Source Water Protection Plan
Berkeley Co P S W D-Bunker Hill

PWSID: WV3300202

Berkeley County

Public Version

September 2021

Prepared By:

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Superintendent of Operations

In cooperation with Berkeley Co P S W D-Bunker Hill

WV Bureau for Public Health, Source Water Assessment and Protection Program

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

Responsible party of designee authorized to sign for water utility is on file:

Steve DeRidder

Name of Authorizing Signatory:

Superintendent of Operations

Title of Authorizing Signatory:

8/12/2021

Date of Submission (mm/dd/yyyy):

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SOURCE WATER PROGRAM ACRONYMS

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

1.0 PURPOSE

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

The intent of this document is to describe what Berkeley Co P S W D-Bunker Hill 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, Berkeley Co P S W D-Bunker Hill 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 Berkeley Co P S W D-Bunker Hill 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

BERKELEY CO P S W D-BUNKER HILL 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 BERKELEY CO P S W D-BUNKER HILL

Administrative office location:	251 Caperton Boulevard Martinsburg, WV 25403, Bunker Hill, BERKELEY, WV, 25413		
Is the system a public utility, according to the Public Service Commission rule?	Yes		
Date of Most Recent Source Water Assessment Report:	1/1/2001		
Date of Most Recent Source Water Protection Plan:	7/1/2019		
Population served directly:	31185		
Bulk Water Purchaser Systems:	System Name	PWSID Number	Population
Total Population Served by the Utility:	31185		
Does utility have multiple Source Water Protection Areas(SWPAs)?	Yes		
How many SWPAs does the utility have?	2		

5.0 WATER TREATMENT AND STORAGE

As required, Berkeley Co P S W D-Bunker Hill 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 Berkeley Co P S W D-Bunker Hill 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. Berkeley Co P S W D-Bunker Hill Water Treatment Information

Default Facility	
Water treatment processes (in order of occurrence) includes:	DISINFECTION, FILTRATION, DIATOMACEOUS EARTH, FLUORIDATION
The treatment capacity is approximately (GPD):	34,000,000
Current average production is approximately (GPD):	1,900,000
Maximum gallons of water treated and produced at that plant in one day during the past year was:	2,000,000
Minimum gallons of water treated and produced at that plant in one day during the past year was:	1,000,000
Plant is operated an average of hours a day:	18
Maximum number of hours of operation in one day at that plant during the past year was:	24
Minimum number of hours of operation in one day at that plant during the past year was:	8
How many storage tank(s) are maintained on systems distrbution system:	8
Total gallons of treated water storage:	3,971,000
Total gallons of raw water storage (GALs):	0

Table 3. Berkeley Co P S W D-Bunker Hill Surface Water Sources

Intake Name	Facility #	Local Name	Describe Intake	State Id Code	Date Constructed / Modified	Frequency of Use (Primary / Backup / Emergency)	Activity Status (Active/Inactive)
INTAKE-BAKER LAKES QUARRY	3490585	BAKER QUARRY WELL NO. 1	Inactive but possible emergency source	IN001	1/1/2009	Emergency	Inactive

Table 4. Berkeley Co P S W D-Bunker Hill Ground Water Sources

Well/Spring Name	Facility #	Local Name	Date Constructed / Modified	Completion Report Available (Yes/No)	Well Depth (ft)	Casting Depth (ft)	Grout (Yes/No)	Frequency of Use (Primary / Backup / Emergency)	Activity Status (Active/Inactive)
LEFEVRE SPRING	-	LEFEVRE SPRING	1/1/1958	No	0	0	None	Permanent	Active
SPRINGDALE WL2	-		1/1/2005	Yes	400	140	Other	Permanent	Inactive

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 warrant 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. 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. The Ohio River ZCC delineations include 1,320 feet (1/4 mile) measured from the bank of the main stem of the Ohio River and 500 feet on a 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

Intake Name	Baker Lakes Quarry
Size of WSDA (Square Miles)	7
River Watershed Name (8-digit HUC)	Conococheague-Opequon - 02070004
Size of Zone of Critical Concern (Acres)	1487
Size of Zone of Peripheral Concern (Acres) (Include ZCC area)	1487
Do you blend with ground water	Yes
Do you have an intake or well/spring missing from the list?	No
Intake Name	LEFEVRE SPRING (M-5)
Method of Delineation for Groundwater Sources	Conjunctive Delineation
Area of Wellhead Protection Area (Acres)	3,393
Intake Name	
Method of Delineation for Groundwater Sources	Radius
Area of Wellhead Protection Area (Acres)	288

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 Berkeley Co P S W D-Bunker Hill 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.

Berkeley Co P S W D-Bunker Hill 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
Jim Ouellet	Berkeley Co P S W D-Bunker Hill	Executive Director	(304)267-4600	_jouellet@berkeleywater.org
Steve DeRidder	Berkeley Co P S W D-Bunker Hill	Chief Operator	(304)274-5801	sderidder@berkeleywater.org
	Berkeley Co P S W D-Bunker Hill			
	Berkeley Co P S W D-Bunker Hill			
Eddie Gochenour	Berkeley Co P S W D-Bunker Hill	OHSEM Director	(304)264-1345	egochenour@berkeleywv.org
	Berkeley Co P S W D-Bunker Hill			
Mike Thompson	Berkeley County Council	Planning Department Director	(304)267-5106	mthompson@berkeleywv.org
Alana Hartman	WVDEP	Environmental Resources Analyst	(304)822-7266	alana.c.hartman@wv.gov
Jennifer O'Brien	Eastern Panhandle RP&D Council	Assistant Director	(304)263-1743	jwishmyer@region9wv.com
Bill Clark	Eastern Panhandle RP&D Council	Director	(304)263-1743	bclark@region9wv.com
*Regina (Suzy) Lucas	WVCA	Conservation Specialist	(304)263-4376	epcd@wvca.us
*Joseph A. Castaldo	DOT	Berkeley Co Supervisor	(304)267-0060	joe.a.castaldo@wv.gov
Date of First Protection Team Meeting:		Protection Team Meeting was held Thursday, November 19, 2015 at Berkeley Co P S W D-Bunker Hill. Meeting minutes attached in Appendix E.		

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	A list of local stakeholders invited to join the Protection Team is provided in Appendix F-4. Reasons for their absence are explained therein. Appendix F-4. BCPSWD Bunker Hill WTP Protection Team Meeting Minutes Bunker Hill WTP and Potomac River Plant Protection Team Meeting November 19, 2015 251 Caperton Blvd. Martinsburg, WV Meeting Objectives: The purpose of this meeting was to establish a Protection Team, an entity which will work to forward source water protection efforts and strategies for the BCPSWD Bunker Hill and Potomac River Systems. More specifically, the Team worked to prioritize the major Potential Significant Sources of Contamination, critical areas, and other threats deemed of greatest concern to the systems' water supply sources. Management Strategies and Implementation Plans were developed for the highest priority threats. Education and Outreach Strategies were also discussed, and Implementation Plans were created for these and other management activities. PUBLIC MEETING JUNE 24, 2019 5:00 PM

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 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 from 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. 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 Berkeley Co P S W D-Bunker Hill 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 local stakeholders in addition to 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.

The Berkeley Co P S W D-Bunker Hill 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 Berkeley Co P S W D-Bunker Hill and not already appearing in datasets from the WVBPH can be found in .**Table 7**.

Table 7. Locally Identified potential Sources of Significant Contamination

Please see Appendix A to view this information.

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 these priority PSSCs was selected and ranked by the Berkeley Co P S W D-Bunker Hill 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

Berkeley Co P S W D-Bunker Hill 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. Berkeley Co P S W D-Bunker Hill 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.

Table 8. Priority PSSCs or Critical Areas

PSSC or Critical Area	Priority Number	Reason for Concern
Interstates and Highways	1	Threat to source water due to the potential for accidental leaks and spills of vehicle fluids or hazardous freight; the area is underlain by karst terrain and contains losing streams which put groundwater sources at a higher risk from surface water contaminant pathways.
Railroad Traffic	2	Threat to surface water and shallow groundwater aquifers due to the possibility of spills and derailments.
Sinkholes	3	When sinkholes occur, a direct conduit from the surface to groundwater is created, and natural soil filtration processes are often bypassed. Water quality threats are dependent on surrounding land uses.
Commercial Activity	4	Facilities such as gas stations and auto repair shops lie within and just outside of the SWPA and pose a threat due to the potential for accidental leaks/spills, improper disposal of hazardous wastes or improperly managed stormwater runoff.
Private Septic Systems	5	The status of some older septic systems is unknown and failures and leaks are possible. Unlike other areas, in karst terrain a septic system tends to fail downwards and can therefore be difficult to detect. Centralized sewer is preferable but needs periodic assessment for leaks and collapse, which may be associated with sinkholes.
Agricultural Landuses	6	Due to agricultural land use in the area, nutrient levels can become elevated in surrounding surface water bodies and/or the underlying groundwater system.
New Construction Development	7	Expanded impervious surfaces can reduce natural recharge and introduce stormwater contaminants (including road salt, hydrocarbons and nutrients) into the groundwater system.

Table 9. Priority PSSC Management Strategies

PSSC or Critical Area	Management Activity	Responsible Protection Team Member	Status / Schedule	Comments	Estimated Cost
New Construction Development	Ensure sediment and erosion control measures are being instituted at construction sites. Monitor compliance with existing regulations through inspections and/or contact with WVDEP.	n/a	Not Started		

Table 9. Priority PSSC Management Strategies

PSSC or Critical Area	Management Activity	Responsible Protection Team Member	Status / Schedule	Comments	Estimated Cost
Interstates and Highways	Contact the motor carriers that transport materials along the interstate and determine the types of materials transported. This information can be used to inform and properly prepare emergency response personnel.	n/a	Not Started		
Interstates and Highways	Participate in communications and incident drills with emergency responders to respond quickly to any spills and initiate cleanup activities. In the event that contaminants do find their way into the public water supplies, monitor and react according to standard operating procedures. Erect signs as described in Education and Outreach Strategies. Continue to coordinate with emergency officials to be better prepared in the event of a hazardous spill.	n/a	Not Started		

Table 9. Priority PSSC Management Strategies

PSSC or Critical Area	Management Activity	Responsible Protection Team Member	Status / Schedule	Comments	Estimated Cost
Interstates and Highways	BCPSWD, in conjunction with Berkeley County OHSEM, will work with the Department of Transportation (DOT) to explore opportunities to create and manage pre-stocked emergency spill response kits at state operated facilities along highway and railroad corridors (including the facility at Tabler Station Road). Alternative plans will be arranged should an agreement not be reached by these entities. The county currently possesses 25 bags of absorbent on hand with the possibility of acquiring up to 50 additional bags from neighboring emergency response entities. These entities may contact Frederick County, VA for additional emergency response & coordination of emergency equipment. OHSEM will work with LEPC coordinators and other emergency personnel to ensure that BCPSWD receives timely notification in the event of highway or other roadway spills within SWPAs. BCPSWD and OHSEM will work with the DOT to explore traffic regulation options for key highway corridors, and revisit postings of source water protection signs along these roadways.	Eddie Gochenour	Not Started		Staff time involving members from BCPSWD, DOT, and OHSEM. Material costs for additional spill response kits/absorbent bags.

Table 9. Priority PSSC Management Strategies

PSSC or Critical Area	Management Activity	Responsible Protection Team Member	Status / Schedule	Comments	Estimated Cost
Commercial Activity	BCPSWD will request Groundwater Protection Plans (GPPs) and/or stormwater management plans from WV DEP for commercial facilities located within the SWPAs. From these the utility will investigate what (if any) preventative pollution measures are already in place for these facilities. This will permit the utility to better understand protection strategies already in place at these facilities and more accurately determine the threat posed by specific facilities. BCPSWD will educate facility owners on the potential threat of sinkhole development caused by improper stormwater management. BCPSWD will distribute site-specific Best Management Practice lists, along with advanced hazardous materials containment options to facilities (which will include vaulted Above ground Storage Tanks) on an as-needed basis.	BCPSWD	Not Started	Education outreach and voluntary strategies such as these are the most effective means of source water protection for this hazard at this time, as more restrictive localized regulations cannot be implemented.	BCPSWD staff time putting together information packets/materials for commercial business owners, as well as research time to pull GPPs from WV DEP records
Private Septic Systems	Provide information regarding contamination and source water protection in mailings to homeowners that will encourage them to have their septic system inspected regularly and pumped every 5-10 years as needed. Also, the USEPA provides a complete guide for residents to maintain their septic systems, for the guide, visit: http://epa.gov/owm/septic/pubs/homeowner_guide_long.pdf. "	n/a	Not Started		

Table 9. Priority PSSC Management Strategies

PSSC or Critical Area	Management Activity	Responsible Protection Team Member	Status / Schedule	Comments	Estimated Cost
Private Septic Systems	BCPSWD will work with Public Sewer to develop a leak detection protocol and recommend areas which would benefit from incorporation into the public sewer system, as development occurs. BCPSWD will work with the Health Department, to the degree feasible, to encourage homeowners to maintain and routinely inspect their septic systems or replace old or failing septic systems with Best Available Technologies (BATs).	BCPSWD	Not Started	BCPSWD will pursue this recommendation at the time of the next Sewer Expansion Plan update. Extending the gravity sanitary sewer system to every resident in the county is not feasible.	BCPSWD staff time and public sewer staff time to determine priority sewer expansion areas. Material costs associated with expansion of sewers. Staff time providing informational materials.
Railroad Traffic	Contact the railroad companies to determine the average number of daily (or weekly) trains passing in the ZCC and what types of materials these trains are transporting. Identify the number of rail cars kept on side track, if any, and what activities (such as maintenance) are performed on the side tracks.	n/a	Not Started		
Railroad Traffic	Work with the railroad company to create an emergency response plan in case a hazardous materials spill would occur to prevent or cleanup contamination of the source water.	n/a	Not Started		

Table 9. Priority PSSC Management Strategies

PSSC or Critical Area	Management Activity	Responsible Protection Team Member	Status / Schedule	Comments	Estimated Cost
Railroad Traffic	Berkeley County OHSEM will work with LEPC and other local emergency responders to utilize the training materials provided by CSX railways (i.e., planning guides and in-person/on-site trainings, featuring a safety rail car) and their short line partners, which include Winchester and Western. OHSEM and emergency responders will also work with CSX to inquire about the Rail Respond program, which provides easy mobile access to critical information about what's traveling on CSX rails. Information regarding these programs is provided in Appendix F-7. Emergency personnel have also expressed interest in performing routine Emergency Response drills for Highway and Railroad spills. BCPSWD will work with WV DEP or BPH to perform a Hazmat Re-route request to prevent specific potential contaminants from being transported through system source water protection areas. These entities, along with OHSEM, will work with railroad companies to discuss safety measures, emergency plans and inspection routine(s).	Eddie Gochenour	Ongoing	The Berkeley County OHSEM Director has already started a dialogue with CSX to request training materials and the use of the CSX training car within the next two years.	Staff time involving members from BCPSWD, DOT, OHSEM, other LEPC agencies and BPH and/or WV DEP. Staff time at the LEPC level, and for members of local emergency response stations (e.g., local fire department, police department, etc.).
Agricultural Landuses	Work with the County Extension Service, the Soil and Water Conservation District, and/or the Natural Resource Conservation Service to provide copies of fact sheets covering best management practices for nutrient management, pesticide use, pest management, waste oil disposal, safe chemical handling and/or safe chemical storage.	n/a	Not Started		

Table 9. Priority PSSC Management Strategies

PSSC or Critical Area	Management Activity	Responsible Protection Team Member	Status / Schedule	Comments	Estimated Cost
Agricultural Landuses	Consider working with the local Future Farmers of America members to distribute educational materials and best management practices information.	n/a	Not Started		
Agricultural Landuses	Work with the local livestock owners to determine the placement of animal waste disposal areas and/or areas for burying dead livestock.	n/a	Not Started		
Agricultural Landuses	BCPSWD will work with the County Extension Service, the Soil and Water Conservation District, and/or Natural Resources Conservation Service (NRCS) to encourage agricultural land owners to participate in nutrient management planning, forest conservation, land retirement and management programs (including riparian zone preservation or restoration) within the SWPA. Efforts here will focus on education and outreach measures.	BCPSWD	Not Started	Nutrient management plans are not required for agricultural facilities within Berkeley County but are provided at no cost by the USDA NRCS.	BCPSWD staff time associated with raising local awareness of the existence of these programs.
Sinkholes	Monitor for the formation of any new sinkholes in the SWPA, and establish or encourage buffering around sinkholes. Buffering techniques in use in other regions range from encouraging landowners to provide vegetative buffers to purchasing rights from the landowner.	n/a	Not Started		
Sinkholes	Consider filling in the sinkhole following WVDEP's Sinkhole Mitigation Guidance document, which can be found at http://www.dep.wv.gov/WWE/Programs/gw/Documents/9026_Sinkhole_Mitigation_Guidance_Document_A2005.pdf. If applicable, seek state and/or local permits prior to filling sinkholes.	n/a	Not Started		

Table 9. Priority PSSC Management Strategies

PSSC or Critical Area	Management Activity	Responsible Protection Team Member	Status / Schedule	Comments	Estimated Cost
Sinkholes	Region 9 will be researching available funding opportunities to create a SWPA-specific sinkhole management program. Currently, sinkholes that develop in the County are the responsibility of private land owners and other similar entities (including homeowner's associations). The goal of the sinkhole management program will be to assign responsibility for mitigation and repair to relevant parties, encourage routine investigations along key travel corridors and provide advice and funding opportunities for sinkholes that develop on lands within the SWPA. Implementation of this task will take many years and cooperation from multiple public and private entities. The recommended sinkhole management plan is broadly based upon the Carroll County, MD sinkhole management plan.	Region 9	Not Started	Currently, there is not a specific government entity that oversees sinkhole mitigation and repair once lands have been developed. The Planning Department only has regulations in place to address existing sinkholes on lands that have not been developed.	Region 9 staff time researching available grant funding opportunities. BCPSWD staff time for utilizing funding information provided by Region 9. County Council, BCPSWD and DEP staff time for determining how best to allocate potentially available funds.

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. Berkeley Co P S W D-Bunker Hill 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
Clean Up Events	Coordinate with local Clean Up efforts and publicize projects. Work closely with Watershed Associations in this regard.	BCPSWD	Not Started		Staff time associated with watershed group coordination
General Information Dissemination	BCPSWD will include educational information on the following topics on their website for public use: source water protection, water conservation, household hazardous materials disposal, pharmaceuticals disposal, observing and reporting spills/leaks.	BCPSWD	Not Started		Staff time pulling together information and making it available to public.
Display Information	Include informational materials (i.e., brochures, maps, etc.) in county government offices and other public places (i.e., local fairs). Host non-confidential SWPP online for public review and comment. Work with DOT for protection area sign expansion/coverage.	BCPSWD, Region 9 & WV BPH	Ongoing		Staff time creating and displaying relevant information
Early Education	Work with area schools to include source water protection information into the curriculum, or present information at assemblies or in classroom events (e.g., environmental science class).	BCPSWD	Not Started		Staff time providing information to school system or attending events/classes
Public Meeting	Present Source Water Protection information at already scheduled public meetings (i.e., town board meetings) and/or plan a Source Water specific Public Presentation.	BCPSWD	Not Started	Status / Schedule will be evaluated based on participation and perceived need.	Staff time preparing for and hosting workshops

Table 10. Education and Outreach Implementation Plan

Education and Outreach Strategy	Description of Activity	Responsible Protection Team Member	Status / Schedule	Comments	Estimated Cost
BMP Lists	Distribute lists of industry specific BMPs to the owners of (1) Gas Stations, (2) Car Repair Shops, (3) Agricultural Lands/Facilities within the SWPA (Future Farmers, etc.). Provide SWPP education materials.	BCPSWD	Not Started		Staff time creating BMP lists using published/provided materials

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 Berkeley Co P S W D-Bunker Hill is provided in **Table 11**.

11.1. RESPONSE NETWORKS AND COMMUNICATION

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.

Table 11. Berkeley Co P S W D-Bunker Hill Water Shortage Response Capacity

Can the water utility isolate or divert contamination from the intake and groundwater supply?	Yes
Describe the results of an examination and analysis of the public water system's ability to isolate or divert contaminated waters from its surface water intake or groundwater supply:	Confidential
Describe the results of an examination and analysis of the public water system's existing ability to switch to an alternative water source or intake in the event of contamination of its primary water source:	Confidentlal
Is the Utility able to close the water intake in the event of a spill?	Yes
How long can the Utility keep the intake closed?	60-90 days; depending on storage in the Quarry
Describe the process to close the intake:	Confidentlal
Describe the treated water system's storage capacity of the water system:	Inwood (2) 1,000,000 Gal. each Ridgeway 200,000 Gal. 31 Gerrardstown 171,000 Gal. Airport 500,000 Gal. Liberty Park 600,000 Gal. Contact Tank (2) 250,000 Gal. each
Gallons of storage capacity (raw water)	0
Gallons of storage capacity (treated water)	0
Is the Utility a member of WVRWA Emergency Response Team?:	Yes
Is the Utility a member of WV-WARN?:	Yes
List other agreements to provide receive assistance in case of emergency:	BCPSWD has a purchase agreement with the City of Martinsburg for up to 1,000,000 gpd; they currently purchase 225,000 gpd. BCPSWD also has interconnections with their Potomac River Plant, as well as with Frederick County, Virginia.

11.2. OPERATION DURING LOSS OF POWER

Berkeley Co P S W D-Bunker Hill 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

Can you connect to a generator at the intake/wellhead?:	Yes
Please provide a scenario that best describes your system:	YES, CONFIDENTIAL
What do you have (KW)?	CONFIDENTIAL
What do you need (KW)?	CONFIDENTIAL

Can you connect to a generator at the treatment facility?:		Yes, CONFIDENTIAL	
Please provide a scenario that best describes your system:		YES,CONFIDENTIAL	
What do you have (KW)?		CONFIDENTIAL	
What do you need (KW)?		CONFIDENTIAL	
Can you connect to a generator at the distribution system?:		CONFIDENTIAL	
Please provide a scenario that best describes your system:		YES, The pump stations are hardwired for a quick connection to a portable generator.	
What do you have (KW)?		1CONFIDENTIAL	
What do you need (KW)?		CONFIDENTIAL	
Does the utility have fuel on hand for generator?:		Yes	
Hours:		CONFIDENTIAL	
Gallons:		CONFIDENTIAL	
Provide a list of suppliers and alternate suppliers that could provide fuel in the event of an emergency:		Supplier	Phone Number
Does the utility test the generator(s) periodically?:		Yes	
Does the utility routinely maintain the generator(s)?:		Yes	
If the Utility does not have generator or the ability to connect to a generator, describe plans to respond to power outages:		N/A	

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. Berkeley Co P S W D-Bunker Hill 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 Berkeley Co P S W D-Bunker Hill

Is the Utility able to meet water demands with the current capacity for the next five years?	No
Describe the circumstances and plans to increase capacity:	Berkeley County PSWD is planning on building a plant and is looking for alternative water sources

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 13** is taken from the most recently submitted Berkeley Co P S W D-Bunker Hill PSC Annual Report.

Table 14. Water Loss Information

Water pumped - Total Gallons:		1,695,168,000
*Water purchased - Total Gallons:		82,390,000
Total gallons of water pumped and purchased:		1,777,558,000
Total gallons of water loss accounted for except main leaks:	Mains, plaint, filters, flushing, etc - Total Gallons:	58,434,000
	Fire department - Total Gallons:	1,890,000
	Back washing - Total Gallons:	16,740,000
	Blowing settling basins - Total Gallons:	0
Total Accounted for Water Loss		77,064,000
Unaccounted for lost water - Total Gallons:		350,963,000
Water sold - Gallons:		1,348,394,000
Water Lost From Main Leaks:		1,137,000
Total Gallons of Unaccounted for Lost Water and Water Lost from Main Leaks:		352,100,000
Total percent unaccounted for water		20
Describe the measures to correct water loss greater than 15%:	BCPSWD is actively replacing leaky copper fittings throughout the system to reduce the amount of water lost. Additionally, the Bunker Hill WTP utilizes a leak noise correlation system that listens to the distribution system and produces a report indicating potential leak noise. If the system were also to install meter pits throughout the system, the flow could be monitored by systematically closing valves in designated areas and inspecting the system's master meter to note when flow decreases (See Appendix F-6. Engineering Evaluation for more information).	

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.

Berkeley Co P S W D-Bunker Hill 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?	Yes	
From whom do you receive notices?	We receive notices from the Health Dept., OES and ICPRB	
Are you aware of any facilities, land uses, or critical areas within your protection areas where chemical contaminants could be released or spilled?	Yes	
Are you prepared to detect potential contaminants if notified of a spill?	Yes	
List laboratories (and contact information) on whom you would rely to analyze water samples in case of a reported spill.	Laboratories	
	Name	Phone Number
	CONFIDENTIAL –	
Do you have an understanding of baseline or normal conditions for your source water uality that accounts for seasonal fluctuations?	Yes	

Does your utility (aside from turbidity monitoring) currently monitor your raw water through continuous monitoring at the surface water intake or groundwater source to detect changes in water quality that could indicate contamination?		No
Does your utility collect periodic grab samples (ex. possess reserved sample bottles, on-call laboratory services, and trained personnel) in response to a spill notification or to investigate changes in water quality that could indicate contamination?		Yes
Please explain:		Raw water samples are collected daily for basic water testing
Provide or estimate the capital and O&M costs for your current or proposed early warning system or upgraded system.	Capital Cost:	CONFIDENTIAL
	O&M Cost:	CONFIDENTIAL
Do you serve more than 100,000 customers?		No
Does your system currently receive spill notifications from a state agency, neighboring water system, local emergency responders, or other facilities?		Yes
Are you prepared to detect potential contaminants if notified of a spill?		Yes
Please describe the methods you use to monbitor at the same technical levels utilized by ORSANCO:		

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

Berkeley Co P S W D-Bunker Hill 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. Berkeley Co P S W D-Bunker Hill 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 Berkeley Co P S W D-Bunker Hill 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

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 Berkeley Co P S W D-Bunker Hill'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 AND TABLES

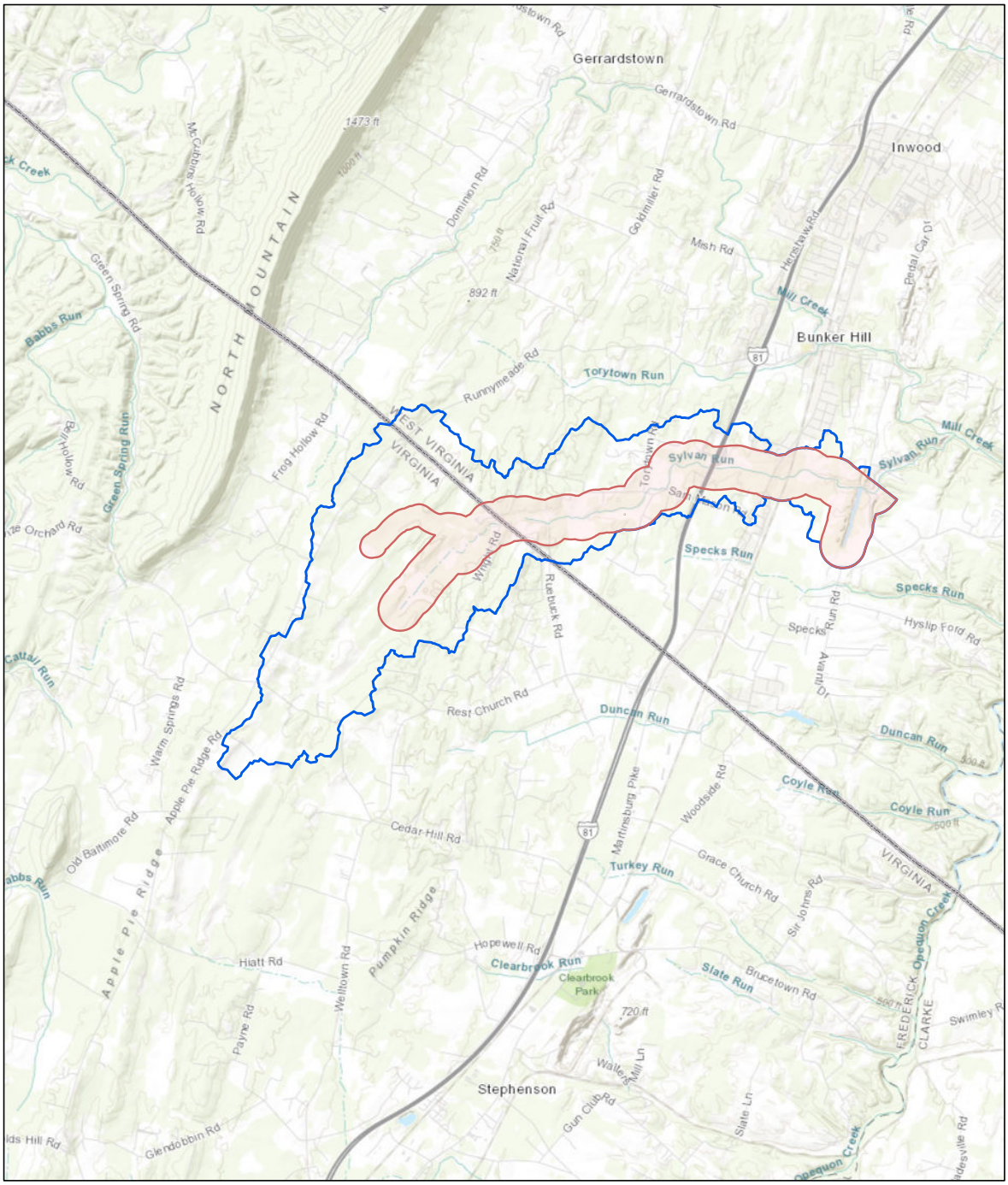
Water Source / Delineation

Surface Water Sources

Intake: Baker Lakes Quarry

Map of watershed delineation area

WV3300202 Baker Lakes Quarry WSDA



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- State_WV

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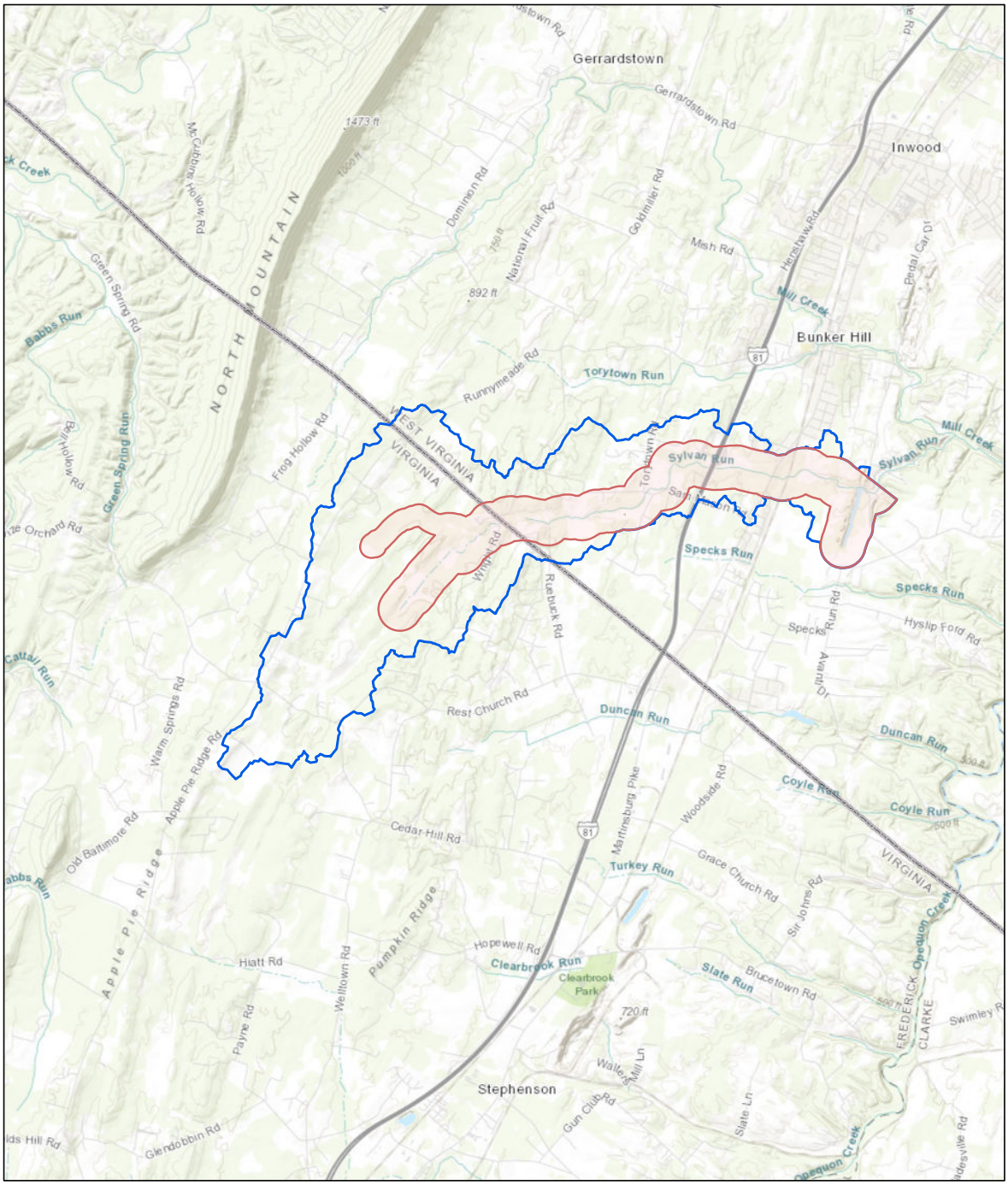
0 1 2 4 km

VITA, West Virginia GIS, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA, NGA, EPA, USDA

Source Water Assessment and Wellhead Protection Programs

Map of zone of critical Concerns

WV3300202 Baker Lakes Quarry WSDA



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0 1 2 4 km

VITA, West Virginia GIS, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA, NGA, EPA, USDA

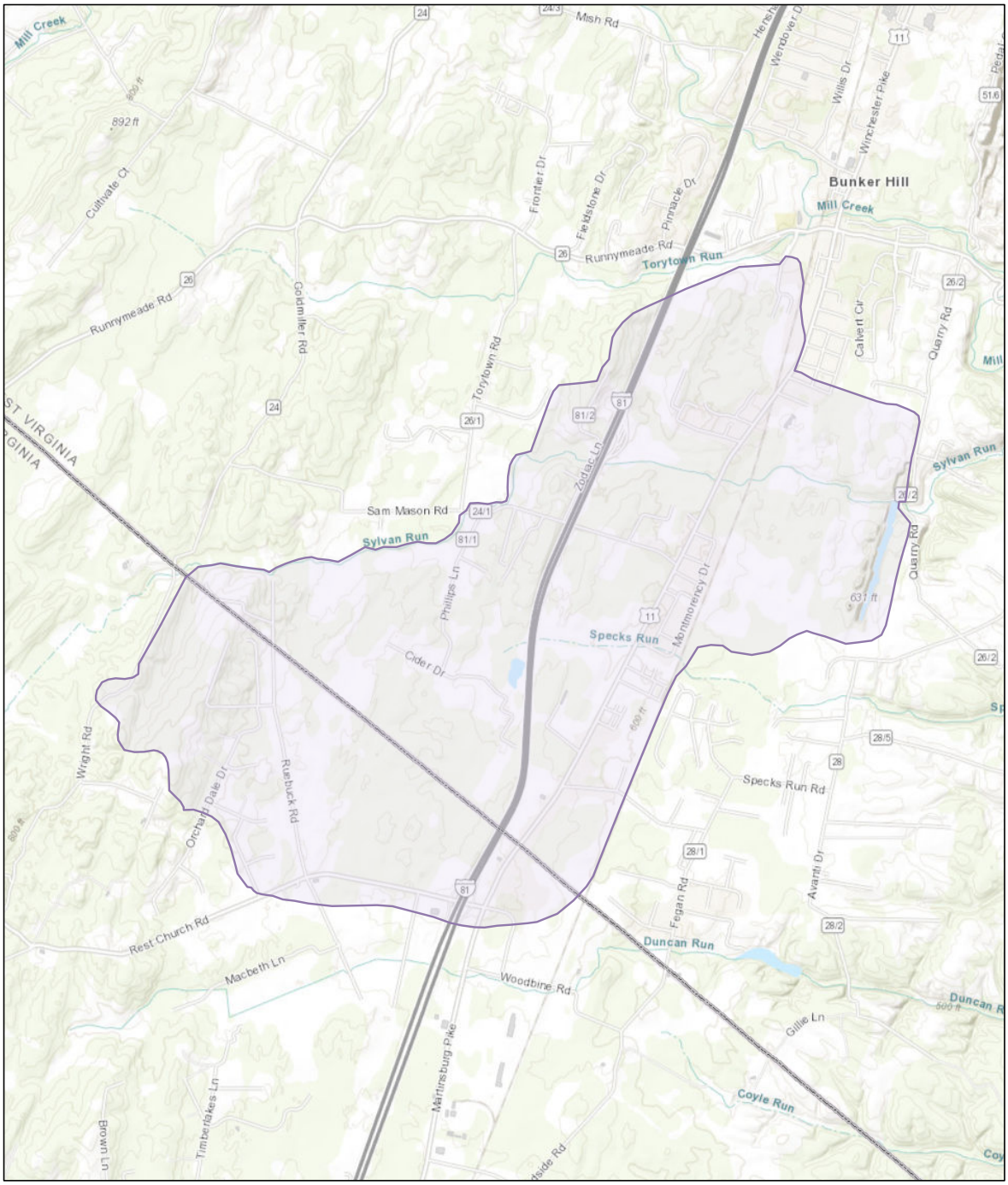
Source Water Assessment and Wellhead Protection Programs

Ground Water Sources

Intake: SP001

Map of wellhead protection

WV3300202 LeFevre Spring WSDA



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0 0.5 1 2 km

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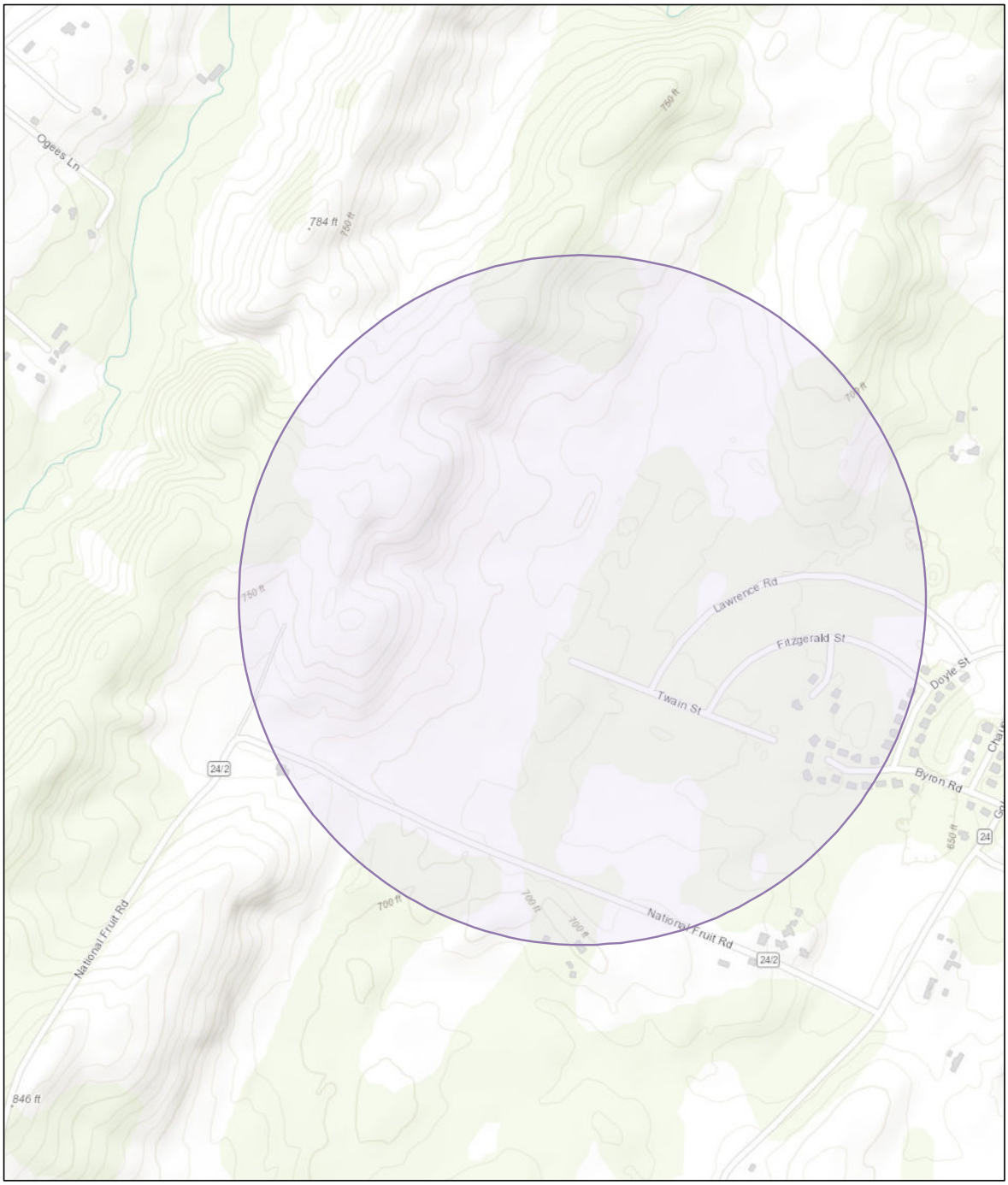
Source Water Assessment and Wellhead Protection Programs

Map of wellhead protection

WV3300202 Springdale Well #2



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0 0.13 0.25 0.5 km

WashCo MD, VITA, West Virginia GIS, Esri, HERE, Garmin, INCREMENT P, Intermap, USGS, METI/NASA, EPA, USDA

Source Water Assessment and Wellhead Protection Programs

PSSC Maps

PSSC Lists

APPENDIX B. EARLY WARNING MONITORING SYSTEM FORMS

Select and Attach the Appropriate Form for Your System

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

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

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

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

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

Appendix B - Form C
Ground Monitoring Worksheet

Describe the type of early warning detection equipment installed:
CONFIDENTIAL
How many monitoring (sentinel) wells are established?:
CONFIDENTIAL.
What is the expeced rate of travel of a contaminant through the groundwater system?:
CONFIDENTIAL
Provide the distance from the contaminant source to the monitoring wells:
CONFIDENTIAL
What is the distance of the monitoring equipment to the well head?:
CONFIDENTIAL
Describe the mechanism to store the data and an institutional framework to analyze and interpret the data:
CONFIDENTIAL
Describe the process to determine the credibility of a contamination event if a change is detected in the quality of source water:
CONFIDENTIAL

APPENDIX C. COMMUNICATION PLAN TEMPLATE

Berkeley Co P S W D-Bunker Hill

PWSID: WV3300202

Authorizing Signature: Jim Ouellet

Contact Phone Number: (304)267-4600

Contact Email Address: jouellet@berkeleywater.org

Plan Developed On: August 2021

ACKNOWLEDGMENTS:

This plan was developed by [insert name, title of person completing plan, and who they work for] 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.

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	Announcement	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	Boil 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	Cannot 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	Do 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	Emergency	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
CONFIDENTIAL			

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., Announcement, Boil Water Advisory, Cannot Drink, Do Not Use, or Emergency)
  - 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

If time permits and the need arises, after the threat level is reduced, and operations return to normal, the water system staff, the communication and source water protection teams, and their partners may 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.

EMERGENCY SHORT FORMS

Emergency Communication Information

	Name	Phone	Email
Designated spokesperson:	Jim Ouellet	(304)267-4600	jouellet@berkeleywater.org
Alternate spokesperson:	Steve DeRidder	(304)274-5803	sderidder@berkeleywater.org
Designated location to disseminate information to media:	251 Caperton Boulevard Martinsburg, WV 25403		
Method of Contact:	Radio Newspaper Television		

Media Contacts:	Name	Title	Phone Number	Email
	Bill Kohler The Herald Mail	Editor	(301)733-5131	billk@heraldmail.com
The Journal		(304)263-8931		WRNR - Main Line
	(304)263-6586		WKMZ - Main Line	
(304)263-2770		WYII		(304)263-0637
	WEPM 1340		(304)263-8868	

Emergency Service Contacts

	Name	Emergency Phone	Alternative Phone	Email
Police	Berkeley Co Sheriff's Office	(911)___-____	(304)267-7000	
Fire	South Berkeley VFD	(911)___-____	(304)229-5337	borsisini@southberkeleyfire.com
Ambulance	South Berkeley VFD	(911)___-____	(304)229-5377	borsini@southberkeleyfire.com
Hazmat	South Berkeley VFD	(911)___-____	(304)263-1345	berkeleycountycomm.org@_
Other				
Other				
Other				

	Coast Guard Facility	(304)264-2600		
	Berkeley Financial Center IRS	(304)263-4901		
	Brentwood Industries	(304)264-9190		
	Chem-Pak	(304)262-1880		
	Guardian Fiberglass	(304)267-6085		
	M.S. Carriers	(304)267-3771		
	Orgill Inc.	(304)262-0101		
	Sexton Can	(304)267-8923		
EED District Office Contact	Name	Phone	Email	
	Alan Marchun	(304)725-9453	alan.f.marchun@wv.gov	
OEHS Readiness Coordinator	Lee Orr	(304)356-4290		

Downstream Water System Contacts	Water System Name	Contact Name	Emergency Phone	Alternate Phone	Email
	Shepherdstown Water (via a spill that affects Opequon Creek)	Charles "Woody" Coe	(304)876-2394		bmyershepherdstownu@s

Are you planning on implementing the TIER Communications plan?:	Yes

Emergency Service Key Staff Members

	Name	Title	Phone	Email
Key Staff Responsible for Coordinating Emergency Response Rrocedures:		CONFIDENTIAL		
Staff Responsible for Keeping Confidential PSSC Information and Releasing to Emergency Responders.				

Emergency Response Information

List Laboratories available to perform sample analysis in case of emergency.	Name	Phone
	PACE Laboratories, Inc.	(304)241-5861
	Environmental Engineering & Technology, Inc.	(757)873-1534
Has utility developed a detailed Emergency Response Plan in accordance with the Public Health Security Bioterrorism preparedness and Response Plan Act of 2002 that covers the following areas?:		Yes
When was the emergency response plan developed or last updated?:		2015

EMERGENCY CONTACT INFORMATION

State Emergency Spill Notification

1-800-642-3074

Office of Emergency Services

http://www.wvdhsem.gov/

Charleston, WV- (304) 558-5380

WV Bureau for Public Health Office of Environmental Health Services (OEHS)

www.wvdhhr.org/oehs

Readiness Coordinator - Lee Orr

Phone: 304-356-4290

Cell: 304-550-5607

E-mail: Lee.E.Orr@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/

APPENDIX D. SINGLE SOURCE FEASIBILITY

Water Source Alternative:

Other	
Name of Alternative:	This system has multiple sources and interconnections
Brief Description of the Alternative:	This system has multiple sources and interconnections
Feasible?:	Yes
Provide Cost Estimate:	$0
Would this alternative supply 100% of your needs?:	Yes
Economic Criteria - Operation and Maintenance Costs:	0
Economic Criteria - Capital Cost:	0
Technical Criteria - Permitting:	0
Technical Criteria - Flexibility:	0
Technical Criteria - Resilience:	0
Technical Criteria - Institutional Requirements:	0
Environmental Criteria - Environmental Impacts:	0
Environmental Criteria - Aesthetic Impacts:	0
Environmental Criteria - Stakeholder Issues:	0
Final Score:	0.00%

Feasibility Study Narrative

Appendix D. Single Source Feasibility Study

The single source feasibility study is required for a public water utility which is served by a single surface water source or a single groundwater source (i.e., one well or one spring). The BCPSWD Bunker Hill WTP has one or more alternative supply sources in place at this time; see **Appendix E** for details. As a result, a single source feasibility study is not required for this utility at this time.

Appendix E. Single Source Feasibility Study Narrative

A feasibility study matrix was deemed unnecessary for the BCPSWD Bunker Hill Water System (BHWS) (PWSID #WV3300202). This plant can utilize the Baker Lakes Quarry as a secondary source that would sufficiently provide raw water to the BHWS plant for a period of 60-90 days, depending on climatic and hydrologic conditions. The operator on duty would have to isolate the contaminated LeFevre Spring water and then activate the Baker Lakes Quarry pumps and open the transmission line valve to provide the BHWS plant with raw water from the Quarry. Once the plant receives water from the Baker Lakes Quarry, the treatment process would continue as if treating water from LeFevre Spring.

In the event that both the LeFevre Spring and Baker Lakes Quarry become impaired by contamination, or should prolonged drought decrease the productivity of both sources, BCPSWD can also utilize water from outside of their treatment plant area, which include interconnections with their Potomac River Plant and the City of Martinsburg.

Matrix Document

Appendix D. Single Source Feasibility Study

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APPENDIX E. SUPPORTING DOCUMENTATION