-81
R-7	SAYCO DEVELOPMENT CO.	S-15-85
R-8	WEST VIRGINIA ENERGY, INC.	S-1071-86

Mining Outlets – Figure A-5

R-Value	Permit Number	Responsible Party	Status Flag
R-9	WV0068195	RAYLE COAL CO.	C
R-10	WV1007319	RAYLE COAL CO.	C
R-11	WV0005801	WINDSOR COAL COMPANY	O
R-12	WV1002724	WEST VIRGINIA ENERGY INC	C
R-13	WV1006878	WEST VIRGINIA ENERGY INC	C
R-14	WV0068161	WEST VIRGINIA ENERGY INC	C
R-15	WV0099082	WEST VIRGINIA ENERGY INC	C
R-16	WV1002716	WEST VIRGINIA ENERGY INC	C

*8 of 37 sites were prioritized and labeled due to their proximity to the intake or level of potential threat. The remaining points in the watershed should be considered by the water system but were not prioritized in this analysis.

USEPA Regulated Sites – Figure A-6

R-Value	Primary Name	Registry	Registry ID
R-17	HAMMOND CROSSROADS MHP	110011000000	110010878345
R-18	MAYHEW WELL CONNECT	110055000000	110055189362
R-19	RYNIAWEC WELL CONNECT	110055000000	110055189353
R-20	WV ENERGY INC, MULTIPLE PERMIT	110055000000	110055003696
R-21	HAMMOND PSD	110055000000	110055017832
R-22	RAW WATER INTAKES	110055000000	110055014595
R-23	MOUNTAINEER BOLT INC	110008000000	110007877333

R-Value	Primary Name	Registry	Registry ID
R-24	VERIZON WEST VIRGINIA INC	110008000000	110007877878
R-25	OHIO POWER CO.	110046000000	110045615991
R-26	ROCKDALE METAL PRODUCTS CORP	110008000000	110007874345
R-27	WINDSOR COAL CO	110002000000	110001929744
R-28	WINDSOR COAL CO. WEST LIBERTY	110025000000	110024874929
R-29	HUPP WELL CONNECT	110055000000	110055189326
R-30	MINGO RUN PIPELINE	110055000000	110055193525
R-31	SEWER SYSTEM IMPROVEMENTS	110055000000	110055007157
R-32	BETHANY TOWN OF	110011000000	110010866633
R-33	BETHANY WWTP	110040000000	110039979609
R-34	BETHANY PEACE POINT EQUESTRIAN	110055000000	110055027340
R-35	PEACE POINT CAMP GROUNDS, INC.	110055000000	110054902655
R-36	PEACE POINT	110011000000	110010809802

*20 of 22 sites were prioritized and labeled due to their proximity to the intake or level of potential threat. The remaining points in the watershed should be considered by the water system but were not prioritized in this analysis.

Leaking Underground Storage Tanks – Figure A-6

R-Value	WV ID	Facility Name	Cleanup Completed
R-37	0500383	PHYSICAL PLANT MANT SHOP	08/04/1999

NPDES Permits – Figure A-6

R-Value	Permit ID	Facility Name	Permit Type	Status Flag
R-38	WVG550840	Hammond Crossroads MHP	Sewage	O
R-39	WVG670467	Mayhew Well Connect	Industrial	O
R-40	WVG670499	West Liberty Extension Pipeline	Industrial	O
R-41	WVG670466	Ryniawec Well Connect	Industrial	O
R-42	WVG551387	Windsor Coal Co. West Liberty Portal	Sewage	O
R-43	WVG670464	Hupp Well Connect	Industrial	O

R-Value	Permit ID	Facility Name	Permit Type	Status Flag
R-44	WVR310007	Parkinson Well Connect	Industrial	O
R-45	WVG670492	Thomas Parkinson Well Connect	Industrial	O
R-46	WVG670490	Worthley Well Connect	Industrial	O
R-47	WVG670491	Mark Owen Well Connect	Industrial	O
R-48	WVG670518	McKinleyville Pipeline	Industrial	O
R-49	WVG551250	Peace Point	Sewage	O

*21 of 42 sites were prioritized and labeled due to their proximity to the intake or level of potential threat. The remaining points in the watershed should be considered by the water system but were not prioritized in this analysis.

Oil/Gas Wells – Figure A-6

R-Value	Permit Number	Responsible Party	Farm Name
R-50	900103	CHESAPEAKE APPALACHIA, L.L.C.	MAYHEW, KATHY
R-51	900129	CHESAPEAKE APPALACHIA, L.L.C.	MAYHEW, KATHY LYNN
R-52	900139	CHESAPEAKE APPALACHIA, L.L.C.	MAYHEW, KATHY LYNN
R-53	900131	CHESAPEAKE APPALACHIA, L.L.C.	MAYHEW, KATHY
R-54	900102	CHESAPEAKE APPALACHIA, L.L.C.	MAYHEW, KATHY
R-55	900109	CHESAPEAKE APPALACHIA, L.L.C.	RYNIAWEC, MIKE
R-56	900119	CHESAPEAKE APPALACHIA, L.L.C.	HARWATT, TERRY D., ET AL
R-57	900097	CHESAPEAKE APPALACHIA, L.L.C.	GREATHOUSE, LINDA REEVES
R-58	900097	CHESAPEAKE APPALACHIA, L.L.C.	GREATHOUSE, LINDA REEVES
R-59	900104	CHESAPEAKE APPALACHIA, L.L.C.	BONE, ROBERT O.
R-60	900123	CHESAPEAKE APPALACHIA, L.L.C.	RIPLEY, JOHN E. & SHERRILL
R-61	900108	CHESAPEAKE APPALACHIA, L.L.C.	RIPLEY, JOHN E. & SHERRILL
R-62	900124	CHESAPEAKE APPALACHIA, L.L.C.	GOOD, JOHN P. JR. - IRREVO
R-63	900113	CHESAPEAKE APPALACHIA, L.L.C.	GOOD, JOHN P. JR. - IRREVO
R-64	900114	CHESAPEAKE APPALACHIA, L.L.C.	GOOD, JOHN P. JR. - IRREVO
R-65	900154	CHESAPEAKE APPALACHIA, L.L.C.	BETHANY COLLEGE
R-66	900107	CHESAPEAKE APPALACHIA, L.L.C.	BETHANY COLLEGE
R-67	900133	CHESAPEAKE APPALACHIA, L.L.C.	WORTHLEY, KIMBERLY CARMEN

R-Value	Permit Number	Responsible Party	Farm Name
R-68	900135	CHESAPEAKE APPALACHIA, L.L.C.	WORTHLEY, KIMBERLY CARMAN
R-69	900088	CHESAPEAKE APPALACHIA, L.L.C.	OWEN, MARK W.
R-70	900101	CHESAPEAKE APPALACHIA, L.L.C.	OWEN, MARK W.
R-71	900089	CHESAPEAKE APPALACHIA, L.L.C.	OWEN, MARK W.
R-72	900095	CHESAPEAKE APPALACHIA, L.L.C.	STONE, MARION PYLE

*23 of 72 sites were prioritized and labeled due to their proximity to the intake or level of potential threat. The remaining points in the watershed should be considered by the water system but were not prioritized in this analysis.

Aboveground Storage Tanks – Figure A-7

R-Value	Responsible Party	Facility Name	Tank Number	Year	Capacity
R-73	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000304	2012	[redacted]
R-74	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000312	2012	[redacted]
R-75	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000313	2012	[redacted]
R-76	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000307	2012	[redacted]
R-77	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000310	2012	[redacted]
R-78	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000302	2012	[redacted]
R-79	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000308	2012	[redacted]
R-80	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000311	2012	[redacted]
R-81	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000305	2012	[redacted]
R-82	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000306	2012	[redacted]
R-83	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000309	2012	[redacted]
R-84	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000303	2012	[redacted]
R-85	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000030	2012	[redacted]
R-86	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000031	2012	[redacted]
R-87	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000028	2012	[redacted]
R-88	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000029	2012	[redacted]
R-89	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000032	2012	[redacted]
R-90	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000027	2012	[redacted]
R-91	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000364	2012	[redacted]

R-Value	Responsible Party	Facility Name	Tank Number	Year	Capacity
R-92	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000367	2012	[redacted]
R-93	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000365	2012	[redacted]
R-94	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000368	2012	[redacted]
R-95	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000369	2012	[redacted]
R-96	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000366	2012	[redacted]
R-97	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000060	2013	[redacted]
R-98	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000057	2013	[redacted]
R-99	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000058	2013	[redacted]
R-100	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000061	2013	[redacted]
R-101	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000062	2013	[redacted]
R-102	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000059	2013	[redacted]
R-103	HAMMOND PSD	Mazella Tank	005-00000001	2002	[redacted]
R-104	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000295	2013	[redacted]
R-105	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000292	2013	[redacted]
R-106	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000293	2013	[redacted]
R-107	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000290	2013	[redacted]
R-108	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000291	2013	[redacted]
R-109	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000294	2013	[redacted]
R-110	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000378	2013	[redacted]
R-111	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000381	2013	[redacted]
R-112	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000376	2013	[redacted]
R-113	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000379	2013	[redacted]
R-114	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000380	2013	[redacted]
R-115	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000377	2013	[redacted]
R-116	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000243	2013	[redacted]
R-117	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000246	2013	[redacted]
R-118	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000247	2013	[redacted]
R-119	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000244	2013	[redacted]
R-120	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000245	2013	[redacted]
R-121	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000242	2013	[redacted]

R-Value	Responsible Party	Facility Name	Tank Number	Year	Capacity
R-122	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000325	2011	[redacted]
R-123	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000323	2011	[redacted]
R-124	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000320	2011	[redacted]
R-125	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000326	2011	[redacted]
R-126	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000321	2011	[redacted]
R-127	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000327	2011	[redacted]
R-128	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000324	2011	[redacted]
R-129	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000322	2011	[redacted]
R-130	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000056	2012	[redacted]
R-131	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000053	2012	[redacted]
R-132	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000054	2012	[redacted]
R-133	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000051	2012	[redacted]
R-134	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000052	2012	[redacted]
R-135	CHESAPEAKE APPALACHIA, L.L.C.	Chesapeake Appalachia, L.L.C.	005-00000055	2012	[redacted]

*64 of 126 sites were prioritized and labeled due to their proximity to the intake or level of potential threat. The remaining points in the watershed should be considered by the water system but were not prioritized in this analysis.

APPENDIX B. EARLY WARNING MONITORING SYSTEM FORMS

Appendix B- Form B

Proposed 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**) along with conductivity, oil-in-water, ORP, and pH sensors.
Where would the equipment be located?
The early warning monitoring systems would be located upstream of the Buffalo Creek raw water intake prior to where surface water would enter the treatment facility.
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 minutes. Hammond 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 Hammond PSD by The Thrasher Group, Inc. This document is attached in **Appendix D.**

APPENDIX C. COMMUNICATION PLAN TEMPLATE

Hammond PSD

PWSID: WV3300508

Administrative Contact: Bob Hildebrand

Contact Phone Number: 304-737-2588

Contact Email Address: hampsd1@hotmail.com

Plan Developed: June, 2016

ACKNOWLEDGMENTS:

This plan was developed by Hammond PSD 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
Bob Hildebrand	Hammond PSD	304-312-1119	hampsd1@hotmail.com	Primary Spokesperson
Robert Fowler	Brooke Co. EMA	304-479-5003	bfowler@brookecountyema.com	Secondary Spokesperson
Kelly Williams	Hammond PSD	712-899-6687	hampsd1@hotmail.com	Member
Frank Ainscough	Hammond PSD	724-747-8467	-	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

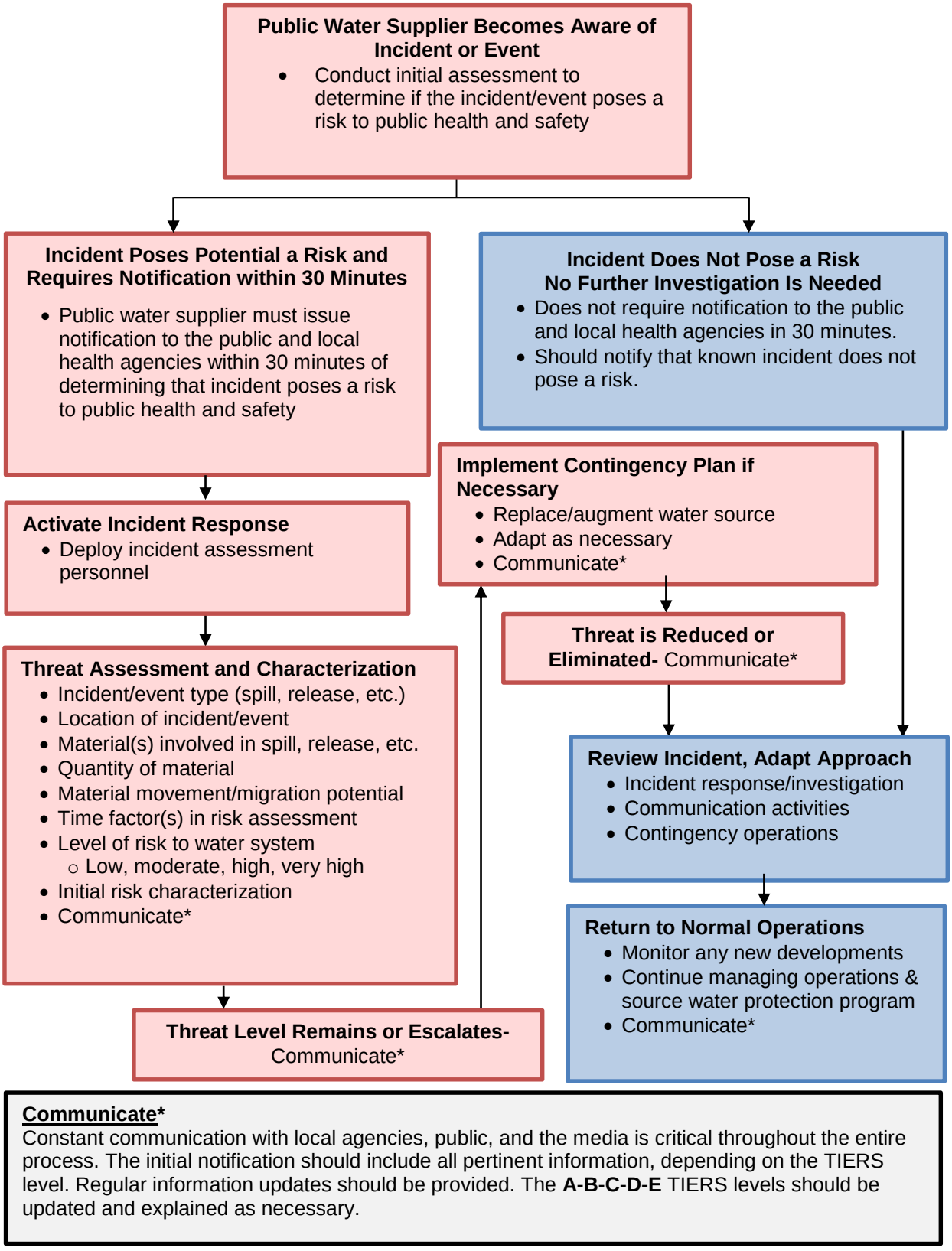
As the flow chart indicates, several iterative cycles will occur after the initial threat assessment, including communication with local agencies and the public, further investigation of the incident, possible implementation of the water system's contingency plan, and eventual elimination of the threat 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:	Bob Hildebrand	304-312-1119	hampsd1@hotmail.com
Alternate spokesperson:	Robert Fowler	304-479-5003	bfowler@brookecountyema.com
Designated location to disseminate information to media:	Hammond PSD Water Treatment Plant		
Methods of contacting affected residents:	Hammond PSD primarily contacts affected residents about important information using posted notices, local radio, television, and newspaper.		

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	Wellsburg Police Department	911	304- 737-1121	-
Local Fire Department	McKinleyville VFD	911	304-737-0394	-
	Bethany VFD	911	304-829-4504	-
	Bethany Pike VFD	911	304-737-2085	-
Local Ambulance Service	Brooke County Ambulance	911	304-737-2000	-
Hazardous Material Response Service	McKinleyville VFD	911	304-737-0394	-
	Bethany VFD	911	304-829-4504	-
	Bethany Pike VFD	911	304-737-2085	-

Sensitive Populations

Other communities that are served by the utility:	None			
Major user/sensitive population notification:	**Name**	**Emergency Phone**	**Alternate Phone**	
	N/A	N/A	N/A	
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	
Alternate OEHS Phone Numbers	(304) 312-0322 (Bob Smith-State Cell) (304) 281-7959 (Bob Smith-Personnel Cell) (304) 243-5802 (Bob Smith-Home) or (304) 558-2981 (OEHS Central Office)			
Downstream Water Contacts:	**Water System Name**	**Contact Name**	**Emergency Phone**	**Alternate Phone**
	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?	Bob Hildebrand	Chief Operator	304-312-1119	hampsd1@hotmail.com
	Robert Fowler	Brooke County EMA Director	304-479-5003	bfowler@brookecountyema.com
Staff responsible for keeping confidential PSSC information and releasing to emergency responders:	Bob Hildebrand	Chief Operator	304-312-1119	hampsd1@hotmail.com
	Robert Fowler	Brooke County EMA Director	304-479-5003	bfowler@brookecountyema.com

Emergency Response Information

List laboratories available to perform sample analysis in case of emergency:	**Name**	**Phone**
	Alloway Labs- Marion, OH	740-389-5991
	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?	2015	

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?

- _____

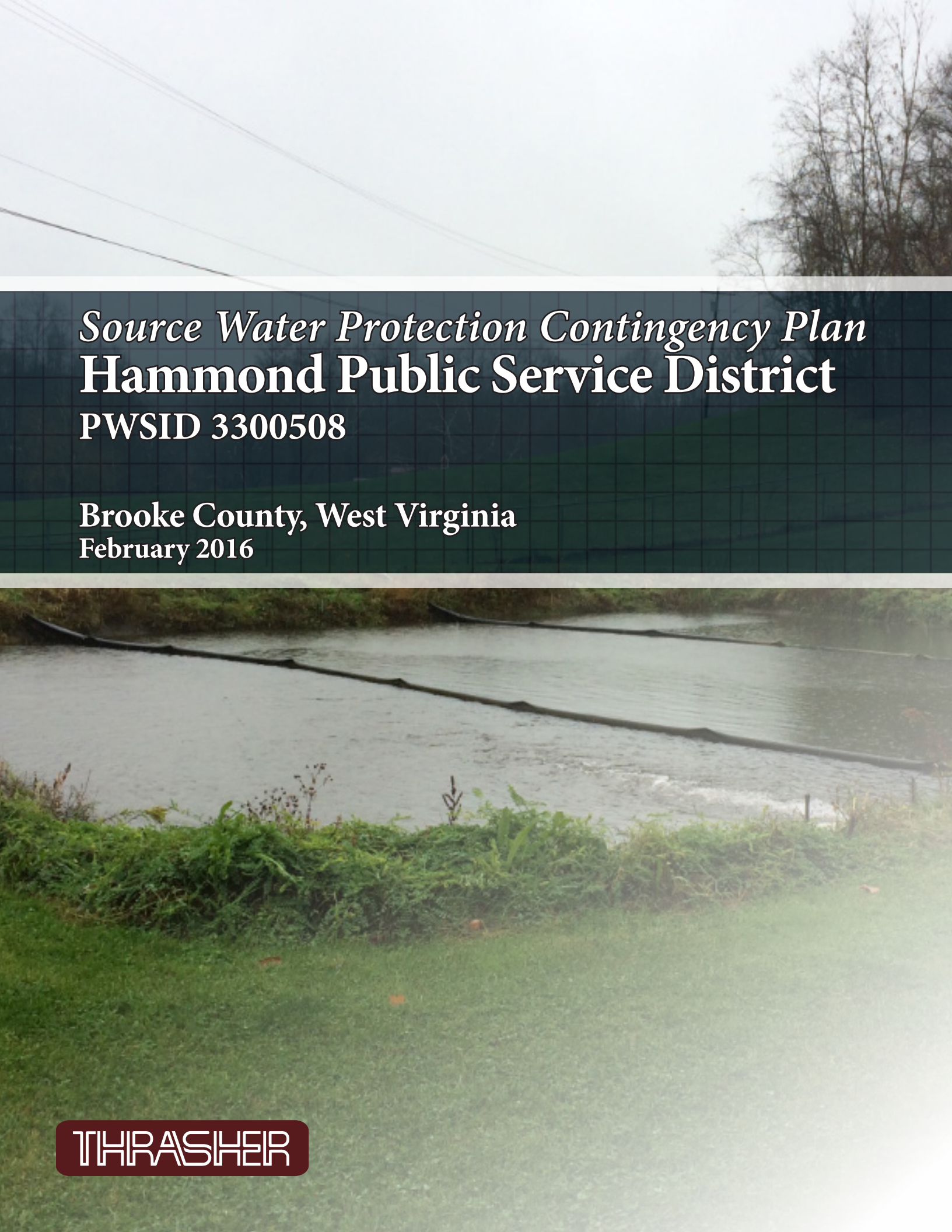
We will inform you when the water is safe to drink. We anticipate resolving the problem within _____ hours/days. For more information – or to report unusual water conditions such as abnormal odors, colors, sheen, etc. – please contact _____ at _____ or _____ at _____.

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

Hammond Public Service District

PWSID 3300508

Brooke County, West Virginia

February 2016

THRASHER

SOURCE WATER PROTECTION CONTINGENCY PLAN
FOR THE
HAMMOND PUBLIC SERVICE DISTRICT

Prepared By:

Project Engineer

THE THRASHER GROUP, INC.

600 White Oaks Boulevard
Bridgeport, West Virginia 26330
www.thrashereng.com
Phone: 304-624-4108 Fax: 304-624-7831

I certify the information in this Source Water Contingency Protection Plan is complete and accurate to the best of my knowledge.

Authorizing Signatory:

_____ _____

Bob Hildebrand
Office Manager

Date

_____

Date of Submission

Funding By:

Office of Environmental Health Services
West Virginia Department of Health and Human Resources

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EXECUTIVE SUMMARY

This Source Water Protection Contingency Plan (SWPCP) is being developed for the Hammond Public Service District (Hammond) in accordance with Senate Bill 373. Hammond is a state regulated public utility served by a single-source intake to a surface water source of supply. As reported in the 2015 PSC Annual Report, the utility operates a public water system serving the areas of Chapman Heights, McCord's Hill, and Marshall Terrace in Brooke County, West Virginia, to provide potable water to 907 residential customers, five (5) commercial customers, and five (5) industrial customers.

Hammond's water treatment facility obtains surface water from Buffalo Creek. The plant has a treatment capacity of 633,600 gallons per day (GPD) and averages eight (8) hours of operation producing approximately 207,000 GPD. Hammond maintains five (5) treated water storage tanks totaling 686,000 gallons of treated water and a reservoir totaling 120,000 gallons of raw water storage. The total combined water storage for the utility is 806,000 gallons. At this time, the water system is experiencing 43.57% unaccounted for water loss and water lost from main leaks; however, the utility is conducting leak detection and making necessary repairs to reduce unaccounted for water loss. Hammond currently does not have an emergency generator. Consequently, the water system does not operate during power outages.

This SWPCP describes in detail the aforementioned aspects of Hammond's public water system and evaluates the technical and economic feasibility of the following four (4) alternatives to provide continued safe and reliable public water service in the event Buffalo Creek is detrimentally affected by contamination, release, spill or other reason.

Backup Intake

Surface Water Intake

Hammond's existing surface water intake is located on Buffalo Creek, a tributary of the Ohio River. The Ohio River has more than adequate supply to provide the average water demand of Hammond. The proposed backup intake would be located on the Ohio River in Wellsburg, West Virginia approximately 1,500 feet upstream the confluence with Buffalo Creek . This location would ensure the backup intake is not susceptible to backflow from Buffalo Creek. The construction of a backup surface water intake on the Ohio River and raw water line to the existing treatment plant was evaluated in the feasibility analysis.

Groundwater Supply

Hammond has utilized wells as a source of water supply in the past. Hammond currently does not have any active wells in service. Testing would be required to determine if groundwater wells could supplant the production of Buffalo Creek and how many wells would be needed. Groundwater springs, not under the influence of surface water flow, are also within the area along Buffalo Creek. Hammond could utilize these springs in conjunction with groundwater wells to establish a groundwater source of supply. The addition of a groundwater source of supply to the system was evaluated in the feasibility analysis.

Interconnection

Hammond is currently interconnected with two separate systems, Ohio County PSD and the City of Wellsburg. There is a significant pressure differential between Ohio County PSD and Hammond that requires additional pressure regulators to be installed to protect Hammond's system. Therefore the existing interconnection with Ohio County PSD was not considered in the feasibility analysis. The interconnection with Wellsburg, however, can supply sufficient flow to satisfy Hammond's average water demand. The interconnection with Wellsburg was analyzed in the feasibility matrix.

Raw and/or Treated Water Storage

Hammond currently has a water storage capacity of 806,000 gallons comprised of 686,000 gallons of treated water storage and 120,000 gallons of raw water storage. Senate Bill 373 requires that each utility maintain at least two (2) days of system storage based on the maximum level of production experienced within the past year. The maximum amount of water produced by Hammond within the past year was 420,100 gallons, therefore 840,200 gallons of total water storage is required to comply with Senate Bill 373. Hammond's remaining required storage could be met by the construction of raw water storage, additional treated water storage, or both.

Based on the evaluation of the water system, the most feasible option for Hammond to continue safe and reliable water service is to utilize the interconnection with Wellsburg. Also, it is recommended that Hammond installs 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 provided in **Appendix C**.

PURPOSE

The goal of the West Virginia Bureau for 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. Every aspect of source water protection is best addressed by engaging local stakeholders.

The intent of this document is to describe what Hammond 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, Hammond acknowledges that implementing measures to prevent contamination is vital to ensuring 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.

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 Hammond 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 (GWUDI).

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 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

Hammond is classified as a state regulated public utility and operates a public water system serving 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
>
> 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, "any 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** on the following page.

Table 1 – Population Served

Administrative office location:	736 Charles Street Wellsburg, West Virginia 26070		
Is the system a public utility, according to the Public Service Commission rule?	Yes		
Date of Most Recent Source Water Assessment Report:	April 2004		
Date of Most Recent Source Water Protection Plan:	February 2011		
Population served directly:	**Customers** Residential 907 Commercial 5 Industrial 5		**Total Customers** **917**
Bulk Water Purchaser Systems:	**System Name**	**PWSID Number**	**Population**
	N/A		
Total Population Served by the Utility:	2,200*		
Does the utility have multiple source water protection areas (SWPAs)?	No		
How many SWPAs does the utility have?	1		

* *Estimated based on West Virginia's 2.43 persons per household as reported by the U.S. Census Bureau*

WATER TREATMENT AND STORAGE

As required, Hammond 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 Hammond 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**. These tables can be found in the following pages.

Table 2 – Water Treatment Information

Water Treatment Process (List in order)	Raw Water Intake ↓ Sedimentation ↓ Filtration ↓ Clarification ↓ Anthracite Filtration ↓ Chlorination ↓ High Service Pumps
Current Treatment Capacity (gal/day)	633,600
Current Average Production (gal/day)	207,313
Maximum Quantity Treated and Produced (gal/day)	420,100
Minimum Quantity Treated and Produced (gal/day)	67,000
Average Hours of Operation in One Day	8
Maximum Hours of Operation in One Day	16
Minimum Hours of Operation in One Day	3
Number of Storage Tanks Maintained	5
Total Gallons of Treated Water Storage (gal)	686,000
Total Gallons of Raw Water Storage (gal)	120,000

Table 3 – 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)
Buffalo Creek Intake	–	N/A	Four (4) 50', 10" PVC SDR 35 intake lines with media cover	Buffalo Creek	1995 *(C)*	Primary	Active

Table 4 – Groundwater Sources

Does the utility blend with groundwater?	No

(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/). Hammond has analyzed its ability to effectively respond to emergencies and this information is provided in **Table 5**.

Table 5 – Water Shortage Response Capability

Can the utility isolate or divert contamination from the intake or groundwater supply?	No
Describe the utility's capability to isolate or divert potential contaminants:	N/A
Can the utility switch to an alternative water source or intake that can supply full capacity at any time?	Yes
Describe in detail the utility's capability to switch to an alternative source:	The interconnection with the City of Wellsburg is capable of fully supplying Hammond's service area.
Can the utility close the water intake to prevent contamination from entering the water supply?	Yes
How long can the intake stay closed?	Approx. 3.9 days based on average production
Describe the process to close the intake:	Manually shut down raw water intake pumps
Describe the treated water storage capacity of the water system:	Five (5) treated water storage tanks totaling 686,000 gallons, operating at 100% capacity
Is the utility a member of WVRWA Emergency Response Team?	Yes
Is the utility a member of WV-WARN?	Yes
List any other mutual aid agreements to provide or receive assistance in the event of an emergency:	None

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**.

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 60 kW and the largest booster station is 60 kW.	
Can the utility connect to generator at the intake/wellhead? If yes, select a scenario that best describes system.	No, the utility does not have a generator and would require electrical work to connect.	
Can the utility connect to generator at the treatment facility? If yes, select a scenario that best describes system.	No, the utility does not have a generator and would require electrical work to connect.	
Can the utility connect to a generator in distribution system? If yes, select a scenario that best describes system.	No, the utility does not have a generator and would require electrical work to connect.	
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**	**Duration**
	N/A	N/A

Table 6 – Generator Capacity (Continued)

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	RT Rogers	Roger Basler	(304) 466-1733
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 emergency generators for the pump station and treatment facility.		

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. Hammond has analyzed its ability to meet future water demands at current capacity and this information is included in **Table 7** on the following page.

Table 7 – 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.	Yes, based on population trends there is no need for an increase in capacity to meet water demands. If population trends change, an upgrade to the plant would be needed 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 contingency protection plan. The data in **Table 8** is taken from the most recently submitted Hammond Public Service District PSC Annual Report.

Table 8 – Water Loss Information

Total Water Pumped (gal)		75,691,000
Total Water Purchased (gal)		476,000
Total Water Pumped and Purchased (gal)		76,167,000
Water Loss Accounted for Except Main Leaks (gal)	**Mains, Plants, Filters, Flushing, etc.**	238,000
	Fire Department	190,000
	Back Washing	2,230,000
	Blowing Settling Basins	–
Total Water Loss Accounted For Except Main Leaks		2,658,000
Water Sold- Total Gallons (gal)		40,326,000
Unaccounted For Lost Water (gal)		18,392,000
Water lost from main leaks (gal)		14,791,000
Total gallons of Unaccounted for Lost Water and Water Lost from Main Leaks (gal)		33,183,000
Total Percent Unaccounted For Water and Water Lost from Main Leaks (%)		43.57
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.

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.

Hammond 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** on the following page 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 WV Spill Hotline.		
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.	No		

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 contingency 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 & RECOMMENDATIONS

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

The Source Water Protection program 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 of 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 are 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 contingency plan, and a multi-faceted approach is the only way to ensure that a system is as protected as possible against source water degradation.

After evaluation, the most feasible option for an alternative source is the interconnection with Wellsburg. Upon completion of the interconnection, Wellsburg's protected groundwater wells can provide Hammond with a feasible source of water from a substantially different source. In the event Buffalo Creek is detrimentally affected by contamination, it is recommended Hammond purchase water from Wellsburg to continue safe and reliable water service. This recommendation is based on an evaluation of the five (5) alternatives. The evaluation consisted of operation and maintenance impacts, capital costs, environmental impacts, along with other criteria. A detailed analysis including supporting documentation is included in the Appendices of this report.

It is also recommended Hammond installs an early warning monitoring system upstream of the surface water intake on Buffalo Creek, as described in **Appendix A,** to protect the system from potential contaminants detected in the primary surface water source and purchases two 60 kW backup generators, one(1) stationary and one (1) portable, to allow operation during a power outage.

RECOMMENDED ALTERNATIVE COST ESTIMATE

Qty.		Description	Unit Price	Total Cost
1	LS	60 kW Portable Generator	$40,000.00	$40,000
1	LS	60 kW Stationary Generator	$24,000.00	$24,000
1	LS	Early Warning Detection Equipment	$50,000.00	$50,000
1	LS	Operation & Maintenance for Early Warning System	$750.00	$750
TOTAL				**$114,750**

EARLY WARNING MONITORING SYSTEM INFORMATION

Proposed 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**) along with conductivity, oil-in-water, ORP, and pH sensors.
Where would the equipment be located?
The early warning monitoring systems would be located upstream of the Buffalo Creek raw water intake prior to where surface water would enter the treatment facility.
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 minutes. Hammond 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

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APPENDIX B

SINGLE SOURCE FEASIBILITY STUDY

Feasibility Matrix **Hammond Public Service District** **PWSID#: WV 3300508** **Date: February 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 Intake	2.3	1.3	**3.7**	**61.1%**	**24.4%**	2.0	3.0	2.7	2.7	**10.3**	**86.1%**	**34.4%**	2.0	3.0	2.3	**7.3**	**81.5%**	**16.3%**	**75.2%**	**$1,881,105.00**	100% backup to the primary water source, environmental Impacts addressed at intake site, majority of construction in rights-of-way
Groundwater Supply	3.0	2.0	**5.0**	**83.3%**	**33.3%**	3.0	3.0	2.0	3.0	**11.0**	**91.7%**	**36.7%**	3.0	3.0	2.7	**8.7**	**96.3%**	**19.3%**	**89.3%**	**$134,000.00**	100% backup to the primary water source using groundwater supply
Interconnect	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**	100% backup to the primary water source with majority of construction in rights-of-way
Treated Water Storage	3.0	2.0	**5.0**	**83.3%**	**33.3%**	3.0	2.5	2.3	2.7	**10.5**	**87.5%**	**35.0%**	3.0	3.0	2.7	**8.7**	**96.3%**	**19.3%**	**87.6%**	**$403,625.00**	Supplement existing storage to meet two (2) day requirement stated in Senate Bill 373
Raw Water Storage	3.0	2.0	**5.0**	**83.3%**	**33.3%**	3.0	2.5	2.3	2.7	**10.5**	**87.5%**	**35.0%**	3.0	3.0	2.7	**8.7**	**96.3%**	**19.3%**	**87.6%**	**$403,625.00**	Supplement existing storage to meet two (2) day requirement stated in Senate Bill 373

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

1. Backup Intake

Surface Water Inake

Hammond's existing surface water intake is on Buffalo Creek, a tributary of the Ohio. The Ohio River has more than adequate supply to provide the average water demand of Hammond. The proposed backup intake would be located along Main Street in Wellsburg, West Virginia, approximately 1,500 feet upstream of the confluence with Buffalo Creek. The upstream location will ensure the backup intake is not also threatened by contamination of Buffalo Creek. The construction of a raw water intake line between the proposed Ohio River backup intake and the existing treatment facility will require approximately 17,500 feet of 6" line. The construction of a raw water pump station on the Ohio River and corresponding intake line was evaluated in the feasibility analysis.

Groundwater Supply

Hammond has been served by groundwater wells in the past; however, the utility currently does not have an active groundwater supply. Hammond could renew the use of groundwater by driling wells or employing underground springs in the area. The drilling of a well across Buffalo Creek, opposite the treatment facility was considered in the feasibility analysis. Auquifer testing would be required to determine the most ideal well site. For the purposes of this evaluation, the construction of 1,000 linear feet of water line was included.

2. Interconnection

Hammond is currently interconnected with two (2) utilities, Ohio County PSD and the City of Wellsburg. Ohio County PSD, which purchases water from the City of Wheeling, currently provides water to Hammond for service to fourteen (14) customers. However, due to the pressure differential between the two (2) systems, pressure regulating measures would need to be implemented in order for Ohio County PSD to provide water to Hammond's entire service area.

Hammond has also recently completed a project that established an interconnection with Wellsburg. Wellsburg draws water from four (4) sealed wells, classified as protected groundwater sources not susceptible to contamination from surface water. Wellsburg has a treatment capacity of 1,008,000 GPD and currently produces an average of approximately 300,000 GPD. As shown below Wellsburg is capable of supplying Hammond's average demand of approximately 207,000 GPD.

$$300{,}000\ GPD\ +\ 207{,}000\ GPD\ =\ 507{,}000\ GPD$$

The existing interconnection with Wellsburg was evaluated in the feasibility analysis.

3. Raw and/or Treated Water Storage

Hammond's combined system storage is 806,000 gallons comprised of 686,000 gallons of treated water storage and 120,000 gallons of raw water storage. According to the most recent monthly operating reports provided by the utility, the water treatment facility produces an average of 207,000 GPD and the maximum quantity produced in the last year was 420,100 gallons.

Senate Bill 373 requires utilities to maintain a minimum system storage capacity equal to two (2) days of the system's maximum level of production experienced within the past year. The minimum required storage capacity for Hammond is calculated to be:

$$420{,}100\ gallons\ per\ day\ \times\ 2\ days\ =\ 840{,}200\ gallons$$

Therefore, the system currently does not meet the required minimum system water storage capacity. The remaining required water storage capacity for Hammond is calculated to be:

$$840{,}200\ gallons\ -\ 806{,}000\ gallons\ =\ 34{,}000\ gallons$$

This evaluation proposes the construction of a 56,000 gallon water storage tank.

Treated Water Storage

The WVBPH design requires utilities to maintain an adequate turnover of at least twenty percent (20%) of distribution storage each twenty-four (24) hour period. The maximum quantity of treated water storage Hammond can maintain is calculated to be:

$$207{,}000\ gallons\ per\ day\ \times 5\ days = 1{,}035{,}000\ gallons$$

Therefore, the addition of 56,000 gallons of treated water storage would not negate compliance with the WVBPH. The construction of a 56,000 gallon treated water storage tank was analyzed in the feasibility matrix.

Raw Water Storage

The construction of a 56,000 gallon raw water storage tank was also analyzed in the feasibility matrix.

Matrix Explanation

The alternative analysis matrix evaluates the utility's ability to implement each of the additional sources outlined. Alternative sources are evaluated for economic, technical and environmental feasibility. The matrix uses a zero (0) to three (3) rating system, with three (3) being very feasible and zero (0) being not feasible. Each category has sub questions to develop an average for the alternative. Once all areas are evaluated, a final feasibility score is given for each of the alternatives for use in determining which option will best suit the utility's needs.

Economic factors evaluated in the matrix include all information needed to fund the alternative source. The matrix considers the current utility budget available per the latest annual report, operation and maintenance costs for each alternative, and the capital cost needed to construct each alternative. Supporting documentation is included in **Appendix D** of the report which provides a breakdown of costs for each alternative that are used as capital costs in the matrix. The economic feasibility of each alternative is compared on a cost per gallon ratio. This ratio is determined by dividing the capital cost of the improvements by the total number of gallons of water produced per year. An average of the economic feasibility factors is then calculated and entered into the overall feasibility matrix found in **Appendix B**.

Technical criteria evaluated include permitting, flexibility, institutional and resilience factors. Permitting costs are included in all supporting documentation for each alternative source. The permitting factors included the permits that would be needed to construct the alternative source for the utility. An additional environmental factor is the feasibly of obtaining each permit. Permits were rated from zero (0) to three (3) based on the difficulty of obtaining the permits for the project. Depending on the project area, some permits may be very difficult and costly to obtain. Flexibility factors evaluate the ability of the alternative to be used as a permanent source of water or if it can only be used on a temporary basis. The intake and interconnections can be used as both temporary and permanent sources. The alternatives' ability to help the utility during seasonal or population increases is also evaluated in the resilience factors. The alternatives that can produce additional water were rated very feasible. Additional criteria evaluated are easements and rights-of-ways that will need to be acquired to construct the alternative source. For interconnections and intakes rights-of-way would be needed to lay the new water line. The feasibility of attaining the rights-of-way was evaluated. All technical criteria was averaged and also entered into the feasibility summary in **Appendix B**.

Environmental aspects for each alternative include impacts, aesthetics and stakeholders. Environmental impacts included any areas in the proposed alternative source area that are protected. Areas that are protected would have a low feasibility because the impacts could be large if the project were constructed. Aesthetics factors include noise, visual impacts, and mitigation measures that could affect the projects feasibility. The aesthetic factors relate to the stakeholder factors. The stakeholders' portion of the environmental criteria involves the community and their acceptance of the new source alternative and the structures that will be constructed.

Feasibility Matrix | **Hammond Public Service District** | **PWSID#: WV 3300508** | **Date: February 2016** | **Completed By: Project Engineer - The Thrasher Group, Inc.**

Criteria	Question	Backup Intake	Feasibility	Groundwater Supply	Feasibility	Interconnect	Feasibility	Treated Water Storage	Feasibility	Raw Water Storage	Feasibility
Economic Criteria											
What is the total current budget year cost to operate and maintain the PWSU (current budget year)?		$409,349.00		$409,349.00		$409,349.00		$409,349.00		$409,349.00	
O and M Costs	Describe the major O&M cost requirements for the alternative?	Labor, power, materials for maintenance	1	Labor, power, materials for maintenance	3	Purchased Water, power	3	Labor, materials for maintenance	3	Labor, materials for maintenance	3
	What is the incremental cost ($/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			***2.3***		***3.0***		***3.0***		***3.0***		***3.0***
Describe the capital improvements required to implement the alternative.		Construction of raw water pump station and water line		Addition of a groundwater source of supply		N/A		The construction of a 56,000 gallon treated water storage tank		The construction of a 56,000 gallon rawwater storage tank	
Capital Costs	What is the total capital cost for the alternative?	$1,881,105.00	1	$134,000.00	2	$0.00	3	$403,625.00	2	$403,625.00	2
	What is the annualized capital cost to implement the alternative, including land and easement costs, convenience tap fees, etc. ($/gal)	$0.02	0	Tenative	2	$0.00	3	$0.01	1	$0.01	1
	Cost comparison of the alternatives annualized capital cost to the current budgeted costs (%)	0.00%	3	Tenative	2	0.00%	3	0.00%	3	0.00%	3
Capital Cost-Feasibility Score			***1.3***		***2.0***		***3.0***		***2.0***		***2.0***
Technical Criteria											
Permitting	Provide a listing of the expected permits required and the permitting agencies involved in their approval.	WV DEP, WV DNR, ACOE, WV SHPO, US FWS, WV DOH and County Floodplain	2	WV DEP, WV DNR, ACOE, WV SHPO, US FWS, WV DOH and County Floodplain	3	N/A	3	WV DEP, WV DNR, ACOE, WV SHPO, US FWS, WV DOH and County Floodplain	3	WV DEP, WV DNR, ACOE, WV SHPO, US FWS, WV DOH and County Floodplain	3
	What is the timeframe for permit approval for each permit?	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	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)	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)	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)	3
	Describe the major requirements in obtaining the permits (environmental impact studies, public hearings, etc.)	Environmental impact studies, water sampling	1	Environmental impact studies.	3	N/A	3	Environmental impact studies.	3	Environmental impact studies.	3
	What is the likelihood of successfully obtaining the permits?	Fair	2	Good	3	N/A	3	Good	3	Good	3
	Does the implementation of the alternative require regulatory exceptions or variances?	No	3	No	3	N/A	3	No	3	No	3
Permitting-Feasibility Score			***2.0***		***3.0***		***3.0***		***3.0***		***3.0***
Flexibility	Will the alternative be needed on a regular basis or only used intermittently?	Intermittently, but can be used permanently	3	Intermittently, but can be used permanently	3	Intermittently, but can be used permanently	3	Intermittently	2	Intermittently	2
	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?)	No impact	3	No impact	3	Current treatment methods will not be required	3	No impact	3	No impact	3
Flexibility-Feasibility Score			***3.0***		***3.0***		***3.0***		***2.5***		***2.5***
Resilience	Will the alternative provide any advantages or disadvantages to meeting seasonal changes in demand?	No	3	No	3	No	3	No	3	No	3
	How resistant will the alternative be to extreme weather conditions such as drought and flooding?	Drought may limit availability of water	2	Drought may limit availability of water	2	Drought may limit availability of water	3	Drought may limit availability of water	2	Drought may limit availability of water	2
	Will the alternative be expandable to meet the growing needs of the service area?	Yes	3	No	1	Limited	3	Limited	2	Limited	2
Resilience-Feasibility Score		0	***2.7***		***2.0***		***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.	None	3	None	3	City of Wellsburg	3	None	3	None	3
	Are any development/planning restrictions in place that can act as a barrier to the implementation of the alternative.	No	3	No	3	N/A	3	No	3	No	3
	Identify potential land acquisitions and easements requirements.	Property acquisition for pump station and easements for waterline	2	Property acquisition for well site	3	N/A	3	Property acquisition for tank site	2	Property acquisition for tank site	2
Institutional Requirements-Feasibility Score			***2.7***		***3.0***		***3.0***		***2.7***		***2.7***
Environmental Criteria											
Environmental Impacts	Identify any environmentally protected areas or habitats that might be impacted by the alternative.	West Fork Watershed	2	None	3	N/A	3	None	3	None	3
Environmental Impacts-Feasibility Score			***2.0***		***3.0***		***3.0***		***3.0***		***3.0***
Aesthetic Impacts	Identify any visual or noise issues caused by the alternative that may affect local land uses?	Fencing and control panel for pump station	3	Fencing and control panel for pump station	3	N/A	3	Water tank on a hill	3	Water tank on a hill	3
	Identify any mitigation measures that will be required to address aesthetic impacts?	Clearance from Culture and History and Local Zoning Commission will be obtained	3	Clearance from Culture and History and Local Zoning Commission will be obtained	3	N/A	3	Clearance from Culture and History and Local Zoning Commission will be obtained	3	Clearance from Culture and History and Local Zoning Commission will be obtained	3
Aesthetic Impacts-Feasibility Score			***3.0***		***3.0***		***3.0***		***3.0***	0	***3.0***
Stakeholder Issues	Identify the potential stakeholders affected by the alternative.	Water Customers	3	Water Customers	3	N/A	3	Water Customers	3	Water Customers	3
	Identify the potential issues with stakeholders for and against the alternative.	Rate Increase may be needed to implement construction	1	Rate Increase may be needed to implement construction	2	N/A	3	Rate Increase may be needed to implement construction	2	Rate Increase may be needed to implement construction	2
	Will stakeholder concerns represent a significant barrier to implementation (or assistance) of the alternative?	No	3	No	3	N/A	3	No	3	No	3
Stakeholder Issues-Feasibility Score			***2.3***		***2.7***		***3.0***		***2.7***		***2.7***
Comments		100% backup to the primary water source, environmental Impacts addressed at intake site, majority of construction in rights-of-way		100% backup to the primary water source using groundwater supply		100% backup to the primary water source with majority of construction in rights-of-way		Supplement existing storage to meet two (2) day requirement stated in Senate Bill 373		Supplement existing storage to meet two (2) day requirement stated in Senate Bill 373	

SUPPORTING DOCUMENTATION

APPENDIX D

EARLY WARNING MONITORING COST ESTIMATE

Qty.		Description	Unit Price	Total Cost
1	EA	Back Panel / Trough / Level (required)	$4,350.00	$ 4,350
1	EA	Probe Module SC1000 (6 sensors)	$ 1,344.00	$ 1,344
1	EA	Internal Card SC1000 (4 mA inputs)	$ 879.00	$879
1	EA	Display Module SC1000	$ 2,770.00	$ 2,770
1	EA	Conductivity Sensor	$ 860.00	$860
1	EA	FP360 SC Sensor, 500 ppb, SS, 1.5 m Cable	$ 17,480.00	$ 17,480
1	EA	ORP Sensor	$ 880.00	$ 880
1	EA	pH Sensor, Ryton	$ 800.00	$ 800
1	LS	Installation	$ 20,637.00	$ 20,637
			TOTAL=	**$ 50,000**

OPERATION & MAINTENATNCE COST ESTIMATE

Qty.		Description	Unit Price	Total Cost
1	LS	Annual O&M Cost	$750.00	$ 750
			TOTAL=	**$ 750**

In addition to the early warning system, Hammond Public Service District should establish a baseline water quality for their sources.

BACKUP INTAKE

Intake Pricing Parameters	Cost per GPM
If the GPM needed is Greater than or Equal to 1,000 GPM (12" Pipe)	$ 1,500.00
If the GPM needed is between 700 GPM to 999 GPM (8" Pipe)	$ 1,750.00
If the GPM needed is less than 700 GPM (6" Pipe)	$ 2,000.00
Intake pricing includes acreage, pumps, screens, concrete, raw water well, electricity, etc.	**$ 880,000.00**

Utility Information		
Existing Capacity	440	GPM
Footage Needed	17,776	LF

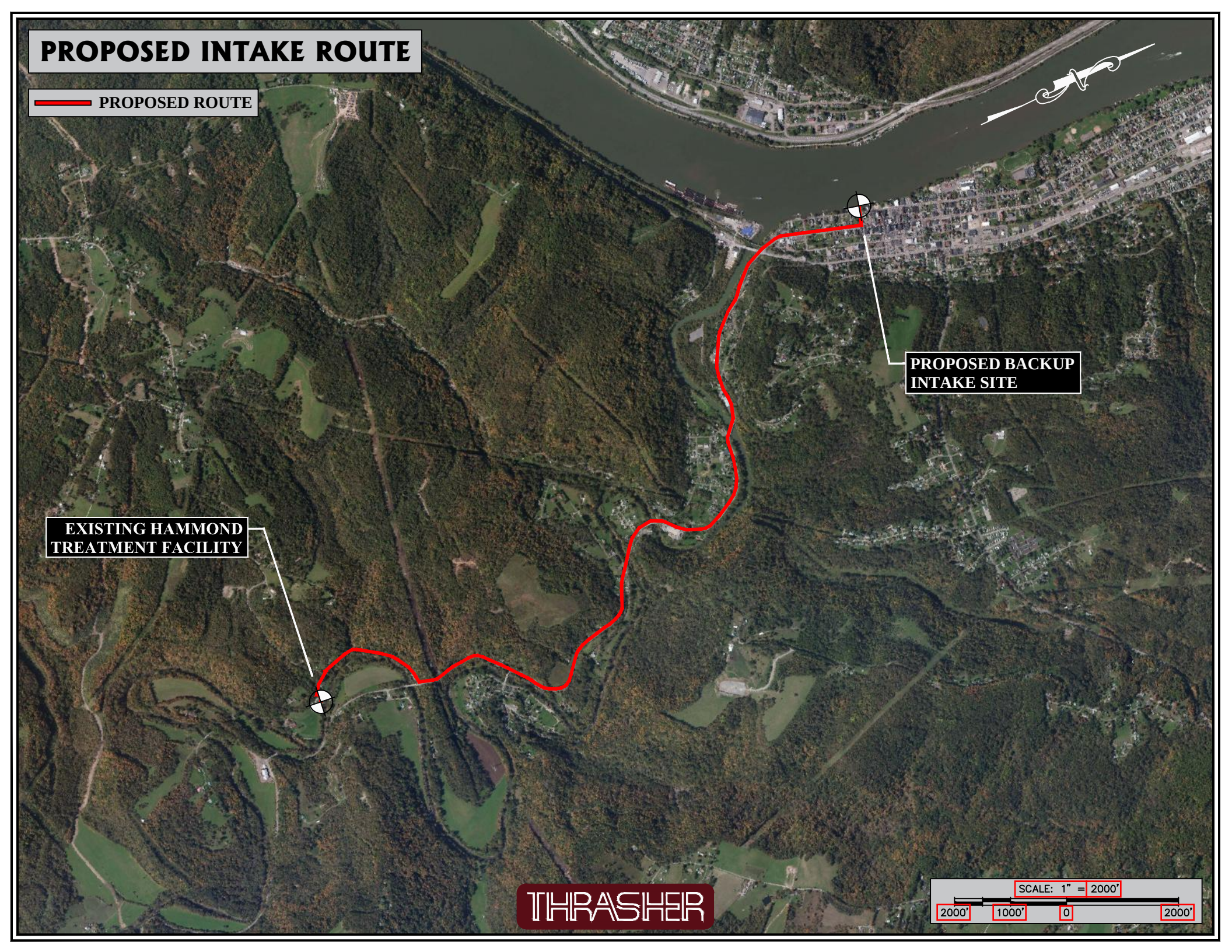
Piping Size	Cost per Foot	Footage	Totals
12" Pipe	$ 60.00	-	$ -
8" Pipe	$ 37.00	-	$ -
6" Pipe	$ 34.00	17,776	$ 604,384.00
			$ 604,384.00

Assumptions
Water will be taken from the North Branch Potomac River. According to the WVDNR, the North Branch is not a mussel stream and will not require a survey to be completed during permitting. Permits required would include WV DEP, WV DNR, ACOE, WV SHPO, US FWS, WV DOH and County Floodplain. Additional fees are predicted to be 25% of overall cost. The fees include legal, engineering and accounting needs.

Additional Environmental Costs		
Mussel Survey	Yes	$ 13,000.00
Permits	Yes	$ 7,500.00
		$ 20,500.00

Totals	
Intake	$ 880,000.00
Piping	$ 604,384.00
Permitting	$ 20,500.00
Additional Fees	$ 376,221.00
Total Cost	**$ 1,881,105.00**

The piping route is included on the following page.


PROPOSED INTAKE ROUTE
PROPOSED ROUTE
PROPOSED BACKUP INTAKE SITE
EXISTING HAMMOND TREATMENT FACILITY
THRASHER
SCALE: 1" = 2000'
2000'
1000'
0
2000'

GROUNDWATER WELL COST ESTIMATE

Quantity		Description	Unit Price	Total Price
1	LS	Additional Groundwater Well including pre-drilling plan and feasibility study, complete drilling and proper construction of the water well, aquifer testing and data analysis of the new water well, completion of a report for WV BPH/WV DHHR, and permanent pumping equipment recommendations.	$100,000.00	$100,000
1000	LF	6" Water Line	$ 34.00	$ 34,000.00

TOTAL $ 134,000.00

WATER STORAGE TANK COST				
Gallons	**Tank Dimension**	**Model Number**	**Cost**	**Cost Per Gallon**
56,000	22.37‘dia. x 19.26’ sidewall height	AQUASTORE tank Model 22 14 - SSWT	$ 86,000	$ 1.54
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 OF WATER STORAGE TANK				
Gallons	**Tank Dimension**	**Model Number**	**Cost**	**Cost Per Gallon**
56,000	22.37‘dia. x 19.26’ sidewall height	AQUASTORE tank Model 22 14 - SSWT	$ 301,850	$ 5.39
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: 6/15/2016

Location: Hammond PSD Office, Wellsburg, WV

Participants: Robert Hildebrand, Kelly Williams, John Krzywdik, Lloyd Van Horn, and TT Representative Russell Myers

- On Wednesday June 15, 2016, the Source Water Protection Team for Hammond PSD met to review and update the draft of the SWPP. Operator Kelly Williams contacted the team members and arranged the meeting, but many of the protection team members were unable to attend, including the EMA Director, who is the alternate spokesperson for the water system. 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 chief operator said he would provide tours of the plant to the public if anyone was interested, but hadn't done so in the past.
    - The priorities that were listed in the old SWPP are still relevant and should be left in the updated plan.
    - Hammond PSD has operational interconnections with the City of Wellsburg and Ohio County PSD, both of which should have sufficient excess capacity to supply Hammond PSD at full capacity if need be. Ohio County PSD could supply the southern portion of the distribution system.
    - The water system has 2 booster pump stations.
    - The Thrasher report contained inaccurate information about the rental generators for Hammond PSD. The primary supplier would be the Brooke County EMA, which has 2 trailer-mounted diesel generators that Hammond PSD could use during an emergency. Brooke County PSD could also potentially supply them with a generator. Their primary fuel supplier would be the Brooke County Board of Education, which has a large bulk diesel tank at the school bus yard. Other than that, they would rely on local gas stations.
    - The primary laboratory that the operators use is Alloway Labs in Marion, OH. Secondary would be the WV State Labs.
    - Bob Fowler would be the alternate spokesperson for the water system. The designated location to hold a press conference would be the water treatment plant so that Bob wouldn't have to leave the plant during an emergency.
    - Hammond PSD does not provide water to any other community and does not sell to any sensitive or major users.
    - The only immediate downstream water system would be Wheeling.
    - Bob Fowler would be the alternate in charge of emergency management and confidential information.
    - The water system does have an Emergency Response Plan that was updated in 2015.

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.

GET INVOLVED IN SOURCE WATER PROTECTION

Hammond PSD 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. Hammond PSD will hold a public meeting to allow customers to review and comment on the plan. Now is your chance to provide your input.

The public meeting will be held at the Hammond PSD Office at 3:00 PM on June 15, 2016, during the regularly scheduled board meeting. For more information please contact:

Phone: 304-737-2588
Email: hampsd1@hotmail.com

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

GET INVOLVED IN SOURCE WATER PROTECTION

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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. You are invited to visit the PSD office to review the draft of the plan before it is submitted. Now is your chance to provide your input.

To get involved in the planning process, please contact the Hammond PSD office to review the plan and provide comments or questions:

Office Phone: 304-737-4421
Email: hampsd1@hotmail.com

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

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.

Hammond PSD Designees:

Name and Title	Phone	Email	Signature	Date
GEN. MANAGER Robert Hildebrand	[redacted]	HAMPSD1@HOTMAIL.COM	Robert Hildebrand	6-15-16
OPERATOR IN TRAINING Kelly Williams		"	Kelly Williams	6-15-16
John Krzywdik Board Member H.P.S.D.		JKrzywdik90@Comcast.net	John Krzywdik	6-15-16
Floyd Van Horn Board Member HPSD		———	Floyd Van Horn	6-15-16

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

Hammond PSD

Source Water Protection Plan - Public Meeting

Date 6/15/16

Attendees:

Name	Organization	Email	Phone
Robert Hildebrand	H.P.S.D.		
Kelly Williams	H.P.S.D		
Floyd Van Horn	HPSD		
John Krzywdzik	H.P.S.D.		

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

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

Hammond Public Service District
736 Charles Street
Wellsburg, WV 26070
Phone: 304-737-4421

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.

Hammond PSD treats water from Buffalo Creek using conventional treatment methods. The primary concerns for the water system are roads, public and private wastewater treatment, oil/gas wells, and vandalism. 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.