Source Water Protection Plan

THE CITY OF MARTINSBURG

PWSID WV 3300212

BERKELEY COUNTY

5/18/2016

Prepared by:

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

Stephen M. Knipe 6/09/2016

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

Stephen M. Knipe

Print Name of Authorizing Signatory (see instructions):

Utilities Director

Title of Authorizing Signatory:

05/18/2016

Date of Submission:

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Acronyms

GWUDI – Groundwater Under Direct Influence of Surface Water

PSSC – Potential Source of Significant Contamination

SWAP Program – Source Water Assessment and Protection Program

SWAR – Source Water Assessment Report

SWPA – Source Water Protection Area

SWPP – Source Water Protection Plan

WHPA – Wellhead Protection Area

WVBPH – West Virginia Bureau for Public Health

WVDEP – West Virginia Department of Environmental Protection

Purpose

The goal of the West Virginia Bureau for Public Health (WVBPH) source water assessment and protection (SWAP) program is to prevent degradation of source waters that 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 at a local level. Every aspect of source water protection is best addressed by engaging local stakeholders and local government offices.

The intent of this document is to describe what the City of Martinsburg has done, is currently doing, and plans to do to protect its sources of drinking water. Although this water system treats water to meet federal and state drinking water standards, conventional treatment does not fully eradicate all potential contaminants. Treatment that goes beyond conventional methods is often very expensive to implement, maintain and operate. By completing this plan, the City of Martinsburg acknowledges that implementing measures to prevent contamination of system water sources can be a relatively economical way to help protect drinking water in ways that it can continue to be provided to customers, reliably and safely.

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

- ❑ Fulfills the West Virginia state requirement for the public water utilities to complete or update their source water protection plan.
- ❑ Provides a means for identification and prioritization of potential threats to sources of drinking water; and the establishment of strategies to minimize the threats.
- ❑ Establishes plans for emergency response to incidents that may come to compromise the water supply source(s) by contamination or depletion, and includes the manner in which the public, state, and local agencies will be notified of such an occurrence.
- ❑ Evaluates and establishes plans for future expansion and development of water resources, including the need to identify secondary sources of water.
- ❑ Ensures optimal treatment conditions exist to provide the safest and highest quality drinking water to customers at the lowest possible cost.
- ❑ Provides opportunities for funding to improve water system infrastructure, purchase land in the protection area, and for other improvements to either the sources, or their associated source water protection areas.

Background: WV Source Water Assessment and Protection (SWAP) Program

Since 1974, the federal Safe Drinking Water Act (SDWA) has set minimum standards on the construction and operation of public water systems, including the City of Martinsburg (the utility), as well as the quality of finished water provided to the public. 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 source water supplying groundwater sources relied upon by public water systems.

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 (both surface water and groundwater sources). As part of this initiative, states must explain how protection areas for each public water system are delineated, how potential contaminant sources are inventoried, and how susceptibility ratings are established.

In 1999, the WVBPH published the West Virginia SWAP 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 the City of Martinsburg can be found in **Table 1**.

State Regulatory Requirements

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

Under the amended and newly added codes, each existing public water utility operating surface water and/or GWUDI sources must have completed or updated a Source Water Protection Plan (SWPP) by July 1, 2016, and must continue to update their plan every three years. Existing SWPPs have been developed for many public water utilities in the past. If available, these SWPPs were reviewed and considered in the development of this updated plan. Any new water system established after July 1, 2016 must submit a SWPP before operations

commence. A new plan is also required when there is a significant change in the Potential Sources of Significant Contamination (PSSC) within the Source Water Protection Area (SWPA).

The code also requires that public water utilities include details regarding PSSCs, protection measures, system capacities, contingency plans, and communication plans in their SWPP. Before a SWPP can be approved, the local health department and public will be invited to contribute information and provide comments for consideration. In some instances, public water utilities may be asked to conduct independent studies of the SWPA and specific threats within their SWPA to gain further insight about the origin of their water for the purpose of developing strategies to better protect these vital resources.

System Information

The City of Martinsburg's system is classified as a state regulated public utility and operates a community public water system. A community public water system is a system that regularly supplies drinking water from its own sources to at least 15 service connections used by year round residents, or regularly serves 25 or more people throughout the entire year. Information on the population served by this utility is presented in **Table 1** below.

Table 1. Population Served by the City of Martinsburg

Administrative office location:		600 Baltimore Street, Martinsburg WV 25401	
Is the system a public utility, according to the Public Service Commission rule?		Yes	
Date of Most Recent Source Water Assessment Report (SWAR):		None	
Date of Most Recent Source Water Protection Plan (SWPP):		September 2000	
Population served directly:		15,650	
Bulk Water Purchaser Systems:	**System Name**	**PWSID Number**	**Population**
	Berkeley County Public Service Water District – Potomac River System	3300218	22,396
	Berkeley County Public Service Water District – Bunker Hill	3300202	27,563
	See computation for population equivalent for water sold to BCPSWD		
Total Population Served by the Utility:		20,979	
Does the utility have multiple source water protection areas (SWPAs)?		Yes	
How many SWPAs does the utility have?		3	

Water Treatment and Storage

As required, the City of Martinsburg 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 backup surface water source (Lake Thomas) from which the City of Martinsburg can draw water in emergency and/or drought scenarios can be found in **Table 3**. Information about the groundwater sources from which the City of Martinsburg draws water can be found in **Table 4**.

Table 2. The City of Martinsburg Water Treatment Information

	Kilmer Springs	Big Springs
Water Treatment Processes (List All Processes in Order)	1. Coagulation 2. Flocculation 3. Filtration 4. Disinfection 5. Fluoridation	
Current Treatment Capacity (gal/day)	4,500,000	
Current Average Production (gal/day)	2,200,000	750,000
Maximum Quantity Treated and Produced (gal)	2,400,000	1,300,000
Minimum Quantity Treated and Produced (gal)	1,600,000	475,000
Average Hours of Operation	24	8
Maximum Hours of Operation in One Day	24	24
Minimum Hours of Operation in One Day	24	6

Number of Storage Tanks Maintained	4
Total Gallons of Treated Water Storage (gal)	5,260,000
Total Gallons of Raw Water Storage (gal)	250,000

Table 3. The City of Martinsburg Surface Water Sources

Source Name	SDWIS #	Local Name	Describe Source	Name of Water Source	Date Constructed/ Modified	Frequency of Use (Primary/ Backup/ Emergency)	Activity Status (Active/Inactive)
Lake Thomas Reservoir	–	Lake Thomas	Portable Pump/Intake would need to be brought in for an emergency	Lake Thomas	N/A	Emergency	Inactive

Table 4. The City of Martinsburg Groundwater Sources

Does the utility blend with groundwater?					The utility primarily uses groundwater and would only blend with or utilize surface water (from Lake Thomas) in an emergency situation.				
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)**
Kilmer Springs	TP001	Kilmer Springs	1930s / 2006	No	_	_	_	Primary	Active
Big Springs Well	TP002	Big Springs Well	2001	Yes	503	422	Yes (102ft)	Primary	Active

Delineations

For groundwater supplies, BPH makes use of two types of SWPA delineations: 1) wellhead delineations and 2) conjunctive delineations, which are developed for supplies identified as GWUDI sources. A Wellhead Protection Area (WHPA) 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 WHPA for the hydrogeologic recharge area (five-year time of travel) and an additionally connected area surrounding a surface water body that contributes water to a groundwater source. Conjunctive delineations, therefore, have been created for GWUDI sources.

Information and maps of the WHPAs, which will be referred to as the Source Water Protection Areas (SWPAs) in this document, for this public water supply were provided to the utility and are attached to this report. See figures provided in **Appendix A.** Other information pertaining to the SWPA is shown in **Table 5**.

Table 5. Source Water Protection Area Delineation Information

Size of WSDA (Acres)	N/A; this system does not have an active surface water intake
River Watershed Name (8-digit HUC)	02070004 Conococheague-Opequon
Size of Zone of Critical Concern (Acres)	N/A; this system does not have an active surface water intake.
Size of Zone of Peripheral Concern (Acres) (Include ZCC area)	N/A; this system does not have an active surface water intake.
Method of Delineation for Groundwater Sources	The Kilmer Springs and Big Springs WHPAs (2) were defined by WVBPH in 1998 based upon work done by Hobba in the 1970's. A third WHPA was identified and delineated by WVBPH as the Central WHPA while the Wellhead Protection Plan was being developed in 2000. Dye tracing studies still need to be performed to determine the degree to which this Central WHPA influences system water sources.
Area of Wellhead Protection Area (Acres)	23,772
Total Area of SWPA (Acres)	23,772

Protection Team

Communities with successful protection plans form a Protection Team to help develop and implement management and protection strategies presented within the SWPP. A Protection Team provides a broader level of oversight of the source water protection effort and includes individuals familiar with protective strategies. Active team members for the City of Martinsburg include: water supply staff (including the utilities director and chief operator), City Planners/Engineers and the City Manager. Office of Homeland Security and Emergency Management (OHSEM) representatives will also be working with the system as the effort continues, as part of a County-wide source water protection effort relating to emergency response preparedness.

The City of Martinsburg utilities director took responsibility for assembling the Protection Team. Members were provided the opportunity to contribute to the development of the plan. The acting members of the Protection Team are listed in **Table 6**. Some government and emergency personnel were unable to participate in this iteration of the source water protection effort. Their participation will be sought in future iterations of the SWPP, which is updated at least every three years or as significant changes occur to PSSCs within the SWPA. The Protection Team reviewed the system's existing SWPP and Source Water Assessment Report (SWAR), included as **Appendix F-3** of this report, as well as newly collected PSSC data to make informed decisions on potential threats, protective measures, and implementation actions. The Protection Team will continue to be responsible for updating the SWPP continually and documenting their efforts to engage local stakeholders.

Table 6. Protection Team Member and Contact Information

Name	Representing	Title	Phone Number	Email
Stephen Knipe	City of Martinsburg	**Utilities Director**	-	-
Sam Blair	City of Martinsburg	**Chief Operator**	-	-
Jeff Wilkerson	City of Martinsburg	**Director of Public Works**	-	-
Michael Covell	City of Martinsburg	**Engineer / Planning Director**	-	-
Mark Baldwin	City of Martinsburg	**City Manager**	-	-
Date of Protection Team Meeting		December 3, 2015		
Efforts to engage local stakeholders and explain absence of required 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. Potential members were invited via email by the Utilities Director.		

Potential Significant Sources of Contamination

This SWPP provides a comprehensive list of the Potential Sources of Significant Contamination (PSSC) contained within the City's SWPA, based upon information obtained from the Department of Environmental Protection (WVDEP), the WVBPH and the Division of Homeland Security and Emergency Management. 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. This does not necessarily indicate that any release has occurred, presently or historically.

The database information that utilities received of PSSCs located in their 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 SWARs and SWPPs. Typical means of identifying and/or confirming the existence of previously identified PSSCs involves performing a "windshield survey," in which a group performs a reconnaissance of potential hazards that can be identified from public rights of way, throughout the SWPA. This same method was used by ALWI to verify the presence of previously identified PSSCs, identify and record new PSSCs and/or change the details of facilities over time (e.g., when a gas station switches owners). Regulated PSSCs are derived from federal and state regulated databases, and may include data from WVDEP, US Environmental Protection Agency, Division of Homeland Security and Emergency Management, and out of state data sources. The presence of these PSSCs also was confirmed by ALWI field personnel to the degree feasible.

Confidentiality of PSSCs

A list of the PSSCs contained within the SWPA is included in this SWPP. However, the exact location, characteristics and approximate quantities of contaminants only were made known to a select designee of the utility. This representative has maintained, and will continue to maintain this information in a confidential manner. In the event of a chemical spill, release or related emergency, information pertaining to such an event will immediately be disseminated to involved emergency responders.

PSSC data from some agencies (e.g., Division of Homeland Security and Emergency Management, WVDEP, etc.) may be restricted due to the sensitive nature of the data. However geospatial data has been provided to the public water utility. To obtain specific details regarding contaminants (such as information included on Tier II reports), the water utility will continue to contact local emergency agencies, directly. Maps and lists of the Non-Confidential PSSCs are provided in **Appendix A. Figures**.

Local and Regional PSSCs

For the purposes of this SWPP, local PSSCs are those that are identified by the utility's Protection Team, consultants to the utility, or local stakeholders, in addition to the PSSCs lists distributed by the WVBPH and other agencies. Local PSSCs may be identified 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. The second reason local PSSCs are identified is because public water utilities may consider expanding the PSSC inventory effort outside of the SWPA, if necessary, to properly identify threats that could impact the drinking water supply source(s).

When conducting local and regional PSSC inventories, some sources are or may be obvious, such as above ground storage tanks, landfills, livestock confinement areas, highway or railroad right of ways, and sewage treatment facilities. Other potential hazards are more difficult to locate, such as abandoned cesspools, underground tanks, French drains, dry wells, or old dumps and mines.

ALWI investigated the City of Martinsburg SWPAs by means of a "windshield survey." The purpose of this survey was to verify the existence of previously identified PSSCs and to identify any new PSSCs. Completion of such a survey increases local knowledge of the presence of PSSCs not listed on the original inventory or in regulated databases. Information on any new or updated PSSCs can be found in **Table 7**.

Table 7. New Locally Identified Potential Significant Sources of Contamination

PSSC Number	Map Code	Site Description	Comments
337	C-9	Cemetery	Embalming fluids and decomposition byproducts may impact drinking water supplies.
356	C-14	Fleet/Truck/Bus Terminals	Likely low impact. Significant impervious surface coverage and outdoor storage of transported goods. Recommend further inquiring/analyzing potential contaminant hazards related to facility.
336	I-1	Asphalt Plants	Paving contractor. Large above ground storage or processing tanks located on-site. Facility directly connected to Winchester and Western Railroad Network. Facility also has NPDES permit. During windshield survey, railway storage cars (for fluids) were observed on-site.
391	C-9	Cemetery	Embalming fluids and decomposition byproducts may impact drinking water supplies.
344	C-3	Automotive Repair	Car retailer with possible garage incorporated in rear right portion of building. Vehicle maintenance/repair and associated fluid storage/removal unknown.
350	C-2	Airports / Abandoned Airfields/Flight School	Company manages and maintains aircraft and distributes fuel.
346	C-3	Automotive Repair	Automotive repair shop that features services including oil changes, transmission fluid replacement, etc.

351	C-3	Automotive Repair	Automotive repair shop that features services including oil changes, transmission fluid replacement, etc.
352	C-3	Automotive (Motorcycle) Repair	Automotive repair and services for motorcycles.
359	C-50	Veterinary Offices	Spills, leaks, or improper handling of x-ray, biological and chemical wastes and other materials during transportation, use, storage and disposal may impact drinking water supplies. Facility is small, but located in close proximity to Big Springs WTP and Evans Run, which is believed to influence Big Springs.
353	C-3	Automotive Repair / Car Wash	Automotive repair shop that features services including oil changes, transmission fluid replacement, etc. Site also features a car wash.
360	C-3	Automotive Repair	Motorcycle and recreational vehicle distributor. Facility also performs services, including oil changes.
361	C-3	Automotive Repair	Automotive repair shop that features services including oil changes, transmission fluid replacement, etc.
347	C-3	Potential Automotive Repair	Previously an AAMCO Transmission, this facility was undergoing change in ownership during our windshield survey. AAMCO Transmission signs were being taken down. The new ownership and facility type are unknown, but presumed to continue being automotive repair.
395	M-6	Fire Station with Emergency Response Vehicles	Unknown maintenance and fuel storage practices

386	C-14	Truck Terminals/Shipping	Shipping company with vehicle storage. Unknown maintenance and fuel storage practices.
334	C-3	Automotive Repair and/or Car Sales	Approximately 20-30 cars on site. Presence of maintenance garage could not be verified from public rights of way.
388	C-22	ASTs and Storage Tank	Unknown contents; owner information not identifiable from public rights of way.
367	M-27	Warehouse with one large bay door	Unknown storage contents
385	I-44	Unknown hazard type	Not accessible or identifiable from public rights of way
354	M-18	Unknown hazard type	Could not be accessed from public rights of way. Present status and use unknown.
402	C-3	(Garage On Site) Automotive Repair	Car retailer with possible garage incorporated in rear right portion of building. Vehicle maintenance/repair and associated fluid storage/removal unknown.
403	C-3	Automotive Repair / Car Wash	Automotive repair shop that features services including oil changes and other fluid replacement, etc. Site also features a car wash.
326	C-50	Veterinary Offices	Spills, leaks, or improper handling of x-ray, biological and chemical wastes and other materials during transportation, use, storage and disposal may impact drinking water supplies.
401	C-3	(Garage On Site) Automotive Repair	Car retailer with 2 door garage incorporated into building. Vehicle maintenance/repair and associated fluid storage/removal unknown, but likely.

327	C-3	Automotive Repair	Automotive repair shop and towing services. 389 Trimble Ave, Martinsburg, WV 25404
376	C-3	Used car sales	
377	C-3	Automotive Repair	Two car garage automotive repair shop.
328	M-26		Low priority threat; sells/distributes pool supplies, chemicals and chlorine.
380	C-14	Fleet/Truck/Bus Terminals	School system bus terminal. Based on signage, presumed garage is on-site.
325	C-9	School facility	Embalming fluids and decomposition byproducts may impact drinking water supplies.
381	C-3	Automotive Repair	Three car bay automotive repair shop. Exact services are unknown.
331	C-27	Laundromat	Dry Cleaning and Laundry Services. http://iaspub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110007878831
332	M-21	School facility	Over-application or improper handling of cleaning products, pesticides or fertilizers used on the school grounds may impact drinking water. Vehicle maintenance wastes may contribute contaminants
383	C-3	Automotive Repair	Automotive repair shop. Exact services are unknown.
384	C-3	Automotive Repair	Used car retailer with 3-bay garage on-site in rear of building. Exact services are unknown.

382	M-21	School facility	Over-application or improper handling of cleaning products, pesticides or fertilizers used on the school grounds may impact drinking water. Vehicle maintenance wastes may contribute contaminants
329	C-3	Automotive Repair	Automotive repair shop that features services including oil changes and other fluid replacement, etc.

Note: The windshield survey for this system was completed prior to receipt of the BPH provided databases. Geospatial information collected during the windshield survey was compared against that provided by BPH for regulated and previously identified PSSCs. ALWI attempted to remove geospatial duplicates and add PSSC numbers for newly identified PSSCs, which are listed above. Numbers not displayed in the table above correspond with PSSCs previously identified in past SWAP reports or in regulated databases, the information for which can be found in **Appendix A**. However, facility details in the databases provided did not always have clear names or characteristics, and as such, some of the PSSCs identified above may be duplicates of those included in the BPH provided databases.

Prioritization of Threats and Management Strategies

It may not be feasible to develop and implement management strategies for all of the PSSCs within the SWPAs, due to the total number identified. For the City of Martinsburg, a total of 324 facilities were identified as PSSCs within the three SWPAs. As such, individual PSSCs were grouped together (e.g., all gas stations are included as commercial facilities) and management strategies were developed for these subsequent groupings.

The identified PSSCs have been prioritized by potential threat based on water quality concerns, proximity to system water sources, and other local concerns. In addition to identifying and prioritizing PSSCs within the SWPAs, local source water concerns may also focus on critical areas. For purposes of this SWPP, a critical area is defined as an area, identified by local stakeholders, within or outside of the SWPA, that may contain one or more PSSC(s), and/or within which immediate response would be necessary to address the incident and to protect source waters. The highest priority PSSCs or critical areas will be addressed first in the management plan. Lower ranked PSSCs will be addressed in the future as time and resources allow. To assess potential threats to the source waters, the City of Martinsburg Protection Team and ALWI have considered information regarding each PSSC.

After identifying local concerns, the City developed and prioritized management strategies to protect the source water from contamination, in cooperation with the WVBPH, local health departments, local emergency responders, OHSEM and other agencies and organizations. This task was completed at the City of Martinsburg Protection Team meeting, hosted at the City Council Chambers on December 4, 2015. A list of local representatives involved in the decision making process were provided in **Table 6**. Source management strategies are any actions taken to protect the source water from specific PSSCs, categories of PSSCs (e.g., agricultural, commercial, etc.), and critical areas. It is advisable to focus source management strategies on high-priority PSSCs, with a particular focus on those that are within the City's jurisdiction. However, the utility can protect against contaminant sources outside of its jurisdiction by working with the officials of other nearby jurisdictions within which sources and/or hazards are located. Also, if watershed groups are active in the area of concern, the utility may be able to partner with them.

A list of these priority PSSCs and critical areas were selected and ranked by the City of Martinsburg Protection Team. This list reflects the concerns of the Protection Team and may contain PSSCs not previously identified and not within the SWPA. It contains a description of why each critical area or PSSC is considered a threat. This information is presented in **Table 8.**

Implementation Plan for Management Strategies

Source management strategies are any actions taken to protect source waters from specific PSSCs, categories of PSSCs, and critical areas. For example, prohibitions of certain land uses or facilities, design standards, best management practices, operating standards, and reporting requirements are typical source management strategies. Land purchases, conservation easements, and purchase of development rights are also considered source management strategies. As a management strategy, water utilities may also consider notification to and coordination with government agencies during a water supply impairment event. Finally, one strategy all water utilities should implement is periodic surveys of their SWPAs to maintain an active and updated inventory and awareness of potential threats.

For source management and education/outreach strategies, this utility has considered how the strategies will be implemented. The initial step in implementation is to discuss responsible parties and timelines for implementation of strategies. The Protection Team members will 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 SWPP. A system of regular updates should be included in every implementation plan.

Proposed commitments and schedules related to both protection strategies and education/outreach strategies may change. The City of Martinsburg Protection Team has developed an implementation plan (Table 9) for each PSSC that is listed in the Prioritization of Threats section. The responsible team member, timeline, and any additional comments for each management strategy are presented in **Table 9**.

Table 8. Priority PSSCs or Critical Areas

PSSC or Critical Area	Big Springs Priority #	Kilmer Springs Priority #	Reason for Concern
Highway (I-81)	1	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 ground water sources at a higher risk from surface water contaminant pathways.
Railroad	2	3	Threat to surface water and shallow groundwater aquifers due to the possibility of spills and derailments.
Industrial & Commercial Activity	3	2	Facilities such as gas stations, auto repair shops, and mining operations lie within the SWPA and pose a threat due to the potential for accidental spills, leaks, improper disposal of hazardous wastes or improperly managed stormwater runoff.
Sinkholes	4	4	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 land uses.
Septic & Sewer Systems	5	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 Activities	6	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.

Table 9. Priority PSSC Management Strategies

PSSC or Critical Area	Management Activity	Responsible Protection Team Member	Status / Schedule	Comments	Estimated Cost
Highway (I-81)	The Berkeley County Public Service Water District and City of Martinsburg, 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 the City receives timely notification in the event of highway or other roadway spill within SWPAs. The City, 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.	Mr. Eddie Gochenour	Long Term (5+ years)		Time and effort to set up meetings to coordinate.

Railroad	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. The City 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).	Mr. Eddie Gochenour	Mid-term (2+ years)	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 and effort for attending meetings and drills
Industrial & Commercial Activity	The City 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. The City will educate facility owners on the potential threat of sinkhole development caused by improper stormwater management. The City 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.	The City of Martinsburg	Request GPPs: Once per facility (2-3 years) Distribute Info: Once per SWAP update (3 yrs.)	Status / Schedule subject to change based on perceived need of SWP education. 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 throughout the entirety of the Martinsburg SWPAs.	Staff time and effort for the distribution of BMP information to industrial and commercial facilities within the SWPA. Note: currently ongoing within corporate boundaries through their MS4 Program

Sinkholes	Region 9 will be researching available funding opportunities to create a SWPA-specific sinkhole management program throughout Berkeley County. 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. Meanwhile, the City will re-evaluate the previously delineated "Zone of Influence" with ESSROC mining company.	(1) Region 9 (2) City of Martinsburg	Long Term (10+ years)	(1) Currently, there is not a specific government entity that oversees sinkhole mitigation and repair once lands have been developed in Berkeley County. The Berkeley County Planning Department only has regulations in place to address existing sinkholes on lands that have not been developed.	Staff time and effort to work in cooperation with Berkeley County for identification of sinkholes within the SWPA.
Agricultural Activities	The City will work with the County Extension Service, the Soil and Water Conservation District, and/or Natural Resources Conservation Service (NRCS) to raise awareness about and promote participation in forest conservation, land retirement and nutrient management programs within the SWPA.	City of Martinsburg	Long Term (5+ years)	Nutrient management plans are not required for agricultural facilities within Berkeley County but are provided at no cost by the USDA NRCS.	Staff time and efforts to attend meetings with NRCS
Septic Systems	The City 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. The City 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).	City of Martinsburg	(1) Pending (2) Long Term (5+ years)	The City 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.	Staff time and effort to work with Health Department in providing septic owners within SWPA information regarding septi systems

Education and Outreach Strategies

The goals of education and outreach strategies are to raise awareness of the need to protect drinking water supplies and build support for implementation strategies. Education and outreach activities will also help ensure that affected citizens and other local stakeholders remain informed and are provided an opportunity to contribute to the development of the SWPP. The City of Martinsburg has created an Education and Outreach plan to keep the local community involved in protecting their sources of drinking water in the future. 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
General Information Dissemination	The City 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.	City of Martinsburg	Short Term (1-2 years)		Printing costs and moderate employee time.
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.	City of Martinsburg	Short Term (1-2 years)		Printing costs and moderate employee time.
Clean Up Events	Coordinate with local Clean Up efforts and publicize projects. Work closely with Watershed Associations in this regard.	City of Martinsburg	Long Term (5+ years)		Employee time and equipment.
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). Consider implementing in conjunction with City and County MS-4 requirements.	City of Martinsburg	Long Term (5+ years)		Moderate employee time.
Display Information	(1) Include informational materials (i.e., brochures, maps, etc.) in County & City government offices and other public places (i.e., local fairs). Work with DOT for protection area sign expansion/coverage. (2) Host non-confidential SWPP online for public review and comment.	City of Martinsburg	(1) Long Term (5+ years) (2) Short Term (ongoing)		Printing costs and moderate employee time.

Contingency Plan

The goal of contingency planning is to identify and document how the utility will prepare for and respond to drinking water shortages or emergencies that may occur due to short and long term water interruption, or incidents of contamination resulting from spills or other events. The City of Martinsburg has examined their capability to protect their sources, treatment, and distribution system from contamination events and water shortages by assessing their water sources to determine if adequate capacity exists to meet demands during such events. They also reviewed their ability to use alternative water sources and minimize water loss, as well as their ability to operate during power outages. In addition, this utility has reported on the feasibility of establishing an early warning monitoring system and meeting future water demands.

For groundwater sources, diverting or removing contaminated groundwater can be extremely difficult and costly. It may involve removing contaminated groundwater via pump and treat methods, or by implementing other remediation technologies. Systems have contingency plans in place to protect each source and treatment facility during contaminant events. The City of Martinsburg can protect their sources by turning off pumps and closing valves to prevent contamination of the treatment plants and/or distribution system. The amount of time that a source can remain offline depends, in part, on the water infrastructure, and should be determined by the utility before an emergency occurs. For groundwater sources, other factors, such as geologic strata orientation and configuration, contaminant type, contaminant viscosity, and retention also affect the period of time over which a groundwater source may not be usable. The longer a source can remain offline in such a case via interconnections and backup sources, the better equipped and flexible a water system will be for responding to emergency events. Incorporation of advanced treatment options into the water system, while expensive, may also offer additional options during contamination events, with the specific treatment methods dependent on the type of contaminant introduced into the groundwater supply.

Treated water storage capacity also becomes important in the event of an emergency or contaminant release. Storage capacity can directly determine how well a water system can respond to a contamination event and how long a source can remain offline. Information regarding the water shortage response capability of the City of Martinsburg is provided in **Table 11**.

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/). The City of Martinsburg has analyzed its ability to effectively respond to emergencies and this information is provided in **Table 11**.

Table 11. The City of Martinsburg Water Shortage Response Capability

Can the utility isolate or divert contamination from the groundwater supply?	Kilmer Springs		Big Springs Well	
	Yes		Yes	
Describe the utility's capability to isolate or divert potential contaminants:	CONFIDENTIAL		CONFIDENTIAL	
Can the utility switch to an alternative water source that can supply full capacity at any time?	Yes			
Describe in detail the utility's capability to switch to an alternative source:	CONFIDENTIAL			
Can the utility close the water source to prevent contamination from entering the water supply?	Yes			
How long can the source stay closed?	N/A			
Describe the process to close the source:	CONFIDENTIAL			
Describe the treated water storage capacity of the water system:	Boyd Orchard	Western Avenue	Red Hill	Stuckey Court
	1,500,000	200,000	2,000,000	260,000
Is the utility a member of WVRWA Emergency Response Team?	Yes			
Is the utility a member of WV-WARN?	Yes			
List any other mutual aid agreements to provide or receive assistance in the event of an emergency:	Interconnection with the Berkeley County Public Service Water District			

Operation During Loss of Power

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

Table 12. Generator Capacity

What is the type and capacity of the generator needed to operate during a loss of power?	CONFIDENTIAL			
Can the utility connect to a generator at the wellhead? If yes, select a scenario that best describes system.	CONFIDENTIAL	CONFIDENTIAL		
Can the utility connect to a generator at the treatment facility? If yes, select a scenario that best describes system.	CONFIDENTIAL	CONFIDENTIAL		
Can the utility connect to a generator in distribution system? If yes, select a scenario that best describes system.	Yes, CONFIDENTIAL			
Does the utility have adequate fuel on hand for the generator?	No, CONFIDENTIAL			
What is your on-hand fuel storage and how long will it last operating at full capacity?	**Gallons**	**Hours**		
	CONFIDENTIAL	CONFIDENTIAL		
Provide a list of suppliers that could provide generators and fuel in the event of an emergency:	**Supplier**		**Contact Name**	**Phone Number**
	Generator	Allegheny Power	Customer Service Rep	888-254-6359
	Generator	WV National Guard	Garrison Commander	304-267-2772
	Fuel	R.M. Roach & Sons	Associate	304-263-3329
	Fuel	Griffith Energy Services	Associate	888-721-5707
Does the utility test the generator(s) periodically?	Yes, Boyd and Stuckey Court Pump Stations are exercised every Tuesday.			
Does the utility routinely maintain the generator?	Yes, weekly.			

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:	At the Kilmer Springs filtration facility, there is not a quick connect for a portable generator. The facility is designed so that the power system is wired through two independent control panels on two separate power grids. If the power goes out on one grid the panel that is wired to the powered grid will automatically come online and will provide power to the facility. In the instance that both grids would be out, a portable generator would have to be hardwired into the facility or the Big Spring filtration facility would have to be brought to full system demand capacity.

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 (future demand). This could mean expanding current sources (e.g., removing water at greater rates than present) or developing new sources in the near future. This can be an expensive and time consuming process, and the water utility should take this into account when determining emergency preparedness. The City of Martinsburg 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 the City of Martinsburg

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, there is enough capacity to support more residential development. Commercial or Industrial development may require additional capacity, depending on the type of commercial or industrial development.
If not, describe the circumstances and plans to increase production capacity:	Re-evaluate withdrawal permit

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 due to the presence of leaks and other perforations in the distribution system. 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

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

Table 14. Water Loss Information

Total Water Pumped (gal)	825,668,479
Total Water Purchased (gal)	None
Total Water Pumped and Purchased (gal)	825,668,479

Water Loss Accounted for Except Main Leaks (gal)	**Mains, Plants, Filters, Flushing, etc.**	25,000,000
	Fire Department	20,000,000
	Back Washing	None
	Blowing Settling Basins	None
Total Water Loss Accounted For Except Main Leaks (gal)		45,000,000
Water Sold- Total Gallons (gal)		619,363,000
Unaccounted For Lost Water (gal)		46,305,479
Water lost from main leaks (gal)		115,000,000
Total gallons of Unaccounted for Lost Water and Water Lost from Main Leaks (gal)		161,305,479
Total Percent Unaccounted For Water and Water Lost from Main Leaks (gal)		19.5%
If total percentage of Unaccounted for Water is greater than 15%, please describe any measures that could be taken to correct this problem:	In addition to actively repairing leaks throughout the system, the City of Martinsburg also routinely inspects the ESSROC mining company property for signs of water main breaks The utility is not always notified when a leak occurs on the ESSROC property. These otherwise unreported leaks could be a major contributing factor to the percent total water loss the utility experiences. The City of Martinsburg could install meter pits to section the distribution system into different zones. This would allow the utility to monitor flow 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).	

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 specific threats to source waters. 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 which conditions are

associated with the sampling event. The City of Martinsburg collects samples for their source throughout the year to better understand the baseline water quality conditions and natural seasonal fluctuations. Having a baseline helps determine if changes in the water quality are indicative of a contamination event. In addition to required water quality sampling analyses, the City of Martinsburg monitors pH, Temperature, Alkalinity, Hardness and Turbidity at both treatment plants on a daily basis.

The City of Martinsburg has established an early warning monitoring system for detecting chemical threats with sufficient time to respond to protect the treatment facility and public health. The utility has also outlined a communication plan, which establishes 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.

The City of Martinsburg 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 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; notifications are received from the West Virginia Department of Environmental Protection and Local Fire and Police Stations. The Department of Health and Human Resources Bureau for Public Health also sends out emails regarding spills reported throughout the County. OHSEM will coordinate with system representatives to notify them of spills within or in proximity to SWPAs.
Are you aware of any facilities, land uses, or critical areas within your protection areas where chemical contaminants could be released or spilled?	Yes; I-81 Corridor and CSX Short Line Partner Railway. Multiple gas stations and other commercial and industrial facilities also exist within the SWPAs.
Are you prepared to detect potential contaminants if notified of a spill?	The utility has the ability to detect potential contaminants that may affect pH, turbidity temperature, alkalinity and hardness. Other contaminants, including VOCs and SOCs, require analysis from an outside laboratory

List laboratories (and contact information) on whom you would rely to analyze water samples in case of a reported spill.	**Laboratories**		
	Name	**Contact**	
	CONFIDENTIAL		
	CONFIDENTIAL		
Do you have an understanding of baseline or normal conditions for your source water quality that accounts for seasonal fluctuations?	Yes; pH, turbidity, temperature, alkalinity and hardness.		
Does your utility currently monitor raw water (through continuous monitoring or periodic grab samples) from a groundwater source on a regular basis?	Yes; pH, turbidity, temperature, alkalinity and hardness. The system is also contemplating recording conductivity and dissolved oxygen on a daily basis.		
Provide or estimate the capital and O&M costs for your current or proposed early warning system or upgraded system.	**Capital**	CONFIDENTIAL	
	Yearly O & M	CONFIDENTIAL	
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 for a surface water supply source or a GWUDI source, the submitted SWPP must also include an examination and analysis of the technical and economic feasibility of alternative sources of water to provide continued safe and reliable public water service in the event its primary source of supply is detrimentally affected by contamination from a chemical release or spill event, or other reasons (including drought). These alternatives may include a secondary source, raw or treated water storage, interconnection with neighboring systems, or other options identified on a local level. A secondary water supply should draw water from a substantially different location or water source to prevent contamination of both sources.

While each of the utility's water treatment plants can meet City demand in the event one of the treatment plants is taken offline (due to contamination, capacity shortfall or for other reasons), the City also has the option of utilizing Lake Thomas, which acts as an emergency reservoir source and would require deployment of a portable intake and pump. The City of Martinsburg also has interconnections with the BCPSWD water system. As a result, completion of the Feasibility Study Matrix spreadsheet was not required for this system; however, a brief narrative is attached (**Appendix E**) which describes the alternatives already in place.

Communication Plan

The Protection Team for this water system has also developed a Communication Plan that documents the manner in which the public water utility, working in concert with state and local emergency response agencies, shall notify the local health agencies and the public of a spill or contamination event, and provide updated information related to any contamination or impairment of the source water supply or the system's drinking water supply. The initial notification to the public for any such event will occur no later than thirty minutes after the public water system becomes aware of the spill, release, or potential contamination of the public water system. The Protection Team will update the Communication Plan continually to ensure contact information is up to date.

The water system has procedures in place for various types of catastrophic spills or other emergencies that can reasonably be predicted at the source location or within the SWPA. The chain-of-command, notification procedures and response actions are known by water system employees, the utility will be working with OHSEM and emergency response personnel to improve the communication and first response systems over the next two years.

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 utility has opted to utilize this procedure. The Communication Plan for the City of Martinsburg is included in **Appendix C**.

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

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 other potentially impacted systems be posted and readily available in the event of an emergency. Key information regarding the City's Emergency Response Plan can be found in **Appendix C**. Several short forms are included and provide quick access to important information about emergency response. The following information is included in the utility's Emergency Response Plan:

- ❑ Emergency Response Team
- ❑ Emergency Communication Equipment
- ❑ List of sensitive populations
- ❑ List of major users
- ❑ Personnel and property protection measures
- ❑ Planned training courses
- ❑ Resource inventory
- ❑ Repair and supply providers
- ❑ Procedures for specific emergency incidents

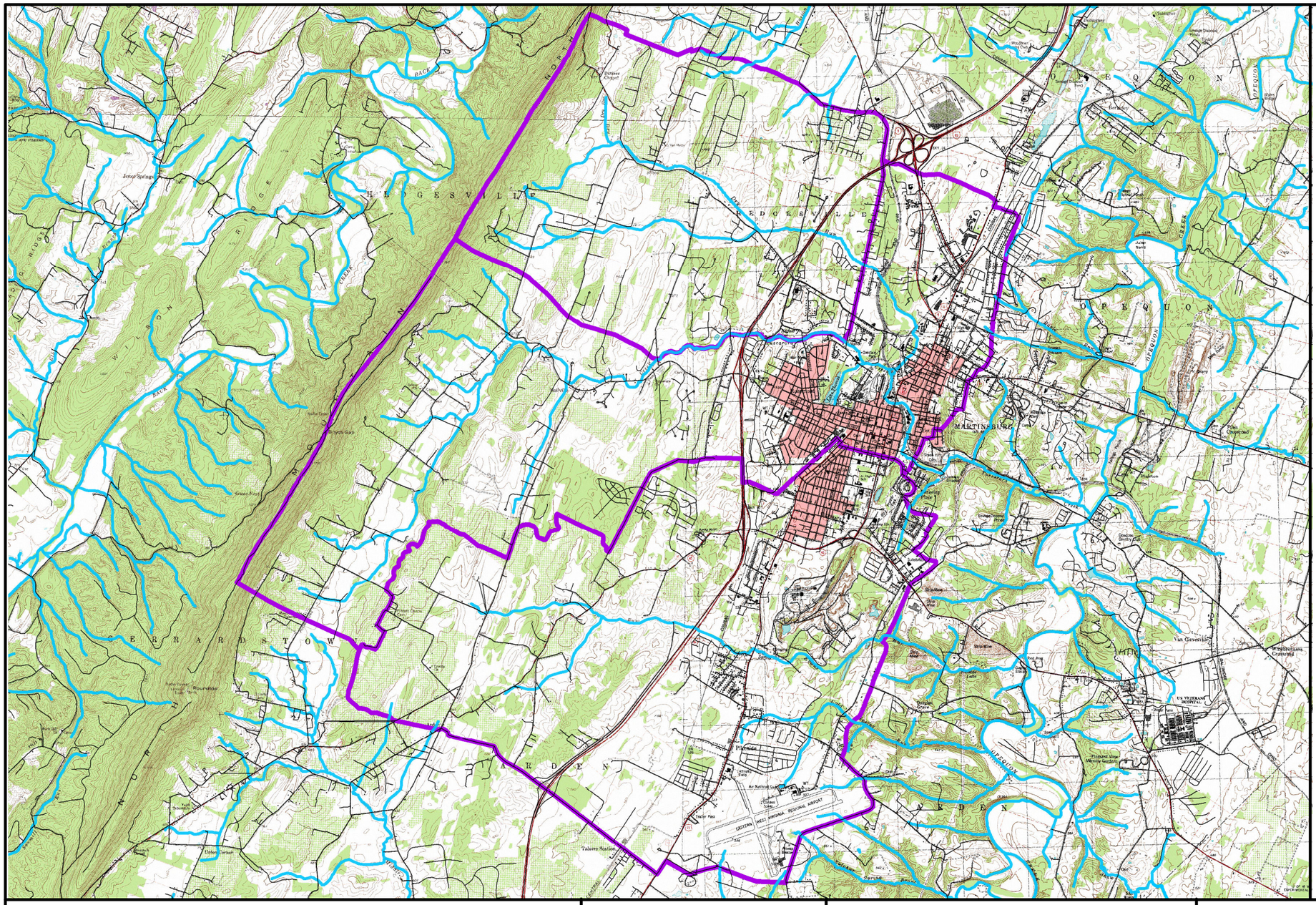
If this information is not included in the Emergency Response Plan, the plan should be reevaluated and updated to provide all important information.

Conclusion

This report represents a detailed explanation of the required elements of the City of Martinsburg's SWPP. Any supporting documentation or other materials that the utility considers relevant to their plan can be found in the **Appendices** of this report.

This SWPP is intended to help prepare the City of Martinsburg to properly handle emergencies that might compromise the quality of the system's source water supply. It is imperative that this SWPP be 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. The community taking local responsibility for the quality of their source water is the most effective way to prevent contamination and protect the water system against contaminated drinking water. Community cooperation, sufficient preparation, and accurate and reliable monitoring are all critical components of this SWPP, and a multi-faceted approach is the only way to ensure that a system is best protected against source water degradation.

Appendix A. Figures



Notes:
1. Source Water Protection Area delineation provided by West Virginia Bureau for Public Health.
2. Stream data, road data and topographic base map from National Resource Conservation Service.
3. This figure is integral to an accompanying protection plan and should only be used in that context.
4. This figure is not intended to be used for boundary verification or survey control purposes.

Client:
WEST VIRGINIA EASTERN PANHANDLE REGIONAL PLANNING AND DEVELOPMENT COUNCIL, REGION 9

ALWI PROJECT NO. WV7S319

Project:
Martinsburg Source Water Protection Plan

Berkeley County, West Virginia

ADVANCED Global Environmental Solutions Land and Water, Inc.

Figure 1:

Wellhead Protection Area

December 21, 2015

Table 1: Public List of Regulated PSSCs

Arc Label	Site Name	PSSC Type
1	CONFIDENTIAL	LUST Site
2	CONFIDENTIAL	LUST Site
3	CONFIDENTIAL	LUST Site
4	CONFIDENTIAL	LUST Site
5	CONFIDENTIAL	LUST Site
6	CONFIDENTIAL	LUST Site
7	CONFIDENTIAL	LUST Site
8	CONFIDENTIAL	LUST Site
9	CONFIDENTIAL	LUST Site
10	CONFIDENTIAL	LUST Site
11	CONFIDENTIAL	LUST Site
12	CONFIDENTIAL	LUST Site
13	CONFIDENTIAL	LUST Site
14	CONFIDENTIAL	LUST Site
15	CONFIDENTIAL	LUST Site
16	CONFIDENTIAL	LUST Site
17	CONFIDENTIAL	LUST Site
18	CONFIDENTIAL	LUST Site
19	CONFIDENTIAL	LUST Site
20	CONFIDENTIAL	LUST Site
21	CONFIDENTIAL	Superfund_Sites
22	CONFIDENTIAL	Mining Permit
23	CONFIDENTIAL	Mining Permit
24	CONFIDENTIAL	Mining Permit
25	CONFIDENTIAL	Mining Permit
26	CONFIDENTIAL	Mining Permit
27	CONFIDENTIAL	VCP
28	CONFIDENTIAL	VCP
29	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
30	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
31	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
32	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
33	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
34	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
35	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
36	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
37	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
38	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
39	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
40	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
41	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
42	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
43	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
44	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
45	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest

Table 1: Public List of Regulated PSSCs

Arc Label	Site Name	PSSC Type
46	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
47	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
48	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
49	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
50	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
51	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
52	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
53	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
54	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
55	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
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87	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
88	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
89	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
90	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest

Table 1: Public List of Regulated PSSCs

Arc Label	Site Name	PSSC Type
91	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
92	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
93	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
94	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
95	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
96	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
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101	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
102	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
103	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
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114	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
115	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
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133	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
134	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
135	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest

Table 1: Public List of Regulated PSSCs

Arc Label	Site Name	PSSC Type
136	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
137	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
138	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
139	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
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180	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest

Table 1: Public List of Regulated PSSCs

Arc Label	Site Name	PSSC Type
181	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
182	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
183	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
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224	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
225	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest

Table 1: Public List of Regulated PSSCs

Arc Label	Site Name	PSSC Type
226	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
227	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
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270	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest

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274	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
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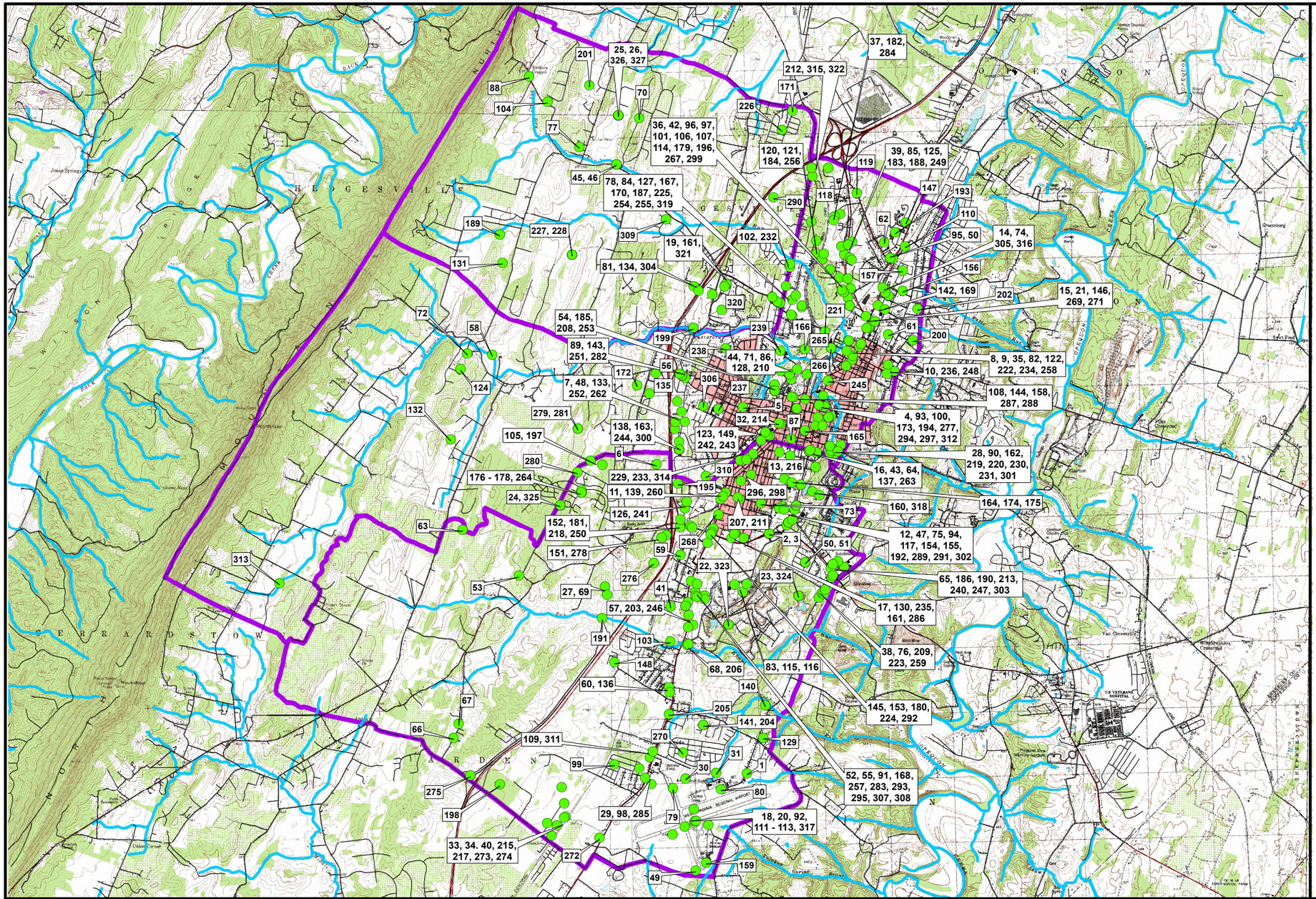
313	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
314	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
315	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest

Table 1: Public List of Regulated PSSCs

Arc Label	Site Name	PSSC Type
316	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
317	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
318	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
319	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
320	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
321	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
322	CONFIDENTIAL	Resource Conservation and Recovery Act Facility of Interest
323	CONFIDENTIAL	Mining Permit
324	CONFIDENTIAL	Mining Permit
325	CONFIDENTIAL	Mining Permit
326	CONFIDENTIAL	Mining Permit
327	CONFIDENTIAL	Mining Permit



EXPLANATION:

- Public PSSC (Labels Correspond to Table 1)
- Road
- Stream
- Martinsburg Wellhead Protection Area

N

Scale:

5,750 2,875 0 5,750 11,500 Feet

Notes:

1. Source Water Protection Area delineation provided by West Virginia Bureau for Public Health.
2. Stream data, road data and topographic base map from National Resource Conservation Service.
3. See report for public PSSC data source.
4. This figure is integral to an accompanying protection plan and should only be used in that context.
5. This figure is not intended to be used for boundary verification or survey control purposes.

Client:

WEST VIRGINIA EASTERN PANHANDLE REGIONAL PLANNING AND DEVELOPMENT COUNCIL, REGION 9

ALWI PROJECT NO. WV7S319

Project:

Martinsburg Source Water Protection Plan

Berkeley County, West Virginia

ADVANCED Land and Water, Inc. — Global Environmental Solutions

Figure 2:

Public Potential Significant Source of Contamination in Wellhead Protection Area

December 21, 2015

Table 2: Public List of Locally Identified PSSCs

Arc Label	SOURCE NAME	SOURCE DESRIPTION	MAP CODE	SOURCE CATEGORY	ASSOCIATED CHEMICALS	THREAT TO GW	THREAT TO SW
325	CONFIDENTIAL	Cemetery	C-9	Commercial	M, SOC, PH	L	L
326	CONFIDENTIAL	Veterinary Offices	C-50	Commercial	MP, R	M	L
327	CONFIDENTIAL	Auto repair shops	C-3	Commercial	PH, M, VOC, HM, SOC	H	M
328	CONFIDENTIAL	Swimming Pools & Related Materials	M-26	Municipal	Chlorine, D	L	L
329	CONFIDENTIAL	Auto repair shops	C-3	Commercial	PH, M, VOC, HM, SOC	H	M
330	CONFIDENTIAL	Auto repair shops	C-3	Commercial	PH, M, VOC, HM, SOC	H	M
331	CONFIDENTIAL	Laundromats	C-27	Commercial	VOC, SOC	L	M
332	CONFIDENTIAL	School Facility	M-21	Municipal	SOC, D, VOC, TO	L	L
333	CONFIDENTIAL	Auto repair shops	C-3	Commercial	PH, M, VOC, HM, SOC	H	M
334	CONFIDENTIAL	Auto repair shops	C-3	Commercial	PH, M, VOC, HM, SOC	H	M
335	CONFIDENTIAL	Gas Stations	C-18	Commercial	PH, M, VOC, SOC	H	M
336	CONFIDENTIAL	Asphalt Plants	I-1	Industrial	PH, VOC	M	H
337	CONFIDENTIAL	Cemetery	C-9	Commercial	M, SOC, PH	L	L
338	CONFIDENTIAL	Agriculture	A-5	Agriculture	NN, SOC, MP	L	L
339	CONFIDENTIAL	Agriculture	A-6	Agriculture	NN, SOC	L	L
340	CONFIDENTIAL	Agriculture	A-5	Agriculture	NN, SOC, MP	L	L
341	CONFIDENTIAL	Agriculture	A-5	Agriculture	NN, SOC, MP	L	L
342	CONFIDENTIAL	Agriculture	A-6	Agriculture	NN, SOC	L	L
343	CONFIDENTIAL	Agriculture	A-6	Agriculture	NN, SOC	L	L
344	CONFIDENTIAL	Auto repair shops	C-3	Commercial	PH, M, VOC, HM, SOC	H	M
345	CONFIDENTIAL	Agriculture	A-5	Agriculture	NN, SOC, MP	L	L
346	CONFIDENTIAL	Auto repair shops	C-3	Commercial	PH, M, VOC, HM, SOC	H	M
347	CONFIDENTIAL	Potential Automotive Repair	C-3	Commercial	PH, M, VOC, HM, SOC	H	M
348	CONFIDENTIAL	Gas Stations	C-18	Commercial	PH, M, VOC, SOC	H	M
349	CONFIDENTIAL	Residential (multi-units)	R-3	Residential	VOC, NN, TO, MP	L	L
350	CONFIDENTIAL	Airports/Abandoned airfields	C-2	Commercial	PH, VOC	H	H
351	CONFIDENTIAL	Auto repair shops	C-3	Commercial	PH, M, VOC, HM, SOC	H	M

Table 2: Public List of Locally Identified PSSCs

Arc Label	SOURCE NAME	SOURCE DESRIPTION	MAP CODE	SOURCE CATEGORY	ASSOCIATED CHEMICALS	THREAT TO GW	THREAT TO SW
352	CONFIDENTIAL	Auto repair shops	C-3	Commercial	PH, M, VOC, HM, SOC	H	M
353	CONFIDENTIAL	Auto repair shops	C-3	Commercial	PH, M, VOC, HM, SOC	H	M
354	CONFIDENTIAL	Unknown Hazard	M-18	Municipal	PH, VOC, SOC, HM, M	H	H
355	CONFIDENTIAL	Car Washes	C-8	Commercial	PH, VOC	L	M
356	CONFIDENTIAL	Fleet/truck/bus terminals	C-14	Commercial	M, VOC, HM, SOC, PH	H	H
357	CONFIDENTIAL	Fire Station	M-6	Municipal	PH, VOC	L	L
358	CONFIDENTIAL	Gas Stations	C-18	Commercial	PH, M, VOC, SOC	H	M
359	CONFIDENTIAL	Veterinary Offices	C-50	Commercial	MP, R	M	L
360	CONFIDENTIAL	Auto repair shops	C-3	Commercial	PH, M, VOC, HM, SOC	H	M
361	CONFIDENTIAL	Auto repair shops	C-3	Commercial	PH, M, VOC, HM, SOC	H	M
362	CONFIDENTIAL	Auto repair shops	C-3	Commercial	PH, M, VOC, HM, SOC	H	M
363	CONFIDENTIAL	Gas Stations	C-18	Commercial	PH, M, VOC, SOC	H	M
364	CONFIDENTIAL	Auto repair shops	C-3	Commercial	PH, M, VOC, HM, SOC	H	M
365	CONFIDENTIAL	Car dealerships	C-7	Commercial	PH, VOC	H	L
366	CONFIDENTIAL	Equipment rental/repair shop	C-13	Commercial	PH, M, VOC	H	L
367	CONFIDENTIAL	Warehouse with one large bay door	C-53	Commercial			
368	CONFIDENTIAL	Gas Stations	C-18	Commercial	PH, M, VOC, SOC	H	M
369	CONFIDENTIAL	Funeral Services and Crematories	C-15	Commercial	M, MP, SOC, HM, VOC	M	L
370	CONFIDENTIAL	Historic Gas Station	C-18	Commercial	PH, M, VOC, SOC	H	M
371	CONFIDENTIAL	Auto repair shops	C-3	Commercial	PH, M, VOC, HM, SOC	H	M
372	CONFIDENTIAL	Gas Stations	C-18	Commercial	PH, M, VOC, SOC	H	M
373	CONFIDENTIAL	Auto repair shops	C-3	Commercial	PH, M, VOC, HM, SOC	H	M
374	CONFIDENTIAL	Gas Stations	C-18	Commercial	PH, M, VOC, SOC	H	M
375	CONFIDENTIAL	Gas Stations	C-18	Commercial	PH, M, VOC, SOC	H	M

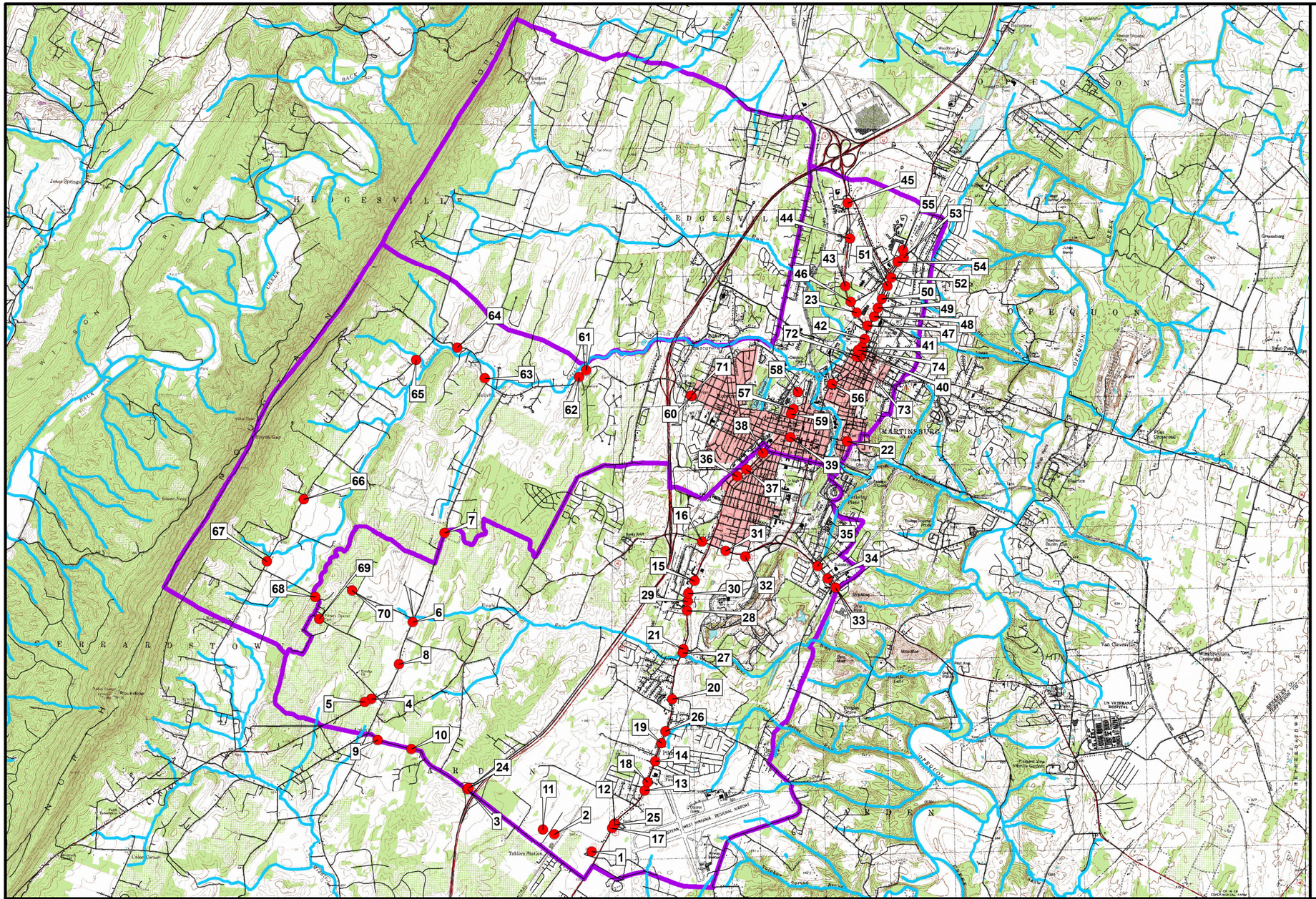
Table 2: Public List of Locally Identified PSSCs

Arc Label	SOURCE NAME	SOURCE DESRIPTION	MAP CODE	SOURCE CATEGORY	ASSOCIATED CHEMICALS	THREAT TO GW	THREAT TO SW
376	CONFIDENTIAL	Auto repair shops	C-3	Commercial	PH, M, VOC, HM, SOC	H	M
377	CONFIDENTIAL	Auto repair shops	C-3	Commercial	PH, M, VOC, HM, SOC	H	M
378	CONFIDENTIAL	Auto repair shops	C-3	Commercial	PH, M, VOC, HM, SOC	H	M
379	CONFIDENTIAL	Auto repair shops	C-3	Commercial	PH, M, VOC, HM, SOC	H	M
380	CONFIDENTIAL	Fleet/truck/bus terminals	C-14	Commercial	M, VOC, HM, SOC, PH	H	H
381	CONFIDENTIAL	Auto repair shops	C-3	Commercial	PH, M, VOC, HM, SOC	H	M
382	CONFIDENTIAL	School Facility	M-21	Municipal	SOC, D, VOC, TO	L	L
383	CONFIDENTIAL	Auto repair shops	C-3	Commercial	PH, M, VOC, HM, SOC	H	M
384	CONFIDENTIAL	Auto repair shops	C-3	Commercial	PH, M, VOC, HM, SOC	H	M
385	CONFIDENTIAL	Unknown Hazard	I-44	Industrial			
386	CONFIDENTIAL	TruckTerminals/Shipping	C-14	Commercial	M, VOC, HM, SOC, PH	H	H
387	CONFIDENTIAL	ASTs, Chemical Drums and Storage	I-3	Industrial	PH, M, VOC, SOC	H	H
388	CONFIDENTIAL	Fire Station with Emergency Vehicles	C-14	Commercial	M, VOC, HM, SOC, PH	H	H
389	CONFIDENTIAL	Gas Stations	C-18	Commercial	PH, M, VOC, SOC	H	M
390	CONFIDENTIAL	Lawn/farms stores	C-28	Commercial	VOC, SOC, NN	L	L
391	CONFIDENTIAL	Cemetery	C-9	Commercial	M, SOC, PH	L	L
392	CONFIDENTIAL	Agriculture	A-5	Agriculture	NN, SOC, MP	L	L
393	CONFIDENTIAL	Agriculture	A-18	Agriculture	MP, SOC	L	L
394	CONFIDENTIAL	Agriculture	A-18	Agriculture	MP, SOC	L	L
395	CONFIDENTIAL	Agriculture	A-5	Agriculture	NN, SOC, MP	L	L
396	CONFIDENTIAL	Agriculture	A-18	Agriculture	MP, SOC	L	L
397	CONFIDENTIAL	Agriculture	A-6	Agriculture	NN, SOC	L	L
398	CONFIDENTIAL	Agriculture	A-6	Agriculture	NN, SOC	L	L
399	CONFIDENTIAL	Lawn/farms stores	C-28	Commercial	VOC, SOC, NN	L	L
400	CONFIDENTIAL	Gas Stations	C-18	Commercial	PH, M, VOC, SOC	H	M

Table 2: Public List of Locally Identified PSSCs

Arc Label	SOURCE NAME	SOURCE DESRIPTION	MAP CODE	SOURCE CATEGORY	ASSOCIATED CHEMICALS	THREAT TO GW	THREAT TO SW
401	CONFIDENTIAL	Auto repair shops	C-3	Commercial	PH, M, VOC, HM, SOC	H	M
402	CONFIDENTIAL	Auto repair shops	C-3	Commercial	PH, M, VOC, HM, SOC	H	M
403	CONFIDENTIAL	Auto repair shops	C-3	Commercial	PH, M, VOC, HM, SOC	H	M

Note: The windshield survey for this system was completed prior to receipt of the BPH provided databases. Geospatial information collected during the windshield survey was compared against that provided by BPH for regulated and previously identified PSSCs. ALWI attempted to remove geospatial duplicates. Numbers not displayed in the above table correspond with PSSCs previously identified in past SWAP reports or in regulated databases.



N

EXPLANATION:

- Locally Identified PSSC (Labels Correspond to Table 2)
- Road
- Stream
- Martinsburg Wellhead Protection Area

Scale:

5,750 2,875 0 5,750 11,500 Feet

Notes:
1. Source Water Protection Area delineation provided by West Virginia Bureau for Public Health.
2. Stream data, road data and topographic base map from National Resource Conservation Service.
3. ALWI Identified PSSC verified by ALWI field reconnaissance.
4. This figure is integral to an accompanying protection plan and should only be used in that context.
5. This figure is not intended to be used for boundary verification or survey control purposes.

Client:
WEST VIRGINIA EASTERN PANHANDLE REGIONAL PLANNING AND DEVELOPMENT COUNCIL, REGION 9

ALWI PROJECT NO. WV7S319

Project:
Martinsburg Source Water Protection Plan

Berkeley County, West Virginia

ADVANCED Land and Water, Inc. — Global Environmental Solutions

Figure 3:
ALWI Identified Potential Significant Source of Contamination in Wellhead Protection Area

December 21, 2015

Appendix B. Early Warning Monitoring System Forms

The following forms have been prepared by WV BPH for use by public utilities, with the proper form dependent on source type (surface or groundwater) and the presence or absence of an early warning monitoring system. The appropriate form for this utility to complete is Form C, as the utility has an existing early warning monitoring system.

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

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

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

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

Appendix B- Form A (Not applicable to the City of Martinsburg)

Existing Early Warning Monitoring System Worksheet- Surface Water Source

Describe the type of early warning detection equipment installed.
Describe the mechanism used to store data and an institutional framework to analyze and interpret the data.
Describe the process used to determine the credibility of a contamination event if a change is detected in the quality of source water.

Appendix B-Form B (Not applicable to the City of Martinsburg)

Proposed Early Warning Monitoring System Worksheet- Surface

Describe the type of early warning detection equipment that could be installed, including the design.
Where would the equipment be located?
What would the maintenance plan for the monitoring equipment entail?
Describe the proposed sampling plan at the monitoring site.
Describe the proposed procedures for data management and analysis.

Appendix B-Form C

Existing Early Warning Monitoring System Worksheet- Groundwater Source

Describe the type of early warning detection equipment installed.
CONFIDENTIAL
How many monitoring (sentinel) wells are established?
None. Due to the complex hydrogeologic setting and widespread geospatial position of PSSCs, there is no guarantee that installation of monitoring wells would provide adequate advanced notification of contamination in the groundwater system. Monitoring wells may be considered in the future if outside funding sources are available. The System may also consider communicating with Essroc to explore possibilities of collecting and analyzing water quality samples from Quarry dewatering wells located across the property.
What is the expected rate of travel of a contaminant through the groundwater system?
Travel times are highly dependent on the 1.) Location of the contaminant source with respect to System sources, 2.) Hydraulic conductivity (0.6 – 120.0 m/d, according to the USGS) of geologic formations, which reflects degree to which fractures are naturally enlarged and 3.) Hydraulic gradient along groundwater flow pathways. As such, travel times vary significantly throughout the SWPAs and change as hydrologic conditions change.
Provide the distance from the contaminant source to the monitoring wells.
CONFIDENTIAL
What is the distance of the monitoring equipment to the wellhead?
CONFIDENTIAL
Describe the mechanism used to store data and an institutional framework to analyze and interpret the data.
CONFIDENTIAL
Describe the process used to determine the credibility of a contamination event if a change is detected in the quality of source water.
If a notable change is detected in water quality for a parameter regularly monitored, an additional water quality sample will be taken immediately for result verification. If the result is confirmed, more comprehensive testing could be performed, depending on the type of water quality change observed (for the purpose of differentiating between hazard types). Martinsburg personnel may also choose to shut down their pumps until an appropriate course of action is determined. This would not affect the quality or quantity of water delivered to customers, as the utility has adequate storage for several days, as well as interconnections and a potential backup source.
If the sample is in violation of an MCL, an additional water quality sample will be taken immediately for result verification. As water quality results are pending, Martinsburg personnel should shut down their pumps until an appropriate course of action is determined. This would not affect the quality or quantity of water delivered to customers, as the utility has adequate storage for several days, as well as interconnections and a potential backup source. Should one of the two sources become unusable, the other source has the capacity to meet the City's water demands.

Appendix B-Form D (Not applicable to the City of Martinsburg)

Proposed Early Warning Monitoring System Worksheet- Groundwater Source

Describe the type of ground water monitoring network that could be installed, including the design and location.
How many monitoring (sentinel) wells would need to be established?
What is the expected rate of travel of a contaminant through the groundwater system?
Provide the distance from the contaminant source to the proposed monitoring wells.
What is the distance from the proposed monitoring equipment to the wellhead?
What would the maintenance plan for the monitoring equipment entail?
Describe the proposed sampling plan at the monitoring site.
Describe the proposed procedures for data management and analysis.

Appendix C. Communication Plan

Communication Plan Template

For the City of Martinsburg

PWSID: __WV3300212_____ District: ___Kearneysville_____

Certified Operator: ____CONFIDENTIAL_____

Contact Phone Number: _____

Contact Email Address: _____

Plan Developed On: _____ Plan Update Due On: _____

ACKNOWLEDGMENTS:

This plan was developed by the City of Martinsburg 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.

Table of Contents

Introduction

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

The public water system has the 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. 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
CONFIDENTIAL				
CONFIDENTIAL				
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 SWPP, 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 SWPP 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; as well as working with the management staff and the communication team to ensure that 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. 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 collecting information about the:

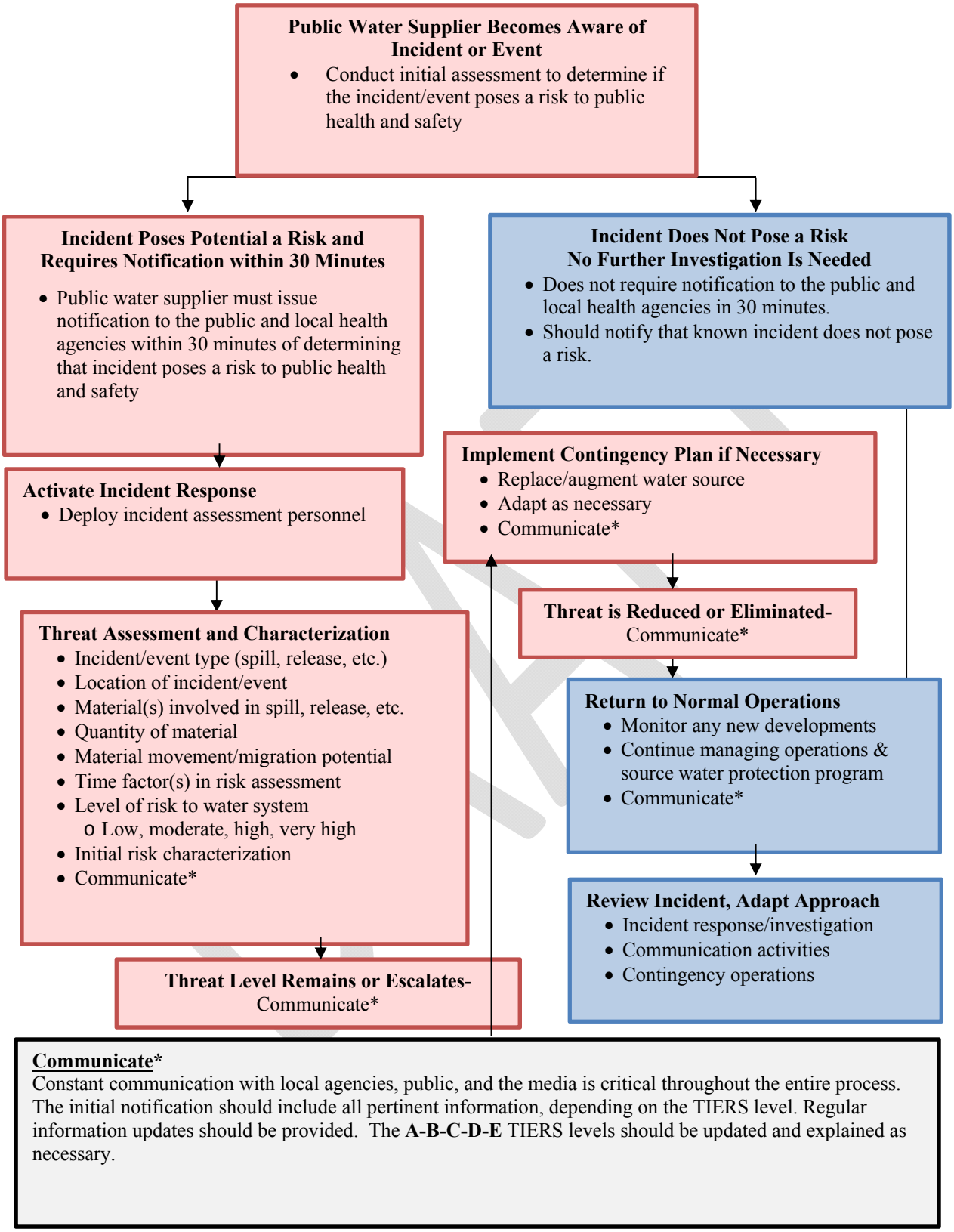
- Incident/event type (spill, release, etc.)
- Location of incident/event
- Type of material(s) involved in spill, release, etc.
- Quantity of material involved
- Potential of the material to move, migrate, or be transported
- Relevant time factor(s) in the risk assessment (e.g., downstream movement 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, **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 to the local water system's source water protection and communication teams
  - If warranted by initial findings regarding the spill, release, or incident
- Notification to 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, 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



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: _____

Emergency Short Form 1

Emergency Communication Information

	Name	Phone Number	Email
Designated spokesperson:	Stephen Knipe	(304) 264-2116 (304) 268-0022	sknpmtbgwater@comcast.net
Alternate spokesperson:	Sam Blair	(304) 264-2166 (304) 268-9788	sblair48@yahoo.com
Designated location to disseminate information to media:	600 Baltimore Street Martinsburg, WV 25401		

Methods of contacting affected residents:	**Word of mouth**		**Posted notices**	
	Television	**X**	**Radio**	**X**
	Newspaper	**X**	**Other**	**X**

	Name	Title	Phone Number	Email
Media contacts:	Bill Kohler; The Herald Mail Co.	Editor	301-733-5131	billk@herald-mail.com
	The Journal	-	304-263-8931 ext. 125	–
	WRNR – Main Line	-	304-263-6586 304-263-6540	info@talkradiowrnr.com
	WLTF – Main Line	-	304-263-8868 Studio – 888-797-5975	–
	WKMZ – Main Line	-	304-263-2770	
	WYII	-	304-263-0637	-
	WEPM 1340	-	304-263-8868 304-263-4321	-
	WHAG Channel 25	-	301-797-4400	-

Emergency Services Contacts

	Name	Emergency Phone	Alternate Phone	Email
Local Police	City of Martinsburg Police	911	304-264-2100	martinsburgpd@martinsburgpd.org
Local Fire Department	City of Martinsburg Fire Department	911	(304) 264-2111	–
Local Ambulance Service	City of Martinsburg Fire Department	911	(304) 264-2111	–
Hazardous Material Response Service	City of Martinsburg Fire Department	911	(304) 264-2111	–

Emergency Short Form 2

Key Personnel

	Name	Title	Phone	Email
Key staff responsible for coordinating emergency response procedures?	CONFIDENTIAL	-	-	-
	CONFIDENTIAL	-	-	-
Staff responsible for keeping confidential PSSC information and releasing to emergency responders:	CONFIDENTIAL	-	-	-
	CONFIDENTIAL	-	-	-
Are you planning on implementing the TIER system?	Yes			

Emergency Short Form 3

Emergency Response Information

List laboratories available to perform sample analysis in case of emergency:	**Name**	**Phone**
	CONFIDENTIAL	-
	CONFIDENTIAL	-
Has the utility developed a detailed Emergency Response Plan in accordance with the Public Health Security Bioterrorism Preparedness and Response Pan Act of 2002 that covers the following areas?	Yes	
When was the Emergency Response Plan developed or last updated?	2015	

Emergency Short Form 4

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

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
Philippi, District 6 (304) 457-2296

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 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 City of Martinsburg 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. Feasibility Study Narrative

A feasibility study matrix was deemed unnecessary for the City of Martinsburg Water System (CMWS) (ID No. EV 3300212). CMWS utilizes two separate treatment plants, the Kilmer Spring filtration facility and the Big Spring filtration facility. The combined average production from both facilities is 2.95 MGD. The current average production rate for the Kilmer Springs filtration facility is 2.2 MGD, while the average production rate for the Big Spring filtration facility is 750,000 GPD. If a contamination event would occur, the CMWS is able to take the affected system completely offline and rely exclusively on production from the uncontaminated facility for system usage demands. In the event of an emergency or a contamination event, the CMWS also has two emergency interconnections with the Berkeley County Potomac River Water System and the Bunker Hill Water System. Finally, if the utility can equip itself with a portable pump and surface water intake, the utility could utilize water from the Lake Thomas Reservoir for treatment via a portable treatment trailer, or directly through the Kilmer Springs filtration facility.

Appendix F. Supporting Documentation

Appendix F-1. ALWI PSSC Update and Source Inspection

Appendix F-2. Locally Identified PSSC Database Search

Appendix F-3. The City of Martinsburg SWAR

Appendix F-4. The City of Martinsburg Protection Team Meeting Minutes

Appendix F-5. Emergency Response Plan Signature Page

Appendix F-6. Engineering Evaluation

Appendix F-7. Railroad Emergency Response Trainings and Services

F-1. ALWI PSSC Update and Source Inspection

Advanced Land and Water, Inc. (ALWI) performed regulatory database reviews and a field reconnaissance in order to identify changes to known PSSCs and to identify and record additional PSSCs not previously documented. The field reconnaissance also included verifying water source locations and reviewing the delineated SWPA. Both point sources and non-point sources of contamination were considered during our field reconnaissance.

PSSC VERIFICATION AND SWPA INSPECTION

On May 5, 2015 and June 9, ALWI performed a visual reconnaissance in the way of a windshield survey from public rights-of-way for the purpose of verifying and updating the PSSC inventory provided in past SWAPs, database reviews and associated lists provided by BPH. In so doing, we observed the existence (or continuing existence) of previously identified PSSCs, and recorded the locations of previously unidentified PSSCs. Results of this updated inventory are listed in **Appendix A**.

During this reconnaissance, local land use conditions were observed, with an emphasis on the potential use, storage and disposal practices of hazardous materials and petroleum products near the City sources and elsewhere throughout the delineated SWPAs. Properties were visually scanned to the degree practicable from public rights-of-way. Global Positioning System (GPS) devices were used to verify geospatial positions of PSSCs.

Though ALWI observed and recorded additional hazards previously unknown to BPH and the System and updated the existing hazard data, (1) contaminant hazards may exist and could remain undetected due to limitations in the methods employed (concealed visual evidence, limited property access, etc.) and/or (2) new contamination hazards may develop in the future. For these reasons, the measures employed herein for identifying contaminant hazards should be repeated periodically for the assessment to remain current.

On May 5, ALWI also observed the location and condition of each of the City of Martinsburg sources and the measures which the System has taken to protect them. At that time we were unable to access the gate into the Kilmer Springs area to verify physical protection measures employed by the system, due to road construction; the spring was instead observed from behind a fence along Old Mill Road.

Appendix F-2. Locally Identified PSSC Database Search

ALWI incorporated information from the following state-maintained environmental databases to supplement the non-confidential point-source hazard inventories, with the date of database publication provided parenthetically as follows:

- Pesticide Businesses (11/6/2015);
- Land Restoration Program Sites (Voluntary Cleanup Program and Comprehensive Environmental Response, Comprehensive, and Liability Act) (11/9/2015);
- Underground Storage Tank and Leaking Underground Storage Tank Databases (5/4/2015 and 11/9/2015 respectfully);
- Resource Conservation and Recovery Act (RCRA) sites (11/9/2015).

The databases helped with interpretations of groundwater susceptibility, in that the listed facilities may be generators of hazardous materials, petroleum products and/or other drinking water contaminants.

Appendix F-3. The City of Martinsburg SWAR

City of Martinsburg
Berkeley County, West Virginia

Wellhead Protection Plan
Final Report

September 2000

CHESTER
ENGINEERS

City of Martinsburg
Berkeley County, West Virginia

Wellhead Protection Plan
Final Report

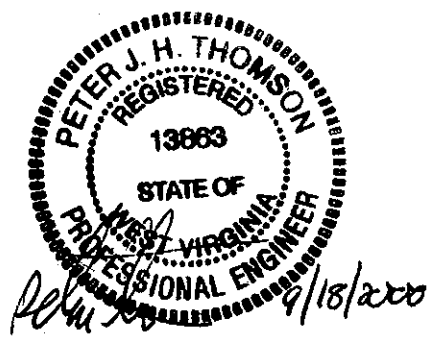
September 2000

City of Martinsburg
Berkeley County, West Virginia

Wellhead Protection Plan
Final Report

September 2000
Project: 3847-16

Prepared By: Andrew Frank, P.E.
Reviewed By: Lawrence W. Johnson, AICP, RLA
Approved By: Peter J.H. Thomson, P.E.



ACKNOWLEDGEMENTS

The successful completion of the Martinsburg Wellhead Protection Plan (WHPP) was made possible through a collaboration of dedicated efforts of the City of Martinsburg, the West Virginia Bureau of Public Health, and the members of the Community Participation Team. In light of these efforts, we would like to extend our gratitude to the following participants:

City of Martinsburg:
The Honorable George Karos, Mayor
Councilman Christopher Baker
Councilman Richard Yauger
Councilman Max Parkinson
Councilman Roger Lewis
Councilman Glenville Twigg
Councilman Donald Anderson
Councilman Gregg Wachtel

Community Participation Team:

Mr. Mark S. Baldwin	City Manager, City of Martinsburg
Chief Brad Waldeck	Fire Chief, City of Martinsburg Fire Department
Mr. Steve Knipe	Utilities Director, City of Martinsburg
Mr. Mike Covell	City Engineer, City of Martinsburg
Mr. D. Wayne Dunham	President, Berkeley County Commission
Ms. Sherry Cunningham	Berkeley County Planning Commission
Mr. Gary Gess	Capital Cement Corporation
Mr. Richard Paden	West Virginia Eastern Panhandle S.C.D.
Mr. Steven Allen	Office of Emergency Services
Ms. Twila Stowers Carr	Berkeley County Health Department
Mr. Mike O'Donnell	Tuscarora Creek Watershed
Ms. Norma Finfrock	Berkeley County League of Women Voters
Mr. Dwight E. Wilkins	West Virginia DOT Highway
Mr. Roger Boyer	Potomac Headwaters RC&D Project

State of West Virginia:

Mr. William Toomey	West Virginia Bureau of Public Health – EED
Mr. Reuben Gillispie	West Virginia Bureau of Public Health – EED
Mr. G. Michael Mower	West Virginia Bureau of Public Health – EED

Chester Engineers:
Mr. Lawrence W. Johnson, AICP, RLA
Mr. Peter J.H. Thomson, P.E.
Mr. John Richendrfer
Mr. Andrew Frank, P.E.

Wellhead Protection Plan
For
The City of Martinsburg
Berkeley County, West Virginia

TABLE OF CONTENTS

Wellhead Protection Plan
For
The City of Martinsburg
Berkeley County, West Virginia
September 2000

Background:

The City of Martinsburg obtains its water supply from the ground below the City and its surrounding areas; therefore, the City must be confident that the water it extracts from the earth is and will always be of a consistently high quality. A reliable ground water supply is a necessary resource for enabling the development of the Martinsburg community. The water that infiltrates into the earth typically travels slowly through the porous soil, allowing the filtration of materials and the absorption of organic compounds. Groundwater taken from a stationary point is typically of a consistent quality that is suitable for providing drinking water with little manmade filtration. Groundwater is normally less dependent on weather conditions than surface water and is better protected from pollutants than surface water. However, due to the Karst geology that surrounds the City, the water supply has been determined to be Groundwater Under the Direct Influence (GUDI) of Surface Water, which makes it more susceptible to contamination than other types of groundwater[1]. Because pollutants that enter the ground within the area that feeds a drinking water supply system can affect its quality and safety, it is important for the community to take appropriate measures to ensure its protection.

In order to protect the water sources for public water supply systems (PWSS), the Safe Water Drinking Act was amended in 1986 to require each state to develop a Wellhead Protection Program (WHPP). In turn the West Virginia WHPP requires each public drinking water supply system to complete its own Wellhead Protection Plan under the direction and approval of the Environmental Engineering Division (EED) of the Bureau for Public Health (BPH). The purpose of creating and enforcing such a plan is to prevent contamination of the water supply and to ensure that safe drinking water will continue to be available to the public in the future.

Because the public benefits directly from the protection of their water source, it is essential that they play a significant role in developing a plan of how to maintain this vital resource and how to react to and deal with any contamination that may occur. Public interest in and support of the final WHPP is crucial to its implementation and ultimate success. This is why one of the primary steps in creating a WHPP is to construct a Community Participation Team (CPT), made up of individuals from various backgrounds and experiences with a vested interest in protecting the water source. The CPT members were selected based on recommendations by the State and suggestions from public documents related to wellhead protection (see Table C). Once the CPT was formed, regular meetings were held between April and June 2000 to review WHPP research

[1] Karst land forms are created by the dissolution of underlying rock formations, such as limestone and dolostone, that is characterized by sinkhole depressions, discontinuous surface drainage, large springs, caves, and underground drainage systems.

conducted by Chester Engineers, Inc. and to formulate the contents of the Contingency and Management Plans.

The State of West Virginia also developed the Source Water Assessment and Protection Program (SWAP), which is for the protection of the state's source waters, which is administered by the Environmental Engineering Division of the Bureau for Public Health. The EED developed a manual issued February 4, 1999, for the implementation of SWAP and the development of WHPPs. The manual divides the protection process into two general phases, implementation and management. The implementation phase consists of assessing the existing conditions of the PWSS and the water sources that supply it. The major components of this phase include:

I. Resource Characterization
II. Delineation of Wellhead Protection Areas
III. Inventory of the Potential Significant Contaminant Sources
IV. Susceptibility Determination
V. Source Water Assessment Reports

The management phase of the process involves planning for the continual protection of the system, including planning for future growth, and for dealing with incidents of contamination. The two main sections that fall under this phase are:

VI. Management Plans
VII. Contingency Plans

The creation of the Martinsburg WHPP has been a coordinated effort of the CPT, the City, Berkeley County, and the State. As a document that is approved by the State and accepted by the City, it is to be made available for public use and reference. Promoting the plan and informing the public of its importance will help make it effective. The WHPP will, however, continue to evolve as the area continues to develop and face new challenges in the protection of its water supply. For this reason, the WHPP will undergo periodic review, amendment, and updating, as new information and protection strategies become available.

Phase I – SWAP Implementation:

I. Resource Characterization

The City of Martinsburg water system (PWID No. WV 3300212) services a population of about 15,000. The existing system connections provide water to approximately 5,167 residential, 728 commercial, and 12 industrial customers who consume about 3.7 million gallons per day (MGD). The entire system is fed with groundwater taken from two sources: Kilmer Spring in the northwestern section of the City and the Big Springs Pumping Station to the south of the City (refer to Map #1). Big Springs receives water from a combination of three wells located on Capital Cement Corporation property, one of which, the Capitol Cement City Supply Well, is owned by the City.

According to a West Virginia Environmental Engineering Division letter, dated March 20, 1996, "the sources for the Martinsburg water supply have been determined to be ground sources under the direct influence (GUDI) of surface water." Therefore, the City has been required to install filtration systems to treat groundwater taken from both sources. Two filtration plants have been designed for the water supply and are scheduled to begin construction in the fall of 2000.

In January of 1998, an Aquifer Study was performed for the City of Martinsburg by Chester Engineers, Inc. which summarized the general aquifer characteristics as follows:

Groundwater supplies from wells and springs can be derived from several different lithologies within the limits of the Martinsburg area. Generally, there are two different rock types (carbonates and clastics) that are capable of yielding adequate quantities of groundwater for domestic use. The clastic aquifers lie primarily east of the City and consist of shale and minor amounts of siltstone within the Martinsburg Formation. Minimal primary porosity and low permeability are characteristic of the shale aquifers, and groundwater flows predominantly through secondary features such as joints, fractures, bedding plane partings, and possibly along cleavage planes. Water supplies from the shale are usually dependable and adequate for domestic use.

Carbonate aquifers, including both limestone and dolomite aquifers, are located within and to the west of the City. The carbonate units are dense with minimal primary porosity and groundwater flow occurs primarily through secondary openings. Secondary openings in the carbonate units consist of fractures, joints, bedding plane partings, and solutionally widened openings. Many of the limestone units have high permeabilities due to the solutionally widened openings. Groundwater flow within the limestone units may have diffuse flow and/or conduit flow characteristics based upon the degree of fracturing and the solubility of the limestone. Diffuse-flow carbonate aquifers tend to act more homogeneously and have been less affected by solution and water moves along the many joints and bedding planes. Diffuse groundwater flow is generally slower and not concentrated in certain portions of the aquifer, but is often more dispersed throughout. On the other hand, conduit flow can occur in carbonate aquifers when some of the passages have been substantially opened by solution and water will tend to drain freely and more quickly through only a small portion of the aquifer. Hobba, in Water Resources of the Potomac River Basin, West Virginia: River Bulletin No. 3 (1972), found that limestone aquifers may be capable of yielding six times more water than the shale aquifers. However, wells in carbonate terrain have a wider range in yield when compared with wells in shale and dry holes are not uncommon.

As described above, the majority of the groundwater relies on secondary features for avenues of flow. These secondary features not only determine flow direction but also dictate whether a well will produce adequate quantities of water, depending upon the penetration of one or more of these features.

II. Delineation of Wellhead Protection Areas

A Wellhead Protection Area (WHPA) is the surface and subsurface area contributing to a well or spring that supplies water to a PWSS, through which contaminants are able to travel and reach the well or spring. Due to the complex nature of the varying hydrogeologic settings across West Virginia, the EED defines the limits of the protection areas for each public water supply system. The WHPA for the City of Martinsburg was initially defined in 1993 as a single area comprising approximately 25 square miles. Work by Hobba (1970's) suggests two distinct ground water catchment basins exist for Kilmer Springs and the Capitol Cement City Supply Well. Based on this information, the WVBPH approved the Kilmer Spring and the Capitol Cement City Supply Well WHPA areas on April 18, 1998, as depicted on Maps #2 and 3. This was based on limited dye tracing and Hobba's ground water evaluation, which is the best available information. Over the course of the WHPP development, a secondary WHPA was identified and delineated by the State as the Central WHPA as depicted on Map #4. Until additional dye tracing eliminates this central area, the Central WHPA is considered part of the overall protection and management area for the WHP program. Furthermore, future testing and investigation could result in revisions to each WHPA.

III. Inventory of Potential Contaminant Sources

One of the key components of protecting the water sources is locating and identifying potential contaminant sources within the WHPA. The SWAP Program Manual provides a table of land uses and activities that are considered to be significant potential sources of contamination to drinking water (refer to Table A). The table divides the sources into categories including Agriculture, Residential, Municipal, Commercial, and Industrial and further classifies sources by type (i.e., dry cleaners, gas stations, etc.) and assigns each with a ranking depicting the level of threat it poses to both ground water and surface water. Each source type receives designations having high, medium, or low (H, M, or L in the table) threat levels to either ground or surface water, which were decided upon by the State. Furthermore, the State has developed a list of chemicals associated with each source type. It should be noted that in areas of Karst geology, as is the Martinsburg area, a low threat level should not be equated with being a non-threat because this type of terrain does not typically provide the same natural filtration of many pathogenic organisms that other types of aquifers may provide. The Potential Contaminant Sources table was used extensively during the source inventory effort to identify sources within the Martinsburg WHPAs.

There are several available resources listing information on potential contamination sources within a given area, many of which are maintained by the State. The West Virginia Public Information Office maintains two databases of Underground Storage Tanks (USTs) within the state. One tracks USTs currently in use, while the other lists USTs out of use. In addition, the West Virginia Office of Environmental Remediation maintains a list of Leaking USTs (LUSTs). The State assigns each facility with an identification number, which has been included in the inventory. Tables B1, B2, and B3 are edited versions (as of September 1999) of these statewide lists to show those sites that

are in the general Martinsburg area and identify the individual USTs and LUSTs at each facility.

In addition, the Office of Water Resources Groundwater Program keeps copies of Groundwater Protection Plans (GPP) for those sites that are required to submit GPPs to the State. The WV Air National Guard, 167th Airlift Group at the Eastern WV Regional Airport is the only facility in the WHPAs with a GPP currently on file with the State. Many different types of facilities are required to have a GPP prepared and kept on-site but are not required to file it with the State unless a complaint is made or incident occurs. Furthermore, there are other public and private groups that maintain websites such as the U.S.E.P.A. Envirofacts Warehouse and RTK NET sites, which post information on various facilities including their EPA identification numbers. Another source used in this effort was the original City of Martinsburg Wellhead Protection Program prepared in 1994 by Region IX Planning & Development Council, which included many sites that they had identified. Finally, the Martinsburg-Berkeley Springs Yellow Pages were used to find other potential sources, as well as, to cross reference information found in the other resources.

The way that these various resources were organized made it convenient to find sites in the general Martinsburg area; however, there was no direct indication of whether the these sites were located within the defined WHPAs. The only way to ultimately decide which sites were in each of the WHPAs was to canvas the areas and conduct a "windshield survey" to visually confirm each site. This detailed survey was performed by Chester Engineers, Inc. on the two main WHPAs, while information on the Central WHPA was obtained by the State. This survey was completed by driving along each roadway within each WHPA and recording information for each potential site identified. It should be noted that particular sites were assigned as source types based on general information about that site. A Global Positioning System (GPS) recorder was used to obtain a coordinate reading for each site, which was typically taken at the property entrance along the main roadway. The information obtained in the field was then cross-referenced with the various resource lists to compile as much information about each site as possible. While many sites within the City were fairly easy to locate and identify, most of the area outside the City is rural farmlands without clear identification or limits; therefore, contact names and addresses were not always available.

Sinkholes are a very important source of potential contamination in Karst areas because they can provide a direct connection from the ground surface into the aquifer. Unfortunately, no existing inventory of sinkholes within the Berkeley County and Martinsburg areas could be located. A number of contacts through the State and CPT were investigated, with only a few known sinkhole areas identified. The following list describes some of the general locations of identified sinkholes within the WHPAs. However, it is recommended that this list be continued and expanded through the WHPP update process.

- Along the eastbound ramp of Exit 16 from I-81.
- Along Edwin Miller Boulevard.

- The "caves" from the Adams Stevens House to the King Street House and at the Brewery House on Burke Street near the Railroad Tracks.
- Under the "land bridge" at the intersection of Rt. 45 and South Queen Street.
- Along Rock Cliff Drive near the DOH depot.

The research and inventory efforts made for the individual WHPAs have identified a significant number of potential contaminant sources within the area. Furthermore, the attached databases should represent the vast majority of sites that can affect the water supply. However, as the area continues to develop, and additional information becomes available, future efforts will need to be made to update and refine the databases.

IV. Susceptibility Determination

The SWAP manual uses a two-tier assessment to determine susceptibility of each well or spring to contamination. The first step is the Tier I Assessment of Physical Barrier Effectiveness, which compares intake integrity with hydrologic sensitivity. The State considers each well or spring to be of poor integrity if it is not constructed to the Public Water Design standards or if its construction is unknown. The spring houses at Kilmer Spring were constructed over seventy years ago and will be undergoing rehabilitation in the near future. While the Capital Cement City Supply Well, drilled in 1968, may meet current standards, the Big Springs Pumping Station also receives water from two wells owned by Capital Cement which may not meet current standards. The Martinsburg region is designated as being in Karst geology, which has a high sensitivity designation. The combination of these two designations gives both of the intakes a High Potential Susceptibility, which means they may be affected by an incident of contamination.

The second step is the Tier II assessment, which relates the Tier I resultant susceptibility with the ranking of Potential Significant Contamination Sources (PSCS) within the WHPAs. The overall land use ranking is based on the highest value given to a PSCS within each WHPA. Kilmer Spring is located very close to Interstate 81, making it particularly susceptible to a hazardous spill that may occur. Similarly, the Capitol Cement City Supply Well is susceptible to the effects of the surrounding mining operation, as well as, the potential for accidental spills at the regional airport or the nearby railroad. In addition, both of the main WHPAs contain other land uses, such as gas stations and auto repair shops that rank as high level threats to groundwater; therefore, both areas would have a High Groundwater Susceptibility. It should be noted that even if the wells and spring were to be considered of high source integrity, both areas would still have a High Groundwater Susceptibility because of the Karst geology and the high concern land use.

V. Source Water Assessment Reports

A. Kilmer Spring

Hydrologic Setting – Kilmer Spring is located in the northwest section of the City, approximately 1,300 feet east of Interstate 81. The spring is adjacent to Tuscarora Creek and in close proximity to a cross fault. Three spring houses exist where groundwater is

under artesian conditions coming from the Conococheague Limestone Unit. The spring has an approximate elevation of 460 feet Above Mean Sea Level (AMSL). It is suspected that Kilmer Spring is under the influence of surface water from Dry Run, which is located approximately 1 mile north of the spring at an elevation of 500 AMSL and experiences water loss.

Construction – The spring houses are stone buildings built at least seventy years ago and are in need of some rehabilitation. During the construction of the proposed water treatment facilities, these buildings are slated to receive new roofs. The immediate area surrounding the spring houses is fenced with a locked gate, and the access road leading to the area is also secured with a locked gate.

Potential Significant Contaminant Sources and Land Uses – The inventory of the Kilmer Spring WHPA consists of approximately 85 potential sources, of which 10 are considered high threats to ground water. Most of the high threat sources include auto repair shops, car dealerships, and gas stations; however, aside from I-81, none of the high threats are within 1,500 feet of the spring. Refer to Map #2 and the Kilmer Spring inventory database (Inventory A) for further information on the potential sources within the WHPA. Land use within the WHPA is approximately 10% commercial/industrial, 20% residential and 70% agricultural.

Water Quality – Despite being classified as GUDI, the finished water quality has been generally good. The raw water has contained bacteria that will need the filtration that will be provided by the proposed treatment facility. During a three year period between August 1994 and July 1997, the average water turbidity from Kilmer Springs was 0.14 Nephelometric Turbidity Units (NTU), which is the basic unit used for measuring the cloudiness of water, with a peak value of 0.74 NTU. The raw water turbidity only exceeded 0.5 NTU on two days during that period. Periodic analysis for a variety of bacterial, organic, and inorganic contaminants in the water have consistently yielded values below the maximum contaminant levels (MCL) as regulated by the Safe Drinking Water Act.

SWAP Management – Due to the karst geology of the WHPA and the proximity of major roadways, this water source is highly susceptible to contamination by pollutants. Best Management Practices covering the use of pesticides on crops and orchards should be encouraged within the large agricultural areas. Furthermore, a strong contingency plan for spills that occur on area roadways will be required to keep the drinking water supply safe. In addition, the proposed filtration plan will help insure high quality finished water that will provide consistently safe water for the PWSS customers.

B. Capitol Cement City Supply Well

Hydrologic Setting – The Capitol Cement City Supply Well is one of three wells located on the property of the Capitol Cement Corporation to the south of the City, The three deep wells produce water from an underground limestone mine that was mined until operations changed in the late 1960s. The wells are located between 440 and 470 feet

below ground and pump water from the large underground lake formed by the flooding of the mine. Water level depths have recently ranged from 300 to 400 feet with an approximate average of 350 feet. Water is reportedly flowing continuously from four zones of varying depths within the mine shaft. Capital Is presently open-pit mining the New Market limestone, the Chambersburg limestone, and the Martinsburg shale. It is suspected that a portion of the water comes from Evans Creek, which flows over the southern portion of the deep mined area. The City Supply Well has a capacity of 1.0 MGD but typically only pumps between 0.5 and 0.7 MGD. The two wells owned by Capital Cement pump an estimated average of 9.0 MGD. About 3.0 MGD is used as process water by Capital Cement, more than 1.0 MGD is delivered to the Big Springs Pumping Station to supply the City drinking water system, and the remainder is released into Evans Run.

Well Construction – The City well was completed in 1971. It is cased and grouted with 18" casing to a depth of 200 feet. The well is about 470 feet deep and was constructed to the current standards at that time. The wells owned by Capitol Cement are reported to have been constructed without surface casing, which creates a greater potential for surface water infiltration.

Potential Significant Contaminant Sources and Land Uses – The inventory of the Capitol Cement City Supply Well WHPA consists of approximately 145 potential sources, of which 60 are considered high threats to ground water. Most of the high threat sources include auto repair shops, car dealerships, and gas stations. The most significant sources are Capitol Cement, the West Virginia Eastern Regional Airport, the railroad, and I-81. Refer to Map #3 and the Capitol Cement City Supply Well Inventory database (Inventory B) for further information on the potential sources within the WHPA. Land use within the WHPA is approximately 20% commercial/industrial, 20% residential and 60% agricultural.

Water Quality – Historical data shows that this source has generally yielded clean water. The raw water has contained bacteria that will need the filtration that will be provided by the proposed treatment facility. During a three year period between August 1994 and July 1997, the average raw water turbidity was 0.27 NTU, with a peak value of 1.34 NTU. Of 722 samples taken, 116 exceeded 0.5 NTU and only 1 exceeded 1.0 NTU. Periodic analysis for a variety of bacterial, organic, and inorganic contaminants in the water have consistently yielded values below the maximum contaminant levels (MCL) as regulated by the Safe Drinking Water Act.

SWAP Management – Due to the karst geology of the WHPA and the proximity of major roadways, this water source is highly susceptible to contamination by pollutants. Best Management Practices covering the use of pesticides on crops and orchards should be encouraged over the large agricultural areas. Furthermore, a strong contingency plan for spills that occur on area roadways will be required to keep the drinking water supply safe. In addition, the proposed filtration plan will help insure high quality finished water that will provide consistently safe water for the PWSS customers.

Phase II – Management:

During the timeframe that the Martinsburg WHPP was being created, the BPH issued a template dated February 1, 2000, for preparing a WHPP. The State has asked that the template be used for the Management Plan and Contingency Plan portions of the WHPP.

VI. Management Plan

A. Protection Management

The CPT discussed a variety of management possibilities to help protect the City's WHPAs. It was noted that the management strategies employed through the WHPP should have an inter-jurisdictional approach because the WHPAs cross political boundaries. The following is a list of options suggested by the CPT members. Each of the options accepted by the CPT are included in the WHPP as recommendations for the City to pursue further:

1. Physically identify the limits of the WHPA with roadside signage. Particular routes to be signed could include I-81, Route 45, and the road crossing North Mountain. The actual form of the signs have not been decided, but should have a general message of "Now entering the Martinsburg watershed", or something similar.
2. Implement Land Use Planning tools to influence future development within the WHPAs. One way to accomplish this is for the City and County to adopt a zoning ordinance that would govern certain uses that are considered high level threats to the groundwater (e.g., industrial or commercial uses that use certain chemicals).
3. Provide maps of the WHPAs to the Berkeley County Planning Commission and City Planners to make them aware of the location of proposed development in relation to the water supply sources. The plan reviewers should provide this information to landowners other review agencies during the development process.
4. Establish easements around known sinkholes to buffer development impacts from these critical entry points into the groundwater source. Buffering techniques in use in other regions range from encouraging landowners to provide vegetative buffers to purchasing development rights from the landowners. Once significant sinkholes are identified, individual assessments will need to be made to determine the best method of buffering.
5. Establish funds to purchase land banks of critical areas (e.g., around sinkholes) to preserve the areas from future development. This could also include the transfer of development rights from critical areas to less critical areas.
6. Support and encourage the implementation of Best Management Practices for agricultural areas including grazing lands, crop production farms, and orchards. In addition, support information can be provided to residents and commercial users to encourage the reduction in over use of common pesticides and fertilizers.
7. Implement systems for the regular collection of hazardous waste from residential communities. The Eastern Panhandle Soil Conservation District and the Berkeley County Solid Waste Authority has helped organize amnesty days in the past where residents could bring in all types of hazardous wastes without any threat of

punishment for having hazardous wastes at their homes. Some of the items that could be collected include pesticides, used oil, antifreeze, paint cans, cleaning solvents, and other hazardous waste products.

8. Encourage and implement public education about the City's water supply regarding its susceptibility to contamination and ways to protect it. This could come in the form of brochures containing information and advice about groundwater and the local terrain. The Eastern Panhandle Soil Conservation District does have some existing brochures that could be helpful as they now exist, or used as a guide to create new brochures. Public education could also come in the form of presentations to various groups. The Berkeley County Health Department has an on-going educational program that is presented to all fourth graders in the county.
9. Support and encourage the identification of contamination incidents by citizens. Currently, individuals are able to access the Hazardous Incident Response Team through the 911 system; however, a non-emergency number could also be established for people to call and report any chronic incidents of contamination or the location of new potential sources, such as sinkholes. Until a non-emergency procedure is established, the Utilities Director has agreed to receive reports.
10. Include information regarding contamination and wellhead protection in mailings to homeowners, including non-emergency contact information. Typical suggested mailings that reach large numbers of people included water bills and tax bills.
11. Create a case history of past contamination incidents or near incidents to inform people of the "nightmare stories" that can occur. For example, the April 2000 Baltimore & Ohio Railroad train derailment could be identified as a "close call."
12. Reduce existing chronic threats by developing a program to remove and replace Leaky Underground Storage Tanks (LUSTs) within the WHPA that are now in service. In addition, a program to remove abandoned USTs could be created. Programs to remove such threats could be encouraged through incentives to the owners of the tanks.
13. Reduce the amount of septic systems in use by extension of the public sewer system. There are plans currently in design for the Berkeley County Public Service Sewer District that will bring much of the WHPAs west of I-81 into public sewer (refer to Map #5).
14. Provide support for applications to obtain funding for additional emergency response and spill containment training and equipment by OES and the City Water Department in order to maintain and improve their abilities to respond to contamination incidents.
15. Conduct additional dye tracings and investigations to verify and refine the WHPA delineation. This will provide the City with a higher level of confidence in the areas in which various management efforts will be created.

These concepts should be reviewed as recommendations to the City Council as management techniques to receive further consideration and development. It was noted at a CPT meeting that including ideas in the WHPP could be used to support future State or Federal funding applications. Additional suggestions may be added to this list.

B. Protection Implementation

The implementation of any of the above mentioned suggestions will require further analysis once they are accepted by the City in the WHPP. That analysis would involve creating a strategy to implementing a particular management technique, which would identify the resources, involvement, and timeframe required.

VII. Contingency Plan

Due to the susceptibility of both water sources due to proximity of significant threats and the potentially fast transportation of water through the fractured rock, there is a need to be prepared in case of an emergency. A timely and effective response to a contamination incident will require a great deal of communication and coordination between agencies and individuals working to resolve the problem.

A. Identification of Possible Disruption Threats

The CPT discussed a variety of possible incidents that could disrupt service, but focused primarily on acute contamination incidents. Some of the critical potential incidents that threaten the Martinsburg WHPAs and were identified by the CPT members were:

- **I-81**: A spill incident on I-81, including diesel fuel tank ruptures, fuel tanker accidents and chemical transport truck accidents. It was noted that there are a wide variety of dangerous substances that travel along the interstate that could particularly threaten Kilmer Spring, due to its proximity to I-81. It was also noted that other roadways in the region are similar threats, but I-81 would typically handle a greater volume of traffic.
- **B&O Railroad**: The railroad was identified as an additional threat similar to I-81. A section of railroad passes through the central WHPA and there is a spur within the southern WHPA and serves Capital Cement.
- **Terrorism**: It was noted that this is a growing threat in all areas and people should be aware that terrorists could target water systems. Terrorism can be a threat in terms of both contamination and service disruption. More training for police and fire departments has focused on the threat of terrorism in recent years.
- **Vandalism**: This threat is similar to terrorism as people could purposely contaminate or otherwise disrupt the water system.
- **Backflow**: Backflow can occur when a drastic drop in pressure in the water distribution system causes a water tap, like a hose, actually draw water into the system rather than releasing water. For example, if a hose is used to fill a swimming pool, a sudden pressure drop could suck pool water into the water system.

B. Designation of Emergency Coordinator

The CPT discussed the need to have a central person to lead and coordinate the effort to respond to a water disruption and manage the control of contamination within the system. Any emergency would require close coordination between all parties involved in the response, including the various Fire Departments and Police Departments, the City Manager's office, the Office of Emergency Services, and the City Water Department (refer to Tables D&E). The Water Department would be deeply involved with any incident. The Utilities Director has the authority to issue mandatory water restrictions for the City. Because of the involvement and responsibility of the Water Department, the City of Martinsburg Utilities Director is recommended to be the Emergency Coordinator.

C. Equipment and Material Resources

The CPT discussed the existence and availability of the Berkeley County Office of Emergency Services (O.E.S.) as a resource to the City. It was noted that OES has the equipment and materials that would be needed to respond to an acute contamination incident such as a spill. OES has a branch called the Hazardous Incident Response Team (HIRT) that is trained to respond to such spills. OES is connected to the 911 system through the various Fire Departments in the area. If a spill occurred, one could call 911 who would then contact the appropriate Fire Department. The Fire Department would then contact OES. The CPT recommends that it be emphasized to the public that the 911 system should be used in the event of an acute contamination incident.

D. Procedures to Communicate with Water Users

The CPT evaluated who would be the point of contact to inform the public during a water emergency. Various suggestions were made including the City Manager and the Utilities Director. The recommended suggestion was to allow the Emergency Coordinator to assign a contact, as they would be the one organizing the information to be given out. Furthermore, the need to have a set procedure for communicating to the public was discussed, but generally it seemed that it should be a case-by-case decision to be made by the Emergency Coordinator.

E. Procedures to Shut Down the Well

The CPT evaluated who would be responsible for shutting down the City's well and it was agreed that the City Water Department would be responsible. The mapping of the water system was also discussed, and it was noted that the Water Department will have GIS mapping of the entire system in the near future. Furthermore, they would eventually be able to perform water modeling to analyze the distribution of water throughout the system to help determine the limits of a shutdown for a particular contamination incident.

The need to determine how much storage was available in the system in case of a shut down was also discussed. The City is in the process of upgrading its water system with the construction of the Baltimore & Williams filtration facility, which treats water from Kilmer Spring, and the Big Springs filtration facility, which treats water from the Capital Cement City Supply Well. Once the upgrades are completed, Kilmer Spring will produce an average of 1.7 million gallons per day (mgd) and Big Springs will produce 2.3 mgd. Furthermore, Kilmer Spring will have the capacity to produce 4.0 mgd and Big Springs will have the capacity to produce 5.0 mgd. With a total average daily demand of 4.0 mgd, either facility could temporarily fulfill the City's needs in case of a shut down of the other facility. The City currently has about 2.5 MG of water storage and will be creating an additional 1.5 MG of storage in the next two years for a total of 4.0 MG of storage capacity. This means that if both systems were shut down, there would still be 4.0 MG in the system. The time frame that this water supply could last would depend on the level of restrictions imposed by the City.

F. Source of Emergency Water

The CPT discussed a number of alternative water sources in case of an emergency. Those sources discussed included:

- Interconnections with other PSDs: The City system is interconnected to both the Opequon PSD and the Berkeley County PSD. The system is capable of both drawing and providing water to the other PSDs. Furthermore, these interconnections are metered and there are existing accounts with the PSDs to allow water sharing. Future plans call for an interconnection with the Hedgesville PSD.
- Lake Thomas: This is the main surface waterbody in the area, but there would be some difficulties in utilizing this water. First the water would require treatment, and secondly, this waterbody could be affected by the same contamination that would disrupt Kilmer Springs.
- Tanker Trucks: Tanker trucks from various Fire Departments around the surrounding Counties could be used to haul water in from other locations. In addition, tanker trucks could be available from the National Guard.

G. Funding

The CPT discussed the availability of emergency funding for an emergency and it was confirmed that the City is able to make funds available to cover the expenses incurred during an emergency. The CPT discussed the possibility of imposing fines on parties responsible for incidents, and it was confirmed that the State and Federal Codes do allow for legal remedies for such cases if the need arises.

Sequential Number	Map Code	PCS Category	PCS Name	Associated Chemicals	Threat to GW
1	C-9	Commercial	Cemetery	M, SOC, PH	L
2	C-31	Commercial	Medical/dental offices/clinics	MP, D, R	M
3	A-15	Agriculture	Greenhouse/Nursery	MP, NN	L
4	I-29	Industrial	Plastics/synthetics producer	VOC, SOC, M	H
5	C-21	Commercial	Hardware/lumber/parts store	VOV, SOC, HM, M	L
6	M-7	Municipal	Highway	PH, VOC, M	M
7	C-28	Commercial	Lawn/farms store	VOC, SOC, NN	L
8	A-6	Agriculture	Crops: orchards	NN, SOC	L
9	A-6	Agriculture	Crops: orchards	NN, SOC	L
10	A-6	Agriculture	Crops: orchards	NN, SOC	L
11	A-6	Agriculture	Crops: orchards	NN, SOC	L
12	A-5	Agriculture	Crops, corn, soybean, wheat	NN, SOC, MP	L
13	A-6	Agriculture	Crops: orchards	NN, SOC	L
14	A-6	Agriculture	Crops: orchards	NN, SOC	L
15	A-6	Agriculture	Crops: orchards	NN, SOC	L
16	A-6	Agriculture	Crops: orchards	NN, SOC	L
17	A-6	Agriculture	Crops: orchards	NN, SOC	L
18	C-3	Commercial	Auto repair shop	PH, M, VOC, HM, SOC	H
19	C-21	Commercial	Hardware/lumber/parts stores	VOV, SOC, HM, M	L
20	A-18	Agriculture	Pasture*	MP, SOC	L
21	A-6	Agriculture	Crops: orchards	NN, SOC	L
22	A-5	Agriculture	Crops, corn, soybean, wheat	NN, SOC, MP	L
23	C-3	Commercial	Auto repair shop	PH, M, VOC, HM, SOC	H
24	A-6	Agriculture	Crops: orchards	NN, SOC	L
25	A-5	Agriculture	Crops, corn, soybean, wheat	NN, SOC, MP	L
26	A-6	Agriculture	Crops: orchards	NN, SOC	L
27	A-5	Agriculture	Crops, corn, soybean, wheat	NN, SOC, MP	L
28	A-6	Agriculture	Crops: orchards	NN, SOC	L
29	A-5	Agriculture	Crops, corn, soybean, wheat	NN, SOC, MP	L
30	A-6	Agriculture	Crops: orchards	NN, SOC	L
31	C-52	Commercial	Welding Shop	M, VOC	M
32	A-5	Agriculture	Crops, corn, soybean, wheat	NN, SOC, MP	L
33	C-3	Commercial	Auto repair shop	PH, M, VOC, HM, SOC	H
34	A-5	Agriculture	Crops, corn, soybean, wheat	NN, SOC, MP	L
35	A-18	Agriculture	Pasture*	MP, SOC	L
36	A-6	Agriculture	Crops: orchards	NN, SOC	L
37	C-8	Commercial	Car wash	PH, VOC	L
38	C-34	Commercial	Paint store	M, VOC, SOC	L
39	A-5	Agriculture	Crops, corn, soybean, wheat	NN, SOC, MP	L
40	M-7	Municipal	Highway	PH, VOC, M	M
41	I-29	Industrial	Plastics/synthetics producer	VOC, SOC, M	H
42	A-5	Agriculture	Crops, corn, soybean, wheat	NN, SOC, MP	L
43	C-53	Commercial	Other		

44	C-53	Commercial	Other		
45	A-5	Agriculture	Crops, corn, soybean, wheat	NN, SOC, MP	L
46	I-9	Industrial	Electrical / electronic manufacturing	M, VOC, HM, SOC	M
47	C-14	Commercial	Fleet/truck/bus terminals	M, VOC, HM, SOC, PH	H
48	C-7	Commercial	Car dealership	PH, VOC	H
49	C-7	Commercial	Car dealership	PH, VOC	H
50	C-13	Commercial	Equipment rental/repair shop	PH, M, VOC	H
51	C-38	Commercial	Photo processing	M, VOC, SOC	M
52	A-21	Agriculture	Slaughterhouses	MP, TO, T, SOC, D	H
53	M-32	Municipal	Eastern Regional Jail	VOC, NN, TO, MP	L
54	C-53	Commercial	Other		
55	C-21	Commercial	Contracting business	VOV, SOC, HM, M	L
56	A-6	Agriculture	Crops: orchards	NN, SOC	L
57	A-5	Agriculture	Crops, corn, soybean, wheat	NN, SOC, MP	L
58	C-21	Commercial	Hardware/lumber/parts store	VOV, SOC, HM, M	L
59	C-3	Commercial	Auto repair shop	PH, M, VOC, HM, SOC	H
60	C-21	Commercial	Hardware/lumber/parts store	VOV, SOC, HM, M	L
61	C-53	Commercial	Residential Cleaning Operation	VOC, SOC	M
62	C-13	Commercial	Equipment rental/repair shop	PH, M, VOC	H
63	C-3	Commercial	Auto repair shop	PH, M, VOC, HM, SOC	H
64	C-18	Commercial	Gas Station	PH, M, VOC, SOC	H
65	C-7	Commercial	Car dealership	PH, VOC	H
66	C-21	Commercial	Hardware/lumber/parts store	VOV, SOC, HM, M	L
67	C-3	Commercial	Auto repair shop	PH, M, VOC, HM, SOC	H
68	I-3	Industrial	Chemical Drums/Storage	PH, M, VOC, SOC	H
69	C-18	Commercial	Gas Station	PH, M, VOC, SOC	H
70	C-3	Commercial	Auto repair shop	PH, M, VOC, HM, SOC	H
71	C-3	Commercial	Auto repair shop	PH, M, VOC, HM, SOC	H
72	A-6	Agriculture	Crops: orchards	NN, SOC	L
73	C-7	Commercial	Car dealership	PH, VOC	H
74	C-18	Commercial	Gas Station	PH, M, VOC, SOC	H
75	C-3	Commercial	Auto repair shop	PH, M, VOC, HM, SOC	H
76	M-6	Municipal	Fire Station	PH, VOC	L
77	C-33	Commercial	Office building	PH, VOC, SOC	L
78	C-33	Commercial	Office building	PH, VOC, SOC	L
79	C-33	Commercial	Office building	PH, VOC, SOC	L
80	C-7	Commercial	Car dealership	PH, VOC	H
81	C-21	Commercial	Hardware/lumber/parts stores	VOV, SOC, HM, M	L
82	C-18	Commercial	Gas Station	PH, M, VOC, SOC	H
83	C-22	Commercial	Heating oil company	PH, VOC	H
84	A-5	Agriculture	Crops, corn, soybean, wheat	NN, SOC, MP	L
85	I-2	Industrial	Cement/concrete plant	PH, VOC, HM, SOC	M
86	C-2	Commercial	Airports/Abandoned airfields	PH, VOC	H

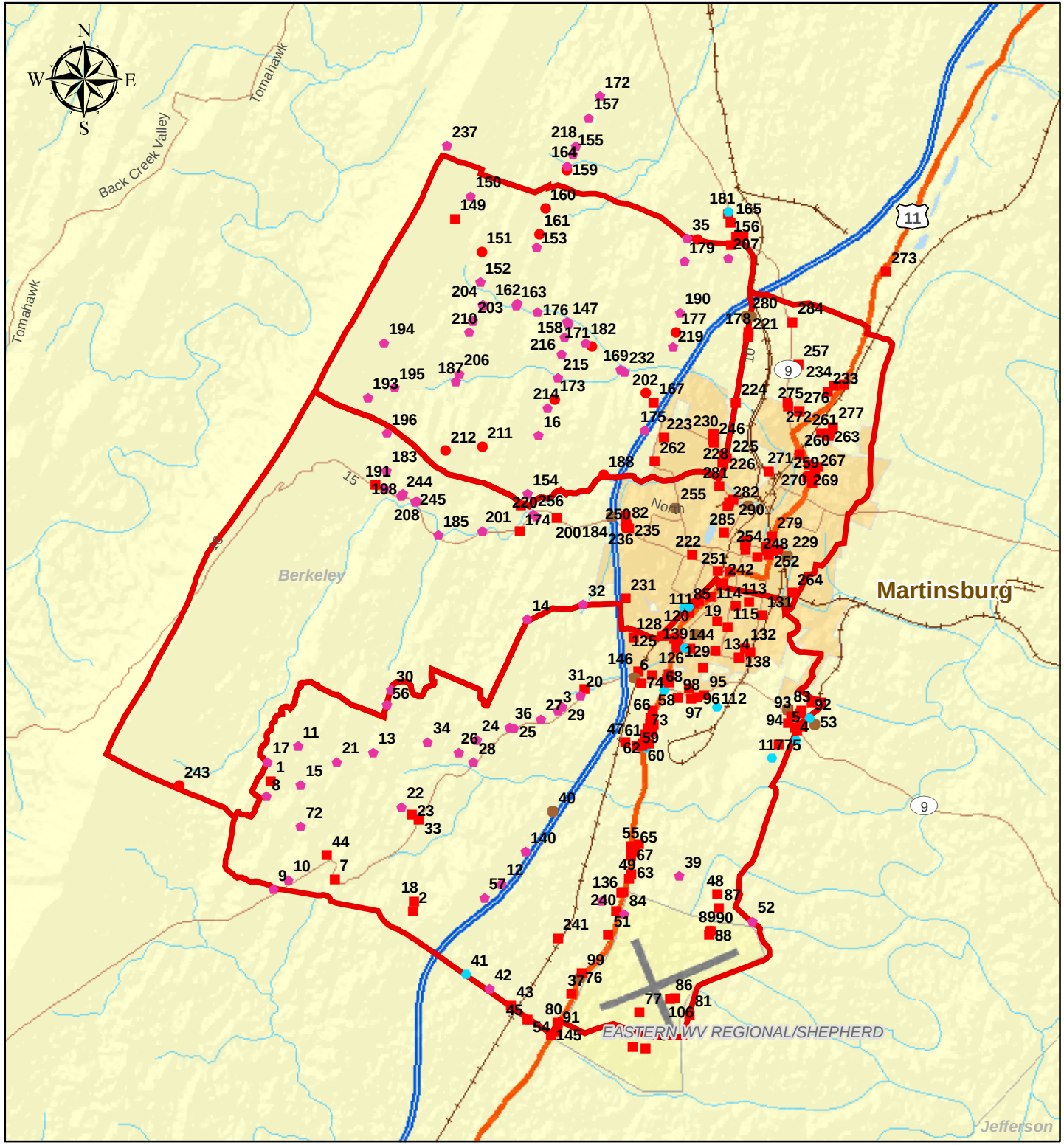
87	C-14	Commercial	Fleet/truck/bus terminals	M, VOC, HM, SOC, PH	H
88	C-2	Commercial	Airports/Abandoned airfields	PH, VOC	H
89	M-14	Municipal	Military Base (past and present)	PH, R, M, VOC, SOC	H
90	C-38	Commercial	Photo processing	M, VOC, SOC	M
91	C-8	Commercial	Car wash	PH, VOC	L
92	I-11	Industrial	Foundries and metal fabricators	M, HM, VOC, SOC, PH	H
93	C-7	Commercial	Car dealership	PH, VOC	H
94	C-7	Commercial	Car dealership	PH, VOC	H
95	C-4	Commercial	Boat service	PH, VOC, NN, M HM	M
96	C-5	Commercial	Body shop	VOC, PH	H
97	C-42	Commercial	Recreational vehicle/mini storage	PH, VOC	L
98	C-28	Commercial	Lawn/farms store	VOC, SOC, NN	L
99	C-14	Commercial	Fleet/truck/bus terminal	M, VOC, HM, SOC, PH	H
100	M-27	Municipal	Waste transfer/recycling station	PH, M	M
101	C-8	Commercial	Car wash	PH, VOC	L
102	C-49	Commercial	Utility Substation Transformers	PH, VOC, SOC	H
103	C-42	Commercial	Recreational vehicle/mini storage	PH, VOC	L
104	C-18	Commercial	Gas Station	PH, M, VOC, SOC	H
105	C-14	Commercial	Fleet/truck/bus terminal	M, VOC, HM, SOC, PH	H
106	C-2	Commercial	Airports/Abandoned airfields	PH, VOC	H
107	C-43	Commercial	Repair Shop (engine, appliances, etc.)	PH, VOC, SOC	H
108	C-43	Commercial	Plumbing/Heating/Air Conditioning	PH, VOC, SOC	H
109	M-19	Municipal	Recycling/reduction facility	M, VOC, HM, SOC	L
110	C-3	Commercial	Auto repair shop	PH, M, VOC, HM, SOC	H
111	C-43	Commercial	Repair Shop (engine, appliances, etc.)	PH, VOC, SOC	H
112	I-2	Industrial	Cement/concrete plant	PH, VOC, HM, SOC	M
113	C-9	Commercial	Cemetery	M, SOC, PH	L
114	C-37	Commercial	Pharmacy	VOC, SOC	L
115	C-7	Commercial	Car dealership	PH, VOC	H
116	C-27	Commercial	Laundromat	VOC, SOC	L
117	I-2	Industrial	Cement/concrete plant	PH, VOC, HM, SOC	M
118	C-21	Commercial	Hardware/lumber/parts stores	VOV, SOC, HM, M	L
119	C-7	Commercial	Car dealership	PH, VOC	H
120	C-37	Commercial	Pharmacy	VOC, SOC	L
121	C-3	Commercial	Auto repair shop	PH, M, VOC, HM, SOC	H
122	C-3	Commercial	Auto repair shop	PH, M, VOC, HM, SOC	H
123	C-8	Commercial	Car wash	PH, VOC	L
124	C-13	Commercial	Equipment rental/repair shop	PH, M, VOC	H
125	C-21	Commercial	Hardware/lumber/parts stores	VOV, SOC, HM, M	L
126	C-18	Commercial	Gas Station	PH, M, VOC, SOC	H
127	C-3	Commercial	Auto repair shop	PH, M, VOC, HM, SOC	H

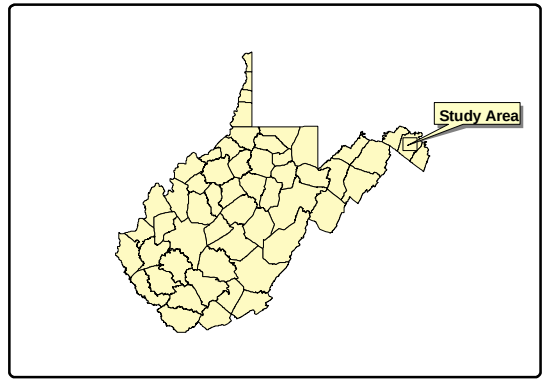
128	C-37	Commercial	Pharmacies	VOC, SOC	L
129	I-9	Industrial	Electrical / electronic manufacturing	M, VOC, HM, SOC	M
130	C-7	Commercial	Car dealership	PH, VOC	H
131	C-3	Commercial	Auto repair shop	PH, M, VOC, HM, SOC	H
132	C-9	Commercial	Cemetery	M, SOC, PH	L
133	C-21	Commercial	Hardware/lumber/parts stores	VOV, SOC, HM, M	L
134	C-3	Commercial	Auto repair shop	PH, M, VOC, HM, SOC	H
135	C-18	Commercial	Gas Station	PH, M, VOC, SOC	H
136	C-7	Commercial	Car dealership	PH, VOC	H
137	M-14	Municipal	Military Base (past and present)	PH, R, M, VOC, SOC	H
138	C-7	Commercial	Car dealership	PH, VOC	H
139	C-3	Commercial	Auto repair shop	PH, M, VOC, HM, SOC	H
140	A-5	Agriculture	Crops, corn, soybean, wheat	NN, SOC, MP	L
141	C-18	Commercial	Gas Station	PH, M, VOC, SOC	H
142	C-3	Commercial	Auto repair shop	PH, M, VOC, HM, SOC	H
143	C-8	Commercial	Car wash	PH, VOC	L
144	I-30	Industrial	Public Utilities (phone, gas, electric power)	M, VOC, SOC	M
145	C-49	Commercial	Utility Substation Transformers	PH, VOC, SOC	H
146	C-18	Commercial	Gas Station	PH, M, VOC, SOC	H
147	A-6	Agriculture	Crops: orchards	NN, SOC	L
148	C-18	Commercial	Gas Station	PH, M, VOC, SOC	H
149	C-9	Commercial	Cemetery	M, SOC, PH	L
150	A-6	Agriculture	Crops: orchards	NN, SOC	L
151	R-4	Residential	Residential (single family homes)	VOC, SOC, NN	L
152	A-6	Agriculture	Crops: orchards	NN, SOC	L
153	A-6	Agriculture	Crops: orchards	NN, SOC	L
154	A-5	Agriculture	Crops, corn, soybean, wheat	NN, SOC, MP	L
155	A-5	Agriculture	Crops, corn, soybean, wheat	NN, SOC, MP	L
156	C-21	Commercial	Commercial Contracting	VOC, SOC, HM, M	L
157	A-5	Agriculture	Crops, corn, soybean, wheat	NN, SOC, MP	L
158	A-5	Agriculture	Crops, corn, soybean, wheat	NN, SOC, MP	L
159	R-4	Residential	Residential (single family homes)	VOC, SOC, NN	L
160	R-4	Residential	Residential (single family homes)	VOC, SOC, NN	L
161	R-4	Residential	Residential (single family homes)	VOC, SOC, NN	L
162	A-18	Agriculture	Pasture*	MP, SOC	L
163	A-5	Agriculture	Crops, corn, soybean, wheat	NN, SOC, MP	L
164	A-5	Agriculture	Crops, corn, soybean, wheat	NN, SOC, MP	L
165	C-18	Commercial	Gas Station	PH, M, VOC, SOC	H
166	C-31	Commercial	Medical/dental offices/clinics	MP, D, R	M
167	C-31	Commercial	Medical/dental offices/clinics	MP, D, R	M
168	C-3	Commercial	Auto repair shop	PH, M, VOC, HM, SOC	H
169	A-6	Agriculture	Crops: orchards	NN, SOC	L
170	C-31	Commercial	Medical/dental offices/clinics	MP, D, R	M

171	R-4	Residential	Residential (single family homes)	VOC, SOC, NN	L
172	A-6	Agriculture	Crops: orchards	NN, SOC	L
173	R-4	Residential	Residential (single family homes)	VOC, SOC, NN	L
174	C-9	Commercial	Cemetery	M, SOC, PH	L
175	A-18	Agriculture	Pasture*	MP, SOC	L
176	A-5	Agriculture	Crops, corn, soybean, wheat	NN, SOC, MP	L
177	R-4	Residential	Residential (single family homes)	VOC, SOC, NN	L
178	C-3	Commercial	Auto repair shop	PH, M, VOC, HM, SOC	H
179	A-18	Agriculture	Pasture*	MP, SOC	L
180	R-4	Residential	Residential (single family homes)	VOC, SOC, NN	L
181	I-30	Industrial	Public Utilities (phone, gas, electric power)	M, VOC, SOC	M
182	A-5	Agriculture	Crops, corn, soybean, wheat	NN, SOC, MP	L
183	A-6	Agriculture	Crops: orchards	NN, SOC	L
184	M-7	Municipal	Highway	PH, VOC, M	M
185	A-18	Agriculture	Pasture*	MP, SOC	L
186	C-14	Commercial	Fleet/truck/bus terminal	M, VOC, HM, SOC, PH	H
187	A-5	Agriculture	Crops, corn, soybean, wheat	NN, SOC, MP	L
188	R-4	Residential	Residential (single family homes)	VOC, SOC, NN	L
189	C-7	Commercial	Car dealership	PH, VOC	H
190	A-5	Agriculture	Crops, corn, soybean, wheat	NN, SOC, MP	L
191	C-53	Commercial	Burkhart's Market	VOC, SOC, NN	L
192	M-20	Municipal	Road maintenance depots/deicing operations	PH, VOC, M	H
193	A-6	Agriculture	Crops: orchards	NN, SOC	L
194	A-6	Agriculture	Crops: orchards	NN, SOC	L
195	A-5	Agriculture	Crops, corn, soybean, wheat	NN, SOC, MP	L
196	A-6	Agriculture	Crops: orchards	NN, SOC	L
197	A-18	Agriculture	Pasture*	MP, SOC	L
198	A-6	Agriculture	Crops: orchards	NN, SOC	L
199	C-43	Commercial	Repair Shop (engine, appliances, etc.)	PH, VOC, SOC	H
200	C-9	Commercial	Cemetery	M, SOC, PH	L
201	A-18	Agriculture	Pasture*	MP, SOC	L
202	R-4	Residential	Residential (single family homes)	VOC, SOC, NN	L
203	A-6	Agriculture	Crops: orchards	NN, SOC	L
204	A-18	Agriculture	Pasture*	MP, SOC	L
205	A-6	Agriculture	Crops: orchards	NN, SOC	L
206	A-5	Agriculture	Crops, corn, soybean, wheat	NN, SOC, MP	L
207	A-6	Agriculture	Crops: orchards	NN, SOC	L
208	A-5	Agriculture	Crops, corn, soybean, wheat	NN, SOC, MP	L
209	C-3	Commercial	Auto repair shop	PH, M, VOC, HM, SOC	H
210	A-6	Agriculture	Crops: orchards	NN, SOC	L
211	R-4	Residential	Residential (single family homes)	VOC, SOC, NN	L
212	R-4	Residential	Residential (single family homes)	VOC, SOC, NN	L
213	C-53	Commercial	Electrical / electronics	M, HM	L
214	A-5	Agriculture	Crops, corn, soybean, wheat	NN, SOC, MP	L
215	A-18	Agriculture	Pasture*	MP, SOC	L

216	A-18	Agriculture	Pasture*	MP, SOC	L
217	A-6	Agriculture	Crops: orchards	NN, SOC	L
218	A-5	Agriculture	Crops, corn, soybean, wheat	NN, SOC, MP	L
219	A-15	Agriculture	Greenhouse/Nursery	MP, NN	L
220	A-15	Agriculture	Greenhouses/Nursery	MP, NN	L
221	C-3	Commercial	Auto repair shop	PH, M, VOC, HM, SOC	H
222	C-3	Commercial	Auto repair shop	PH, M, VOC, HM, SOC	H
223	C-24	Commercial	Hospital	R, VOC, MP, D	M
224	C-52	Commercial	Welding Shop	M, VOC	M
225	C-31	Commercial	Medical/dental offices/clinics	MP, D, R	M
226	C-31	Commercial	Medical/dental offices/clinics	MP, D, R	M
227	C-12	Commercial	Dry cleaners	VOC, SOC	H
228	C-49	Commercial	Utility Substation Transformers	PH, VOC, SOC	H
229	M-8	Municipal	Historic railroad right-of-ways	M, PH	M
230	C-33	Commercial	Office building/complex	PH, VOC, SOC	L
231	C-12	Commercial	Dry cleaners	VOC, SOC	H
232	A-6	Agriculture	Crops: orchards	NN, SOC	L
233	C-12	Commercial	Dry cleaners	VOC, SOC	H
234	C-12	Commercial	Dry cleaners	VOC, SOC	H
235	C-18	Commercial	Gas Station	PH, M, VOC, SOC	H
236	C-18	Commercial	Gas Station	PH, M, VOC, SOC	H
237	A-5	Agriculture	Crops, corn, soybean, wheat	NN, SOC, MP	L
238	C-8	Commercial	Car wash	PH, VOC	L
239	A-5	Agriculture	Crops, corn, soybean, wheat	NN, SOC, MP	L
240	C-3	Commercial	Auto repair shop	PH, M, VOC, HM, SOC	H
241	C-41	Commercial	Railroad Tracks	PH, M, VOC, SOC	H
242	C-3	Commercial	Auto repair shop	PH, M, VOC, HM, SOC	H
243	R-4	Residential	Church	VOC, SOC, NN	L
244	A-6	Agriculture	Crops: orchards	NN, SOC	L
245	A-18	Agriculture	Pasture*	MP, SOC	L
246	C-49	Commercial	Utility Substation Transformers	PH, VOC, SOC	H
247	I-2	Industrial	Cement/concrete plant	PH, VOC, HM, SOC	M
248	C-23	Commercial	Historic gas station	PH, M, VOC	H
249	M-14	Municipal	Military Base (past and present)	PH, R, M, VOC, SOC	H
250	C-18	Commercial	Gas Station	PH, M, VOC, SOC	H
251	C-18	Commercial	Gas Station	PH, M, VOC, SOC	H
252	C-12	Commercial	Dry cleaners	VOC, SOC	H
253	C-53	Commercial	Other		
254	C-12	Commercial	Dry cleaners	VOC, SOC	H
255	M-15	Municipal	Park lands	NN, SOC	L
256	A-15	Agriculture	Greenhouses/Nurseries	MP, NN	L
257	C-18	Commercial	Gas Station	PH, M, VOC, SOC	H
258	M-5	Municipal	Drinking Water Treatment Plant	D	L
259	C-8	Commercial	Car wash	PH, VOC	L
260	C-12	Commercial	Dry cleaners	VOC, SOC	H

261	C-48	Commercial	Underground Storage Tanks	PH, VOC	H
262	C-31	Commercial	Medical/dental offices/clinics	MP, D, R	M
263	C-18	Commercial	Gas Station	PH, M, VOC, SOC	H
264	C-22	Commercial	Heating oil companies	PH, VOC	H
265	C-28	Commercial	Lawn/farms store	VOC, SOC, NN	L
266	C-12	Commercial	Dry cleaners	VOC, SOC	H
267	C-3	Commercial	Auto repair shop	PH, M, VOC, HM, SOC	H
268	C-31	Commercial	Medical/dental offices/clinics	MP, D, R	M
269	C-27	Commercial	Laundromat	VOC, SOC	L
270	C-18	Commercial	Gas Station	PH, M, VOC, SOC	H
271	C-3	Commercial	Auto repair shop	PH, M, VOC, HM, SOC	H
272	C-3	Commercial	Auto repair shop	PH, M, VOC, HM, SOC	H
273	C-18	Commercial	Gas Station	PH, M, VOC, SOC	H
274	C-3	Commercial	Auto repair shop	PH, M, VOC, HM, SOC	H
275	C-18	Commercial	Gas Station	PH, M, VOC, SOC	H
276	C-27	Commercial	Laundromat	VOC, SOC	L
277	C-3	Commercial	Auto repair shop	PH, M, VOC, HM, SOC	H
278	C-18	Commercial	Gas Station	PH, M, VOC, SOC	H
279	C-22	Commercial	Heating oil companies	PH, VOC	H
280	M-20	Municipal	Road maintenance depots/deicing operations	PH, VOC, M	H
281	C-14	Commercial	Truck terminal	M, VOC, HM, SOC, PH	H
282	C-3	Commercial	Auto repair shop	PH, M, VOC, HM, SOC	H
283	C-3	Commercial	Auto repair shop	PH, M, VOC, HM, SOC	H
284	C-18	Commercial	Gas Station	PH, M, VOC, SOC	H
285	C-22	Commercial	Heating oil companies	PH, VOC	H
286	C-3	Commercial	Auto repair shop	PH, M, VOC, HM, SOC	H
287	C-28	Commercial	Lawn/farms store	VOC, SOC, NN	L
288	C-12	Commercial	Dry cleaners	VOC, SOC	H
289	C-12	Commercial	Dry cleaners	VOC, SOC	H
290	C-46	Commercial	Sawmill	PH, VOC, SOC	M
291	C-7	Commercial	Car dealership	PH, VOC	H





Map Key

Potential Contaminant Sources

- Agriculture
- Commercial
- Industrial
- Municipal
- Residential
- Source Water Protection Area

This map is provided as a public service by the West Virginia Bureau for Public Health. The Bureau makes NO representation regarding completeness or accuracy of the data hereon. Efforts are made to verify and update the data used to generate this map. However, with data sets of this size and nature, eliminating all errors is difficult. Thus, the user assumes total responsibility for verification.

Source locations not included for reasons of security

City of Martinsburg
WV3300212
Berkeley County

Scale: 1:84,000
Drawn by: JEM
06/28/05

0 0.5 1 2
Miles

Appendix F-4. The City of Martinsburg Protection Team Meeting Minutes

The City of Martinsburg Water System

Protection Team Meeting

December 3, 2015

232 N. Queen Street Martinsburg, WV

In Attendance:

Steve Knipe	City of Martinsburg Water System
Sam Blair	City of Martinsburg Water System
Zachary Neal	Advanced Land and Water, Inc.
Sarah Taggart	Advanced Land and Water, Inc.
Stephen M. Gyurisin	Advanced Planning Associates, LC
Monica Whyte	West Virginia Bureau for Public Health
Jeff Wilkerson	City of Martinsburg Director of Public Works
Michael Covell	City of Martinsburg Engineer / Planning Director
Mark Baldwin	City of Martinsburg; City Manager

Interested Participants Who Could Not Attend:

Eddie Gochenour	Berkeley County Office of Homeland Security & Emergency Management

Invitees Who Did Not Respond:

Alan F. Marchun	WV DHHR Kearneysville District Office
Michael Kanehl	Berkeley County Environmental Inspector; Water & Waste
Paul E. Bragg	City of Martinsburg Fire Chief
Maurice Richards	City of Martinsburg Chief of Police

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 City of Martinsburg Water System. More specifically, the Team worked to prioritize the major Potential Significant Sources of Contamination (PSSC), critical areas, and other threats deemed of greatest concern to the system's 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.

Timeline of Events:

Following introductions from participating Protection Team members, Advanced Land and Water, Inc. (ALWI) staff began a PowerPoint in which we explained the hydrogeologic setting of Berkeley County and broadly covered general system information pertaining to water source locations and delineated areas that influence system sources, which are termed Wellhead Protection Areas (WHPAs). From there, we introduced our list of prioritized PSSCs, management strategies related to those PSSCs and education and outreach strategies to engage and educate the public on source water protection efforts. We then asked the protection team to opine on our PSSC list and edit prioritization, if and where appropriate. We also encouraged Protection Team members to identify additional PSSCs they felt may have been of concern. The Protection Team did not add any additional PSSCs. We discussed implementation measures for protection strategies, as well as education and outreach strategies, and assigned responsibility to Protection Team members who volunteered to handle each strategy.

Public Workshop Discussion:

Prior to the formal start of the Protection Team meeting, we discussed available options for a Public Workshop in the future with City of Martinsburg Water System staff. The Director of the

Martinsburg Water Department (Steve Knipe) decided to work with the Berkeley County Public Service Water District (BCPSWD) to combine public workshop efforts for the City of Martinsburg Water System with BCPSWD's Bunker Hill Water Treatment Plant and Potomac River Plant systems. Over the phone, BCPSWD and the City of Martinsburg agreed to host the joint workshop on Wednesday, December 16th, 2015 at 1:00pm in the City of Martinsburg Council Chambers room, located at 232 N. Queen Street Martinsburg, WV. Region 9, in conjunction with the directors of both water systems, decided that a formal press release, in addition to electronic postings on system websites, would be an effective means of disseminating public workshop information to water customers and interested individuals located throughout Berkeley County.

The City of Martinsburg Specific Discussions:

During the presentation, ALWI displayed current and future land use maps, with the BPH delineated WHPAs overlain. The future growth area maps, which we acquired from the Berkeley County Council website, depict anticipated land development within the WHPAs associated with City of Martinsburg water sources. The overall, rectangular City of Martinsburg WHPA consists of three smaller wellhead protection areas. Two of these smaller wellhead protection areas, which are located on the northern (Kilmer Spring WHPA) and southern (Big Spring WHPA) sides of the City, were delineated using dye-tracing studies and other methods and. A third source water protection area (the Central WHPA) that covers land between the Kilmer Springs and Big Springs WHPAs, needs to undergo further evaluation to determine the influence of land uses and hazards present in this zone on system water sources. The future growth area maps indicate that town center growth is anticipated to expand in all three WHPAs, as is residential growth. When discussing the large number of industrial and commercial activities within the WHPAs, Mark Baldwin expressed his concern that establishing and honoring an urban growth boundary would be essential to source water protection, and that without some restriction or zoning, many of the Protection Team's goals would be difficult to implement. The maps also showed that approximately 6% of the Kilmer Spring WHPA, 13% of the Big Springs WHPA, and 28% of the central WHPA are within City Limits, with the remainder of each WHPA falling under the jurisdiction of Berkeley County. ALWI recommended that the System continue to work with representatives from Berkeley County (in conjunction with BCPSWD) to limit incompatible land use development wherever possible within the City of Martinsburg WHPAs outside of City Limits.

ALWI-identified PSSCs and Critical Areas within the City of Martinsburg WHPAs were presented and discussed, with ALWI staff explaining the basis for each potential threat. Prior to the meeting, ALWI had prioritized these potential threats in order from highest priority to lowest priority, as shown below.

1. Highway (I-81) Corridors
2. Railroad Corridors
3. Industrial & Commercial Activities

4. Sinkholes
5. Septic Systems
6. Agricultural Activities

ALWI asked that the Protection Team consider these threats, add additional threats conceived by the Team, assess the prioritization of the threats and make any revisions to prioritization, as presented to the team. The Protection Team agreed that the above list accurately describes area threats to the system sources. However, the Protection Team decided that individual priority orders for each water treatment plant would be more appropriate (See Table 8) than treating the water system holistically. The protection team did not recommend any other revisions to the ALWI-identified table of PSSCs and Critical Areas.

Management Strategies developed and recommended by ALWI for each of these priority concerns were discussed thereafter (see Table 9). During the discussion, team members volunteered to oversee implementation of the recommended management strategies. Relevant management and implementation strategies were discussed as follows:

- **Highways –** In response to the ALWI recommended management strategies, the City of Martinsburg agreed to establish communications with the Department of Transportation (DOT) in regards to posting additional "Now Entering a Source Water Protection Area" signs on I-81 and other roadways in the WHPA. The Protection Team is aware that the DOT already possesses road signs of this nature, and that they are currently posted on state roads but not federal roads such as I-81. The City of Martinsburg will work with BCPSWD in this regard to request signage be posted along federal roads as well. While Mr. Eddie Gochenour was unable to attend this meeting, though he has expressed interest in future involvement with the Protection Team. ALWI recommendations included establishing pre-stocked emergency spill response stations along the highway and railroad corridors, and reaching out to the Department of Transportation (DOT) to discuss various traffic regulation options, particularly for hazardous wastes. At this time, Mr. Gochenour is undertaking similar efforts for the BCPSWD. Advances that he makes in that regard may also extend to the City of Martinsburg, as Mr. Gochenour is working on a Berkeley County-wide Emergency Response effort. While much of his work will focus on railroad entities and training related to railroad emergency response (discussed below), he has volunteered to work with BCPSWD to contact the DOT to pursue greater emergency response equipment stocks/storage in key areas (mainly near source water protection areas) throughout the County, in addition to other key recommendations included above.

- **Railroad** – ALWI recommended that the City of Martinsburg emergency personnel work with CSX and their shortline partners and take advantage of free training (online and in-classroom) offered by the railroad corporation. These training exercises include online workshops, training at emergency personnel facilities, and train car response workshop activities. ALWI iterated that Mr. Eddie Gochenour is currently working on a county-wide emergency preparedness effort in this regard, and that the City and City emergency response personnel should work with Mr. Gochenour in this regard.

- **Industrial & Commercial Activity –**The possibility of creating a source water protection specific ordinance or amending existing ordinances to forward source water protection goals was discussed. However, it was ultimately decided that this strategy would not be a feasible option for the City at this time, as such facilities could still be constructed within the WHPAs, but in less restrictive lands under County jurisdiction. As a result, the City of Martinsburg will pursue educative and volunteer strategies, such as reviewing the Groundwater Protection Plans of various facilities and educating facility owners on the potential threat of sinkhole development caused by stormwater management. The City of Martinsburg will also distribute site-specific lists of Best Management Practices (BMP) to facilities during every SWPP update, as a means of continuous education and outreach to these entities.

- **Sinkholes -** Due to the presence of karst terrain, which underlies the region and encompasses the majority of the WHPAs, ALWI recommended that the City of Martinsburg establish a Sinkhole Management Program, possibly modeled after the Carroll County, MD Sinkhole Management Program. Such a program could be adopted by the City alone. However, the City would achieve a better level of protection by working with Berkeley County to address sinkholes that come to develop within the Martinsburg WHPAs, but outside City jurisdiction. ALWI explained the general outline of the Carroll County Sinkhole Management Plan, whereby the locations of known sinkholes and karst geologic boundaries are mapped, responsible parties for sinkhole formation and mitigation are established and/or determined, protocol for regular sinkhole inspections on County lands are instituted and cost-sharing initiatives for sinkhole mitigation are presented. When asked what policies the City of Martinsburg presently has in place for sinkhole management, Mike Covell stated that the City is responsible for sinkholes that occur on City property, and the State is responsible for sinkholes occurring on State property. The City of Martinsburg decided that they would pursue the development of a sinkhole management plan in the long term. Mr. Steve Knipe iterated that the City of Martinsburg and ESSROC mining company had historically discussed a "zone of influence", referring to the area affected by mining techniques, including dewatering. The City of Martinsburg will meet with ESSROC again in the future to discuss an update to this zone of influence.

- **Agricultural Activities** – In response to the ALWI recommended management strategies the City of Martinsburg agreed to work with the Berkeley County Extension Service, the Soil and Water Conservation District, and the Natural Resources Conservation Service (NRCS) to promote participation in and raise awareness about available forest conservation, land retirement, and nutrient management programs. While discussing nitrate levels recorded by the water system at the two different treatment plants, the Protection Team found out that agricultural activities may not be the predominant source of nitrate in the groundwater (GW). Steve Knipe explained that urea is commonly used as a deicer at the nearby airport, which could contribute additional nitrate to the GW system in proximity to the Big Springs WTP. Steve Knipe also hypothesized that nitrate may also originate from explosives associated with ESSROC's routine blasting. Both of these

possible sources of nitrate are in proximity to the Big Springs source, which showed one nitrate sample exceeding 7 mg/L in January 2013 (the Maximum Contaminant Level (MCL) for nitrate is 10 mg/L). Addressing agricultural activities remains a low priority for the system, as nitrate levels at both Kilmer Springs and Big Springs have historically been below 50% of the MCL. The City of Martinsburg will consider the above discussion when reviewing the GPPs for ESSROC and the Martinsburg Air Guard.

- **Septic Systems** – The City of Martinsburg will work with Public Sewer during the next sewer expansion planning period to recommend specific areas currently on private well and septic that would benefit from incorporation into the public sewer system. The City of Martinsburg will work with the Health Department to identify properties with old or failing septic systems and encourage homeowners to replace them with Best Available Technologies (BATs).

During the course of the meeting, the Communication Plan component of the SWPP was discussed. The plan requires that a Communication Team be formed and comprised of personnel who would play an integral part in disseminating information between the system, the public and other entities involved, should an emergency contamination event occur. Although the City of Martinsburg extended an invitation to local emergency and law enforcement personnel, none were able to attend this meeting. ALWI recommends that the City of Martinsburg attempt to engage these entities in the future, regarding the communication plan, as well as emergency response protocol in the event of a contaminant occurrence.

The Education and Outreach Strategies recommended by ALWI were discussed, and responsible members were chosen for each category (See Table 10). The Protection Team meeting concluded at approximately 4:00 PM.

Appendix F-5. Emergency Response Plan Signature Page

Appendix F-6. Engineering Evaluation

CONFIDENTIAL

Appendix F-7. Railroad Emergency Response Trainings and Services

The information included in this Appendix may be found at the following web addresses (respectfully):

Online Education:

- General - https://www.csx.com/index.cfm/about-us/safety/community/emergency-responder-training-and-education/
- Online Trainings – www.csxsafe.com
- Planning Guides – http://csxhazmat.kor-tx.com/
- Additional Training Opportunities - http://www.beyondourrails.org/index.cfm/safety/

Rail Respond:

- Program Information – http://www.beyondourrails.org/index.cfm/safety/respond/

Safety Train:

- Program Information – http://www.beyondourrails.org/index.cfm/news-stories/articles/csx-safety-train-delivers-enhanced-outreach-to-first-responders-and-communities/
- Related Article – http://www.richmond.com/business/article_6b1526cf-e3fe-55d4-bec6-37601609a875.html
- CSX Corporate Social Responsibility Report (additional information on the Safety Train program may be found on page 50) - https://www.csx.com/index.cfm/library/files/responsibility/csr-report-files/corporate-social-responsibility-report/

Community

Rail Security Partnerships

Emergency Responder Training and Education

Emergency Responder Training and Education

CSX provides emergency planning assistance and training to local fire, police and emergency response personnel in the communities we serve.

Online Training at CSXSAFE.com

CSX hosts a free online training program to educate emergency personnel on how to safely respond to incidents on and around railroad property and equipment.

CSXSAFE offers participants the opportunity to gain an understanding of how railroads operate, including some of the hazards of working around the rails and necessary protocols to keep responders safe.

The web-based program takes less than an hour to complete and is intended to provide important information to public agency personnel in fire and police departments, rescue and emergency medical organizations about basic rail safety precautions, railroad operations, initial-response procedures, types of rail equipment and who to call in an emergency.

Upon completion of the training modules, participants take a quiz, print a certificate of completion and are able to browse through upcoming in-person training opportunities being offered across the CSX network.

Training Materials

The CSX Transportation Public Safety and Environment department provides free training and emergency planning materials for emergency response agencies. Visit our Training Materials for Emergency Responders page to request any of the following items:

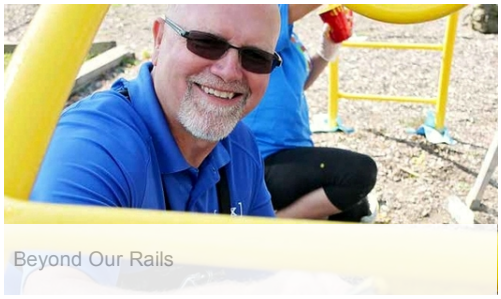
- Community Awareness Emergency Planning Guide
- Emergency Response to Railroad Incidents Self Study Guide
- Emergency Response to Railroad Incidents Self Study Video
- Locomotive Emergency Response Operations Video

Related Links

Corporate Social Responsibility

CSX Police Department

Emergency Responders



SAFE
CSX Safety Awareness For Emergencies

CSX

WELCOME TO CSX SAFE,

a course designed by CSX to help local emergency responders manage incidents involving rail property and equipment. CSX is dedicated to managing safe railways, and by working together with professionals like you, we can better protect and serve the communities in which we live and work.

Emergency response procedures require attention to detail. While this site is geared toward all responders, CSX provides discipline-specific training for police, fire & rescue, and other response agencies.

Once you've passed the quiz and are ready to take your emergency response training further, please visit the "More" section of this site.

To save your quiz progress, receive your certificate, or enroll in live training, you must have cookies enabled and be logged in.

CSX Transportation is a proud member of TRANSCAER

Train Photos Courtesy of Ron Flanary

TRAINING MATERIALS FOR EMERGENCY RESPONDERS

Welcome

The CSX Transportation Public Safety and Environment department provides training and emergency planning materials for emergency response agencies free of charge. On this website, you can request the following items:

- Community Awareness Emergency Planning Guide
- Emergency Response to Railroad Incidents Self Study Guide
- Emergency Response to Railroad Incidents Self Study Video
- Locomotive Emergency Response Operations Video

Please follow the directions below to request these materials.

To login, please select the agency type with which you are affiliated.
You will need to provide evidence of your need for the materials requested before your order is filled.

CSX Transportation provides training materials to response agencies located in the states in which we operate. Due to the high demand for these training products, CSXT cannot provide materials for agencies in states other than those served by CSXT. If you are associated with a response agency west of the Mississippi River, Wisconsin, or any other area not served by CSXT, you should contact the railroad company operating in your jurisdiction for training.

CSX Transportation proudly supports TRANSCAER® (Transportation Community Awareness Emergency Response), a voluntary national outreach effort that focuses on assisting communities prepare for and respond to a possible hazardous material transportation incident.

City/County Government
Consultant/Private Company
CSX Employee
EMA - County
EMA - State
EMS
Fire Department - Paid
Fire Department - Volunteer
Police
State/Federal Government

GO

Alternatively, you may login as an authorized CSX employee with your email address and password.

Username:

Password:

LOGIN

Forgot Your Password?

Play It Safe

Youth Safety Outreach

Rail Respond

Safety

At CSX, safety encompasses every aspect of company operations. Guided by a policy to ensure the safety of our employees, our customers and the communities we serve, CSX works relentlessly to prevent injuries and accidents through education, programming and advocacy at all levels.

Youth Safety Outreach

Play It Safe Outreach Campaign

Rail Safety First Responders

Through Rail Respond, CSX and First Responders work hand-in-hand to seamlessly share information to safeguard the communities and customers they serve.

LEARN MORE

Safety Train

Emergency Responder Training

Rail Respond

Online Training

Training Materials

VIEW ALL

Safety

Play It Safe

Youth Safety Outreach

Rail Respond

Rail Respond

CSX Rail Respond is the first program of its kind among Class I railroads. It provides firefighters, police officers and other emergency responders with easy mobile access to critical information about what's traveling on CSX rails.

Designed specifically to aid first responders in the event of a rail emergency, CSX Rail Respond quickly identifies the contents of rail cars carrying hazardous materials. Through the mobile website, responders can securely access:

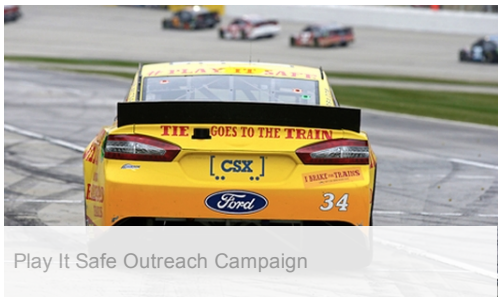
- Real-time information on the contents of rail cars.
- Real-time complete train list information.
- A suite of other useful emergency response information designed to assist when responding to a rail-related transportation emergency.

This innovative system builds on CSX's longstanding commitment to communicate with, collaborate with and train first responders in hopes of advancing our top priority: the safety of our communities, our employees and our customers' freight.

CSX Rail Respond, designed to work on smartphones, tablets or desktop PC, can be accessed through iPhone, Android devices and most browsers.

First responders can request access at www.csxrailrespond.com .

Youth Safety Outreach



Play It Safe Outreach Campaign

CSX Safety Train Delivers Enhanced Outreach to First Responders and Communities

CSX's Safety Train: Energy Preparedness Program, with rolling classrooms and specialized hands-on training, has taken to the rails on an expanded first responder training initiative. The train will travel over much of the company's crude oil service territory over the next several months.

This CSX Safety Train will begin in mid-May, visiting numerous communities in Pennsylvania, New York, New Jersey, Ohio, Indiana and Illinois. The company's enhanced training program offers fire fighters, police officers, emergency medical technicians and other first responders insights on how rail cars work and how to deal with rail incidents. CSX's first responder training already reaches hundreds of emergency personnel each year.

Upcoming training sessions will include Philadelphia; South Kearny, N.J.; Kingston, Albany, Syracuse, Rochester, Buffalo and New York, N.Y.; Erie, Pa.; Cleveland and Willard, Ohio; Garrett, Ind.; and Chicago. More details will be provided as the schedule is finalized.

"As the market for shipping crude oil has grown, so has our commitment to and responsibility for moving those shipments safely and efficiently," said Skip Elliott, CSX's vice president-public safety, health and environment. "This year, in light of increased crude oil movements on our network, we have expanded our engagement with first responders and emergency personnel along key routes to include training specific to crude oil movements."

The CSX Safety Train is comprised of a locomotive, four tank cars, one flat car equipped with a variety of tank car valves and fittings, two classroom cars and a caboose. CSX hazardous material specialists will lead training sessions with specific instruction on how crude oil is shipped. The train and instruction will help strengthen CSX's partnership with first responders and provide a higher state of emergency readiness.

Increased emergency response training and tuition assistance are part of a voluntary agreement that the nation's railroads reached with the U.S. Department of Transportation earlier this year. As part of this comprehensive agreement, the nation's railroads have lowered maximum authorized speeds for certain trains carrying crude oil in designated cities, increased track inspections on key oil routes, and agreed to implement additional trackside safety technology.

The CSX Safety Train is just one of a number of continuing programs through which CSX offers training and recognition to emergency responders and customers. Just recently, CSX presented its Chemical Safety Excellence Award to more than 70 shippers who had incident-free records in 2013.

Training already reaches hundreds of first responders through the Safety Train, hands-on sessions at training centers operated by CSX and the Association of American Railroads, classroom training at local fire stations, exercises and table-top drills, and thousands more through web-based and self-study courses. In September 2013, nearly 100 crude oil customers were trained by a CSX team.

Location: Jacksonville, FL

Published: May 26, 2014

Photos

The City of Martinsburg Public Water System

Public Outreach and Involvement Summary

The Protection Team: Efforts to engage local stakeholders, government officials and specific members of the community in forming the City of Martinsburg Source Water Protection Team are listed below.

1. ALWI provided the system a recommended list of entities (including local stakeholders, government officials, etc.) to consider inviting to participate on the Protection Team. This list also contained contact information for each potential invitee.
2. Water system representatives from the City of Martinsburg sent electronic invitations (email) to selected invitees.
3. The corresponding minutes for the December 3, 2015 Protection Team Meeting can be found in Appendix F-4 of the City of Martinsburg Source Water Protection Plan (SWPP).

The Public Workshop: Efforts to publicize the City of Martinsburg Source Water Protection Public Workshop are listed below.

1. A Press Release was developed and provided to both the City of Martinsburg and the Eastern Panhandle Regional Planning & Development Council (Region 9). The press release was distributed to the local media and posted on the Region 9 website.

The SWPP Report: Efforts to inform the public of the SWPP update and to engage the public to provide comments and opinions on the content of the report are listed below.

1. ALWI created a SWPP Summary PowerPoint presentation for Region 9 to host on their website. This afforded the public an opportunity to view general SWPP information prior to the Draft SWPP being uploaded for public review and comment.
2. A public version of the SWPP Draft was posted on the Region 9 website for the public to opine on, prior to final submittal of the plan to WV BPH. At the close of the public comment period, ALWI discussed comments received with the system and updated the SWPP accordingly.

Computation for population equivalent for water sold to Berkeley County Public Service Water District for Fiscal Year 2015/2016.

Total water sold to BCPSWD = 111,781,000 Gallons

Calculate average water sold GPD = 111,781,000 / 365 = 306,249 GPD

Calculate number of households = 306,249/ 150 GPD per Household. = 2042 Households

Calculate Population Equivalent = 2042 Household X 2.61 residents per household

= 5329 Equivalent Population.

METERED RATIO AND UNACCOUNTED FOR WATER WORK SHEET

UTILITY City of Martinsburg
TELEPHONE NO. 304/264-2116

DATES: **FROM July 1, 2014 to June 30, 2015**

				Gallons
1.	Water Delivered to system for retail service			825,668,479 (D)
2.	Metered Water (M)		Gallons	
	a.	Residential	263,212,000	
	b.	Commercial	283,999,000	
	c.	Industrial	0	
	d.	Other	5,693,000(Bulk.)	
	TOTAL			552,904,000 (M)
3.	Metered Ratio (=M/Dx100)			66.9 % Percent
4.	Un-metered Water (Um=D-M)			272,764,479 (UM)
5.	Allowances (A) (Known or Estimated)			
	a.	Municipal Use	25,000,000	
	b.	Hydrant Use	20,000,000	
	c.	Broken/Dead Meters	15,000,000	
	d.	Other (Attach List)	100,000,000	
	TOTAL			160,000,000 (A)
6.	Un-accounted For Water (UFW=UM-A)			112,764,447 (UFW)
7.	Un-accounted For Ratio (UFW/D X100) Percent			13.6 %

REPORTED BY: Stephen M. Knipe, Utilities Director
TITLE

SEND COPY TO:

Public Service Commission of West Virginia
Water and Sewer Section/Engineering
201 Brooks Street, P.O. Box 812
Charleston, WV 25323
304/340-0300