Source Water Protection Plan
Kanawha Falls Public Service District

PWSID WV3301037

Fayette County

April 2016

Prepared by:

Tetra Tech, Inc.

803 Quarrier Street, Suite 400

Charleston, WV 25314

In cooperation with Kanawha Falls PSD

TETRA TECH

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Preparer's Name

Title of Preparer

Name of Contractor/Consultant

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

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

Print Name of Authorizing Signatory:

Title of Authorizing Signatory:

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 Kanawha Falls 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, Kanawha Falls 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 Kanawha Falls 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

Kanawha Falls 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 Kanawha Falls PSD

Administrative office location:	Rt. 39, Gauley Bridge, WV 25085		
Is the system a public utility, according to the Public Service Commission rule?	Yes		
Date of Most Recent Source Water Assessment Report:	June 2004		
Date of Most Recent Source Water Protection Plan:	September 2010		
Population served directly:	According to the 2015 PSC Annual Report, Kanawha Falls PSD directly serves around 980 customers, or 2,450 people.		
Bulk Water Purchaser Systems:	**System Name**	**PWSID Number**	**Population**
	Gauley River PSD (Also purchases some water from the City of Summersville)	WV3301042	800 customers or around 2,000 people are served by Kanawha falls.
Total Population Served by the Utility:	The utility serves a total population of around 4,450 people.		
Does the utility have multiple source water protection areas (SWPAs)?	No		
How many SWPAs does the utility have?	1		

5.0 WATER TREATMENT AND STORAGE

As required, Kanawha Falls 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 Kanawha Falls 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. Kanawha Falls PSD Water Treatment Information

Water Treatment Processes (List All Processes in Order)	Water treatment processes include coagulation, sedimentation, filtration, disinfection, and fluoridation.
Current Treatment Capacity (gal/day)	The current treatment capacity of the treatment plant is approximately 1,440,000 gallons/day.
Current Average Production (gal/day)	Current average production is around 736,000 gallons/day.
Maximum Quantity Treated and Produced (gal)	The maximum quantity that the plant produced in a single day in the last year was around 1,000,000 gallons.
Minimum Quantity Treated and Produced (gal)	The minimum quantity produced in a single day in the last year was around 380,000 gallons.
Average Hours of Operation	The water treatment plant is staffed and operated an average of 12 hours/day.
Maximum Hours of Operation in One Day	The maximum number of hours of operation in a single day in the last year was 24 hours.
Minimum Hours of Operation in One Day	The minimum number of hours of operation in a single day in the last year was 7 hours.
Number of Storage Tanks Maintained	The water system maintains 6 treated water storage tanks and 3 booster pump stations.
Total Gallons of Treated Water Storage (gal)	The total treated water storage capacity of the water system is around 1,235,000 gallons.
Total Gallons of Raw Water Storage (gal)	The water system does not have any raw water storage.

Table 3. Kanawha Falls 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)
Kanawha River Intake	-	Kanawha Intake	The intake is a screened straight pipe that extends approximately 50’ into the river.	Kanawha River	1980	Primary	Active

Table 4. Kanawha Falls 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 8,384 square miles.
River Watershed Name (8-digit HUC)	Upper Kanawha River Watershed- 05050006
Size of Zone of Critical Concern (Acres)	The ZCC covers approximately 14,325 acres.
Size of Zone of Peripheral Concern (Acres) (Include ZCC area)	The zone of peripheral concern covers approximately 69,199 acres, including the ZCC.
Method of Delineation for Groundwater Sources	N/A. The system does not have any groundwater sources.
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 Kanawha Falls 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.

Kanawha Falls 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
Carl King	Kanawha Falls PSD	**Chief Operator**	304-779-2600	kfpsd_12@yahoo.com
Rick Wagner	Kanawha Falls PSD	**Utility Manager**	304-632-1633	kfpsd_12@yahoo.com
Roger Wagner	Kanawha Falls PSD	**Board Chairman**	[redacted]	rwagner@glbsm.com
Kim Houghton	Town of Gauley Bridge	**Town Recorder**	[redacted]	kimhoughton@suddenlink.net
Damon Runyon	Gauley Bridge Fire Department	**Fire Chief**	304-632-1810	Damon_47@yahoo.com
Chris Farrish	WV DHHR Environmental Engineering Division	**WV DHHR District Engineer**	304-575-8524	chris.b.farrish@wv.gov
Date of first protection team meeting		4/6/2016		
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 Kanawha Falls PSD first met on 4/6/2016 at the Kanawha Falls PSD Office in Gauley Bridge, WV. Carl King arranged the meeting and contacted the recommended team members by phone. All recommended team members were present except Chris Farrish, who will be involved in planning efforts in the future. See attached meetings notes in **Appendix E. Supporting Documentation** for more information. Staff from Kanawha Falls PSD also participated in a public event that was held at Hawks Nest State Park on March 22, 2016. See **Table 10. Education and Outreach Implementation Plan** for more information. This event fulfilled the public engagement requirement of the source water protection planning process.		

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 Kanawha Falls 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.

Kanawha Falls 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 Kanawha Falls 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 Kanawha Falls 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

Kanawha Falls 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. Kanawha Falls 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
Highway and Railway Traffic	1	The railroad tracks and highway run parallel to the Kanawha River through the ZCC. Utility staff feel that railways are the primary concern for the water system. A Norfolk Southern line runs parallel to the river upstream of the intake. If an accident were to occur on or along the river, it may be difficult to contain spill materials and these could potentially contaminate the surface water. There is currently no way for utility staff to know what kind of materials are being transported and how often.
Hydroelectric Facility	2	Hawks Nest hydroelectric facility is located upstream of the intake. Occasionally this facility will report spills or releases to the Kanawha Falls water treatment plant, but always in time for the operators to close the intake. These releases have the potential to impact the water system, but staff at this facility have always effectively communicated any concerns.
Potential line breaks from public sewer near surface water	3	Public sewer lines run upstream of the intake. If a line break occurs, untreated sewage, could contaminate the surface water source, raising concentrations of Total coliform, particularly fecal coliform.

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 4 management strategies recommended in the existing plan. 2 of these strategies have either been implemented or the priorities they address are no longer a concern for the water system. 2 of these address priorities that are ongoing or continue to be a concern. These are incorporated in this plan update and listed below.	-	-	-	-

Highway and Railway Traffic	Utility personnel will contact Norfolk Southern to learn more about the schedules and cargo of the regular shipments that run through the ZCC. They will continue to coordinate with emergency officials from the county, railroad, and industrial site to be better prepared in the event of a spill or accident.	Utility staff	By 2019 SWPP update	-	Cost associated with staff time and participation in training activities
Hydroelectric Facility	Utility staff feel that this potential threat is effectively managed and will maintain constant communication with Hawks Nest Hydro.	Utility staff	Ongoing effort and communication	-	Cost associated with staff time.
Potential line breaks from public sewer near surface water	Kanawha Falls PSD water treatment plant staff also manage the public sewer system and are in constant contact with the operators of the sewer system. Continue to monitor the PSD's sewer system to prevent or detect leaks immediately. If necessary, utility staff could extend sewer service to unserved areas in the future.	Utility staff	Ongoing efforts	-	Cost associated with staff time during normal operating hours.
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
Yearly Source Water Protection Team Meetings	The Protection Team for Kanawha Falls 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	Kanawha Falls PSD staff have worked in the past with Fayette County Office of Emergency Services to respond to emergencies effectively and maintain water service to customers. 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 meet yearly as part of the Source Water Protection Team.	Water utility staff and emergency response personnel	Yearly, during regular Protection Team Meetings	-	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. Kanawha Falls 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	Utility staff participated in a public event hosted by Fayette County and the WV Rivers Coalition. The event took place at Hawks Nest State Park on March 22, 2016. Customers from several utilities attended the event, including Kanawha Falls PSD. Attendees received information about source water protection and the requirements for public water systems. Informational booths were set up for each utility to allow the customers the opportunity to speak with utility staff and review the draft source water protection plans. In addition, utility staff posted a flyer around town and in the PSD office informing customers of their ability to review and comment on the plan.	Utility Staff	March 22, 2016	Utility staff from Kanawha Falls PSD attended the public event and made themselves available to answer any questions their customers might have. They advertised the meeting for several weeks by posting flyers around Gauley Bridge and by announcing the event at a city council meeting. In all, approximately 30-40 people attended the meeting. Tetra Tech staff developed an informational poster for the public event that is attached in **Appendix E. Supporting Documentation.**	Minimal cost related to operator time.
Consumer Confidence Report	The utility 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. Include also a reference to this source water protection plan and how customers can access a copy.	Utility Staff	Yearly	This would be in addition to required Source Water Assessment information, including source of water and susceptibility to contamination.	CCR required by SDWA, included in annual budget.
Brochures, pamphlets, and letters	Send a brochure providing educational information to residences and businesses. These will alert the recipients of the need for source water protection and conservation. See **Appendix E** for example brochure that can be customized. Funding for the brochures may be available through the Wellhead and Source Water Protection Grant Program.	Utility Staff	Yearly	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 a sample brochure attached in **Appendix E** that could be used to provide information about source water to customers.	Cost in brochure printing and mailing

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 messages in school newsletter to raise awareness about source water protection and conservation.	Utility Staff	Yearly, as requested by local schools.	Operator could 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.	Cost associated with staff time to coordinate, visit classroom and provide tour.
Plant Tours	Continue to provide tours of the water plant to interested organizations such as watershed groups, schools, colleges and civic organizations. Tours are offered upon request and typically are conducted at least once a year for the college engineering students.	Operator	Regularly	Local Emergency Responders are provided with plant information including the layout and chemicals stored.	Minimal cost associated with operator's time.

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

Table 11. Kanawha Falls PSD Water Shortage Response Capability

Can the utility isolate or divert contamination from the intake or groundwater supply?	Yes
Describe the utility's capability to isolate or divert potential contaminants:	The utility has access to booms they can use to isolate the raw water intake from surface contaminants. WVA Manufacturing, which is located just downstream from the treatment plant, also has booms available. They can also close the intake to isolate it from potential contaminants.
Can the utility switch to an alternative water source or intake that can supply full capacity at any time?	No

Describe in detail the utility's capability to switch to an alternative source:	The utility has no means of switching to an alternative source of raw water.
Can the utility close the water intake to prevent contamination from entering the water supply?	Yes
How long can the intake stay closed?	If the tanks were full when the intake went closed, the water system could operate for 1.7 days. This is partially dependent on the ability of Gauley River PSD, who is supplied by Kanawha Falls, to conserve their water.
Describe the process to close the intake:	The operator can manually close a valve to shut off the intake and prevent contaminated raw water from entering the plant.
Describe the treated water storage capacity of the water system:	Kanawha Falls PSD has 6 treated water storage tanks and 2 booster pump stations (BPS). Boomer Tank- 200,000 gallons Falls View Tank #1- 300,000 gal. Falls View Tank #2- 300,000 gal. Gauley Bridge High Tank- 107,000 gal. Gauley Bridge Low Tank- 223,000 gal. Charlton Heights Tank- 105,000 gal. **Total= 1,235,000 gal. treated water storage** The utility does not have any raw water storage.
Is the utility a member of WVRWA Emergency Response Team?	The utility is a member of West Virginia Rural Water Association (WVRWA) but not the WVRWA Emergency Response Team.
Is the utility a member of WV-WARN?	No
List any other mutual aid agreements to provide or receive assistance in the event of an emergency:	The utility has an informal mutual aid agreement with West Virginia American Water in Montgomery, who provided them with water tankers during the 2015 train derailment.

11.2 OPERATION DURING LOSS OF POWER

Kanawha Falls 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 Kanawha Falls water treatment plant requires a 250kW generator, and the two booster stations each require a 50 kW generator to operate during a power outage. They currently do not own any generators, and plan on renting them as needed.

Can the utility connect to generator at intake/wellhead? If yes, select a scenario that best describes system.	No. The raw water intake is located directly adjacent to the treatment plant and the pumps are powered by the plant, so a generator is not necessary.		
Can the utility connect to generator at treatment facility? If yes, select a scenario that best describes system.	Yes. The treatment plant is fully wired to be connected to a generator that will be rented or borrowed during a power outage.		
Can the utility connect to a generator in distribution system? If yes, select a scenario that best describes system.	Yes. Both booster pump stations are fully wired for a generator that will be rented or borrowed during a power outage.		
Does the utility have adequate fuel on hand for the generator?	No. Kanawha Falls PSD does not have any on-site fuel storage.		
What is your on-hand fuel storage and how long will it last operating at full capacity?	**Gallons**	**Hours**	
	None	N/A	
Provide a list of suppliers that could provide generators and fuel in the event of an emergency:	**Supplier**		**Phone Number**
	Generator	Mountaineer Generator- Elkins, WV	304-636-0011 or 724-324-2122
	Generator	Walker Caterpillar- Belle, WV	304-949-6400
	Fuel	West Virginia Division of Highways- Kanawha Falls, WV	304-647-7450
	Fuel	Sunoco- Montgomery, WV	304-442-8900
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:	The utility has had no problem renting generators when they needed them in the past and plans to rent them again in the event of a power outage.		

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. Kanawha Falls 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 Kanawha Falls 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- The utility does not expect any significant changes in demand over the next 5 five years, and the treatment plant is currently operating at an average of 50%-60% of capacity. No water line extensions are planned for the next five years, and there is no expected increase in population. The water system's opinions concerning the demand for the next five years are generally supported by population trends projected based on US Census Bureau 2000 and 2010 data. According to the 2005 Interim State Population Projections (1), WV as a whole will see a population decline between 2010 and 2030. In addition, researchers at the WVU College of Business and Economics specifically project that populations within Fayette County will decrease from population of 46,039 in 2010 to a projected population of 44,611 in 2020 (2). Census data and projections cannot account for increases in daily demand due to water line extensions. If in the future water line extension projects are proposed the daily demands will be reassessed to determine if the source and treatment facilities can support increased demand.
If not, describe the circumstances and plans to increase production capacity:	N/A

(1)US Department of Commerce, United State Census Bureau. 2005 Interim State Population Projections. Table 1. http://www.census.gov/population/projections/data/state/projectionsagesex.html. Accessed June 10, 2015.

(2) Christiadi, Ph.D., Deskins, John, Ph.D., Lego, Brian. WVU College of Business and Economics, Bureau of Business and Economic Research. March 2014. WVU Research Corporation. http://be.wvu.edu/bber/pdfs/BBER-2014-04.pdf Accessed June 10, 2015.

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 Kanawha Falls PSD PSC Annual Report.

Table 14. Water Loss Information

Total Water Pumped (gal)		204,000,000
Total Water Purchased (gal)		0
Total Water Pumped and Purchased (gal)		204,000,000
Water Loss Accounted for Except Main Leaks (gal)	**Mains, Plants, Filters, Flushing, etc.**	0
	Fire Department	0
	Back Washing	0
	Blowing Settling Basins	0
Total Water Loss Accounted For Except Main Leaks		0
Water Sold- Total Gallons (gal)		182,500,000
Unaccounted For Lost Water (gal)		21,489,000
Water lost from main leaks (gal)		11,000,000
Total gallons of Unaccounted for Lost Water and Water Lost from Main Leaks (gal)		21,500,000
Total Percent Unaccounted For Water and Water Lost from Main Leaks (gal)		10.54%
If total percentage of Unaccounted for Water is greater than 15%, please describe any measures that could be taken to correct this problem:		The utility has been successful in keeping their total water loss under 15% and plans to continue to manage their system as efficiently as possible.

*This information was taken from the 2013 Public Service Commission Annual Report for Kanawha Falls PSD. The 2013 report was used because the 2015 report did not contain information about water production or loss.

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.

Kanawha Falls 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

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?	Yes. Kanawha Falls PSD has received notices about possible contamination from Brookfield Energy, who manages the hydro-electric plants upstream. The have also received notices from the West Virginia Division of Homeland Security and Emergency Management	
Are you aware of any facilities, land uses, or critical areas within your protection areas where chemical contaminants could be released or spilled?	Yes. The utility's primary concerns are the hydro-electric energy plants that operate immediately upstream from the intake. The plants have had issues in the past but maintain regular communication with the operators at Kanawha Falls about any accidents or spills that may occur.	
Are you prepared to detect potential contaminants if notified of a spill?	No	
List laboratories (and contact information) on whom you would rely to analyze water samples in case of a reported spill.	**Laboratories**	
	Name	**Contact**
	REIC Laboratory- Beaver, WV	800-999-0105, 304-255-2500, info@reiclabs.com
	ALS Environmental- South Charleston, WV	304-356-3168
	WV State Laboratory, Environmental Chemistry Section- Charleston, WV	304-965-2694

Do you have an understanding of baseline or normal conditions for your source water quality that accounts for seasonal fluctuations?		Yes - The utility tests daily for pH, turbidity, chlorine, fluoride, and alkalinity. They have an understanding of normal baseline conditions for their raw water source.		
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?		No. See Form B in **Appendix A**.		
Provide or estimate the capital and O&M costs for your current or proposed early warning system or upgraded system.	**Monitoring System**	**YSI EXO 2 (B-1)**	**Hach sc1000 (B-2)**	**Real Tech Full Scanning Monitoring System (B-3)**
	Capital	Total Capital Cost- $19,000	Approximate Capital Cost- $18,907	Approximate Capital Cost- $24,155
	Yearly O & M	Parts and calibration- Approximately $1,000 Data management and telemetry- $1,000	Full service contract with Hach Service Representative- $2,258 Online Viewer-$600	Replacement Lamps- $1,480 Smart-Sense Monitoring Service- $499
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		

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

Kanawha Falls 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. Kanawha Falls 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 Kanawha Falls 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

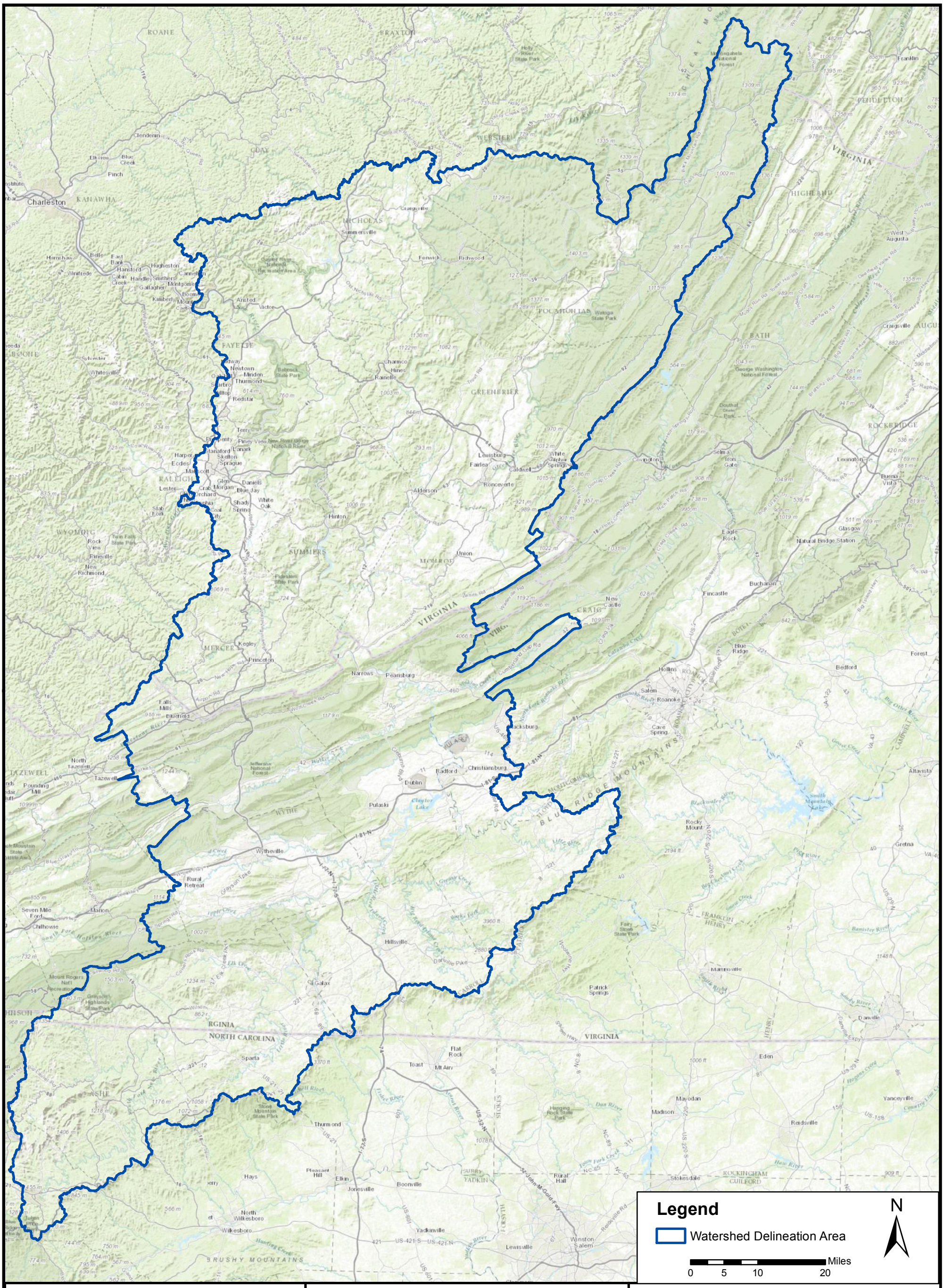
A public water utility must be prepared for any number of emergency scenarios and events that would require immediate response. It is imperative that information about key contacts, emergency services, and downstream water systems be posted and readily available in the event of an emergency. Elements 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 Kanawha Falls 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



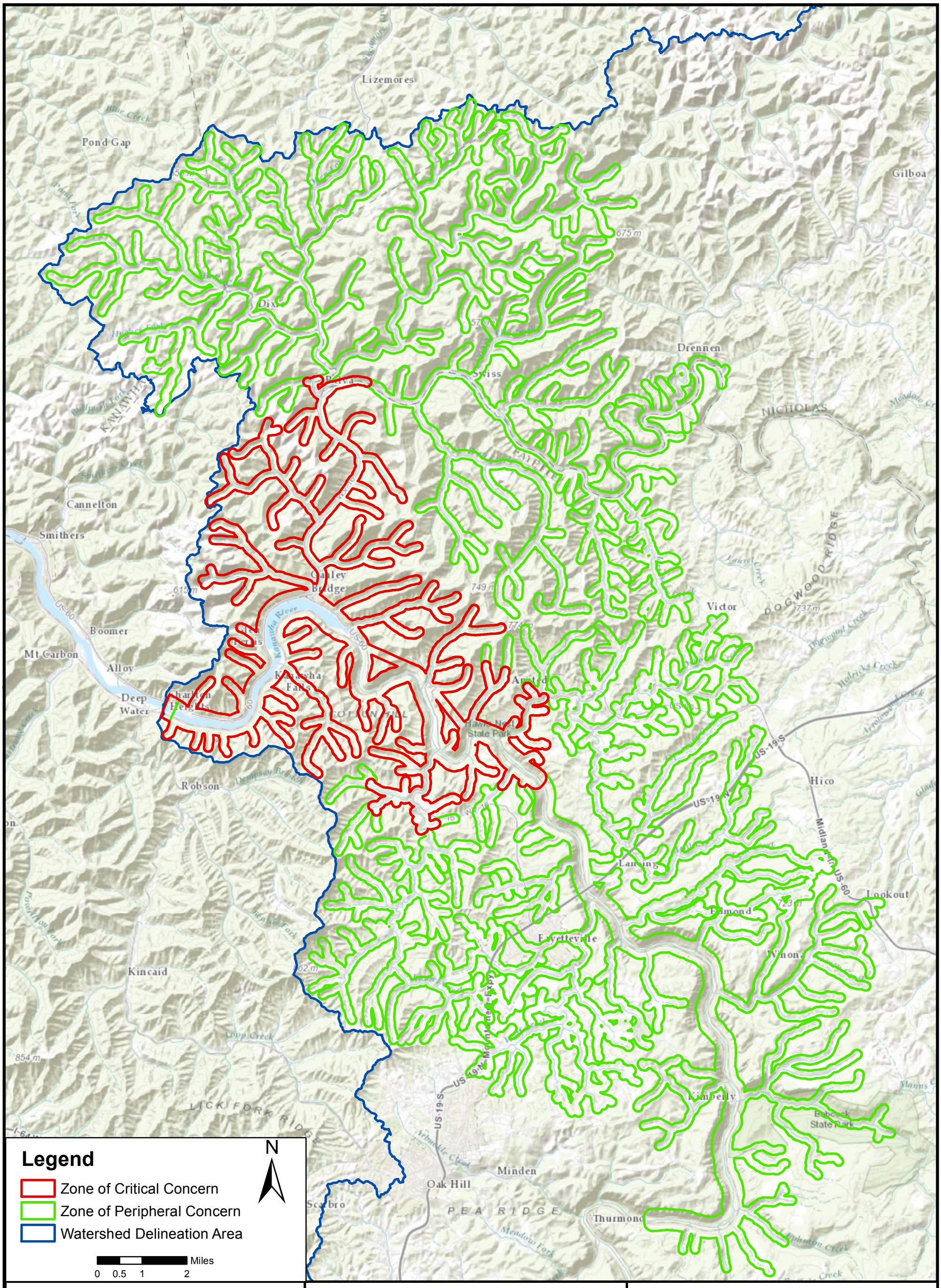
TETRA TECH
803 Quarrier Street, Suite 400
Charleston, WV 25301

Kanawha Falls PSD
PWSID: WV330103
Source Water Protection Plan

Figure A-1. Watershed Delineation Area

CREATED BY: CEM

DATE: 03/17/16



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Charleston, WV 25301

Kanawha Falls PSD
PWSID: WV3301037
Source Water Protection Plan

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

CREATED BY: CEM

DATE: 03/17/16

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

Legend

- Abandoned Mine Land Areas
- Abandoned Mine Land Highwalls
- Abandoned Mine Land Points
- Bond Forfeiture Sites
- Coal Refuse Sites
- Landfill Closure Assistance Program Sites
- Leaking Underground Storage Tanks
- Mining Outlets
- NPDES Permits
- Oil and Gas Wells
- USEPA Regulated Sites
- Volunteer Remediation

Field Verified PSSCs

- Agriculture
- Commercial
- Industrial
- Municipal
- Residential
- EPA FRS Data for Virginia
- Points of Interest
- Zone of Critical Concern
- Zone of Peripheral Concern
- Watershed Delineation Area

N

0 5 10 20 Miles

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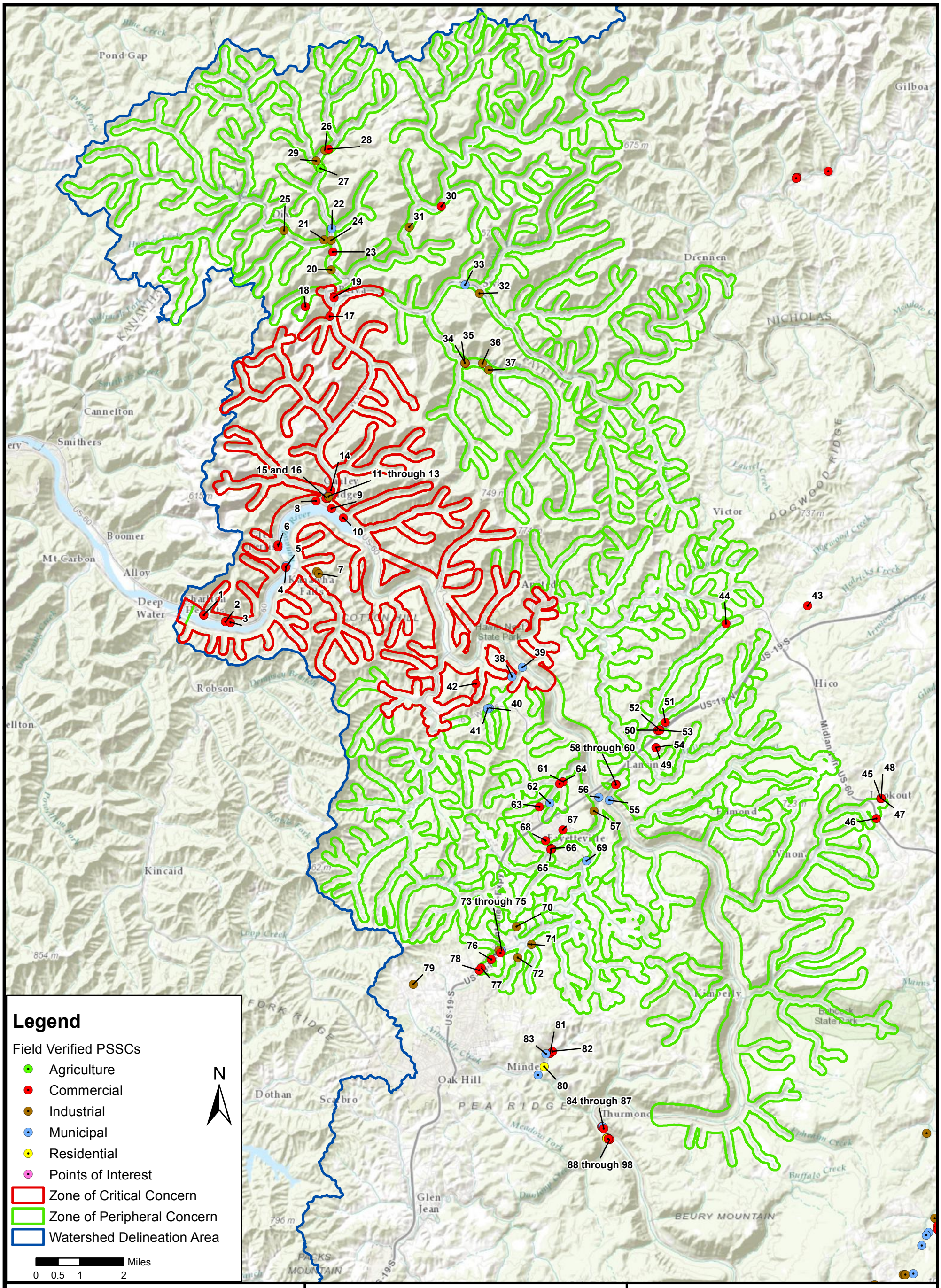
Kanawha Falls PSD
PWSID: WV330103
Source Water Protection Plan

Figure A-3. All PSSCs in the Watershed Delineation Area

CREATED BY: CEM

DATE: 03/21/16



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Charleston, WV 25301

Kanawha Falls PSD
PWSID: WV3301037
Source Water Protection Plan

Figure A-4. Field Verified PSSCs and Points of Interest

CREATED BY: CEM

DATE: 03/17/16

*Note: Waterline extensions have been excluded from the Abandoned Mine Land Highwalls layer displayed on this figure.

Legend

- Abandoned Mine Land Areas
- Abandoned Mine Land Highwalls
- Abandoned Mine Land Points
- Oil and Gas Wells
- Zone of Critical Concern
- Zone of Peripheral Concern
- Watershed Delineation Area

N

Miles
0 0.5 1 2

R-1

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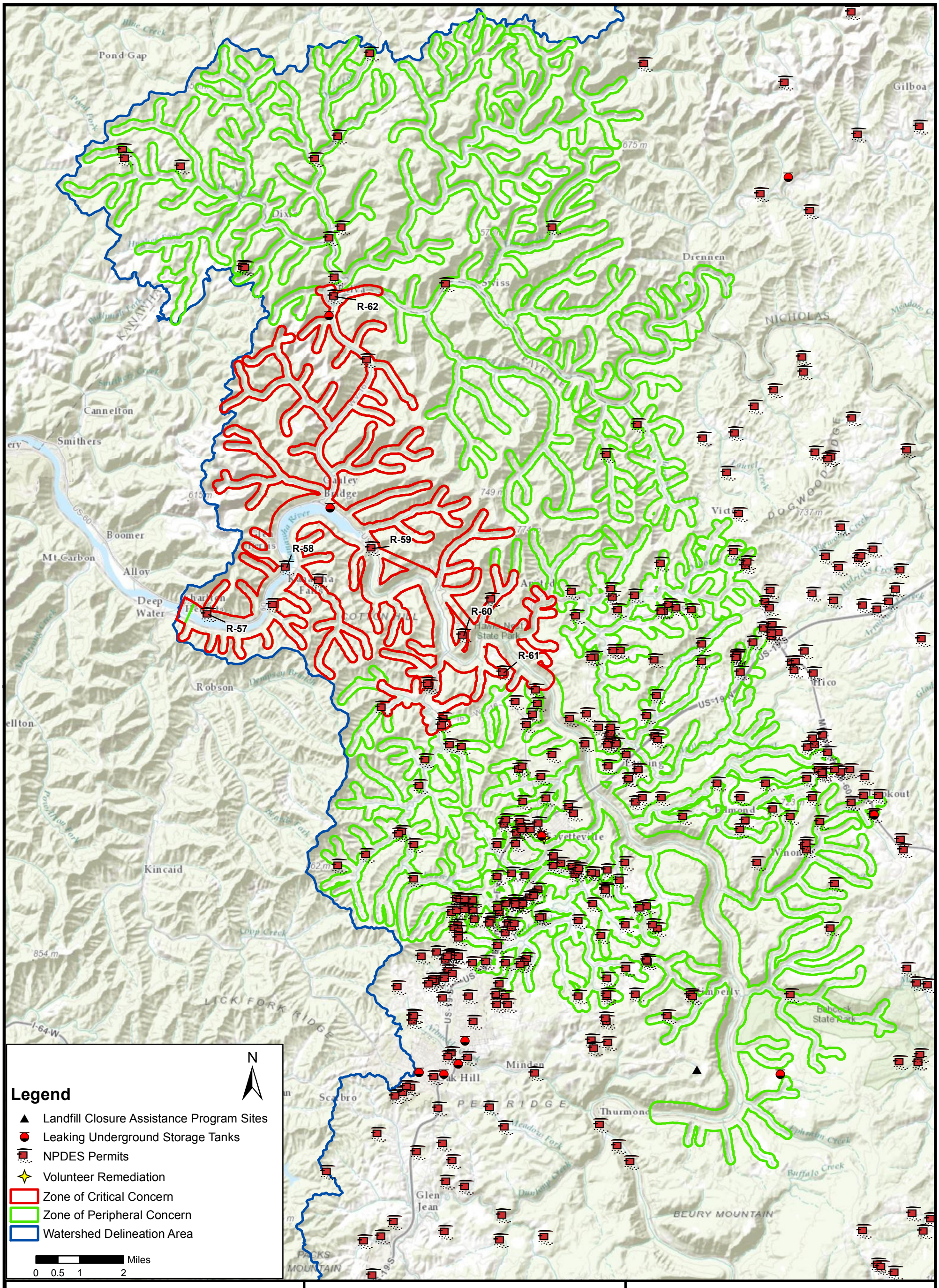
803 Quarrier Street, Suite 400
Charleston, WV 25301

Kanawha Falls PSD
PWSID: WV3301037
Source Water Protection Plan

Figure A-5. Selected Sources: Abandoned Mine Land Areas, Highwalls, and Points, and Oil/Gas Wells

CREATED BY: CEM

DATE: 03/17/16



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Charleston, WV 25301

Kanawha Falls PSD
PWSID: WV3301037
Source Water Protection Plan

Figure A-6. Selected Sources: Landfill Closure Assistance Program Sites, Leaking Underground Storage Tanks, NPDES Permits, and Volunteer Remediation

CREATED BY: CEM

DATE: 03/17/16

R-56
R-55
R-53
R-54
R-51
R-50
R-52
R-49

*Note: The mining outlet data layer displayed on this figure only includes those records where the inspectable unit type is "OUTLT".

Legend

- Bond Forfeiture Sites
- Coal Refuse Sites

Mining Permits

# of outlets per permit

- 1 - 5
- 6 - 12
- 13 - 22
- 23 - 34
- 35 - 57

- Zone of Critical Concern
- Zone of Peripheral Concern
- Watershed Delineation Area

Miles
0 0.5 1 2

N

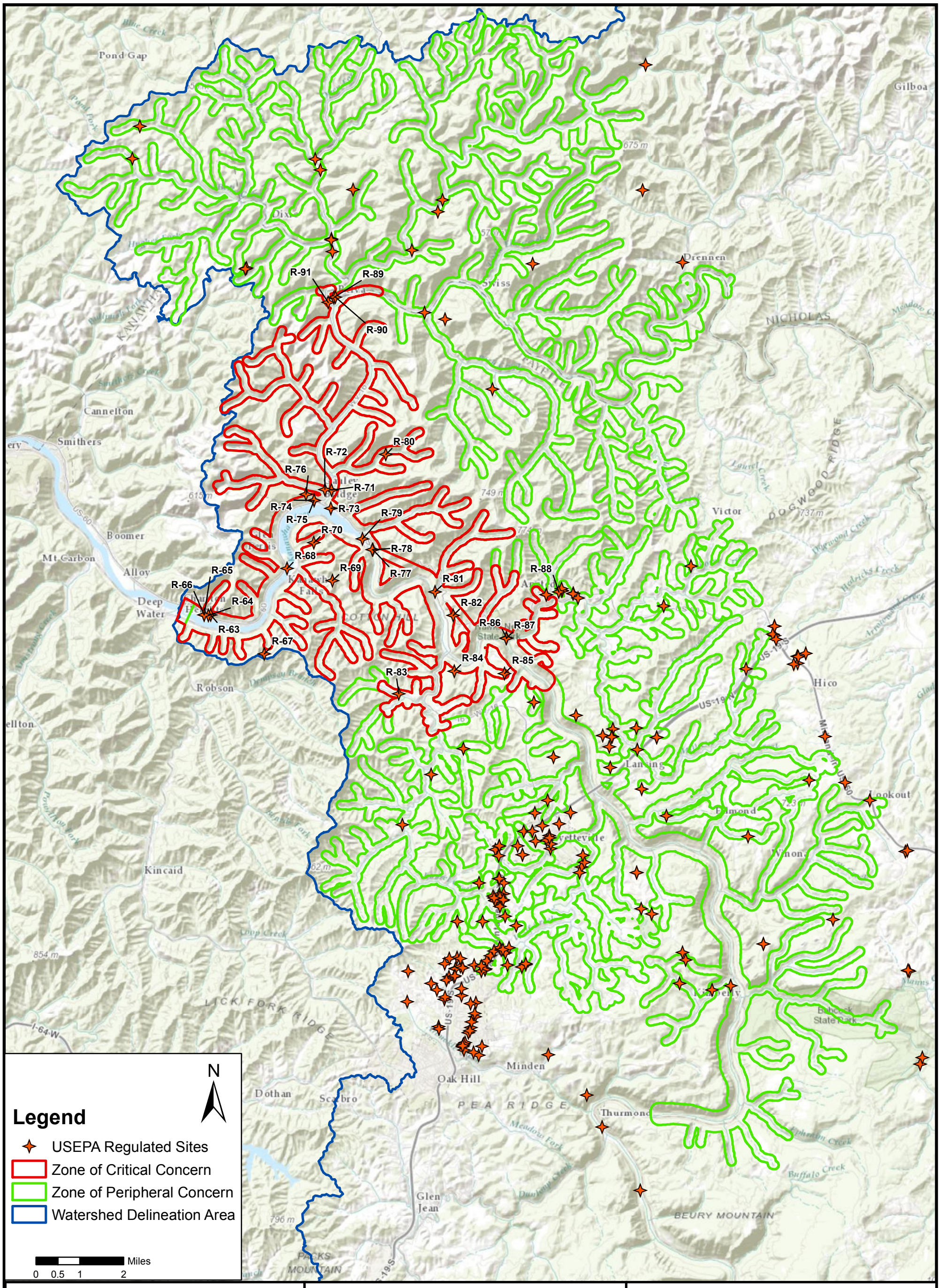
TETRA TECH
803 Quarrier Street, Suite 400
Charleston, WV 25301

Kanawha Falls PSD
PWSID: WV3301037
Source Water Protection Plan

Figure A-7. Selected Sources: Bond Forfeiture Sites, Coal Refuse Sites and Mining Permits

CREATED BY: CEM

DATE: 03/17/16



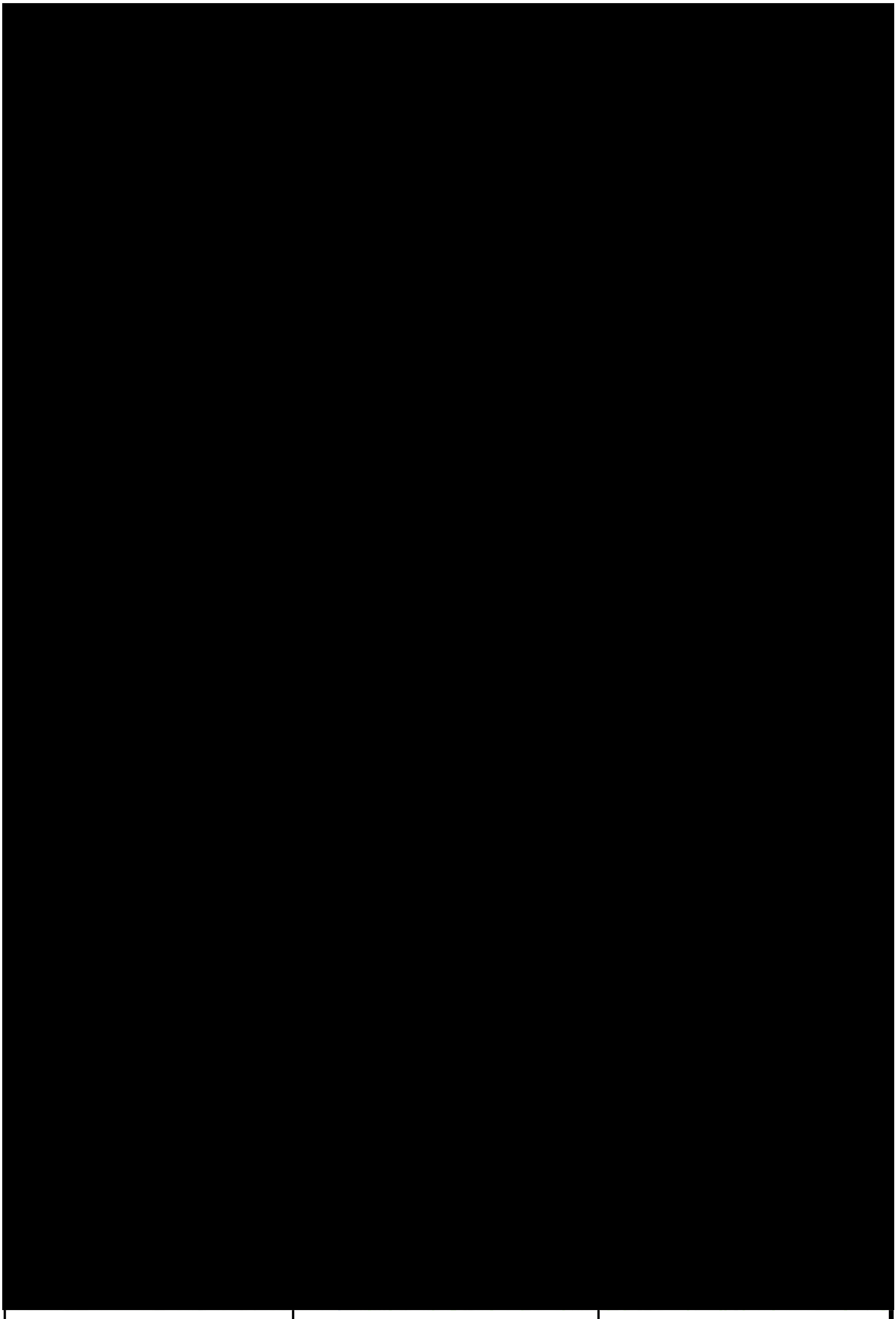
TETRA TECH
803 Quarrier Street, Suite 400
Charleston, WV 25301

Kanawha Falls PSD
PWSID: WV3301037
Source Water Protection Plan

Figure A-8. Selected Sources: USEPA Regulated Sites

CREATED BY: CEM

DATE: 03/17/16



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

Kanawha Falls PSD
PWSID: WV3301037
Source Water Protection Plan

Figure A-9. Aboveground Storage Tanks

CREATED BY: RWM

DATE: 4/5/2016

List of Regulated PSSCs

Kanawha Falls PSD – PSSC Summary

PSSC Layer	In ZCC	Around ZCC	In ZPC	Around ZPC	In Watershed	Total Records
Above Ground Storage Tanks	54	57	89	221	1426	1847
AML Points	14	3	62	121	395	595
Bond Forfeiture	0	3	15	41	238	297
Closed Landfills	0	0	0	1	1	2
Field Verified PSSCs	23	4	53	34	940	1054
Landfill Monitoring Wells	0	0	0	4	0	4
LUST	2	0	1	4	131	138
Mining Outlets	38	86	146	482	3141	3893
NPDES Permits	11	7	108	163	2424	2713
Oil/Gas Wells	140	165	334	505	1797	2941
Points of Interest	0	0	0	0	25	25
USEPA Regulated Sites	23	6	74	116	2423	2642
Virginia Field Verified PSSCs	0	0	0	0	153	153
Volunteer Remediation	0	0	0	2	24	26
Coal Refuse Sites						
Total	305	331	882	1694	13118	16330

Field Verified PSSCs (SWAP_PCS) – Figure A-4

PSSC Number	Site Name	Site Description	Map Code	Relative Risk	Comments
1	Division of Highways Falls View Substation	Road maintenance depots/deicing operations	M-20	3.08	Former National Guard armory
2	Car Wash - Closed	Car washes	C-8	1.70	Now closed
3	Napa Care Center and Cogar's Tire Service	Auto repair shops	C-3	2.73	none

PSSC Number	Site Name	Site Description	Map Code	Relative Risk	Comments
4	Division of Highways maintenance garage	Road maintenance depots/deicing operations	M-20	3.08	Same as R-12. Still used to store gravel. A raised berm surrounds site to prevent runoff.
5	PCS #4	Auto repair shops	C-3	2.73	AUTO REPAIR SHOP - STATE ROAD MAINTENANCE GARAGE IN KANAWHA FALLS
6	LKM Auto Sales, LLC	Car dealerships	C-7	1.20	No auto mechanic shop presently. Wash cars, runoff into sewer system.
7	Kanawha Falls Community Water	Permitted Discharge Pipe (outfall)	I-27	5.07	G & L Coal Company
8	Pennington Funeral Home	Funeral services and crematories	C-15	1.68	
9	Little General Sunoco Station	Gas Stations	C-18	2.88	
10	PCS #1	Camp grounds	C-6	1.62	NEW RIVER CAMPGROUND; NEAR RIVER
11	Car Washes	Car washes	C-8	1.70	
12	Gauley Bridge Fire Department	Fire Stations	M-6	1.19	
13	Go Mart Gas Station	Gas Stations	C-18	2.88	
14	Gauley Auto Care	Auto repair shops	C-3	2.73	
15	Three River Auto Car Lot	Car dealerships	C-7	1.20	
16	Gas Well with brine tank	Wells: oil and gas	I-40	2.79	
17	BrownÆs Service Station	Gas Stations	C-18	2.88	
18	AUTO REPAIR (ARS3)	Auto repair shops	C-3	2.73	DEAN TIRES, 2 BAYS
19	Auxier Welding, Inc.	Welding Shops	C-52	1.17	
20	Wells: oil and gas	Wells: oil and gas	I-40	2.79	Gas Well
21	Clonch Industries	Wood preserving/treatment facilities	I-41	4.72	
22	Dixie Grade School	Schools	M-21	1.47	
23	D & D Auto and Tire Shop	Auto repair shops	C-3	2.73	
24	Clonch Industries	Sawmills	I-32	3.74	

PSSC Number	Site Name	Site Description	Map Code	Relative Risk	Comments
25	PCS #17	Mining: Surface	I-24	5.22	SMIS ON BELLS CREEK ROAD (TERRY EAGLE COAL CO.)
26	Gas Well with brine tank	Wells: oil and gas	I-40	2.79	
27	PCS #21 Confined Animal Feeding Operations	Confined Animal Feeding Operations	A-3	4.93	CONFINED ANIMAL FEEDLOT IN BENTREE
28	B-J Used Auto Sales	Car dealerships	C-7	1.20	
29	Elswick Lumber Company	Sawmills	I-32	3.74	
30	Appalachian Power - Belva Substation	Utility Substation Transformers	C-49	2.95	
31	Wells: oil and gas	Wells: oil and gas	I-40	2.79	Gas Well Across Twenty Mile Creek from point.
32	Gas Well with brine tank	Wells: oil and gas	I-40	2.79	
33	PCS #28 Illegal Dump	Illegal Dump	M-10	6.38	DUMP SITE AT JODIE
34	Rich Creek Cemetery	Cemeteries	C-9	1.24	
35	Well #3 XTO Energy	Wells: oil and gas	I-40	2.79	
36	Gas Well with brine tank	Wells: oil and gas	I-40	2.79	
37	PCS #26	Mining: Surface	I-24	5.22	POWELLTON COAL CO., LLC
38	West Virginia American Water New River Regional drinking water plant	Drinking Water Treatment Plants	M-5	1.50	
39	Drinking Water Treatment Plant	Drinking Water Treatment Plants	M-5	1.50	
40	Evangel Fellowship SBC	Other	M-32	0.00	Formerly Beckwith School
41	PCS#3	Wells: water supply	M-31	0.00	WELLS: WATER SUPPLY AT BECKWITH SCHOOL
42	MIKES CAR WASH (CW1)	Car washes	C-8	1.70	LOCATED ON MOUNTAIN DR.
43	River Retreat	Above Ground Storage Tanks	C-1	6.75	
44	New River Foodland #1	Heating oil companies	C-22	3.20	
45	Divide Elementary	Other	C-53	0.00	
46	Nutall Middle School	Above Ground Storage Tanks	C-1	6.75	
47	Divide Elementary	Heating oil companies	C-22	3.20	
48	Divide Elementary	Above Ground Storage Tanks	C-1	6.75	

PSSC Number	Site Name	Site Description	Map Code	Relative Risk	Comments
49	MILL CREEK LUXURY CABINS INC.	Above Ground Storage Tanks	C-1	6.75	
50	WILDWATER EXPEDITIONS	Camp grounds	C-6	1.62	
51	FACTORY DISCOUNT STORE	Junk yards, scrap and auto	C-25	3.36	
52	WILDWATER EXPEDITIONS	Above Ground Storage Tanks	C-1	6.75	
53	WILDWATER EXPEDITIONS	Golf courses	C-20	1.17	
54	MILL CREEK LUXURY CABINS INC.	Other	C-53	0.00	
55	Railroad tracks near river	Railroad Tracks (right of way)	M-17	4.88	
56	New River Gorge parking lot, commercial parking, rest rooms	Park lands	M-15	1.47	
57	Discharge pipe not found	Permitted Discharge Pipe (outfall)	I-27	5.07	Not found, not reported in plan or shown on figure.
58	CANYON RIM GIFT SHOP	Cemeteries	C-9	1.24	
59	CANYON RIM GIFT SHOP	Other	C-53	0.00	
60	CANYON RIM GIFT SHOP	Golf courses	C-20	1.17	
61	Campground Complex	Camp grounds	C-6	1.62	
62	Fayetteville wastewater treatment plant	Wastewater Treatment Plant	M-29	4.03	
63	Historic gas station	Historic gas stations	C-23	3.00	
64	AEP Fayetteville Utility Substation Transformers	Utility Substation Transformers	C-49	2.95	
65	D and L Packette	Historic gas stations	C-23	3.00	duplicate of 1682
66	Sherry's Car wash now closed	Car washes	C-8	1.70	duplicate of 1683
67	Huse Memorial Park cemetery	Cemeteries	C-9	1.24	
68	PCS #5 Photo processing/printing	Photo processing/printing	C-38	1.61	PHOTO PROCESSING/PRINTING WHITEWATER PHOTOGRAPHY
69	Fayette Recycling Center	Recycling/reduction facilities	M-19	2.40	Old drinking water plant
70	BP Industries Machine and metalworking shops	Machine and metalworking shops	I-20	2.55	Machine Shop
71	BERWIND LAND COMPANY	Wells: oil and gas	I-40	2.79	PEAKE OPERATING COMPANY

PSSC Number	Site Name	Site Description	Map Code	Relative Risk	Comments
72	BERWIND LAND COMPANY	Wells: oil and gas	I-40	2.79	PEAKE OPERATING COMPANY
73	WHITEWATER INN	Wastewater Treatment Plant	M-29	4.03	Sewage Treatment Plant
74	Industrial Storage Area	Other	I-44	0.00	Industrial Storage
75	BTB Wrecker Services	Junk yards, scrap and auto	C-25	3.36	Car Wash, Wrecker Shop, Junkyard
76	Fayette Square	Parking lots/malls	C-35	1.53	Parking Lot/Mall
77	Exxon	Gas Stations	C-18	2.88	Gas Station
78	Chevron	Gas Stations	C-18	2.88	Gas Station/Mini Mart
79	AML Refuse Pile	Mines: abandoned	I-23	5.04	Refuse Pile
80	Septic Systems	Septic Systems (discharging to stream or surface)	R-5	5.70	Septic Systems
81	Perfect Image Body Shop	Body shops	C-5	2.84	Auto Body Repair Shop
82	Johnsons Auto Body	Body shops	C-5	2.84	Auto Body Repair Shop
83	Well	Wells: water supply	M-31	0.00	Mine source
84	NATONAL PARK SERVICE THURMOND DEPOT	Other	C-53	0.00	
85	NATIONAL PARK SERVICE THURMOND DEPOT	Golf courses	C-20	1.17	
86	NATIONAL PARK SERVICE THURMOND DEPOT	Radioactive waste disposal sites	M-16	3.04	
87	NATIONAL PARK SERVICE THURMOND DEPOT	Other	C-53	0.00	
88	New River Gorge Dun Glen	Recreational vehicle/mini storage	C-42	0.75	
89	New River Gorge Dun Glen	Above Ground Storage Tanks	C-1	6.75	Propane Tank
90	New River Gorge Dun Glen	Auto repair shops	C-3	2.73	
91	New River Gorge Dun Glen	Fuel Oil Storage	R-1	2.57	
92	New River Gorge Dun Glen	Above Ground Storage Tanks	C-1	6.75	Propane Tank
93	New River Gorge Dun Glen	Septic Systems (leach field)*	R-6	2.13	
94	NEW RIVER GORGE DUN GLEN	Above Ground Storage Tanks	C-1	6.75	
95	New River Gorge Dun Glen	Above Ground Storage Tanks	C-1	6.75	Propane Tank
96	NEW RIVER GORGE DUN GLEN	Above Ground Storage Tanks	C-1	6.75	

PSSC Number	Site Name	Site Description	Map Code	Relative Risk	Comments
97	New River Gorge Dun Glen	Septic Systems (leach field)*	R-6	2.13	
98	New River Gorge Dun Glen	Septic Systems (leach field)*	R-6	2.13	

Only 98 of 1054 points were prioritized and labeled due to their potential threat level or proximity to the intake. The remaining points should be considered by the water system but were not prioritized in this analysis.

Abandoned Mine Lands – Figure A-5

PSSC Number	Regulation Type	Pad Number	Pad Name
R-1	AML_Points	WV004156	MILL CREEK COMPLEX

Only 1 of 592 point was prioritized and labeled due to its proximity to the intake. The remaining points lie within the watershed and should be considered by the utility but were not prioritized in this analysis.

Note: PSSCs R-2 through R-48 were relabeled as ASTs.

Bond Forfeiture Sites – Figure A-7

PSSC Number	Regulation Type	Company	Permit Number	Date Revoked
R-49	SPREC	CHICOPEE COAL COMPANY, INC.	O-6021-89	1/31/2003
R-50	SPREC	G & L COAL CO.	S-3035-87	5/21/1996
R-51	SPREC	G & L COAL CO.	U-3036-87	5/21/1996

Only 3 of 296 points were prioritized and labeled in this analysis. The remaining points in the watershed should be considered important by the water system, but were not prioritized in this analysis. In addition, only one site per unique permit was labeled, so some of these permits may have more than one outlet.

Mining Outlets – Figure A-7

PSSC Number	Regulation Type	Permit Number	Responsible Party	Status Flag	Permit Count
R-52	HPU	WV1000951	G & L COAL CO	C	14
R-53	HPU	WV0097144	KANAWHA ENERGY COMPANY	O	5
R-54	HPU	WV0097110	APPALACHIAN MINING INC	C	16
R-55	HPU	WV1001442	APPALACHIAN MINING INC	C	6

PSSC Number	Regulation Type	Permit Number	Responsible Party	Status Flag	Permit Count
R-56	HPU	WV1022504	KANAWHA ENERGY COMPANY	O	17

Only 5 of 530 points were prioritized and labeled in this analysis. The remaining points in the watershed should be considered important by the water system, but were not prioritized in this analysis. In addition, only one site per unique permit was labeled, so some of these permits may have more than one outlet.

NPDES Permits – Figure A-6

PSSC Number	Regulation Type	Permit ID	Facility Name	Permit Type
R-57	OWRNPDES_Permits	WVG980103	Falls View Substation	Industrial
R-58	OWRNPDES_Permits	WVG980105	Glen Ferris Stockpile	Industrial
R-59	OWRNPDES_Permits	WV0116301	Hawks Nest Hydroelectric Facility	Industrial
R-60	OWRNPDES_Permits	WVG551477	Downey Ridge Environmental Co	Sewage
R-61	OWRNPDES_Permits	WVG640137	Fayette Plateau (New River) WTP	Industrial
R-62	OWRNPDES_Permits	WVG611275	Auxier Welding Inc	Industrial

Only 6 of 2713 points were prioritized and labeled in this analysis. The remaining points in the watershed should be considered important by the water system, but were not prioritized in this analysis.

USEPA Regulated Sites – Figure A-8

PSSC Number	Regulation Type	Primary Name	Registry ID	Registry
R-63	Superfund_RCRA		110020977898	110021000000
R-64	Superfund_RCRA	FALLS VIEW SUBSTATION	110041949498	110042000000
R-65	Superfund_RCRA	MONTGOMERY ARMORY	110054935326	110055000000
R-66	Superfund_RCRA	FAYETTE CO.-SUBHEADQUARTERS	110054951904	110055000000
R-67	Superfund_RCRA	DEEPWATER AT KANAWHA FALLS	110055012141	110055000000
R-68	Superfund_RCRA	GLEN FERRIS STOCKPILE	110037938943	110038000000
R-69	Superfund_RCRA	G & L COAL COMPANY (S-3035	110054953163	110055000000
R-70	Superfund_RCRA	RIVER RIDGE AT KANAWHA FALLS	110054997152	110055000000
R-71	Superfund_RCRA	JOHN'S GAULEY AUTO CARE	110007890274	110008000000
R-72	Superfund_RCRA	GAULEY BRIDGE ELEMENTARY	110021735069	110022000000

PSSC Number	Regulation Type	Primary Name	Registry ID	Registry
R-73	Superfund_RCRA	LITTLE GENERAL STORE #3060	110033161548	110033000000
R-74	Superfund_RCRA	J C BAKER - GAULEY BRIDGE UST PULL	110039589022	110040000000
R-75	Superfund_RCRA	GAULEY BRIDGE VFD / FORMER SERVICE STATION / JC BAKER & SON (USTS)	110041687467	110042000000
R-76	Superfund_RCRA	GAULEY BRIDGE	110046140948	110046000000
R-77	Superfund_RCRA	HAWKS NEST HYDRO	110028045960	110028000000
R-78	Superfund_RCRA	HAWKS NEST HYDROELECTRIC FACIL	110037519726	110038000000
R-79	Superfund_RCRA	CSX TRANSPORTATION BRIDGE REPL	110046133698	110046000000
R-80	Superfund_RCRA	CARBONDALE TOWER 117 69 KV LIN	110045520539	110046000000
R-81	Superfund_RCRA	HONEY CREEK BRIDGE, S310-16-23	110055011589	110055000000
R-82	Superfund_RCRA	CHIMNEY CORNER - TURKEY CREEK	110054990907	110055000000
R-83	Superfund_RCRA	FAYETTE CO. REGIONAL WATER PRO	110054952949	110055000000
R-84	Superfund_RCRA	LAMBS CONCRETE PRODUCTS CORP	110054962073	110055000000
R-85	Superfund_RCRA	FAYETTE PLATEAU	110046130441	110046000000
R-86	Superfund_RCRA	HAWKS NEST STATE PARK	110054957944	110055000000
R-87	Superfund_RCRA	HAWKS NEST STATE PARK	110054964829	110055000000
R-88	Superfund_RCRA	WV BROADBAND GRANT #2672 FAYET	110055016227	110055000000
R-89	Superfund_RCRA	AUXIER WELDING INC	110007881499	110008000000
R-90	Superfund_RCRA	AUXIER WELDING INC	110031111730	110031000000
R-91	Superfund_RCRA	RELOCATION WV 39+1, U310-39-5.	110055036973	110055000000

Only 29 of 219 points were prioritized and labeled in this analysis. The remaining points in the watershed should be considered important by the water system, but were not prioritized in this analysis.

Aboveground Storage Tanks (AST_Chemicals) – Figure A-9

PSSC Number	Facility Name	Responsible Party	Tank Label	Year	Capacity	Contents
R-92	Hutchs Wrecker Service	MAXUM PETROLUEM PRODUCTS, INC.	010-00000339	2008	[redacted]	
R-93	Kanawha Energy Company	KANAWHA ENERGY COMPANY	010-00000617	2004		
R-94	Brown's Service Station	BROWNS SERVICE STATION	034-00000315	1990		
R-95	Madison Production District	EQT PRODUCTION COMPANY	010-00000048	2000		

PSSC Number	Facility Name	Responsible Party	Tank Label	Year	Capacity	Contents
R-96	Madison Production District	EQT PRODUCTION COMPANY	010-00000051	2005	[redacted]	
R-97	Madison Production District	EQT PRODUCTION COMPANY	010-00000057	1964		
R-98	Madison Production District	EQT PRODUCTION COMPANY	010-00000058	1968		
R-99	Madison Production District	EQT PRODUCTION COMPANY	010-00000064	1999		
R-100	Madison Production District	EQT PRODUCTION COMPANY	010-00000070	1974		
R-101	Madison Production District	EQT PRODUCTION COMPANY	010-00000071	1996		
R-102	Madison Production District	EQT PRODUCTION COMPANY	010-00000072	1996		
R-103	Madison Production District	EQT PRODUCTION COMPANY	010-00000073	2005		
R-104	Madison Production District	EQT PRODUCTION COMPANY	010-00000074	2005		
R-105	Madison Production District	EQT PRODUCTION COMPANY	010-00000075	2009		
R-106	Madison Production District	EQT PRODUCTION COMPANY	010-00000076	2009		
R-107	Madison Production District	EQT PRODUCTION COMPANY	010-00000078	2007		
R-108	Madison Production District	EQT PRODUCTION COMPANY	010-00000079	2006		
R-109	Madison Production District	EQT PRODUCTION COMPANY	010-00000084	2010		
R-110	Madison Production District	EQT PRODUCTION COMPANY	010-00000087	1999		
R-111	Madison Production District	EQT PRODUCTION COMPANY	010-00000095	2000		
R-112	Madison Production District	EQT PRODUCTION COMPANY	010-00000098	2001		
R-113	Madison Production District	EQT PRODUCTION COMPANY	010-00000104	1996		
R-114	Madison Production District	EQT PRODUCTION COMPANY	010-00000105	1996		
R-115	Madison Production District	EQT PRODUCTION COMPANY	010-00000106	1968		
R-116	Madison Production District	EQT PRODUCTION COMPANY	010-00000121	2002		
R-117	Madison Production District	EQT PRODUCTION COMPANY	010-00000122	2005		
R-118	Madison Production District	EQT PRODUCTION COMPANY	010-00000129	2006		
R-119	Madison Production District	EQT PRODUCTION COMPANY	010-00000138	2005		
R-120	Madison Production District	EQT PRODUCTION COMPANY	010-00000140	1985		
R-121	KV Oil & Gas FA0558	HAYDEN HARPER ENERGY	010-00000150	1994		
R-122	KV Oil & Gas FA0512	HAYDEN HARPER ENERGY	010-00000152	1992		
R-123	KV Oil & Gas FA0510	HAYDEN HARPER ENERGY	010-00000154	1991		
R-124	KV Oil & Gas FA0563	HAYDEN HARPER ENERGY	010-00000155	1996		
R-125	KV OIL & GAS FA515	HAYDEN HARPER ENERGY	010-00000156	1992		

PSSC Number	Facility Name	Responsible Party	Tank Label	Year	Capacity	Contents
R-126	10490	CNX GAS COMPANY LLC	010-00000186	1987	[redacted]	
R-127	13046	CNX GAS COMPANY LLC	010-00000190	1993		
R-128	KV Oil & Gas FA0522	HAYDEN HARPER ENERGY	010-00000193	1994		
R-129	KV Oil & Gas FA0505	HAYDEN HARPER ENERGY	010-00000196	1991		
R-130	KV Oil & Gas FA0516	HAYDEN HARPER ENERGY	010-00000197	1992		
R-131	KV Oil & Gas FA0524	HAYDEN HARPER ENERGY	010-00000198	1992		
R-132	KV Oil & Gas FA0521	HAYDEN HARPER ENERGY	010-00000199	1997		
R-133	KV Oil & Gas FA0526	HAYDEN HARPER ENERGY	010-00000200	1992		
R-134	KV Oil & Gas FA0527	HAYDEN HARPER ENERGY	010-00000201	1992		
R-135	KV Oil & Gas FA0528	HAYDEN HARPER ENERGY	010-00000202	1992		
R-136	KV Oil & Gas FA0529	HAYDEN HARPER ENERGY	010-00000203	1997		
R-137	KV Oil & Gas FA0530	HAYDEN HARPER ENERGY	010-00000204	1992		
R-138	KV Oil & Gas FA0533	HAYDEN HARPER ENERGY	010-00000205	1992		
R-139	KV Oil & Gas FA0536	HAYDEN HARPER ENERGY	010-00000206	1997		
R-140	KV Oil & Gas FA0547	HAYDEN HARPER ENERGY	010-00000207	1992		
R-141	KV Oil & Gas FA0555	HAYDEN HARPER ENERGY	010-00000208	1994		
R-142	KV Oil & Gas FA0556	HAYDEN HARPER ENERGY	010-00000209	1994		
R-143	Midvale E0400 10	HAYDEN HARPER ENERGY	010-00000211	1996		
R-144	Midevale E0407 13	HAYDEN HARPER ENERGY	010-00000212	1996		
R-145	KV Oil & Gas FA509	HAYDEN HARPER ENERGY	010-00000222	1991		
R-146	KV Oil & Gas FA0550	HAYDEN HARPER ENERGY	010-00000317	1994		
R-147	Maben Office	EXCO RESOURCES (PA), LLC	010-00000369	2009		
R-148	Maben Office	EXCO RESOURCES (PA), LLC	010-00000370	2009		
R-149	KV Oil & Gas FA0503	HAYDEN HARPER ENERGY	010-00000386	1992		
R-150	KV Oil & Gas FA0504	HAYDEN HARPER ENERGY	010-00000387	1991		
R-151	Fayette 341X Meter	HAYDEN HARPER ENERGY	010-00000388	2000		
R-152	Peabody Coal 7	CABOT OIL & GAS CORPORATION	010-00000461	1998		
R-153	KV Oil & Gas FA0506	HAYDEN HARPER ENERGY	010-00000464	1992		
R-154	Midvale E0401 11	HAYDEN HARPER ENERGY	010-00000467	1996		
R-155	KV OIL & GAS FA559	HAYDEN HARPER ENERGY	010-00000502	1994		

PSSC Number	Facility Name	Responsible Party	Tank Label	Year	Capacity	Contents
R-156	KV OIL & GAS FA0525	HAYDEN HARPER ENERGY	010-00000507	1994	[redacted]	
R-157	Rhyan 2	CABOT OIL & GAS CORPORATION	034-00000300	1974		
R-158	Hawks Nest Hydro LLC	GARLETTS, RANDY	010-00000563	2013		
R-159	Appalachian Handwoods	MAXUM PETROLUEM PRODUCTS, INC.	010-00000407	2008		
R-160	ENERVEST OPERATING, LLC	ENERVEST OPERATING L. L. C.	010-00000005	1985		
R-161	ENERVEST OPERATING, LLC	ENERVEST OPERATING L. L. C.	010-00000007	1985		
R-162	ENERVEST OPERATING, LLC	ENERVEST OPERATING L. L. C.	010-00000014	1985		
R-163	Madison Production District	EQT PRODUCTION COMPANY	010-00000049	2000		
R-164	Madison Production District	EQT PRODUCTION COMPANY	010-00000052	2005		
R-165	Madison Production District	EQT PRODUCTION COMPANY	010-00000110	1974		
R-166	10494	CNX GAS COMPANY LLC	010-00000175	1987		
R-167	Camden #2 & #4	BUCKEYE OIL PRODUCING CO	010-00000184	2005		
R-168	10489	CNX GAS COMPANY LLC	010-00000185	1987		
R-169	10479	CNX GAS COMPANY LLC	010-00000187	1987		
R-170	10491	CNX GAS COMPANY LLC	010-00000188	1987		
R-171	12997	CNX GAS COMPANY LLC	010-00000189	1991		
R-172	Semet Solvay #13 1674	HAYDEN HARPER ENERGY	010-00000213	2004		
R-173	Semet Solvay #13 1674	HAYDEN HARPER ENERGY	010-00000214	2004		
R-174	Semet Solvay #14 1675	HAYDEN HARPER ENERGY	010-00000215	2004		
R-175	Semet Solvay #15 1676	HAYDEN HARPER ENERGY	010-00000216	2004		
R-176	Semet Solvay #16 1677	HAYDEN HARPER ENERGY	010-00000217	2004		
R-177	Semet Solvay #17 1678	HAYDEN HARPER ENERGY	010-00000218	2004		
R-178	Semet Solvay #18 1679	HAYDEN HARPER ENERGY	010-00000219	2004		
R-179	Calhoun County, WV Tanks	CNX GAS COMPANY LLC	010-00000224	1991		
R-180	KV Oil & Gas FA0506	HAYDEN HARPER ENERGY	010-00000463	1992		
R-181	Fayette Co E0341T	HAYDEN HARPER ENERGY	010-00000466	1988		
R-182	MORRIS D 1657	HAYDEN HARPER ENERGY	010-00000501	1985		

PSSC Number	Facility Name	Responsible Party	Tank Label	Year	Capacity	Contents
R-183	SEMET SOLVAY #11 1672	HAYDEN HARPER ENERGY	010-00000573	2004	[redacted]	
R-184	SEMET SOLVAY COMPRESSOR	HAYDEN HARPER ENERGY	010-00000575	2003		
R-185	Hawks Nest Hydro LLC	GARLETTS, RANDY	010-00000562	2011		
R-186	KV OIL & GAS FA0513	HAYDEN HARPER ENERGY	010-00000151	1992		
R-187	KV OIL & GAS FA0511	HAYDEN HARPER ENERGY	010-00000504	1992		
R-188	Hawks Nest Hydro LLC	GARLETTS, RANDY	010-00000566	1998		
R-189	Fayette County Board of Education	MAXUM PETROLUEM PRODUCTS, INC.	010-00000353	2010		
R-190	WVAW New River Water Treatment Plant	WV AMERICAN WATER CO	010-00000551	1999		
R-191	WVAW New River Water Treatment Plant	WV AMERICAN WATER CO	010-00000554	1999		
R-192	Hawks Nest Hydro LLC	GARLETTS, RANDY	010-00000564	1930		
R-193	Hawks Nest Hydro LLC	GARLETTS, RANDY	010-00000565	1930		
R-194	Fields Creek Storage Area	LOADOUT, LLC	010-00000594	1992		
R-195	Fayette County/Falls View Substation	WVDOH-EQUIPMENT DIVISION	010-00000191	2005		
R-196	Fayette County/Falls View Substation	WVDOH-EQUIPMENT DIVISION	010-00000191	2005		
R-197	WVAW New River Water Treatment Plant	WV AMERICAN WATER CO	010-00000552	1999		
R-198	WVAW New River Water Treatment Plant	WV AMERICAN WATER CO	010-00000553	1999		

Only 107 of 2670 sites were prioritized and labeled due to their potential threat or proximity to the intake. The remaining points in the watershed should be considered to be important by the water system but were not prioritized in this analysis. Additionally, Regulated Points R-2 – R-48 were omitted from the PSSC list.

APPENDIX B. EARLY WARNING MONITORING SYSTEM FORMS

Form B - Proposed Early Warning Monitoring Systems

Kanawha Falls PSD

Primary Surface Water Source:

There are many possible solutions for designing and installing an early warning monitoring system. Over time, this technology changes and improves and it is difficult to determine the type of equipment that will be useful and effective in the long term. This plan is a proposed system that would work for Kanawha Falls PSD using current technology and the current plant and intake configuration.

The primary raw water source for Kanawha Falls PSD is the Kanawha River and the intake is located directly in front of the water treatment plant on the riverbank, about 150' away.

B-1. YSI EXO 2 Monitoring System Proposal
Describe the type of early warning detection equipment that could be installed, including the design.
The YSI EXO 2 Multiport Sonde can accommodate 6 different sensors and has an automatic wiper mechanism to remove biofouling from the sensor tips, which reduces maintenance time. The sonde is built to be resilient and low maintenance, and is capable of providing online water quality monitoring that can be transmitted real time to a designated PC or website that can be accessed by any designated user. The sonde can hold up to 6 sensors, but this plan recommends 4 of the more basic sensors that would be sufficient to detect any sudden shifts in water quality in any West Virginia stream or river. These sensors would include: conductivity/temperature, optical dissolved oxygen, pH, and fluorescent dissolved organic matter (fDOM). The fDOM sensor could potentially detect petroleum products in the water but is not entirely reliable for this purpose. At this time, YSI does not make a sensor for petroleum products for the EXO 2 but likely will in the future, at which time it is recommended that the utility purchase it. Other sensors could be purchased in the future as well if deemed necessary by the utility.
Where would the equipment be located?
The sonde would be attached to the intake pipe itself, which extends only a few feet into the Kanawha River. This would provide a stable foundation for the equipment and also ensure that the device is able to sample the water that is actually entering the intake pipe and not missing potential contaminants because it is located on the wrong side of the stream or too far from the intake. The suggested method of mounting the sonde involves drilling holes in a PVC pipe, capping the end, inserting the sonde and attaching to the intake pipe structure using brackets or chains. This will protect the sensor from debris and hide it from view somewhat. The sonde would be hardwired to the YSI Storm 3 data analysis/telemetry system. Since the Kanawha Falls PSD water treatment plant is so close to the intake, the Storm 3 could be located in the plant itself. If this was not possible and it needed to be located on the bank closer to the intake, the unit is contained in a waterproof case and comes with a solar photovoltaic panel capable of powering both the data analysis unit and the sonde, so long as the sonde is hardwired to the Storm 3. The device can be battery powered as well if this is not an option.

What would the maintenance plan for the monitoring equipment entail?
The maintenance plan for the system would involve replacing the dissolved oxygen sensor cap, replacing the pH electrode cap, and purchasing pH, turbidity, and conductivity calibration solution on a yearly basis. The sonde itself is designed to last from 5-10 years and should be inspected and calibrated once a month. In addition, there is a recurring yearly fee associated with the real-time data/telemetry package for managing the website and data analysis.
Describe the proposed sampling plan at the monitoring site.
The sonde can be programmed to take regular measurements at any intervals defined by the operator or user. These measurements can also be taken in bursts, averaged over a period of time, or modified automatically as water quality levels change. Data is stored in the Storm 3 and transmitted to the plant computer as it is recorded. This information can be transmitted wirelessly via a cellular modem. The cellular transmitter is powerful enough to work even in areas with poor cell reception.
Describe the proposed procedures for data management and analysis.
The Storm 3 package includes data management software that can generate data reports and presentations and allow the user to modify and adjust sampling schedules remotely from the plant. The sonde can be programmed to alert the user when any of the water quality parameters exceeds a user-defined level. This will allow the operator to program the system to notify them when their previously observed baseline conditions are exceeded in time for them to shut down the pumps and close off the intake. The operator can receive alerts via text message and email at the treatment plant computer or any designated cell phone.

B-2. Hach sc1000 Monitoring System Proposal
Describe the type of early warning detection equipment that could be installed, including the design.
The Hach sc1000 online monitoring system includes a controller, back panel, display module, and trough. Raw water is pumped into the trough from the source where it can be sampled in real time. The probe module can accommodate up to 6 sensors, which means it can monitor up to 6 parameters at once. This plan suggests the following sensors: conductivity, pH, turbidity, and dissolved oxygen. Hach can also supply a sensor to detect oil in water, which would cost an additional $18,414.00 and would possibly be a good investment for any water system if sufficient funds were available. This sensor is not included in the quoted capital cost. There are several other probes for other parameters that are available from Hach, and these could be purchased as deemed necessary by the utility.
Where would the equipment be located?
The sc1000 Controller, back panel, and trough could be located in the plant itself. A small diameter line would run out from the plant the length of the intake pipe to pull raw water back to the controller where it would flow into the trough for sampling. The closer this sampling line can be to the actual intake, the more accurately it will reflect the raw water that is actually entering the plant. This option would require the utility to purchase a

line or hose long enough to reach the intake pipe and a small pump. The line and pump could be fairly low-tech and inexpensive, as the sc1000 only requires a minimum of 900 mL/min. of flow.

The controller will be equipped with the MODBUS advanced communications/networking unit, which can transmit readings in real time directly to the SCADA system in the treatment plant to alert the operators in any change in baseline water quality. The sc1000 can either be hardwired to the computer at the treatment plant or it can use a cellular modem to transmit the data if there is sufficient cellular signal.

What would the maintenance plan for the monitoring equipment entail?

The maintenance plan for the system would entail a yearly maintenance contract with the manufacturer. A Hach Service Representative would regularly service the monitoring equipment. This service would take care of all parts, labor, and preventative maintenance and would include 2-3 scheduled maintenance visits per year.

Describe the proposed sampling plan at the monitoring site.

The sc1000 monitors the quality of water flowing through the trough in real time, and can transmit this data back to the plant as it is collected. The actual timing of the sampling plan could be determined by the utility.

Describe the proposed procedures for data management and analysis.

It is recommended that the utility purchase the Hach Universal Data Gateway software, which would help to process and analyze the incoming information into easily interpreted reports. The price of this software is included in the rough capital cost.

B-3. Real Tech Full Scanning UV-VIS Monitoring System

Describe the type of early warning detection equipment that could be installed, including the design.

The Real Tech Full Scanning UV-VIS monitoring system provides full ultraviolet/visible scanning for organics and other specific parameters that may indicate a contamination event. The included PC Controller is pre-loaded with the software needed to store and process this information to establish a “normal” or “baseline” set of conditions for the raw water source. In addition to the UV-VIS sensors, the system can accommodate up to 8 additional sensors that are available from a third party and priced separately.

This plan includes pricing and details for a system equipped to measure conductivity, pH, temperature, and dissolved oxygen. Other additional sensors could be purchased and added if deemed necessary by the utility.

Where would the equipment be located?

In the case of Kanawha Falls PSD, the UV-VIS Full Monitoring System could be located in the water treatment plant since it is so close to the raw water intake. A small-diameter line or hose would run from the treatment plant to the intake pipe to pull raw water back to the controller where it would flow into the unit for sampling. The closer the end of the sampling line can be to the actual intake, the more accurately it will reflect the raw water that is actually entering the plant. This option would require the utility to purchase enough line to reach the intake as well as a small pump. The line and pump could be fairly small and inexpensive, as the

system only requires a minimum of 300-800 mL/min. of flow. The system also includes the Real Pump Clean System, which provides flow and automatic chemical cleaning of the sensors and reduces maintenance time.

This system would require a reliable electrical source, but it could likely be powered by the water treatment plant since it is so close.

What would the maintenance plan for the monitoring equipment entail?

The maintenance plan for the system would require about 2 hrs/month for scheduled maintenance tasks. It is also recommended that a monthly laboratory reference sample is taken to effectively calibrate the sensors.

The Smart-Sense Web Monitoring Service package costs an additional $499/yr., but provides additional support and remote accessibility by Real Tech, and it is recommended. The Deuterium and Tungsten lamps would also need to be replaced every six months at a cost of $740.

Describe the proposed sampling plan at the monitoring site.

The Full Scanning UV-VIS system continuously monitors raw water as it is pumped through the unit, and is capable of establishing baseline conditions that account for seasonal variability, which can help to reduce false alarms.

Describe the proposed procedures for data management and analysis.

The Real Tech monitoring system is capable of communicating with the treatment plant via Modbus, Ethernet, USB, or cell modem. It can be integrated with the treatment plant's SCADA system to provide real-time information about conditions at the intake and provides full remote monitoring.

It is also recommended that the utility take advantage of the Smart-Sense Web Monitoring service offered by Real-Tech to analyze and interpret data taken by the monitoring system. This consultation service requires an additional service fee, which is included in this quote.

APPENDIX C. COMMUNICATION PLAN TEMPLATE

Kanawha Falls PSD

PWSID: WV3301037 **District:** Beckley

Certified Operator: Carl King

Contact Phone Number: 304-632-1633

Contact Email Address: kfpsd_12@yahoo.com

Plan Developed On: July 1, 2016

ACKNOWLEDGMENTS:

This plan was developed by Kanawha Falls PSD to meet certain requirements of the Source Water and Assessment Protection Program (SWAPP) and the Wellhead Protection Program (WHPP) for the State of West Virginia, as directed by the federal Safe Drinking Water Act (SDWA) and state laws and regulations.

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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
Rick Wagner	Kanawha Falls PSD	304-632-1633	kfpsd_12@yahoo.com	Primary Spokesperson
Carl King	Kanawha Falls PSD	304-779-2600	kfpsd_12@yahoo.com	Secondary Spokesperson
Roger Wagner	Kanawha Falls PSD	304-640-2131	rwagner@glbsm.com	Member
Damon Runyon	Gauley Bridge Fire Department	304-632-1810	Damon_47@yahoo.com	Member

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

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

COMMUNICATION TEAM DUTIES

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

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

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

- Be knowledgeable on elements of the Source Water Protection Plan and Communication Plan
- Attend team meetings to ensure up-to-date knowledge of the system and its functions
- Participate in periodic exercises that “game out” incident response and communication tasks
- Help to educate local officials, the media, and others on source water protection

- Cooperate with water supplier efforts to coordinate incident response communication
- Be prepared to respond to requests for field investigations of reported incidents
- Not speak on behalf of the water supplier unless designated as the system's spokesperson

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

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

INCIDENT / EVENT COMMUNICATION PROCEDURE

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

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

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

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

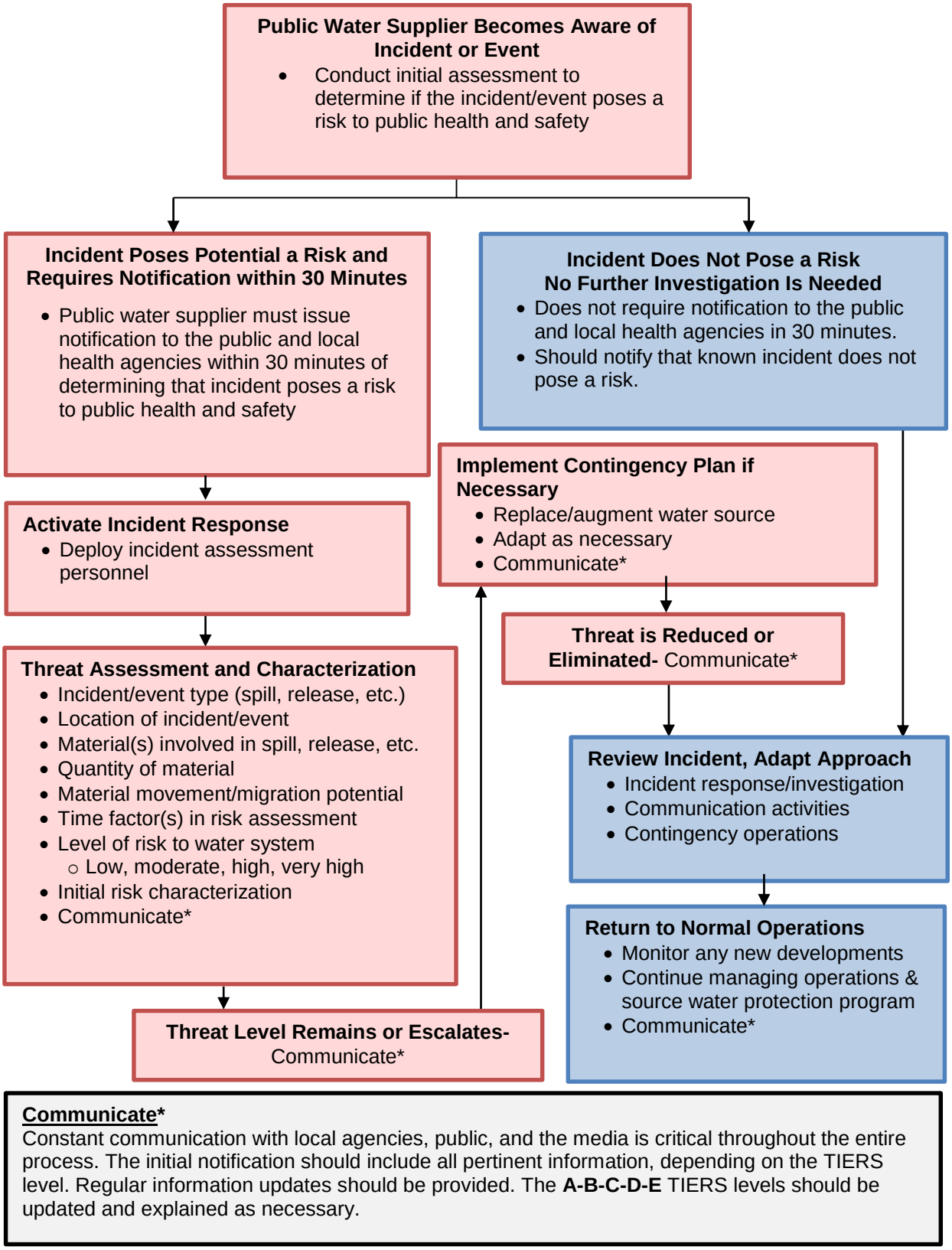
As the flow chart indicates, several iterative cycles will occur after the initial threat assessment, including communication with local agencies and the public, further investigation of the incident, possible implementation of the water system's contingency plan, and eventual elimination of the threat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

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

After the threat level is reduced and operations return to normal, the water system staff, as well as the communication and source water protection teams and their partners, will conduct a post-event review and

assessment. The purpose of the review is to examine the response to the incident, relevant communication activities, and overall outcomes. Plans and procedures may be updated, altered, or adapted based on lessons learned through this process.

TIERS FLOW CHART



EMERGENCY SHORT FORMS

Emergency Communication Information

	Name	Phone Number	Email
Designated spokesperson:	Rick Wagner	304-632-1633	kfpsd_12@yahoo.com
Alternate spokesperson:	Carl King	304-779-2600	-
Designated location to disseminate information to media:	Kanawha Falls PSD Office or the water treatment plant		
Methods of contacting affected residents:	Kanawha Falls PSD primarily contacts affected residents about important information using local newspapers, posted notices, radio, and television. The water system staff are looking into the possibility of adopting an emergency notification system to facilitate communication with customers.		

	Name	Title	Phone Number	Email
Media contacts:	WVNSTV	59 News CBS Affiliate, Oak Hill, WV	304-929-6420	news@wvnstv.com
	WSAZ	News Channel 3 NBC Affiliate, Charleston, WV	304-344-3521	news@wsaz.com
	WOAYTV 50	ABC Affiliate, Oak Hill, WV	304-469-3361	news@woay.com

Emergency Services Contacts

	Name	Emergency Phone	Alternate Phone	Email
Local Police	Gauley Bridge Police Department	911	304-632-2504	-
Local Fire Department	Gauley Bridge Fire Department	911	304-632-1810	-
Local Ambulance Service	Jan Care General Ambulance Service	911	304-632-1122	-

			304-779-2166	
Hazardous Material Response Service	Boomer Volunteer Fire Department	304-779-2763	304-574-3590	-

Sensitive Populations

Other communities that are served by the utility:	Gauley Bridge, Boomer, Alloy		
Major user/sensitive population notification:	**Name**	**Emergency Phone**	**Alternate Phone**
	World Changers Christian Academy	304-810-9222	-
	Boomer Baptist Church School	304-442-8967	-
	Gauley Bridge Elementary School	304-632-2661	-
EED District Office Contact:	**Name**	**Phone**	**Email**
	John Stafford	304-256-6666 EED Central Office 304-558-2981	john.pb.stafford@wv.gov
OEHS Readiness Coordinator	Warren Von Dollen	304-356-4290 (main) 304-550-5607 (cell)	warren.r.vondollen@wv.gov

Downstream Water Contacts:	**Water System Name**	**Contact Name**	**Emergency Phone**	**Alternate Phone**
	Armstrong PSD	Joe Burdett	Treatment Plant 304-442-5044	Don Navarro 304-442-5647
	WVAW-Montgomery District	Dave Peters	Treatment Plant 304-442-9728	304-340-2038
	Community of Cedar Grove	Kenneth Barton	Treatment Plant 304-595-2991	Utility Office 304-595-1841

Are you planning on implementing the TIER system?	Yes

Key Personnel

	Name	Title	Phone	Email
Key staff responsible for coordinating emergency response procedures?	Rick Wagner	Utility Manager	304-632-1633	kfpsd_12@yahoo.com
	Carl King	Chief Operator	304-779-2600	-
Staff responsible for keeping confidential PSSC information and releasing to emergency responders:	Rick Wagner	Utility Manager	304-632-1633	kfpsd_12@yahoo.com
	Carl King	Chief Operator	304-779-2600	-

Emergency Response Information

	Name	Phone
List laboratories available to perform sample analysis in case of emergency:	REIC Laboratory- Beaver, WV	800-999-0105, 304-255-2500, info@reiclabs.com
	ALS Environmental- South Charleston, WV	304-356-3168
	WV State Laboratory, Environmental Chemistry Section- Charleston, WV	304-965-2694
Has the utility developed a detailed Emergency Response Plan in accordance with the Public Health Security Bioterrorism Preparedness and Response Pan Act of 2002?	No	
When was the Emergency Response Plan developed or last updated?	N/A	

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 Plan

Contingency Plan and Feasibility Study

KANAWHA FALLS PSD

PWSID WV3301037
FAYETTE COUNTY

SEPTEMBER 2015

Prepared by:

Tetra Tech, Inc.
803 Quarrier Street, Suite 400
Charleston, WV 25314

In cooperation with Kanawha Falls PSD

TETRA TECH

Victor D'Amato, PE

9/10/15
Date

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Background

To fulfill the requirements of Senate Bill 373 and Legislative Rule 64 CSR 3, Kanawha Falls Public Service District (PSD) has participated in a study to evaluate its existing contingency planning and feasibility of source water alternatives. This Contingency Planning and Feasibility Study report documents the results of the study and provides information about the utility's ability to prevent contaminants from entering the water system if possible, and sufficiently respond to an emergency if necessary. This report represents only a portion of the required elements of the Source Water Protection Plan for Kanawha Falls PSD. The information presented in this report will be included in the final Source Water Protection Plan.

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. Utilities should examine their capacity to protect their intake, treatment facility, and distribution system from contamination. They should also review their ability to use alternative sources, minimize water loss, meet future water demands, and operate during power outages. In addition, utilities should report the feasibility of establishing an early warning monitoring system. The following sections address these considerations and present information required for the source water protection plan.

Responding to Water Shortage or Contamination Event

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 includes 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 in the event of such an emergency also becomes extremely important. 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 Kanawha Falls PSD is provided in **Table 1**.

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/). Kanawha Falls PSD has analyzed its ability to effectively respond to emergencies and this information is also provided in **Table 1**.

Table 1. Kanawha Falls PSD Water Shortage Response Capability

Can the utility isolate or divert contamination from the intake or groundwater supply?	Yes
Describe the utility's capability to isolate or divert potential contaminants:	The utility has access to booms they can use to isolate the raw water intake from surface contaminants. WVA Manufacturing, which is located just downstream from the treatment plant, also has booms available.
Can the utility switch to an alternative water source or intake that can supply full capacity at any time?	No
Describe in detail the utility's capability to switch to an alternative source:	The utility has no means of switching to an alternative source of raw water.
Can the utility close the water intake to prevent contamination from entering the water supply?	Yes
How long can the intake stay closed?	If the tanks were full when the intake went closed, the water system could operate for 1.7 days. This is partially dependent on the ability of Gauley River PSD, who is supplied by Kanawha Falls, to conserve their water.
Describe the process to close the intake:	The operator can manually close a valve to shut off the intake and prevent contaminated raw water from entering the plant.
Describe the raw and treated water storage capacity of the water system:	Kanawha Falls PSD has 6 treated water storage tanks and 2 booster pump stations (BPS). Boomer Tank- 200,000 gallons Falls View Tank #1- 300,000 gal. Falls View Tank #2- 300,000 gal. Gauley Bridge High Tank- 107,000 gal. Gauley Bridge Low Tank- 223,000 gal. Charlton Heights Tank- 105,000 gal. **Total= 1,235,000 gal. treated water storage** The utility does not have any raw water storage.
Is the utility a member of WVRWA Emergency Response Team?	The utility is a member of West Virginia Rural Water Association (WVRWA) but not the WVRWA Emergency Response Team.
Is the utility a member of WV-WARN?	No

List any other mutual aid agreements to provide or receive assistance in the event of an emergency:	The utility has an informal mutual aid agreement with West Virginia American Water in Montgomery, who provided them with water tankers during the 2015 train derailment.

Operation During Loss of Power

Kanawha Falls PSD 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 summarized in **Table 2**.

Table 2. Kanawha Falls PSD Generator Capacity

What is the type and capacity of the generator needed to operate during a loss of power?		The Kanawha Falls water treatment plant requires a 250kW generator, and the two booster stations each require a 50 kW generator to operate during a power outage. They currently do not own any generators, and plan on renting them as needed.	
Can the utility connect to generator at intake/wellhead? If yes, select a scenario that best describes system.		No. The raw water intake is located directly adjacent to the treatment plant and the pumps are powered by the plant, so a generator is not necessary.	
Can the utility connect to generator at treatment facility? If yes, select a scenario that best describes system.		Yes. The treatment plant is fully wired to be connected to a generator that will be rented or borrowed during a power outage.	
Can the utility connect to a generator in distribution system? If yes, select a scenario that best describes system.		Yes. Both booster pump stations are fully wired for a generator that will be rented or borrowed during a power outage.	
Does the utility have adequate fuel on hand for the generator?		No. Kanawha Falls PSD does not have any on-site fuel storage.	
What is your on-hand fuel storage and how long will it last operating at full capacity?		**Gallons**	**Hours**
		None.	N/A
Provide a list of suppliers that could provide generators and fuel in the event of an emergency:	**Supplier**		**Contact Information**
	Generator	Mountaineer Generator- Elkins, WV	(304) 636-0011 or (724) 324-2122

	Generator	Walker Caterpillar- Belle, WV	(304) 949-6400
	Fuel	West Virginia Division of Highways- Kanawha Falls, WV	(304) 647-7450
	Fuel	Sunoco- Montgomery, WV	(304) 442-8900
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:		The utility has had no problem renting generators when they needed them in the past and plans to rent them again in the event of a power outage.	

Future Water Supply Needs

When planning for potential emergencies and developing contingency plans, a utility needs not only to 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. Kanawha Falls PSD has analyzed its ability to meet future water demands at current capacity, and this information is included in **Table 3**.

Table 3. Future Water Supply Needs for Kanawha Falls 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- The utility does not expect any significant changes in demand over the next 5 five years, and the treatment plant is currently operating at an average of 50%-60% of capacity. No water line extensions are planned for the next five years, and there is no expected increase in population. The water system's opinions concerning the demand for the next five years are generally supported by population trends projected based on US Census Bureau 2000 and 2010 data. According to the 2005 Interim State Population Projections [(1)], WV as a whole will see a population decline between 2010 and 2030. In addition, researchers at the WVU College of Business and Economics specifically project that populations within Fayette County will decrease from population of 46,039 in 2010 to a projected population of 44,611 in 2020 [(2)]. Census data and projections cannot account for increases in daily demand due to water line extensions. If in the future water line extension projects are proposed the daily demands will be

	reassessed to determine if the source and treatment facilities can support increased demand.
If not, describe the circumstances and plans to increase production capacity:	N/A

(1)US Department of Commerce, United State Census Bureau. 2005 Interim State Population Projections. Table 1. http://www.census.gov/population/projections/data/state/projectionsagesex.html. Accessed June 10, 2015.

(2) Christiadi, Ph.D., Deskins, John, Ph.D., Lego, Brian. WVU College of Business and Economics, Bureau of Business and Economic Research. March 2014. WVU Research Corporation. http://be.wvu.edu/bber/pdfs/BBER-2014-04.pdf Accessed June 10, 2015.

Water Loss

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. This can include unmetered uses, leaks, and other losses. 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.

Metered usages are most often those that are distributed to customers. Non-metered usages that are being estimated include uses such as by the 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 subtracting the metered and non-metered uses from the total raw water pumped, the utility can calculate 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 shortage or other emergency and should be included in the calculation of percentage of water loss for purposes of the source water protection plan. The data in **Table 4** is taken from the most recently submitted Kanawha Falls PSD PSC Annual Report.

Table 4. Annual Water Loss Information*

Total Water Pumped (gal)		204,000,000
Total Water Purchased (gal)		0
Total Water Pumped and Purchased (gal)		204,000,000
Water Loss Accounted for Except Main Leaks (gal)	**Mains, Plants, Filters, Flushing, etc.**	0
	Fire Department	0
	Back Washing	0

	Blowing Settling Basins	0
Total Water Loss Accounted For Except Main Leaks		0
Water Sold- Total Gallons (gal)		182,500,000
Unaccounted For Lost Water (gal)		21,489,000
Water lost from main leaks (gal)		11,000,000
Total gallons of Unaccounted for Lost Water and Water Lost from Main Leaks (gal)		21,500,000
Total Percent Unaccounted For Water and Water Lost from Main Leaks (gal)		10.54%
If total percentage of Unaccounted for Water is greater than 15%, please describe any measures that could be taken to correct this problem:	The utility has been successful in keeping their total water loss under 15% and plans to continue to manage their system as efficiently as possible.	

*Water loss data is taken from the 2013 Public Service Commission Annual Report for Kanawha Falls PSD. The 2013 report was used because the 2014 report did not contain information about water production or loss.

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 provides 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 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 Potential Sources of Significant Contamination (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 preservation 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, 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.

Kanawha Falls 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 can be found in **Table 5** and in **Appendix A.**

Table 5. Early Warning Monitoring System Capabilities

<table>
<tr><td colspan="2">Does your system currently receive spill notifications from a state agency, neighboring water system, local emergency responders, or other facilities? If yes, from whom do you receive notices?</td><td colspan="2">Yes. Kanawha Falls PSD has received notices about possible contamination from Brookfield Energy, who manages the hydro-electric plants upstream.

The have also received notices from the West Virginia Division of Homeland Security and Emergency Management</td></tr>
<tr><td colspan="2">Are you aware of any facilities, land uses, or critical areas within your protection areas where chemical contaminants could be released or spilled?</td><td colspan="2">Yes. The utility's primary concerns are the hydro-electric energy plants that operate immediately upstream from the intake. The plants have had issues in the past but maintain regular communication with the operators at Kanawha Falls about any accidents or spills that may occur.</td></tr>
<tr><td colspan="2">Are you prepared to detect potential contaminants if notified of a spill?</td><td colspan="2">No</td></tr>
<tr><td rowspan="4">List laboratories (and contact information) on whom you would rely to analyze water samples in case of a reported spill.</td><td colspan="3">Laboratories</td></tr>
<tr><td>Name</td><td colspan="2">Contact</td></tr>
<tr><td>REIC Laboratory- Beaver, WV</td><td colspan="2">800-999-0105, (304) 255-2500, info@reiclabs.com</td></tr>
<tr><td>ALS Environmental- South Charleston, WV</td><td colspan="2">(304) 356-3168</td></tr>
<tr><td colspan="2">Do you have an understanding of baseline or normal conditions for your source water quality that accounts for seasonal fluctuations?</td><td colspan="2">Yes - The utility tests daily for pH, turbidity, chlorine, fluoride, and alkalinity. They have an understanding of normal baseline conditions for their raw water source.</td></tr>
<tr><td colspan="2">Does your utility currently monitor raw water (through continuous monitoring or periodic grab samples) at the surface</td><td colspan="2">No. See Form B in Appendix A.</td></tr>
</table>

water intake or from a groundwater source on a regular basis?				
Provide or estimate the capital and O&M costs for your proposed early warning monitoring system or upgraded system.	**Monitoring System**	**YSI EXO 2 (Table B-1)**	**Hach sc1000 (Table B-2)**	**Real Tech Full Scanning Monitoring System (Table B-3)**
	Capital	Total Capital Cost- $19,000	Approximate Capital Cost- $18,907	Approximate Capital Cost- $24,155
	Yearly O & M	Parts and calibration- Approximately $1,000 Data management and telemetry- $1,000	Full service contract with Hach Service Representative- $2,258 Online Viewer-$600	Replacement Lamps- $1,480 Smart-Sense Monitoring Service- $499
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 in 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 developing 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 in addition to what is currently stored to meet water system design standards, interconnection with neighboring systems, or other options identified on a local level. Note that a secondary intake must draw water supplies from a substantially different location on the same water source, or from an entirely different water source.

To accomplish this requirement, the utility has examined existing and possible alternatives and ranked them by their technical, economic, and environmental feasibility according to the West Virginia Department of Health and Human Resources Bureau for Public Health (WVBPH) 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, the utility has documented the process used to examine the feasibility of each alternative, and has generated scores that compare the alternatives. The Feasibility Study Matrix is attached as **Appendix B**.

In addition to the Feasibility Study Matrix spreadsheet, a brief narrative is also included in **Appendix B** that identifies one or more feasible alternative, provides a summary of data used to make this determination, and briefly summarizes the results of the matrix.

Appendix A. Early Warning Monitoring System

Form B - Proposed Early Warning Monitoring Systems

Kanawha Falls PSD

Primary Surface Water Source:

There are many possible solutions for designing and installing an early warning monitoring system. Over time, this technology changes and improves and it is difficult to determine the type of equipment that will be useful and effective in the long term. This plan is a proposed system that would work for Kanawha Falls PSD using current technology and the current plant and intake configuration.

The primary raw water source for Kanawha Falls PSD is the Kanawha River and the intake is located directly in front of the water treatment plant on the riverbank, about 150' away.

B-1. YSI EXO 2 Monitoring System Proposal
Describe the type of early warning detection equipment that could be installed, including the design.
This plan uses the YSI EXO 2 Multiport Sonde, which can accommodate 6 different sensors and has an automatic wiper mechanism to remove biofouling from the sensor tips, which reduces maintenance time. The sonde is built to be resilient and low maintenance, and is capable of providing online water quality monitoring that can be transmitted real time to a designated PC or website that can be accessed by any designated user. The sonde can hold up to 6 sensors, but this plan recommends 4 of the more basic sensors that would be sufficient to detect any sudden shifts in water quality in any West Virginia stream or river. These sensors would include: conductivity/temperature, optical dissolved oxygen, pH, and fluorescent dissolved organic matter (fDOM). The fDOM sensor could potentially detect petroleum products in the water but is not entirely reliable for this purpose. At this time, YSI does not make a sensor for petroleum products for the EXO 2 but likely will in the future, at which time it is recommended that the utility purchase it. Other sensors could be purchased in the future as well if deemed necessary by the utility.
Where would the equipment be located?
The sonde would be attached to the intake pipe itself, which extends only a few feet into the Kanawha River. This would provide a stable foundation for the equipment and also ensure that the device is able to sample the water that is actually entering the intake pipe and not missing potential contaminants because it is located on the wrong side of the stream or too far from the intake. The suggested method of mounting the sonde involves drilling holes in a PVC pipe, capping the end, inserting the sonde and attaching to the

intake pipe structure using brackets or chains. This will protect the sensor from debris and hide it from view somewhat.

The sonde would be hardwired to the YSI Storm 3 data analysis/telemetry system. Since the Kanawha Falls PSD water treatment plant is so close to the intake, the Storm 3 could be located in the plant itself. If this was not possible and it needed to be located on the bank closer to the intake, the unit is contained in a waterproof case and comes with a solar photovoltaic panel capable of powering both the data analysis unit and the sonde, so long as the sonde is hardwired to the Storm 3. The device can be battery powered as well if this is not an option.

What would the maintenance plan for the monitoring equipment entail?

The maintenance plan for the system would involve replacing the dissolved oxygen sensor cap, replacing the pH electrode cap, and purchasing pH, turbidity, and conductivity calibration solution on a yearly basis. The sonde itself is designed to last from 5-10 years and should be inspected and calibrated once a month.

In addition, there is a recurring yearly fee associated with the real-time data/telemetry package for managing the website and data analysis.

Describe the proposed sampling plan at the monitoring site.

The sonde can be programmed to take regular measurements at any intervals defined by the operator or user. These measurements can also be taken in bursts, averaged over a period of time, or modified automatically as water quality levels change. Data is stored in the Storm 3 and transmitted to the plant computer as it is recorded. This information can be transmitted wirelessly via a cellular modem. The cellular transmitter is powerful enough to work even in areas with poor cell reception.

Describe the proposed procedures for data management and analysis.

The Storm 3 package includes data management software that can generate data reports and presentations and allow the user to modify and adjust sampling schedules remotely from the plant.

The sonde can be programmed to alert the user when any of the water quality parameters exceeds a user-defined level. This will allow the operator to program the system to notify them when their previously observed baseline conditions are exceeded in time for them to shut down the pumps and close off the intake. The operator can receive alerts via text message and email at the treatment plant computer or any designated cell phone.

B-2. Hach sc1000 Monitoring System Proposal
Describe the type of early warning detection equipment that could be installed, including the design.
The Hach sc1000 online monitoring system, which includes a controller, back panel, display module, and trough. Raw water is pumped into the trough from the source where it can be sampled in real time. The probe module can accommodate up to 6 sensors, which means it can monitor up to 6 parameters at once. This plan suggests the following sensors: conductivity, pH, turbidity, and dissolved oxygen. Hach can also supply a sensor to detect oil in water, which would cost an additional $18,414.00 and would possibly be a good investment for any water system if sufficient funds were available. This sensor is not included in the quoted capital cost. There are several other probes for other parameters that are available from Hach, and these could be purchased as deemed necessary by the utility.
Where would the equipment be located?
The sc1000 Controller, back panel, and trough could be located in the plant itself. A small diameter line would run out from the plant the length of the intake pipe to pull raw water back to the controller where it would flow into the trough for sampling. The closer this sampling line can be to the actual intake, the more accurately it will reflect the raw water that is actually entering the plant. This option would require the utility to purchase a line or hose long enough to reach the intake pipe and a small pump. The line and pump could be fairly low- tech and inexpensive, as the sc1000 only requires a minimum of 900 mL/min. of flow. The controller will be equipped with the MODBUS advanced communications/networking unit, which can transmit readings in real time directly to the SCADA system in the treatment plant to alert the operators in any change in baseline water quality. The sc1000 can either be hardwired to the computer at the treatment plant or it can use a cellular modem to transmit the data if there is sufficient cellular signal.
What would the maintenance plan for the monitoring equipment entail?
The maintenance plan for the system would entail a yearly maintenance contract with the manufacturer. A Hach Service Representative would regularly service the monitoring equipment. This service would take care of all parts, labor, and preventative maintenance and would include 2-3 scheduled maintenance visits per year.
Describe the proposed sampling plan at the monitoring site.
The sc1000 monitors the quality of water flowing through the trough in real time, and can transmit this data back to the plant as it is collected. The actual timing of the sampling plan could be determined by the utility.
Describe the proposed procedures for data management and analysis.
It is recommended that the utility purchase the Hach Universal Data Gateway software, which would help to process and analyze the incoming information into easily interpreted reports. The price of this software is included in the rough capital cost.

B-3. Real Tech Full Scanning UV-VIS Monitoring System
Describe the type of early warning detection equipment that could be installed, including the design.
This plan utilizes the Real Tech Full Scanning UV-VIS monitoring system, which provides full ultraviolet/visible scanning for organics and other specific parameters that may indicate a contamination event. The included PC Controller is pre-loaded with the software needed to store and process this information to establish a "normal" or "baseline" set of conditions for the raw water source. In addition to the UV-VIS sensors, the system can accommodate up to 8 additional sensors that are available from a third party and priced separately. This plan includes pricing and details for a system equipped to measure conductivity, pH, temperature, and dissolved oxygen. Other additional sensors could be purchased and added if deemed necessary by the utility.
Where would the equipment be located?
In the case of Kanawha Falls PSD, the UV-VIS Full Monitoring System could be located in the water treatment plant since it is so close to the raw water intake. A small-diameter line or hose would run from the treatment plant to the intake pipe to pull raw water back to the controller where it would flow into the unit for sampling. The closer the end of the sampling line can be to the actual intake, the more accurately it will reflect the raw water that is actually entering the plant. This option would require the utility to purchase enough line to reach the intake as well as a small pump. The line and pump could be fairly small and inexpensive, as the system only requires a minimum of 300-800 mL/min. of flow. The system also includes the Real Pump Clean System, which provides flow and automatic chemical cleaning of the sensors and reduces maintenance time. This system would require a reliable electrical source, but it could likely be powered by the water treatment plant since it is so close.
What would the maintenance plan for the monitoring equipment entail?
The maintenance plan for the system would require about 2 hrs/month for scheduled maintenance tasks. It is also recommended that a monthly laboratory reference sample is taken to effectively calibrate the sensors. The Smart-Sense Web Monitoring Service package costs an additional $499/yr., but provides additional support and remote accessibility by Real Tech, and it is recommended. The Deuterium and Tungsten lamps would also need to be replaced every six months at a cost of $740.
Describe the proposed sampling plan at the monitoring site.

The Full Scanning UV-VIS system continuously monitors raw water as it is pumped to through the unit, and is capable of establishing baseline conditions that account for seasonal variability, which can help to reduce false alarms.
Describe the proposed procedures for data management and analysis.
The Real Tech monitoring system is capable of communicating with the treatment plant via Modbus, Ethernet, USB, or cell modem. It can be integrated with the treatment plant's SCADA system to provide real-time information about conditions at the intake and provides full remote monitoring. It is also recommended that the utility take advantage of the Smart-Sense Web Monitoring service offered by Real-Tech to analyze and interpret data taken by the monitoring system. This consultation service requires an additional service fee, which is included in this quote.

Single Source Alternatives Feasibility Study

KANAWHA FALLS PSD

PWSID: WV3301037

TETRA TECH

PURPOSE

This Source Water Alternatives Feasibility Study (the Study) is prepared in accordance with legislative rule 64CSR3. The rule provides for numerous source water protection planning activities. As part of these activities, if a secondary source of water supply is not available, public water systems (PWSs) are required to prepare a study to determine the technical and economic feasibility of the following options to provide continued water service in the event the source water becomes contaminated. The options include:

- Constructing or establishing a secondary or backup intake which would draw water supplies from a substantially different location or water source;
- Constructing additional raw water storage capacity and/or treated water storage capacity to provide at least two days of system storage based on the plant's maximum level of production experience in the last year;
- Creating or constructing an operation interconnection(s) between PWS with other PWS plants or another PWS to allow the utility to receive its water from a different source of supply;
- Any other alternative which is available to the PWS to secure safe and reliable alternative water supply.

If one or more of the above options is determined to be feasible, the PWS is required to provide additional detail on the costs, risks and benefits of implementing each feasible alternative.

This Study utilizes the matrix provided by the West Virginia Department of Health and Human Resources, Bureau for Public Health to determine the feasibility of the alternatives for the Kanawha Falls Public Services District (PSD). The matrix provides a systematic method of evaluating alternatives using numerous factors and a system to rank the economic, technical and environmental feasibility of each alternative.

SYSTEM DESCRIPTION

The Kanawha Falls PSD provides water service to approximately 2,700 people. Located in Fayette County, the PWS uses the Kanawha River as its raw water supply. **Figure 1** presents the location of the PWS. The design capacity of the WTP is 1.44 MGD and the WTP uses pre-sedimentation, sedimentation, soda-ash treatment and fluoridation to treat the water to potable standards. **Table 1** below provides a summary of the recent demands in the Kanawha Falls system.

Table 1. Kanawha Falls PSD Capacity and Demands

Parameter	Value
2014 Average Day Demand (MGD)	0.736
2014 Maximum Day Demand (MGD)	1.181
WTP Capacity (MGD)	1.44
WTP Utilization at Maximum Day Demand	82%
MDD to ADD Ratio [(1)]	1.60

(1) Ratio Calculated using Maximum Daily Demand (MDD)/Average Daily Demand (ADD)

Storage in the Kanawha Falls system is provided by elevated storage tanks throughout the distribution system. **Table 2** provides a summary of the tanks.

Table 2. City of Kanawha Falls Storage

Name	Type	Volume (gallons)
ST006 - Boomer Tank	Elevated	200,000
ST007 - Falls View Tank 2	Elevated	300,000
ST005 - Falls View Tank 1	Elevated	300,000
ST003 - Gauley Bridge (high)	Elevated	107,000
ST002 - Gauley Bridge (low)	Elevated	223,000
ST004 - Charlton Heights	Elevated	105,000
Total		1,235,000
2014 ADD (MGD)		0.736
Days Storage		1.68 days

Currently Kanawha Falls does not meet the two day average day demand requirement. Given the relatively sprawling, non-looped nature of the distribution system it is unlikely the storage tanks can provide water beyond their specific supply zones. In the event of a WTP outage the higher elevation tanks will likely be at the highest risk of emptying first.

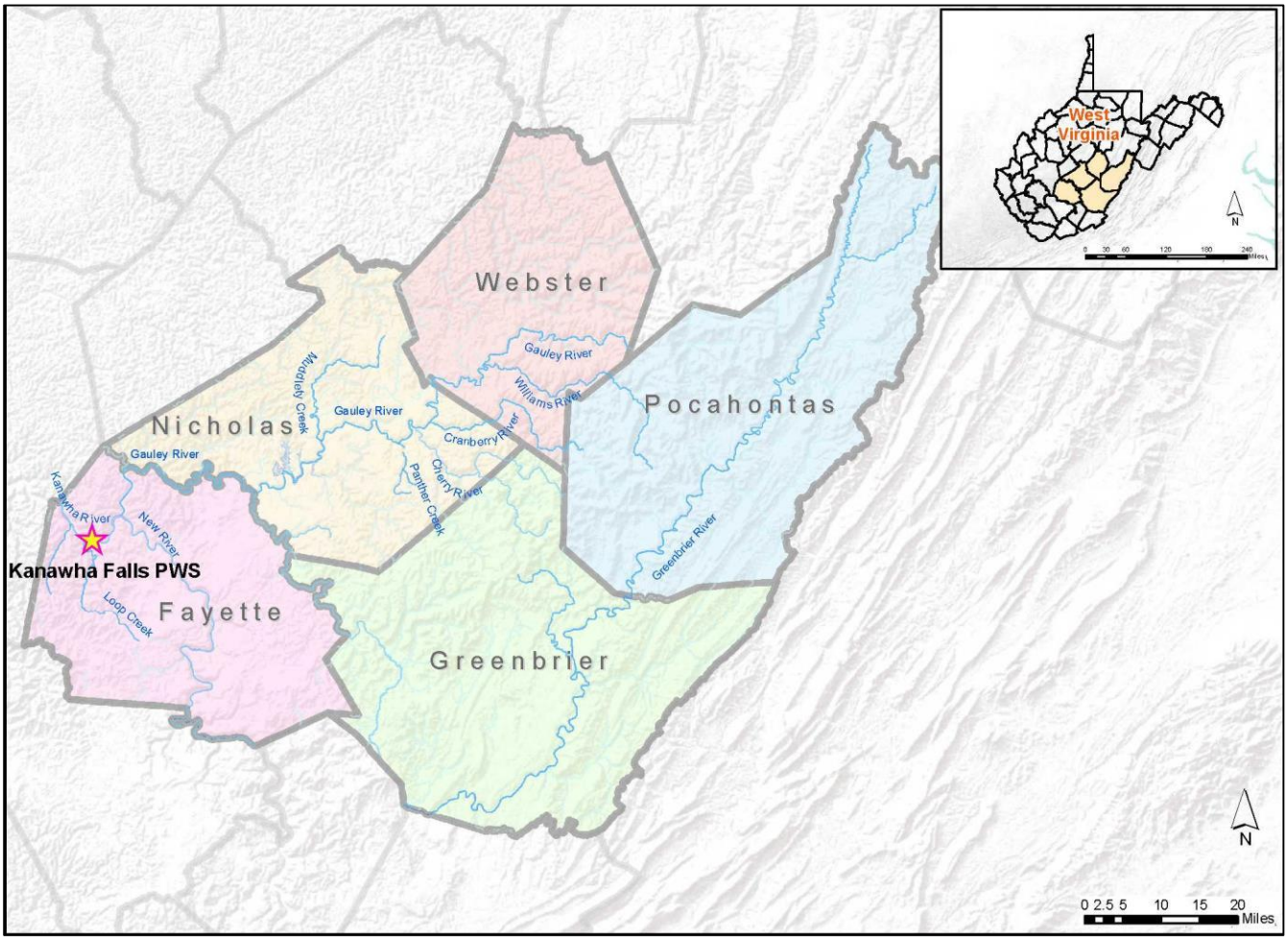


Figure 1. Kanawha Falls PSD Location Map

ALTERNATIVES

The alternatives evaluated are based on matching the capacity of the Kanawha Falls WTP. This will provide a common level of service among all alternatives. **Table 3** below provides the basis for sizing each alternative:

Table 3. Alternatives – Sizing Basis

Alternative	Backup Intake	Raw Storage	Treated Storage	Interconnect
Basis	Max day	2 days of max day demand	2 days of max day demand	Average day
Value	1.44 MGD	2.88 MG	2.88 MG	0.897 MGD

Cost estimates were developed based on a conceptual analysis of each alternative. All costs were reviewed for accuracy and compared with actual costs of similar projects and RSMeans CostWorks 2014. The estimates include materials, installation and contractor's overhead and profit. The estimates are also based on the following assumptions and considerations:

- Piping is priced as mechanical joint ductile iron unless noted otherwise, and includes provisions for road crossings, aerial crossings and site restoration.
- Raw water and treated water storage tanks are priced as steel ground tanks with site work and installation included.
- Pumps are sized and priced based on conceptual level estimates of the required pumping conditions (flow and total dynamic head).
- Precast concrete vaults and metal pump enclosures are sized to house the estimated number of pumps required along with HVAC, electrical, and controls equipment.
- Electrical and controls costs are estimated at 10% of the overall facility costs including pumps.
- Site work is estimated as a lump sum cost based on the approximate size of the disturbed area and other factors that affect level of effort (i.e. whether or not the site is within the 100-yr floodplain).
- Estimates include a 15% engineering allowance and a 30% contingency.
- For purposes of this comparative analysis, costs for land acquisition were estimated at an average $70,000 per acre. This value was used consistently for each alternative and was selected as an average cost to account for unknown site specific variables (e.g. land and structure values, potential remediation costs, acquisition services, etc.).

All capital costs are annualized over a twenty year period using a 2.5% interest rate and 0.50% closing costs.

O&M cost estimates are developed based on the specific operational requirements for each alternative and include labor and materials. Estimates of power consumption of pumps are based on pump size, number of pumps, and estimated hours of operation. O&M tank estimates assume the exterior and interior are repainted every ten years and the raw water tanks are cleaned annually and treated water tanks cleaned every 5 years.

Backup Intake

The nearest water body that could potentially supply the WTP is Loop Creek in Deepwater, WV located across the Kanawha River from the WTP. Further investigation is required to verify that this water body can support the WTP capacity. This alternative requires about 6,800 feet of 12-inch pipe and an intake structure and pump station.

Raw Water Storage

The raw water storage alternative includes installing a 3.0 MG steel ground storage tank on land adjacent to the WTP site. The tank would require increasing the size of the pumps at the intake structure to fill the tank and installing an additional set of pumps to transfer raw water from the tank to the WTP. Portions of the proposed tank site are within the 100 year flood plain, requiring additional site work and measures to compensate for flood storage.

Treated Water Storage

Like the raw water storage alternative, treated water tankage would be located adjacent to the WTP and have a similar size and configuration without requiring modifications to the intake pumps. Providing additional treated water storage could present some operational challenges for the PWS in meeting the 20% daily turnover requirement (§64-77-9.4). With full tanks, the PWS may be faced with having to drain water during periods of low demand to meet the turnover requirement, resulting in an increase in non-revenue water for the system. This tank would also be located in the 100 year flood plain, and would require additional site work and measures to compensate for flood storage.

Interconnection

The nearest PWS with available supply for Kanawha Falls PSD is the WV American Water New River WTP in Anstead. This project would require approximately 88,000 feet of 10-inch pipe. However, with the elevation difference between the two systems pumps are not required. It is important to note that this WTP uses the New River as a source which is a tributary of the Kanawha River. If a pollution event were to affect the New River WTP, it would not be able to provide service to Kanawha Falls.

FEASIBILITY DETERMINATION

The attached matrix and sub-schedules (**Tables 4, 5, 6, and 7**) present the feasibility rankings of the alternatives. The interconnection with WV American Water does not rank high mostly due to the cost of extending a line from Kanawha Falls to Anstead.

Treated water storage is a possible alternative but adding additional volume would create potential operational issues associated with having to maintain a 20% turnover in volume and increasing nonrevenue water.

A backup intake on Loop Creek ranks as a feasible alternative having both a low cost and a relatively high technical score. However, its viability depends upon verification of whether there is sufficient flow to support Kanawha Falls' demands.

The highest ranked alternative is constructing raw water storage on the available land adjacent to the WTP site.

Table 4. Feasibility Matrix

Water Management Strategy Description	Economic Criteria					Technical Criteria							Environmental Criteria						Final Score	Capital Cost	Comments
	45%					45%							10%						100%		
	Operation and 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	3.0	3.0	**6.0**	**100.0%**	**45.0%**	2.0	3.0	1.0	2.0	**8.0**	**66.7%**	**30.0%**	2.0	3.0	2.0	**7.0**	**77.8%**	**7.8%**	**82.8%**	**$1,554,000**	The ability of Loop Creek to meet system needs is not documented and requires further study
Interconnect	3.0	1.0	**4.0**	**66.7%**	**30.0%**	2.2	2.5	2.7	2.3	**9.7**	**80.8%**	**36.4%**	3.0	3.0	2.0	**8.0**	**88.9%**	**8.9%**	**75.3%**	**$9,945,000**	The WV American New River WTP has sufficient capacity to provide Kanawha Falls with ADF
Treated water storage	3.0	2.0	**5.0**	**83.3%**	**37.5%**	1.6	1.5	2.3	2.7	**8.1**	**67.5%**	**30.4%**	3.0	2.5	2.0	**7.5**	**83.3%**	**8.3%**	**76.2%**	**$4,427,000**	Tank would be located on acquired property adjacent to the WTP
Raw Water Storage	3.0	2.0	**5.0**	**83.3%**	**37.5%**	2.4	3.0	2.3	2.7	**10.4**	**86.7%**	**39.0%**	3.0	2.5	2.0	**7.5**	**83.3%**	**8.3%**	**84.8%**	**$4,427,000**	Tank would be located on acquired property adjacent to the WTP

Table 5. Alternatives Table

Criteria	Question	Backup Intake	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)?		$649,200.00		$649,200.00		$649,200.00		$649,200.00	
O and M Costs	Describe the major O&M cost requirements for the alternative?	Electricity for pumping; maintenance	3	labor and materials to maintain pipe line; no pump station	3	Electricity for transfer pumps, labor, maintenance; does not included water flushed	3	Electricity for transfer pumps, labor, recurring maintenance	3
	What is the incremental cost ($/gal) to operate and maintain the alternative?	$695.00	3	$520.00	3	$11,437.00	3	$13,037.00	3
	Cost comparison of the incremental O&M cost to the current budgeted costs (%)	0.11%	3	0.08%	3	1.76%	3	2.01%	3
O and M-Feasibility Score			***3.0***		***3.0***		***3.0***		***3.0***
Describe the capital improvements required to implement the alternative.		Intake structure and pump station; 6800 ft. of 12" diameter pipe		88,000 feet of 10" pipe		3 MG ground storage tank and transfer pumps		3 MG ground storage tank and transfer pumps	
Capital Costs	What is the total capital cost for the alternative?	$1,554,000	3	$9.945,000	1	$4,427,000	2	$4,427,000	2
	What is the annualized capital cost to implement the alternative, including land and easement costs, convenience tap fees, etc. ($/gal)	$100,000.00	3	$641,000.00	1	$285,000.00	2	$285,000.00	2
	Cost comparison of the alternatives annualized capital cost to the current budgeted costs (%)	15.40%	3	98.74%	1	43.90%	2	43.90%	2
Capital Cost-Feasibility Score			***3.0***		***1.0***		***2.0***		***2.0***

Table 5. Alternatives Table (Cont'd)

Criteria	Question	Backup Intake	Feasibility	Interconnect	Feasibility	Treated Water Storage	Feasibility	Raw Water Storage	Feasibility
Technical Criteria									
Permitting	Provide a listing of the expected permits required and the permitting agencies involved in their approval.	See Permitting Sub-schedule	2	See Permitting Sub-schedule	2	See Permitting Sub-schedule	2	See Permitting Sub-schedule	2
	What is the timeframe for permit approval for each permit?	See Permitting Sub-schedule	2	See Permitting Sub-schedule	2	See Permitting Sub-schedule	2	See Permitting Sub-schedule	2
	Describe the major requirements in obtaining the permits (environmental impact studies, public hearings, etc.)	See Permitting Sub-schedule	2	See Permitting Sub-schedule	2	See Permitting Sub-schedule	2	See Permitting Sub-schedule	2
	What is the likelihood of successfully obtaining the permits?	There may not be sufficient capacity in Loop Creek to support a permit	1	No identified barriers	2	Potential for nonrevenue water issues	1	No identified barriers	3
	Does the implementation of the alternative require regulatory exceptions or variances?	None identified	3	None identified	3	In order to avoid flushing water additional studies may be required to support a variance from the 20% turnover rule	1	None Identified	3
Permitting-Feasibility Score			***2.0***		***2.2***		***1.6***		***2.4***
Flexibility	Will the alternative be needed on a regular basis or only used intermittently?	Intermittent	3	Intermittent	2	Full time operations	2	Full time operations; with ability for intermittent	3
	How will implementing the alternative affect the PWSU's current method of treating and delivering potable water including meeting Safe Drinking Water Act regulations? (ex. In the case of storage, will the alternative increase the likelihood of disinfection byproducts?)	No changes in treatment or water delivery with the backup source	3	No identified changes	3	With the requirement to turn over 20% of tank volume the system will be required to flush water during days when demands are low.	1	There will be additional operating requirements for the new equipment but the existing treatment process will be minimally affected.	3
Flexibility-Feasibility Score			***3.0***		***2.5***		***1.5***		***3.0***

Table 5. Alternatives Table (Cont'd)

Criteria	Question	Backup Intake	Feasibility	Interconnect	Feasibility	Treated Water Storage	Feasibility	Raw Water Storage	Feasibility
Resilience	Will the alternative provide any advantages or disadvantages to meeting seasonal changes in demand?	There may not be sufficient capacity in Loop Creek to support a permit	1	Yes. Interconnect will provide back up in other emergency situations	3	Yes; only short term	2	Yes; only short term	2
	How resistant will the alternative be to extreme weather conditions such as drought and flooding?	There may not be sufficient capacity in Loop Creek to support a permit	1	May act as an additional source of supply	2	Yes; only short term	2	Yes; only short term	2
	Will the alternative be expandable to meet the growing needs of the service area?	There may not be sufficient capacity in Loop Creek to support a permit	1	Yes	3	Yes	3	Yes	3
Resilience-Feasibility Score			***1.0***		***2.7***		***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 identified	2	Emergency Usage agreement with WV American at the New River WTP	2	None identified	3	None Identified	3
	Are any development/planning restrictions in place that can act as a barrier to the implementation of the alternative?	None identified	2	None Identified	3	None identified	3	None Identified	3
	Identify potential land acquisitions and easements requirements.	Easement and/or property purchase for intake and pump stations	2	Easement and/or property purchase for pump station.	2	The tank site would need to be acquired from its current owner	2	The tank site would need to be acquired from its current owner.	2
Institutional Requirements-Feasibility Score			***2.0***		***2.3***		***2.7***		***2.7***
Environmental Criteria									
Environmental Impacts	Identify any environmentally protected areas or habitats that might be impacted by the alternative.	Intake structure is likely to require surveys for T&E species	2	None identified	3	None identified	3	None Identified	3
Environmental Impacts-Feasibility Score			***2.0***		***3.0***		***3.0***		***3.0***
Aesthetic Impacts	Identify any visual or noise issues caused by the alternative that may affect local land uses?	None identified	3	None identified	3	The storage tank would be a large structure in an area with few comparably sized structures	2	The storage tank would be a large structure in an area with few comparably sized structures	2
	Identify any mitigation measures that will be required to address aesthetic impacts?	None identified	3	None identified	3	None identified	3	None identified	3
Aesthetic Impacts-Feasibility Score			***3.0***		***3.0***		***2.5***		***2.5***

Table 5. Alternatives Table (Cont'd)

Criteria	Question	Backup Intake	Feasibility	Interconnect	Feasibility	Treated Water Storage	Feasibility	Raw Water Storage	Feasibility
Stakeholder Issues	Identify the potential stakeholders affected by the alternative.	See Stakeholder Sub-schedule	2	See Stakeholder Sub-schedule	2	See Stakeholder Sub-schedule	2	See Stakeholder Sub-schedule	2
	Identify the potential issues with stakeholders for and against the alternative.	See Stakeholder Sub-schedule	2	See Stakeholder Sub-schedule	2	See Stakeholder Sub-schedule	2	See Stakeholder Sub-schedule	2
	Will stakeholder concerns represent a significant barrier to implementation (or assistance) of the alternative?	Possibly from an environmental perspective	2	No	2	No	2	No	2
Stakeholder Issues-Feasibility Score			***2.0***		***2.0***		***2.0***		***2.0***
Comments		The ability of Loop Creek to meet system needs is not documented and requires further study		The West Virginia American New River WTP has sufficient capacity to provide Wilderness with ADF		Tank would be located on acquired property adjacent to the WTP		Tank would be located on acquired property adjacent to the WTP	

Table 6. Permitting Sub-Schedule

Permits Required							
Agency	**Permit**	**Back up Intake**	**Interconnect**	**Raw Water Storage**	**Treated Water Storage**	**Other**	**Notes**
WV Bureau Public Health	Construction	yes	yes	yes	yes		
USACOE(1)	404 Permit	yes	no	no	no		
Local/State Road Agency	ROW Utilization	yes	yes	no	no		

(1) US Army Corps of Engineers

Application Period Duration							
Agency	**Permit**	**Back up Intake**	**Interconnect**	**Raw Water Storage**	**Treated Water Storage**	**Other**	**Notes**
WV Bureau Public Health	Construction	90 days	90 days	90 days	90 days		
USACOE	404 Permit	180 days	NA	NA	NA		
Local/State Road Agency	ROW Utilization	90 days	90 days	NA	NA		

Application Requirements							
Agency	**Permit**	**Back up Intake**	**Interconnect**	**Raw Water Storage**	**Treated Water Storage**	**Other**	**Notes**
WV Bureau Public Health	Construction	Engineers Report; Construction Drawings; Specifications	Engineers Report; Construction Drawings; Specifications	Engineers Report; Construction Drawings; Specifications	Engineers Report; Construction Drawings; Specifications		
USACOE	404 Permit	Construction Drawings; Construction Plan	NA	NA	NA		
Local/State Road Agency	ROW Utilization	Construction Drawings	Construction Drawings	NA	NA		

Other Considerations							
Agency	**Permit**	**Back up Intake**	**Interconnect**	**Raw Water Storage**	**Treated Water Storage**	**Other**	**Notes**
WV Bureau Public Health	Construction	Need to document the ability of Loop Creek to meet capacity requirements					
USACOE	404 Permit						
Local/State Road Agency	ROW Utilization		Bridge crossing				

Table 7. Stakeholders Sub-Schedule

List concerns for each alternative by stakeholder						
Stakeholder Group	**Back up Intake**	**Interconnect**	**Raw Water Storage**	**Treated Water Storage**	**Other**	**Notes**
Residential Customers	Cost impacts; Improved protection from contamination	Cost impacts; Improved protection from contamination	Aesthetic concerns; Cost impacts; Improved protection from contamination	Aesthetic concerns; Cost impacts; Improved protection from contamination		Neutral response
System Owner	Additional operations; Cost impacts	Additional operations; Cost impacts	Additional operations; Cost impacts	Operational issue with storage turnover; Cost impacts		Positive to meet regulations and improve service; Negative for treated water storage
Industrial/Commercial Customers	Cost impacts; Improved service and protection from contamination	Cost impacts; Improved service and protection from contamination	Cost impacts; Improved service and protection from contamination	Cost impacts; Improved service and protection from contamination		Neutral to positive response; less sensitive to costs over improved service
Environmental Interest Groups	Minor	Minor	Minor	Minor		Average to negative response

CONCLUSION

Based on the analysis and findings presented Tetra Tech offers the following conclusions:

1. The storage in the Kanawha Falls system can support 1.68 days of average day demand system-wide. Given the configuration of the distribution system it is likely the tanks work independently and those tanks at the higher elevations will likely empty first if the plant were shut down.
2. Based on the scoring system, raw water storage and a backup intake on Loop Creek are the most feasible alternatives and should be considered for further analysis. **Figures 2 and 3** present conceptual sketches of the alternatives and **Tables 8 and 9** present details on the opinion of capital costs.

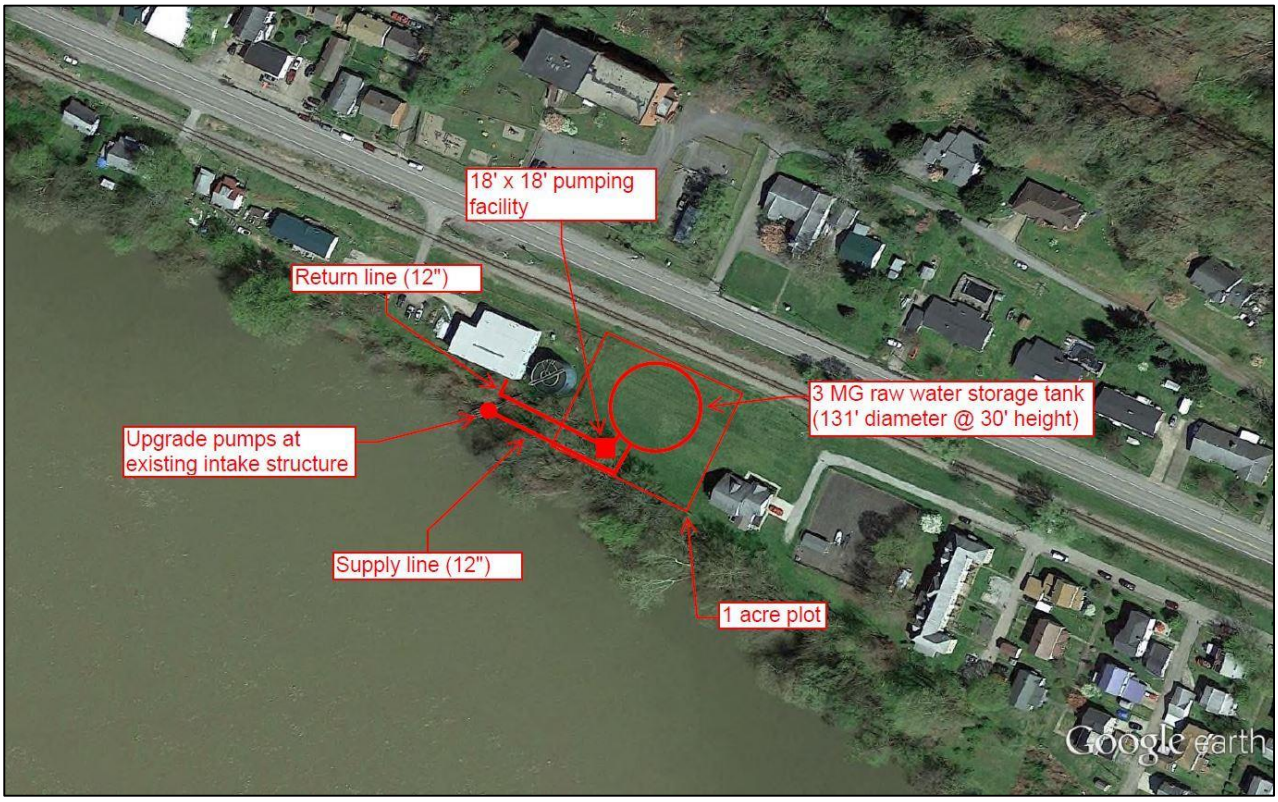


Figure 2. Kanawha Falls PSD Raw Water Storage Conceptual Drawing

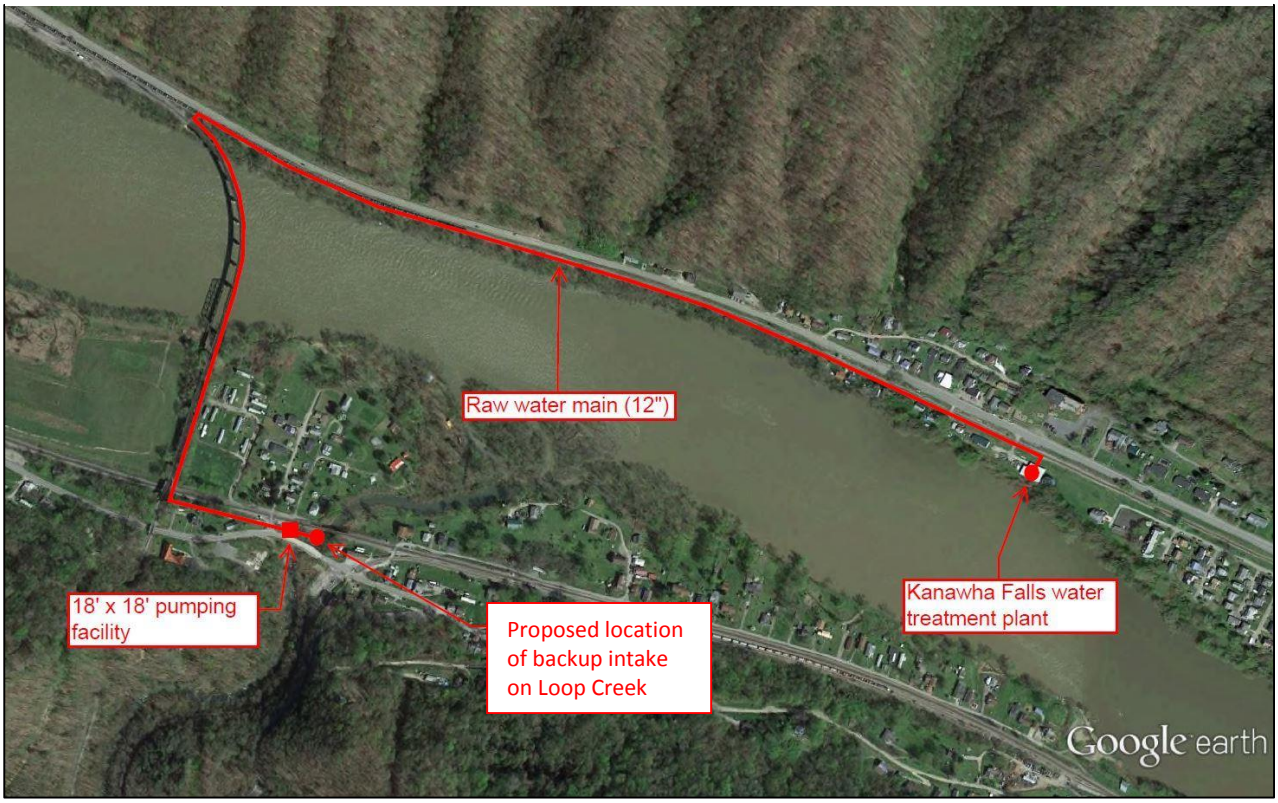


Figure 3. Kanawha Falls PSD Backup Intake Conceptual Drawing

Table 8. Raw Water Storage – Opinion of Cost

Facility Description/Capital Cost				
Item	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
Tank/Reservoir	1	EA	$2,331,375	$2,331,375
Raw Water Transfer Pump	3	EA	$20,000	$60,000
Raw Water Intake Pump	3	EA	$100,000	$300,000
Pre-cast concrete vault for pumps and valves	1	EA	$100,000	$100,000
Electrical & Controls	1	EA	10% PS costs	$46,000
Piping from wet well to tank	256	FT	$92	$23,552
Piping from tank to treatment plant	259	FT	$92	$23,828
Site Work	1	LS	$120,000	$120,000
			Subtotal	**$3,004,755**
			Contingency @ 30%	$901,427
			Eng. Permit, etc. @ 15%	$450,713
			Land	$70,000
			Total Raw Water Storage Capital Costs	**$4,426,895**

Table 9. Backup Intake– Opinion of Cost

Facility Description/Capital Cost				
Item	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
Intake Screen 12"	1	EA	$4,000	$2,000
Flow control/Sluice gate	1	EA	$20,000	$2,000
Intake Piping - 12" RCP	50	FT	$137	$6,850
Piping to plant - 12" DIP (hanging from bridge)	1237	FT	$138	$170,706
Piping to plant - 12" DIP	5567	FT	$92	$512,164
Raw Water Intake Pumps	2	EA	$100,000	$200,000
Pre-Cast Vault for raw water pump station	1	EA	$100,000	$100,000
Electrical & Controls	1	EA	10% PS costs	$30,000
Site Work	1	LS	$50,000	$50,000
			Subtotal	**$1,073,720**
			Contingency @ 30%	$322,116
			Eng. Permit, etc. @ 15%	$161,058
			Land Acquisition and Easements	$370,528
			Total Backup Intake Capital Costs	**$1,556,894**

APPENDIX E. SUPPORTING DOCUMENTATION

E-1. Protection Team Meeting

Date: 4/6/2016

Location: Gauley Bridge Town Hall, Gauley Bridge, WV

Participants: Chief Operator Carl King, Rick Wagner, Roger Wagner, Kim Houghton, Damon Runyon, and Tetra Tech representative Russell Myers

- On Wednesday April 6, 2016, the Source Water Protection Team for Kanawha Falls PSD met at the Kanawha Falls PSD office to discuss the draft of the updated Source Water Protection Plan. All suggested members were in attendance except Chris Farrish, who will be involved in future planning efforts whenever possible.
- Russell presented the draft plan and mapping information to the team and they discussed the potential contaminants as well as some of their priority sites.
    - Utility staff recommended that the old Exxon storage facility that is just downstream of the Kanawha Falls intake should be examined more closely to ensure that it was closed down properly. They are unsure that all the fuels and chemicals on site were disposed of properly, and report that there were both aboveground and underground tanks on site. This would not be an issue for KF but could be for downstream systems like Armstrong PSD.
    - Rick has been wanting to reach out to local recreational users of the Kanawha River to let them know more about source water protection and how they can help protect it. He would like to tell them how to keep an eye out for potential sources of contamination when they are out fishing or riding four wheelers. He asked that TT provide a brochure that can be handed out to users to let them know what to look out for.
    - Rick requested a copy of a flyer that he can use to post around town to solicit comments and questions about the SWPP. Include information in the flyer about alerting staff about potential problems.
    - Utility staff report that the nearby railways are their primary contamination concern. There is no way for staff to know what is being transported or how often. Rick suggested that he could reach out to Norfolk Southern to get more information about these shipments and what kinds of materials they typically transport.
    - The hydroelectric facility upstream, Hawks Nest Hydro, is a potential source of contamination. Incidents have occurred in the past but the facility has very reliable communication with the water plants downstream and always alerts them of any potential problems. They feel that this threat is managed as well as possible. In addition, the Brookfield site is in the process of installing a water treatment/separation system on site, which should further prevent any contamination.
    - The DOH garage that is located upstream manages their road treatment materials and fuels well and staff feel that there is no threat from this site. It can be removed from the priorities list.
    - The upstream sewer system is managed by KF and operators are in constant contact with the water treatment plant.
    - Rick requested a list of examples of free alert systems that he could use to communicate with customers for free. They currently primarily use local radio, TV, and Fayette Co. 911.

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

KANAWHA FALLS PSD
2016 Source Water Protection Plan

TETRA TECH

Kanawha Falls PSD has updated their Source Water Protection Plan (SWPP) in cooperation with the West Virginia Bureau for Public Health and Tetra Tech. This plan was developed according to guidelines in WV code. The intent of the plan is to identify strategies to minimize potential threats to source water and prepare for spills or other emergencies that could affect water service.

Kanawha Falls PSD is a state regulated public utility located near Gauley Bridge, WV that uses raw water from the Kanawha River. Water treatment processes include coagulation, sedimentation, filtration, disinfection, and fluoridation.

Source Water Protection Plan Requirements

- Complete Source Water Protection Plan, if utility's source is surface water or groundwater influenced by surface water
- Engage local government, health department, emergency planners, and affected residents
- Update every 3 years

Source Water Protection Plan Includes:

- System Information
- Protection Team
- Source Water Protection Area Delineations
- Potential Sources of Significant Contamination
- Plan to Manage Prioritized Concerns
- Education and Outreach Activities
- Contingency Plan Information
- Single Source Feasibility Study
- Communication Plan

Protection Team Information

- Kanawha Falls PSD has formed a protection team to contribute to the SWPP that includes:
  - Utility staff, local government, emergency responders, health department, interested public representatives.

Kanawha Falls PSD System Information

- 1,041 customers directly served (approx. 2,602 people) in Fayette County
- Sells water to Gauley River PSD, serving 800 customers indirectly
- Serves approx. 6,300 people directly and indirectly.
- Production Capacity = 1,440,000 gal./day
- Average Production = 736,000 gal./day
- 6 treated water storage tanks
- Total treated water storage capacity = 1,235,000 gal. or roughly 1.7 days of storage at average usage

Source Water Protection Areas

- The watershed delineation area for Armstrong PSD covers approximately 8,384 square miles in the Upper Kanawha River watershed.
- Zone of Critical Concern (ZCC) = 14,325 acres
- Zone of Peripheral Concern (ZPC) = 69,199 acres

Priority Concerns for Mount Hope

- WV Division of Highways garage
- Barge, railroad, and highway traffic
- Public wastewater facilities

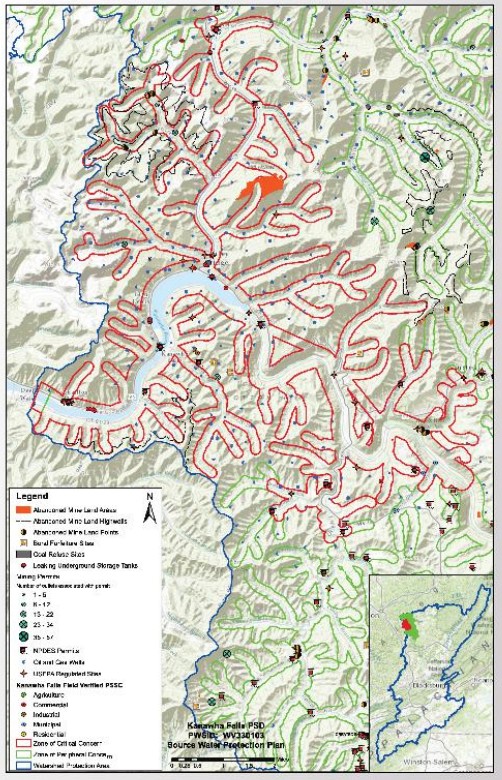
Management Plan, Education/ Outreach Strategies

- Monitor Source Water Protection Area
- Regularly coordinate with emergency responders
- Communicate with managers at the Division of Highways garage and with companies that transport hazardous materials through the ZCC.
- Coordinate with personnel at upstream wastewater facilities regarding overflows and releases.

Communication Plan

- Kanawha Falls PSD will contact affected residents within 30 minutes of determining a threat to human health using:
  - word of mouth
  - radio broadcasts
  - posted notices
  - local newspapers

Monitor local media for status updates once this notification has been made.



Kanawha Falls PSD – PSSC Summary

PSSC Layer	In ZCC	Around ZCC	In ZPC	Around ZPC	In Watershed	Total Records
Above Ground Storage Tanks	54	57	89	221	1426	1874
AMI Points	14	3	62	121	395	595
Bond Forfeiture	0	3	15	41	238	297
Closed Landfills	0	0	0	1	1	2
Field Verified PSSCs	23	4	53	34	940	1054
Landfill Monitoring Wells	0	0	0	4	0	4
Leaking Underground Storage Tanks	2	0	1	4	131	138
Mining Outlets	38	86	146	482	3141	3893
NPDES Permits	11	7	108	163	2424	2713
Oil/Gas Wells	140	165	334	505	1797	2941
Points of Interest	0	0	0	0	25	25
USEPA Regulated Sites	23	6	74	116	2423	2642
Virginia PSSCs	0	0	0	0	153	153
Volunteer Remediation	0	0	0	2	24	26
Coal Refuse Sites	0	0	2	2	34	38
Total	**305**	**331**	**884**	**1696**	**13152**	**16368**

TIERS Reporting System

A	**Announcement**	The water system announces that an incident or event may pose a threat to public health and safety. Additional information will be provided as it becomes available.
B	**Boil Water Advisory**	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	**Cannot Drink**	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	**Do Not Use**	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	**Emergency**	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.

Contact:
Utility Manager – Rick Wagner
PSD Office Phone: 304-632-1633
Tetra Tech, Inc. – Russell Myers
Phone: 304-414-0054
Email: Russell.Myers@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.

Kanawha Falls PSD Designees:

Name	Title	Phone	Email	Signature	Date
Richard Wagner	Gen. Mngr.	304-632-1633		Richard Wagner	4-6-16
Roger Wagner	Chairman	304-640-2131	rwagner@glbsm.com	Wk Wagner	11
Carl King	Chief Operator	304-779-2600		Carl King	4-6-16
Kim Houghton	Town Recorder	[redacted]	kimhoughton@suddenlink.net	K Houghton	4-6-16
Damon Runyon	Fire Chief	304-632-1810	damon_47@yahoo.com	Damon Runyon	4-6-16

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

Kanawha Falls 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. You are invited to contact or visit the Kanawha Falls 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 Kanawha Falls PSD no later than April 29, 2016

Phone: 304-632-1633
Email: kfpsd_12@yahoo.com

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

Kanawha Falls PSD
Gauley Bridge, WV
304-632-1633
kfpsd_12@yahoo.com

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.

Kanawha Falls PSD treats water from the Kanawha River using conventional treatment methods. The Kanawha is used heavily for transportation, electricity generation, and recreation. 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.