

***FOR PUBLIC RELEASE***

# **Source Water Protection Plan Paw Paw Water Works**

PWSID: WV3303308

Morgan County

October 2021

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In cooperation with Paw Paw Water Works  
WV Bureau for Public Health, Source Water Assessment and Protection Program

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

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8/12/2021

Date of Submission (mm/dd/yyyy):

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## SOURCE WATER PROGRAM ACRONYMS

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

## 1.0 PURPOSE

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

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

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

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



## 2.0 BACKGROUND: WV SOURCE WATER ASSESSMENT AND PROTECTION PROGRAM

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

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

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

## 3.0 STATE REGULATORY REQUIREMENTS

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

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

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

## 4.0 SYSTEM INFORMATION

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

**Table 1. Population Served by PAW PAW WATER WORKS**

Administrative office location:		122 Winchester Street, Paw Paw, MORGAN, WV, 25434	
Is the system a public utility, according to the Public Service Commission rule?		Yes	
Date of Most Recent Source Water Assessment Report:		7/1/2004	
Date of Most Recent Source Water Protection Plan:		7/1/2019	
Population served directly:		488	
Bulk Water Purchaser Systems:	System Name	PWSID Number	Population
Total Population Served by the Utility:		488	
Does utility have multiple Source Water Protection Areas(SWPAs)?		No	
How many SWPAs does the utility have?		1	

## 5.0 WATER TREATMENT AND STORAGE

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

**Table 2. Paw Paw Water Works Water Treatment Information**

Default Facility	
Water treatment processes (in order of occurrence) includes:	Raw Water Intake, Chemical Addition of DeIPac and Potassium Permanganate, Mixing Tank, Coagulation, Sand Filtration, Chlorination Holding Basin, Clear Well
The treatment capacity is approximately (GPD):	317,000
Current average production is approximately (GPD):	73,500
Maximum gallons of water treated and produced at that plant in one day during the past year was:	128,000
Minimum gallons of water treated and produced at that plant in one day during the past year was:	31,000
Plant is operated an average of hours a day:	5
Maximum number of hours of operation in one day at that plant during the past year was:	8
Minimum number of hours of operation in one day at that plant during the past year was:	2
How many storage tank(s) are maintained on systems distribution system:	2
Total gallons of treated water storage:	450,000
Total gallons of raw water storage (GALs):	0

**Table 3. Paw Paw Water Works Surface Water Sources**

Intake Name	Facility #	Local Name	Describe Intake	State Id Code	Date Constructed / Modified	Frequency of Use (Primary / Backup / Emergency)	Activity Status (Active/Inactive)
POTOMAC RIVER INTAKE	1942225	INTAKE #1	Screens into 50 LF of 8" ductile steel raw water line into wet well with pump	IN001	1/1/1982	Permanent	Active

**Table 4. Paw Paw Water Works Ground Water Sources**

Well/Spring Name	Facility #	Local Name	Date Constructed / Modified	Completion Report Available (Yes/No)	Well Depth (ft)	Casting Depth (ft)	Grout (Yes/No)	Frequency of Use (Primary / Backup / Emergency)	Activity Status (Active/Inactive)
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## 6.0 DELINEATIONS

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

The WSDA includes the entire watershed area upstream of the intake to the boundary of the State of West Virginia border, or a topographic boundary. The ZCC for a public surface water supply is a corridor along streams within the watershed that warrant more detailed scrutiny due to its proximity to the surface water intake and the intake's susceptibility to potential contaminants within that corridor. The ZCC is determined using a mathematical model that accounts for stream flows, gradient and area topography. The length of the ZCC is based on a five-hour time-of-travel of water in the streams to the water intake, plus an additional one-quarter mile below the water intake. The width of the zone of critical concern is 1,000 feet measured horizontally from each bank of the principal stream, and five hundred feet measured horizontally from each bank of the tributaries draining into the principal stream. Ohio River ZCC delineations are based on ORSANCO guidance and extend 25 miles above the intake. The Ohio River ZCC delineations include 1,320 feet (1/4 mile) measured from the bank of the main stem of the Ohio River and 500 feet on a tributary.

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

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

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

**Table 5. Watershed Delineation Information**

Intake Name	Potomac River
Size of WSDA (Square Miles)	3106
River Watershed Name (8-digit HUC)	Cacapon - 02070003
Size of Zone of Critical Concern (Acres)	18034
Size of Zone of Peripheral Concern (Acres) (Include ZCC area)	54930
Do you blend with ground water	No
Do you have an intake or well/spring missing from the list?	No



## 7.0 PROTECTION TEAM

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

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

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

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



**Table 6. Protection Team Member and Contact Information**

Name	Representing	Title	Phone Number	Email
Darlene Abe	Paw Paw Water Works	Mayor	(304)947-7476	darleneabe@townofpawpaw.com
Steven Bowers	Paw Paw Water Works	Chief Operator	(304)947-5548	bowersbackflow@gmail.com
Allen Marchun	Paw Paw Water Works		(304)725-9453	alan.f.marchun@wv.gov
	Paw Paw Water Works			
Bill Clark	Paw Paw Water Works	Director	(304)263-1743	bclark@region9wv.com
	Paw Paw Water Works			
Marc Yonker	Paw Paw Police Dept.	Chief of Police	(304)947-7476	police@townofpawpaw.com
<b>Date of First Protection Team Meeting:</b>				
Protection Team Meeting was held Wednesday, May 18, 2016 at Paw Paw Water Works. Meeting minutes attached in Appendix E.				
<b>Efforts made to inform and engage local stakeholders (public, local government, local emergency planners, local health department, and affected residents) and explain absence of recommended stakeholders</b>				
The protection team meeting was advertised to the public for two weeks in the Morgan Messenger leading up to the June 4, 2019 meeting.				

## 8.0 POTENTIAL SOURCES OF SIGNIFICANT CONTAMINATION

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

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

### 8.1. CONFIDENTIALITY OF PSSCS

A list of the PSSCs contained within the ZCC should be included in the source water protection plan. In the event of a chemical spill, release or other related emergency, information pertaining to the contaminant shall be immediately disseminated to any emergency responders reporting to the site. The designees for Paw Paw Water Works are identified in the communication planning section of the source water protection plan.

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

### 8.2. LOCAL AND REGIONAL PSSCS

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

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

drains, dry wells, or old dumps and mines.

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

**Table 7. Locally Identified potential Sources of Significant Contamination**

Please see Appendix A to view this information.

### 8.3. PRIORITIZATION OF THREATS AND MANAGEMENT STRATEGIES

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

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

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

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

## 9.0 IMPLEMENTATION PLAN FOR MANAGEMENT STRATEGIES

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

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

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

**Table 8. Priority PSSCs or Critical Areas**

PSSC or Critical Area	Priority Number	Reason for Concern
Zone of Critical Concern (critical area)	1	The ZCC warrants detailed scrutiny due to its proximity to the surface water intake and the intake's susceptibility to potential contaminants within that corridor. The Paw Paw ZCC has been determined using a mathematical model that accounts for stream flows, gradient, and area topography. The length of the ZCC is based on a five-hour time-of-travel of water in the streams to the intake. The width of the ZCC is 1,000 feet measured horizontally from each bank of the principal stream and 500 feet measured horizontally from each bank of the tributaries draining into the principal stream.
Railroad traffic	2	The railroad tracks run parallel to the source water, the Potomac River. An accident on the railroad or leaks from standing train cars may result in spills into the water supply.
Secondary source well acquisition	3	Currently, Paw Paw relies solely upon a single water intake. Without a secondary source, the provider may not be able to supply water to customers in the case of an upstream spill that requires the shutdown of the intakes.
Upstream water provider coordination	4	In 2015, a latex spill in Luke, Maryland upstream from the Paw Paw drinking water intake posed a risk to its source water. Paw Paw was not informed of the spill, or of the anticipated arrival time at their intake downstream of the spill on the Potomac River. Lack of communication with upstream providers could put the water system at risk in the case of a future contamination event.
Koppers	5	While the Koppers wood treatment facility is not currently operational, large quantities of potential contaminants still exist at the site.
Backup generators	6	All contaminants during emergency situations involving loss of power
Emergency planning and coordination	7	n/a
Flood Hazard	8	Any contaminant located in a flood prone area

Develop Emergency Responses Plan	9	All contaminants during emergency situations
Participation in statewide initiatives	10	All contaminants during emergency situations
Source water monitoring program	11	All contaminant sources, especially those release by new developments that the system may not yet be aware of
Septic tanks, and public and private sewer systems	12	Residential septic systems

**Table 9. Priority PSSC Management Strategies**

PSSC or Critical Area	Management Activity	Responsible Protection Team Member	Status / Schedule	Comments	Estimated Cost
Upstream water provider coordination	Upstream contaminants with all upstream providers to implement a communication plan that ensures Paw Paw ample time to respond to future water quality concerns from known spills. Paw Paw Water Works will communicate with upstream water providers—including those in Maryland as well as West Virginia—and provide	Paw Paw Water Works and protection team	Ongoing		Minimal



**Table 9. Priority PSSC Management Strategies**

PSSC or Critical Area	Management Activity	Responsible Protection Team Member	Status / Schedule	Comments	Estimated Cost
	them with emergency contact information for their system. The system will request that all communications should be in the form of a phone call to ensure messages are received immediately at all hours of the day.				
Emergency planning and coordination	Paw Paw Water Works will participate with local fire departments and County Emergency Services on a regular basis. This will ensure that all the agencies are in constant communication with one another and prepared in the event of an emergency.	Town of Paw Paw SWPT, Jim Cummings of the Police Dept.	Ongoing		None
Source water monitoring program	The Public Water System (PWS) may examine the need to develop a source water monitoring program if identified management strategies are not implemented, pumping rates change, or significant changes in land use occurs in the SWPA.	Town of Paw Paw	Ongoing		Significant
Secondary source well acquisition	Paw Paw Water Works should make all efforts to acquire a sufficient secondary source well.	Town of Paw Paw	Ongoing		Significant

**Table 9. Priority PSSC Management Strategies**

PSSC or Critical Area	Management Activity	Responsible Protection Team Member	Status / Schedule	Comments	Estimated Cost
Septic tanks, and public and private sewer systems	<p>Team with the county health department to identify areas in the SWPA where home owners may need to install septic systems or service existing systems.</p> <p>Team with the community to identify areas that would benefit from a cluster system or wastewater line extension to eliminate straight pipes or malfunctioning septic systems. It will also meet with local sewer system operators to review the system's standard operating and emergency procedures.</p>	Town of Paw Paw, and Morgan County Health Department	Ongoing		Significant

**Table 9. Priority PSSC Management Strategies**

PSSC or Critical Area	Management Activity	Responsible Protection Team Member	Status / Schedule	Comments	Estimated Cost
Koppers	<p>Wood Treatment Facility (non-active)</p> <p>Request information from Koppers and/or the WVDEP to ensure reclamation actions will adequately remove hazardous materials from the site and ensure that monitoring of any potential sources of contamination remaining on the site occurs. This would include requesting Tier II forms from Koppers in order to better understand the materials that are still stored on site in above ground storage tanks, as well as requesting copies of the Safety Data Sheets (SDS) for all materials used and stored at the site. The SDSs are information sheets provided by the manufacturer explaining first aid and how to manage spills of the chemical product.</p> <p>Review the groundwater protection plans for the site. These plans are required for industries that may impact groundwater and will contain measures that are also protective of the surface water.</p> <p>Coordinate with company emergency preparedness personnel to insure that they are</p>	Town of Paw Paw SWPT	Ongoing		Minimal

**Table 9. Priority PSSC Management Strategies**

PSSC or Critical Area	Management Activity	Responsible Protection Team Member	Status / Schedule	Comments	Estimated Cost
	aware of the water intake and what to do in case of an emergency, including notification so that the intake can be shut down to prevent contamination from being drawn into the treatment plant				
Participation in statewide initiatives	Statewide initiatives for emergency response, including source water related incidents, are being developed. These include the WWRWA and the WWRWA Emergency Response Team.	Town of Paw Paw	Ongoing		Minimal
Flood Hazard	Paw Paw Water Works will ensure that sufficient operational measures are taken to prevent introduction of contaminated surface water during flood periods. During a heavy precipitation event, floodwater, which can carry contaminants from chemicals to fecal matter with it, may impact the intake.	n/a	Ongoing		Flood Hazard
Backup generators	In the event of a power outage that affects the water treatment plant, Paw Paw Water Works will need another source of power. The system is in the process of seeking funding and investigating sources for backup power generation.	Paw Paw Water Works	Not Started		Significant cost of generators and maintenance.

**Table 9. Priority PSSC Management Strategies**

PSSC or Critical Area	Management Activity	Responsible Protection Team Member	Status / Schedule	Comments	Estimated Cost
Develop Emergency Reponses Plan	Paw Paw Water Works has developed a formal Emergency Response Plan. It will be kept up to date and followed. Information on creating and updating the ERP can be found here: <a href="http://www.nesc.wvu.edu/plan_ahead4.cfm">http://www.nesc.wvu.edu/plan_ahead4.cfm</a>	Town of Paw Paw	Ongoing		None
Zone of Critical Concern (critical area)	Contaminants transported through the ZCC via highways. Coordinate with emergency officials to be better prepared in the event of a hazardous spill, explore the possibility of erecting signs within the SWPA to alert motor carriers of the emergency number(s) to call should a spill occur within the SWPA and identify the types of materials commonly transported. This information will be used to inform and properly prepare emergency response personnel. Invite Morgan County Director of Highways to a meeting to discuss highway related strategies. Work with Region 9 on Hazard Mitigation Planning for Berkeley and Morgan Counties by sending a representative to meetings.	n/a	Ongoing		Minimal

**Table 9. Priority PSSC Management Strategies**

PSSC or Critical Area	Management Activity	Responsible Protection Team Member	Status / Schedule	Comments	Estimated Cost
<p>Zone of Critical Concern (critical area)</p>	<p>Facilities within ZCC                      Communicate with PCS and Facility Owners                      Establish communications with PCS and regulated facility owners, explain that they are operating within the SWPA, and emphasize regulatory Best Management Practices (BMPs).                      A letter template that can be used to initiate a conversation with the facilities is included in Appendix F.                      Guidance for follow-up with individual types of facilities:                      Contact campground personnel to identify and assist in keeping campsites and nearby water free of solid waste, waste water, and petroleum products associated with boats.                      Communicate with current junkyard and station owners the need for them to properly dispose of oil and other automobile products. Ask them to follow regulations, institute BMPs to contain and clean up spills, install and secondary containment around ASTs. Monitor compliance with state environmental regulations. Provide owners or operators with copies of material on underground storage tank maintenance.                      Consider whether operating or historic</p>	<p>Town of Paw Paw</p>	<p>Not Started</p>		<p>Minimal</p>

**Table 9. Priority PSSC Management Strategies**

PSSC or Critical Area	Management Activity	Responsible Protection Team Member	Status / Schedule	Comments	Estimated Cost
Railroad traffic	<p>gas stations and shops are compliant with rules regarding USTs and leaking underground storage tanks (LUSTs). If you suspect an issue with an UST or LUST, contact the W/DEP at (304) 926-0499 and ask for the Underground Storage Tank staff. Contact waste water sludge operations managers/owners to inform them of their operations within the SWPA/ZCC. Work with operators to institute plans for communication in the case of spills.</p> <p>Paw Paw Water Works will establish contact with the rail operator, CSX, to gain an understanding of the main items hauled on the rail. Paw Paw Water Works will contact the CSX HAZMAT Team and/or the Office of Emergency Services in Berkeley Springs to ensure a communications plan is in place to notify the water system should a spill take place. The system may work with the railroad company to create an emergency response plan should any contamination of the source water occur.</p>	Paw Paw Water Works, emergency responders	Ongoing		Minimal

## 10.0 EDUCATION AND OUTREACH STRATEGIES

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



**Table 10. Education and Outreach Implementation Plan**

Education and Outreach Strategy	Description of Activity	Responsible Protection Team Member	Status / Schedule	Comments	Estimated Cost
Education of maintenance staff	Ensure that operations personnel are aware of the vulnerability of the source and take precautions to identify contaminants and reduce potential impacts from contamination. Continue to communicate with maintenance staff the importance of preventing and cleaning up spills at the maintenance garage.	Town of Paw Paw	Ongoing		Minimal
Consumer Confidence Report	The water system publishes a Consumer Confidence Report (CCR) annually, as required by the Safe Drinking Water Act, which is sent to all water customers. Information concerning the source water assessment is included in the CCR. In the future, the system will include a reference to this Source Water Protection Plan and how customers can access a copy.	Town of Paw Paw	Ongoing	The following paragraph or similar paragraph will be included in the CCR: Paw Paw Water Works is committed to protecting its drinking water sources. The drinking water for Paw Paw is sourced from the Potomac River. We updated our Source Water Protection Plans (SWPPs) in 2016 based on the requirements of Senate Bill 373. The SWPP includes physical actions to protect the drinking water sources such as securing a secondary water source, and planning actions such as creating an Emergency Response Plan. It also includes an assessment of potential sources of contamination. The SWPPs were developed by the system in collaboration with a local source water protection team, and with the involvement of the public. Please contact Paw Paw Water Works or visit the Town of Paw Paw website to learn more about source water protection.	Minimal, as the CCR is required annually by Safe Drinking Water Act

**Table 10. Education and Outreach Implementation Plan**

Education and Outreach Strategy	Description of Activity	Responsible Protection Team Member	Status / Schedule	Comments	Estimated Cost
<p>Brochures, pamphlets, and letters</p>	<p>Post information about source water protection on the Town's website and consider sending a brochure or letter providing educational information to residences and businesses located within the ZCC. This information will alert the public of the need for source water protection and conservation. These informational letters and postings will include maps of the ZCC, information on pharmaceuticals and their proper disposal, and information for homeowners about regular septic system maintenance.</p>	<p>Town of Paw Paw</p>	<p>Ongoing</p>	<p>The links below provide educational materials that can be distributed.  <a href="http://water.epa.gov/infrastructure/drinkingwater/sourcewater/protection/citizeninvolvementinresourcewaterprotection.cfm">http://water.epa.gov/infrastructure/drinkingwater/sourcewater/protection/citizeninvolvementinresourcewaterprotection.cfm</a>  <a href="http://www2.epa.gov/sites/production/files/2014-06/documents/growthwater.pdf">http://www2.epa.gov/sites/production/files/2014-06/documents/growthwater.pdf</a>  <a href="http://www.nesc.wvu.edu/pdf/MW/publications/pipeline/PL_Su08.pdf">http://www.nesc.wvu.edu/pdf/MW/publications/pipeline/PL_Su08.pdf</a>  <a href="http://www.epa.gov/owm/septic/pubs/homeowner_guide_long.pdf">http://www.epa.gov/owm/septic/pubs/homeowner_guide_long.pdf</a></p>	<p>Moderate</p>
<p>Public meeting</p>	<p>The PWS may hold an informational meeting with local residents about source water protection efforts. The meeting will increase awareness of the connection between land use and drinking water quality. This meeting could be structured as a water fair or public event with drinking water displays and activities. This can be combined with activities of the local watershed associations. Town council will put informational meetings regarding source water protection on the meeting agenda once per calendar year.</p>	<p>Town of Paw Paw Water and Town Council</p>	<p>Ongoing</p>		<p>Minimal</p>

**Table 10. Education and Outreach Implementation Plan**

Education and Outreach Strategy	Description of Activity	Responsible Protection Team Member	Status / Schedule	Comments	Estimated Cost
<p>Agricultural land fact sheets</p>	<p>Post information about source water protection as it relates to agricultural operations on the Town of Paw Paw's website. They system will work with the County Extension Service, the Soil and Water Conservation District, and/or the Natural Resource Conservation Service to provide copies of fact sheets covering BMPs for nutrient management, pesticide use, pest management, waste oil disposal, safe chemical handling, and safe chemical storage. Consider working with the local Future Farmers of America members to distribute educational materials and BMP information. Work with the local livestock owners to determine the placement of animal waste disposal areas and areas for burying dead livestock.</p>	<p>Town of Paw Paw</p>	<p>Ongoing</p>	<p>Information can be found at the following web addresses:                      WVU Morgan County Extension:  <a href="http://morgan.ext.wvu.edu/">http://morgan.ext.wvu.edu/</a>                      West Virginia Conservation Agency:  <a href="http://www.wvca.us/">http://www.wvca.us/</a>                      National Resources Conservation Agency:  <a href="http://www.nrcs.usda.gov/wps/portal/nrcs/site/national/home/">http://www.nrcs.usda.gov/wps/portal/nrcs/site/national/home/</a>                      EPA brochure:  <a href="http://www.sourcewatercollaborative.org/downloads/AgFieldtoFaucet-BRV3f.pdf">http://www.sourcewatercollaborative.org/downloads/AgFieldtoFaucet-BRV3f.pdf</a>                      Example from Montana:  <a href="http://dnr.mo.gov/pubs/pub1338.pdf">http://dnr.mo.gov/pubs/pub1338.pdf</a></p>	<p>Minimal</p>

**Table 10. Education and Outreach Implementation Plan**

Education and Outreach Strategy	Description of Activity	Responsible Protection Team Member	Status / Schedule	Comments	Estimated Cost
School Curricula	<p>Provide the school system with information and resources to allow them to incorporate source water activities into the school curricula. One example of school curricula is Project WET.</p> <p>In addition, the US Environmental Protection Agency (USEPA) offers free educational materials for teachers and students, including classroom lessons, fact sheets, and interactive games and activities, for grades K-12. Visit schools or invite students for a plant tour to tie in with school curricula.</p> <p>The system may also ask the school to include messages in school newsletters to raise awareness about source water protection and conservation.</p>	Town of Paw Paw, in collaboration with the local school system	Ongoing	<p>For more information regarding free workshops to educate area teachers on Project WET, visit <a href="http://www.dep.wv.gov/WWE/getinvolved/WET/Pages/default.aspx">http://www.dep.wv.gov/WWE/getinvolved/WET/Pages/default.aspx</a>, or contact the WVDEP at (304) 926-0495.</p> <p>USEPA materials can be accessed at the following websites.</p> <p>For general source water protection: <a href="http://www.epa.gov/safewater/kids/index.html">http://www.epa.gov/safewater/kids/index.html</a></p> <p>For water conservation: <a href="http://www.epa.gov/watersense/resources/educational_materials.html">http://www.epa.gov/watersense/resources/educational_materials.html</a></p> <p>Similar protection and conservation related resources can be found at the Groundwater Foundation website: <a href="http://www.groundwater.org/kc/kc.html">http://www.groundwater.org/kc/kc.html</a></p>	Minimal
Plant tours	<p>The PWS will provide tours of the water plant to interested organizations such as watershed groups, schools, and civic organizations. Tours are offered as requested. The PWS may organize a tour with local emergency responders to make them familiar with the facilities in the event of an emergency.</p>	Town of Paw Paw	Ongoing		None

## 11.0 CONTINGENCY PLAN

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

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

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

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

### 11.1. RESPONSE NETWORKS AND COMMUNICATION

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



**Table 11. Paw Paw Water Works Water Shortage Response Capacity**

Can the water utility isolate or divert contamination from the intake and groundwater supply?	Yes
Describe the results of an examination and analysis of the public water system's ability to isolate or divert contaminated waters from its surface water intake or groundwater supply:	The utility can isolate the surface water intake by closing the intake and not allowing any further raw water to be obtained.
Describe the results of an examination and analysis of the public water system's existing ability to switch to an alternative water source or intake in the event of contamination of its primary water source:	N/A
Is the Utility able to close the water intake in the event of a spill?	Yes
How long can the Utility keep the intake closed?	The intake can remain closed until the treated water storage levels become low.
Describe the process to close the intake:	The surface water intake is closed and the raw water pump station is turned off.
Describe the treated water system's storage capacity of the water system:	The current treated water storage amount for the system consists of two (2) water storage tanks totaling 450,000 gallons of treated water. At the time of this report, the Paw Paw system was operating at 90% treated water storage capacity.
Gallons of storage capacity (raw water)	0
Gallons of storage capacity (treated water)	0
Is the Utility a member of WVRWA Emergency Response Team?:	Yes
Is the Utility a member of WV-WARN?:	Yes
List other agreements to provide receive assistance in case of emergency:	n/a

## 11.2. OPERATION DURING LOSS OF POWER

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

**Table 12. Generator Capacity**

Can you connect to a generator at the intake/wellhead?:	Yes
Please provide a scenario that best describes your system:	Generator is hardwired into the water plant and river pumps
What do you have (KW)?	125.00
What do you need (KW)?	
Can you connect to a generator at the treatment facility?:	Yes
Please provide a scenario that best describes your system:	Generator is hardwired into the water plant and river pumps

What do you have (KW)?	125.00
What do you need (KW)?	
Can you connect to a generator at the distribution system?:	No
Please provide a scenario that best describes your system:	
What do you have (KW)?	
What do you need (KW)?	
Does the utility have fuel on hand for generator?:	No
Hours:	
Gallons:	
Provide a list of suppliers and alternate suppliers that could provide fuel in the event of an emergency:	Supplier Phone Number
Does the utility test the generator(s) periodically?:	Yes
Does the utility routinely maintain the generator(s)?:	Yes
If the Utility does not have generator or the ability to connect to a generator, describe plans to respond to power outages:	The treatment plant and intake as a hardwired generator. At the current average usage level, the utility has approximately five (5) days of treated water storage that could flow by gravity through the distribution system. Water could be trucked in (courtesy of the WW BPH) and the Office of Environmental Health Services could also help the utility  The emergency generator capacity for the treatment facility is 60 kW.

### 11.3. FUTURE WATER SUPPLY NEEDS

When planning for potential emergencies and developing contingency plans, a utility needs to not only consider their current demands for treated water but also account for likely future needs. This could mean expanding current intake sources or developing new ones in the near future. This can be an expensive and time consuming process, and any water utility should take this into account when determining emergency preparedness. Paw Paw Water Works 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 Paw Paw Water Works**

Is the Utility able to meet water demands with the current capacity for the next five years?	Yes
Explain how you plan to do so:	

### 11.4. WATER LOSS CALCULATION

In any public water system there is a certain percentage of the total treated water that does not reach the customer. Some of this water is used in treatment plant processes such as back washing filters or flushing piping, but there is usually at least a small percentage that goes unaccounted for. To measure and report on this unaccounted for water, a public utility must use the method described in the Public Service Commission’s rule, Rules for the

Government of Water Utilities, 150CSR7, section 5.6. The rule defines unaccounted for water as the volume of water introduced into the distribution system less all metered usage and all known non-metered usage which can be estimated with reasonable accuracy.

To further clarify, metered usages are most often those that are distributed to customers. Non-metered usages that are being estimated include usage by fire departments for fires or training, un-metered bulk sells, flushing to maintain the distribution system, and water used for backwashing filters and cleaning settling basins. By totaling the known metered and non-metered uses the utility calculates unaccounted for water. Note: To complete annual reports submitted to the PSC, utilities typically account for known water main breaks by estimating the amount of water lost. However, for the purposes of the source water protection plan, any water lost due to leaks, even if the system is aware of how much water is lost at a main break, is not considered a use. Water lost through leaks and main breaks cannot be controlled during a water shortages or other emergencies and should be included in the calculation of percentage of water loss for purposes of the source water protection plan. The data in Table 13 is taken from the most recently submitted Paw Paw Water Works PSC Annual Report.

**Table 14. Water Loss Information**

Water pumped - Total Gallons:		11,023,000
*Water purchased - Total Gallons:		0
Total gallons of water pumped and purchased:		11,023,000
Total gallons of water loss accounted for except main leaks:	Mains, plaint, filters, flushing, etc - Total Gallons:	257,000
	Fire department - Total Gallons:	0
	Back washing - Total Gallons:	650,000
	Blowing settling basins - Total Gallons:	410,000
Total Accounted for Water Loss		1,317,000
Unaccounted for lost water - Total Gallons:		1,647,000
Water sold - Gallons:		7,708,000
Water Lost From Main Leaks:		351,000
Total Gallons of Unaccounted for Lost Water and Water Lost from Main Leaks:		1,998,000
Total percent unaccounted for water		18
Describe the measures to correct water loss greater than 15%:	The utility is fixing leaks when they are found.	

### 11.5. EARLY WARNING MONITORING SYSTEM

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



monitoring system, the utility should consider the logistics of placing and maintaining the equipment, and receiving output data from the equipment.

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

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

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

**Table 15. Early Warning Monitoring System Capabilities**

Does your system currently receive spill notifications from a state agency, neighboring water system, local emergency responders, or other facilities?	Yes	
From whom do you receive notices?	The utility receives spill notifications from the WV Health Department and CSX..	
Are you aware of any facilities, land uses, or critical areas within your protection areas where chemical contaminants could be released or spilled?	Yes	
Are you prepared to detect potential contaminants if notified of a spill?	No	
List laboratories (and contact information) on whom you would rely to analyze water samples in case of a reported spill.	Laboratories	
	Name	Phone Number
	REI Consultants	(304)255-2500
	WV Office of Lab Services	(304)558-3530
Do you have an understanding of baseline or normal conditions for your source water quality that accounts for seasonal fluctuations?	Yes	
Does your utility (aside from turbidity monitoring) currently monitor your raw water through continuous monitoring at the surface water intake or groundwater source to detect changes in water quality that could indicate contamination?	Yes	

Does your utility collect periodic grab samples (ex. possess reserved sample bottles, on-call laboratory services, and trained personnel) in response to a spill notification or to investigate changes in water quality that could indicate contamination?		No
Please explain:		
Provide or estimate the capital and O&M costs for your current or proposed early warning system or upgraded system.	Capital Cost:	50,000
	O&M Cost:	750
Do you serve more than 100,000 customers?		No
Does your system currently receive spill notifications from a state agency, neighboring water system, local emergency responders, or other facilities?		Yes
Are you prepared to detect potential contaminants if notified of a spill?		No
Please describe the methods you use to monitor at the same technical levels utilized by ORSANCO:		

## 12.0 SINGLE SOURCE FEASIBILITY STUDY

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

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

## 13.0 COMMUNICATION PLAN

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

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

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

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

## 14.0 EMERGENCY RESPONSE

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

## 15.0 CONCLUSION

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

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

## APPENDIX A. FIGURES AND TABLES

## Water Source / Delineation

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### Surface Water Sources

Intake: Potomac River



Map of watershed delineation area

Paw Paw Water Works

Source Water Protection Plan

Map of watershed delineation area

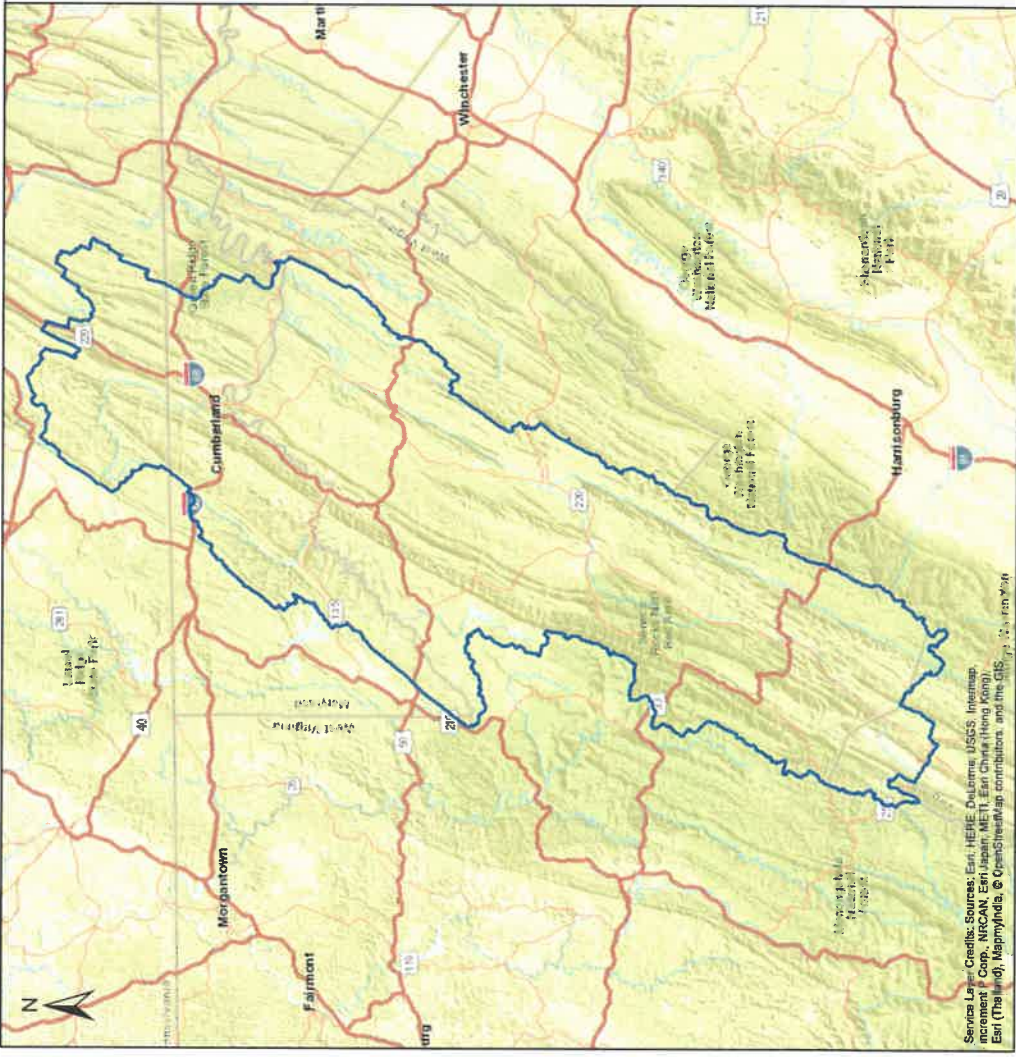
**Paw Paw  
Water Works**

**Water System  
Watershed Delineation**

**Paw Paw Watershed**

Note: The inset map below shows the watershed for the Paw Paw Water Works in a regional context.

0 5 10 20 Miles



Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (The Land), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Map of zone of critical Concerns




Paw Paw Water Works

Source Water Protection Plan

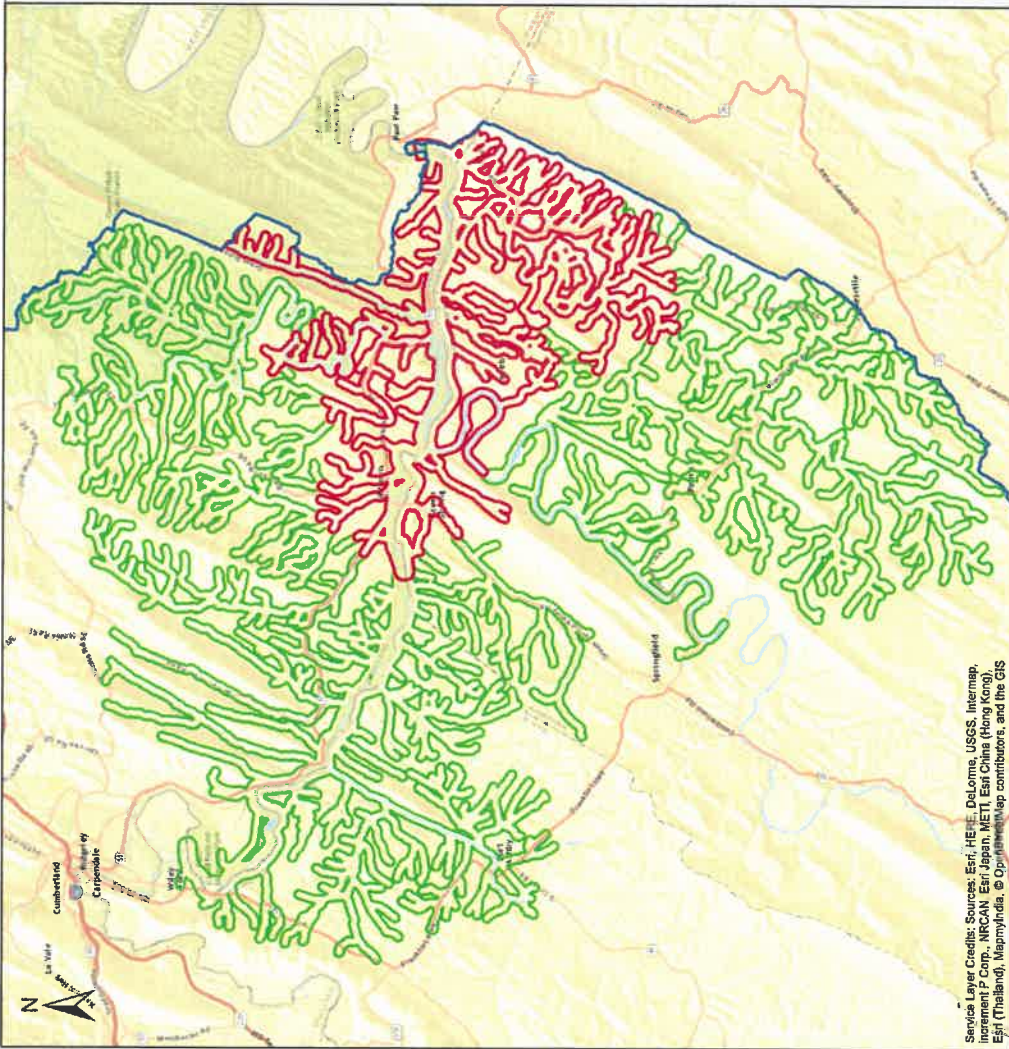
Map of zone of critical Concerns

**Paw Paw Water Works**

**Zones of Concern and Watershed**

-  Paw Paw ZCC
-  Paw Paw ZPC
-  Paw Paw Watershed

Note: The inset map below shows the watershed for the Paw Paw Water Works, and the extent of the ZPC.



Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri, Japan, METI, Esri China (Hong Kong), Swisstopo, Mapbox, © OpenStreetMap contributors, and the GIS User Community

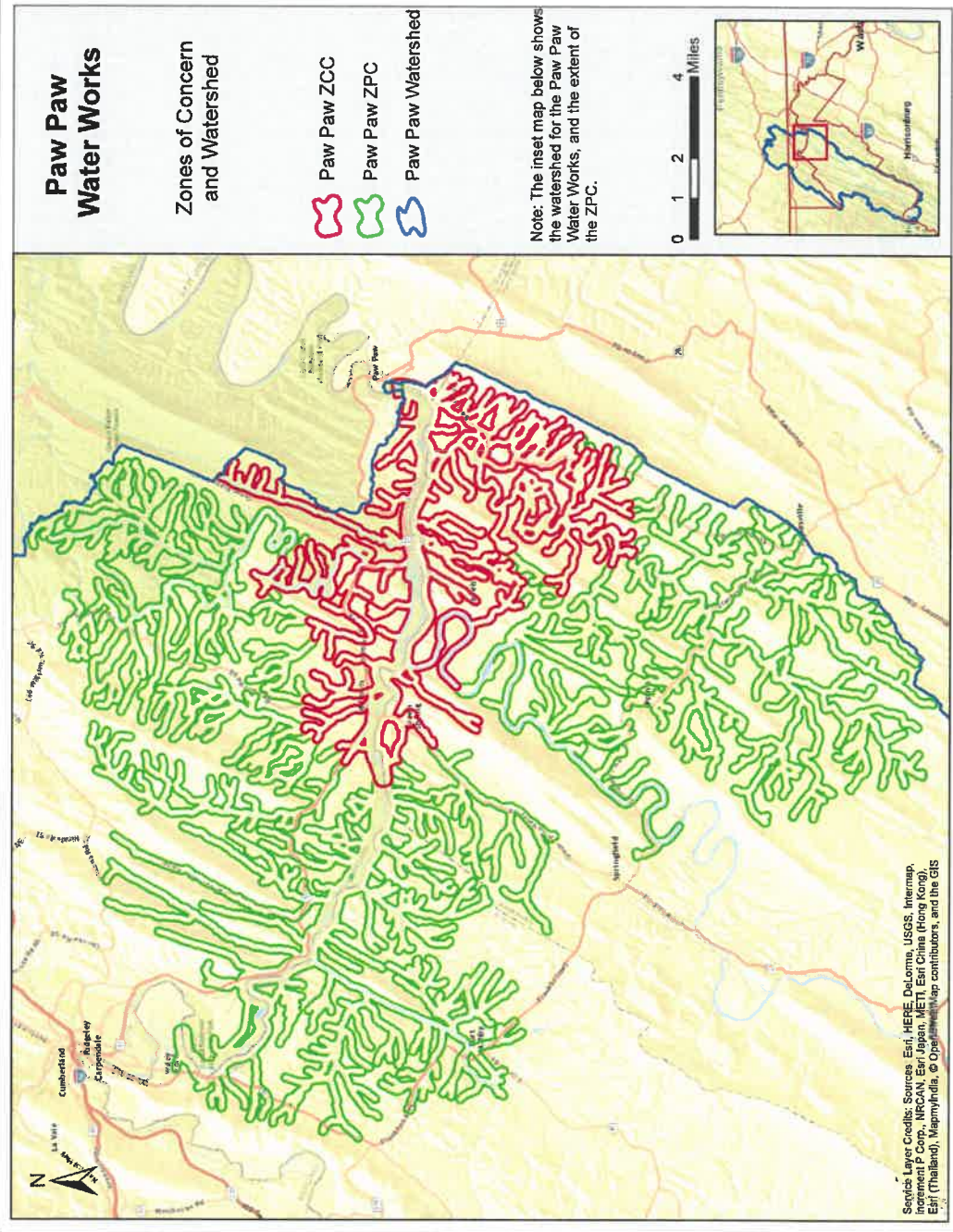


Map of zone of peripheral Concerns

Paw Paw Water Works

Source Water Protection Plan

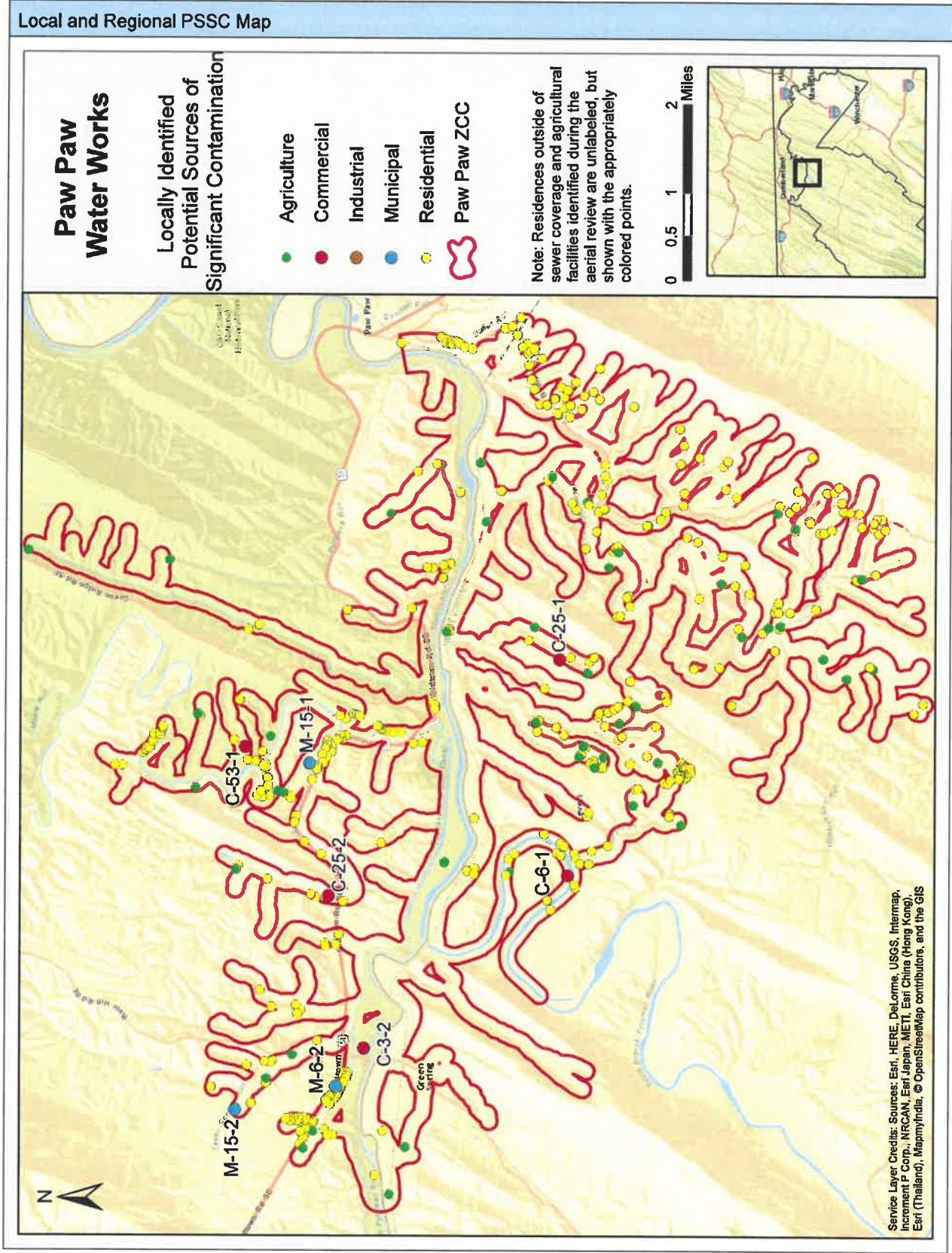
Map of zone of peripheral Concerns



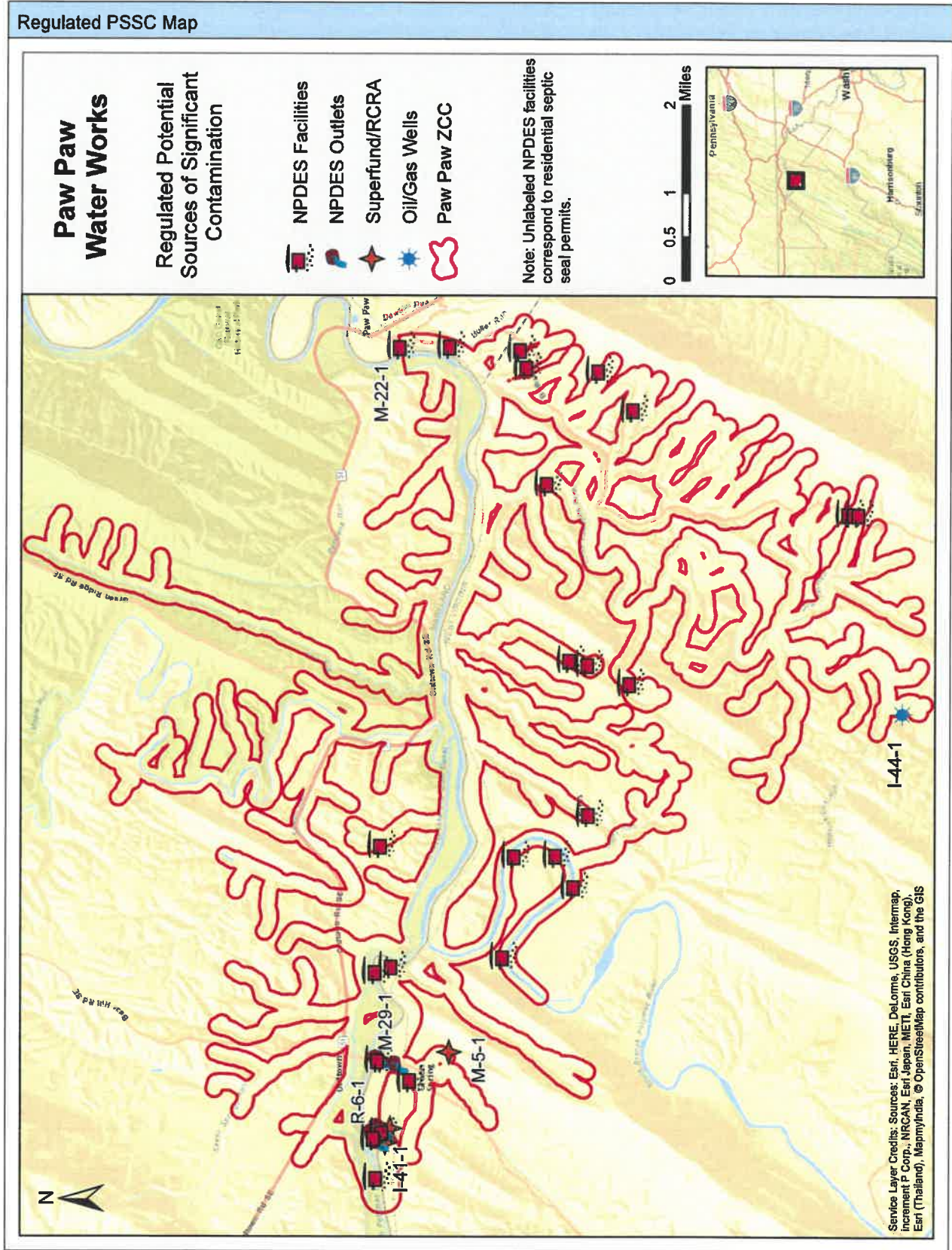
## PSSC Maps

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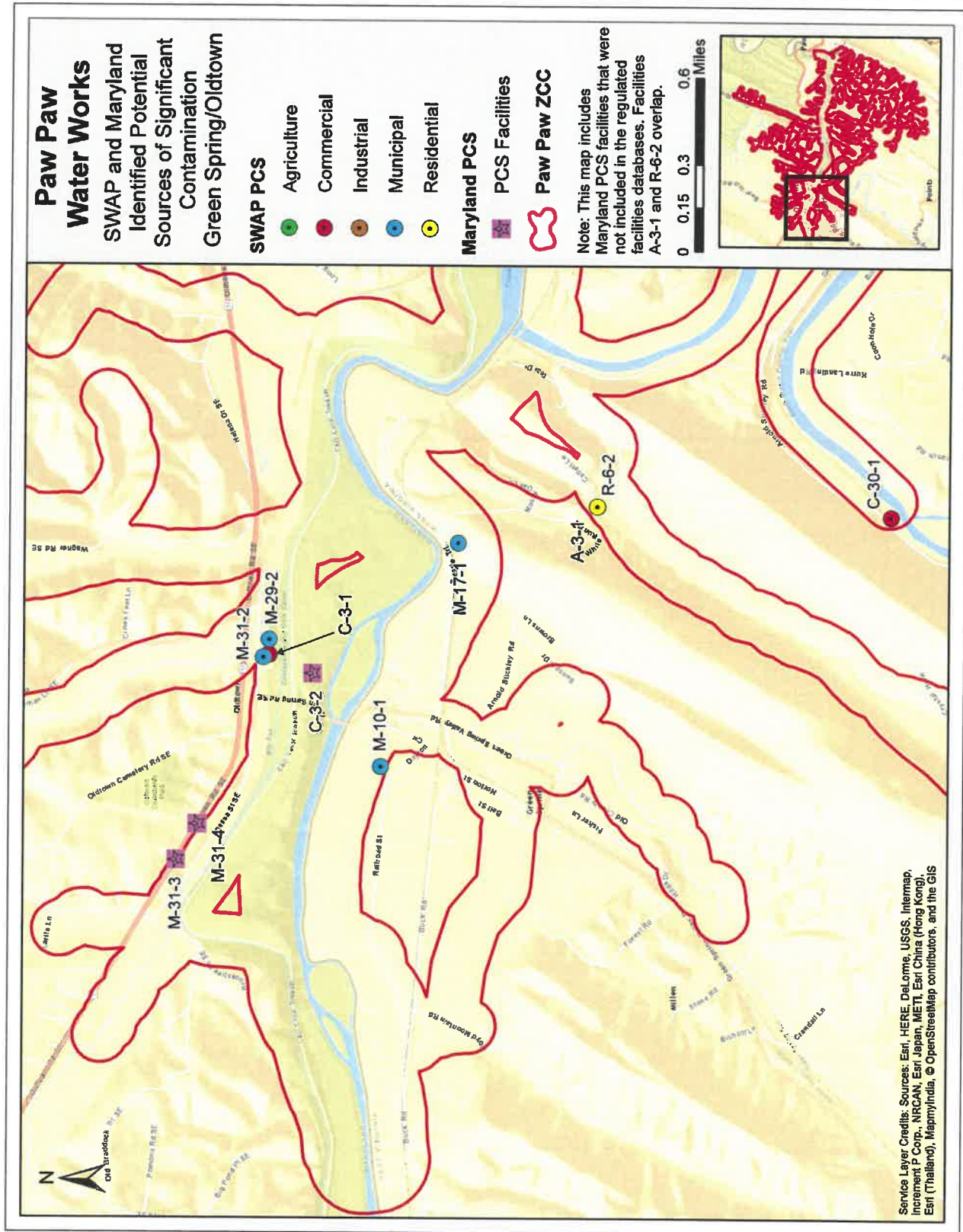


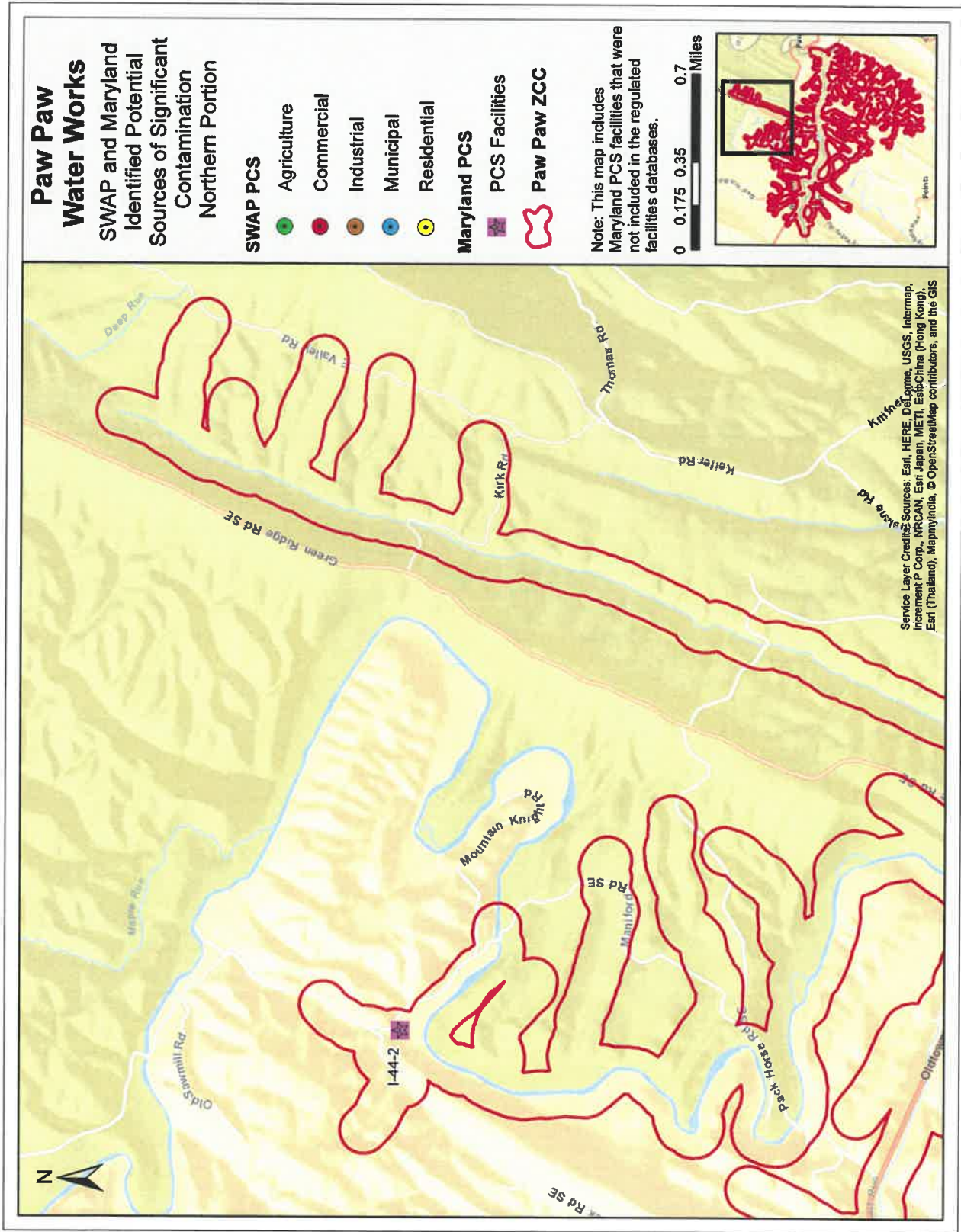




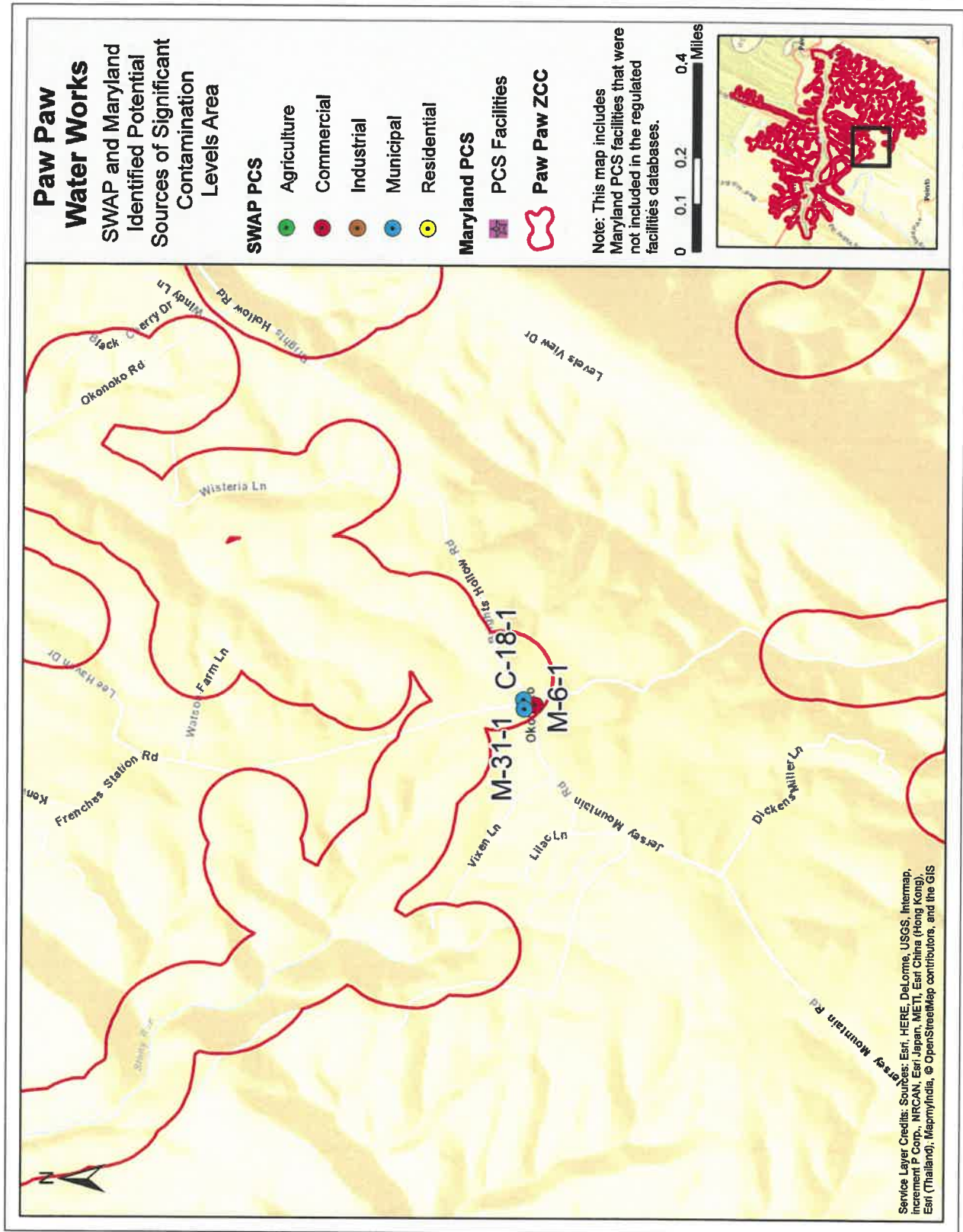












**PSSC Lists**

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Local and Regional PSSC List

List of Locally Identified PSSCs

Map Code	Site Name	Site Description	Comments	BPH Risk
C-53-1	Unknown commercial facility	Large warehouse-like building with large paved parking lot and equipment and supplies outside.		Unknown
C-25-1	Unnamed junkyard (a)	Junk yard, scrap and auto	Petroleum hydrocarbons, volatile organic compounds, synthetic organic compounds, metals, heavy metals	3.4
C-25-2	Unnamed junkyard (b)	Junk yard, scrap and auto	Petroleum hydrocarbons, volatile organic compounds, synthetic organic compounds, metals, heavy metals	3.4
C-3-2	Former Oldtown High School, now auto repair shop	Auto repair shops	Waste oils, solvents, acids, paints, automotive wastes, miscellaneous cutting oils	2.7
M-15-1	Cumberland Outdoor Club	Park lands. This is a privately owned club, but is maintained much like a park with a large pond and mowed areas adjacent to the pond, and also includes a shooting range.	Fertilizers, herbicides, insecticides. It is unlikely this facility would pose significant potential for contamination.	1.5
M-15-2	Unnamed park-like area	Park lands. Likely privately owned large pond with gazebo, dock, and large mowed area adjacent to the pond area.	Waste oils, solvents, acids, paints, automotive wastes, miscellaneous cutting oils	1.5.
M-6-2	Oldtown Volunteer Fire Department	Fire station	Petroleum hydrocarbons, volatile organic compounds. It is unlikely this facility would pose significant potential for contamination.	1.2
C-6-1	Unnamed campground	Campground	Septate, gasoline, diesel fuel from boats, pesticides, household hazardous wastes. It is unlikely this facility would pose significant potential for contamination.	1.6
Not labeled	Various agricultural sites	Includes small farms, fields, and pastures. 52 of these sites were identified.	Agricultural sites that were identified, but are unlikely to pose significant potential for contamination.	Variable
Not labeled	Residential septic systems	Residences located outside of the area served by public sewer service. 357 of these sites were identified.	Individually, these sites are unlikely to pose significant potential for contamination.	Variable

Regulated PSSC List

List of Regulated PSSCs

Map Code	Facility Name	Site Description	Permit ID	Database	BPH Risk
M-22-1	Alkire Septic Service	Sludge/septic land disposal (GP) Sewage	WVSG10052	NPDES	5.0
I-41-1	Koppers Inc. Green Spring Plant	Wood preserving/treatment facility (inactive)	WV0073482	NPDES Superfund RCRA	4.7
M-29-1	Green Spring Sewer Plant	Wastewater treatment plant	WV0105678	NPDES Superfund/ RCRA	4.0
Not Individually Labeled	N/A	22 distinct residential septic seal permits		NPDES	2.5
R-6-1	Koppers Inc.	5W32 – Septic system (drain field disposal method)	0203-99-027	NPDES	2.1
M-5-1	Green Spring Valley PSD Water	Drinking water treatment plant		Superfund/RCRA	1.5
I-44-1	Plugged oil/gas well	Plugged oil/gas well	2700019	Oil and Gas Wells	Unknown

Source Water Assessment Program PSSCs

Map Code	Facility Name	Site Description	PSC Database	BPH Risk
M-17-1	CSX Railroad	Railroad tracks along Potomac River within ZCC	SWAP PCS	4.9
A-3-1	N/A	Small confined animal feeding operation	SWAP PCS	4.9
M-29-2	Oldtown Wastewater Treatment Plant	Wastewater treatment plant	Maryland PCS SWAP PCS	4.0
C-18-1	N/A	Non-active country store and gas station with pumps present, currently for sale.	SWAP PCS	2.9
C-3-1	Unknown	Auto repair shop	SWAP PCS	2.7
R-6-2	N/A	Private residence on septic (leach field)	SWAP PCS	2.1
M-6-1	Levels Volunteer Fire Department	Fire station	SWAP PCS	1.2
C-30-1	N/A	Boat ramp	SWAP PCS	1.0
M-10-1	N/A	Illegal dump (no longer present)	SWAP PCS	6.4
M-31-1	N/A	Water supply well next to Levels Volunteer Fire Department	SWAP PCS	Unknown
M-31-2	PCS #6	Water supply well	SWAP PCS	Unknown
M-31-3	N/A	Water supply well at Oldtown VFW Post No. 9451	Maryland PCS	Unknown
M-31-4	N/A	Water supply well at Oldtown Volunteer Fire Department	Maryland PCS	Unknown
I-44-2	Verizon Maryland	Unknown	Maryland PCS	Unknown

## APPENDIX B. EARLY WARNING MONITORING SYSTEM FORMS

### Select and Attach the Appropriate Form for Your System

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

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

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

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

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

**Appendix B - Form A**  
Surface Monitoring Worksheet

Describe the type of early warning detection equipment installed:
Sensors in a 55 gal drum that raw water runs through to detect water quality
Describe the mechanism to store the data and an institutional framework to analyze and interpret the data:
Information is sent to a website that notifies us to water quality changes
Describe the process to determine the credibility of a contamination event if a change is detected in the quality of source water:
Shut down the plant. Do a visual check of the raw water in the 55 gal drum to see if there is a visible sheen on the water. Water samples would be collected and taken to a local lab for testing



## APPENDIX C. COMMUNICATION PLAN TEMPLATE

**Paw Paw Water Works**

PWSID: WV3303308

Authorizing Signature: Tina Meyers

Contact Phone Number: (304)947-7476

Contact Email Address: all@townofpawpaw.com

Plan Developed On: August 2021

### **ACKNOWLEDGMENTS:**

This plan was developed by [insert name, title of person completing plan, and who they work for] to meet certain requirements of the Source Water and Assessment Protection Program (SWAPP) and the Wellhead Protection Program (WHPP) for the State of West Virginia, as directed by the federal Safe Drinking Water Act (SDWA) and state laws and regulations.



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## INTRODUCTION

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

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

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## TIERS REPORTING SYSTEM

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

**C = Cannot 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 = Do 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 = Emergency.** Water cannot be used for any reason.

Tier	Tier Category	Risk Level	Tier Summary
A	Announcement	Low	The water system is issuing an announcement to the public and public agencies about an incident or event that could pose a threat to public health and safety. Additional information will be provided as it becomes available.
B	Boil Water Advisory	Moderate	Water system users are advised to boil any water to be used for drinking or cooking, due to possible microbial contamination. The system operator will notify users when the boil water advisory is lifted.
C	Cannot Drink	High	System users should not drink or cook with the water until further notice. The water can still be used for showering, bathing, cleaning, and other tasks.
D	Do Not Use	Very High	The water should only be used for flushing commodes and fire protection until further notice. More information on this notice will be provided as soon as it is available.
E	Emergency	Extremely High	The water should not be used for any purpose until further notice. More information on this notice will be provided as soon as it is available.

## COMMUNICATION TEAM

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

Water system communication team members, organizations, and roles.

Team Member Name	Organization	Phone	Email
Tina Meyers	Paw Paw Water Works	(304)947-7476	all@townofpawpaw.com
Steven Bowers	Paw Paw Water Works	(304)947-5548	bowersbackflow@gmail.com

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

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

## COMMUNICATION TEAM DUTIES

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

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

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

- Be knowledgeable on elements of the Source Water Protection Plan and Communication Plan
- Attend team meetings to ensure up-to-date knowledge of the system and its functions
- Participate in periodic exercises that “game out” incident response and communication tasks
- Help to educate local officials, the media, and others on source water protection
- Cooperate with water supplier efforts to coordinate incident response communication
- Be prepared to respond to requests for field investigations of reported incidents
- Not speak on behalf of the water supplier unless designated as the system’s spokesperson

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

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

## INCIDENT / EVENT COMMUNICATION PROCEDURE

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

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

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

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

As the flow chart indicates, several iterative cycles will occur after the initial threat assessment, including communication with local agencies and the public, further investigation of the incident, possible implementation of

the water system's contingency plan, and eventual elimination of the threat and a return to normal operations.

Communication activities during this period will include:

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

If time permits and the need arises, after the threat level is reduced, and operations return to normal, the water system staff, the communication and source water protection teams, and their partners may conduct a post-event review and assessment. The purpose of the review is to examine the response to the incident, relevant communication activities, and overall outcomes. Plans and procedures may be updated, altered, or adapted based on lessons learned through this process.

## EMERGENCY SHORT FORMS

### Emergency Communication Information

	<b>Name</b>	<b>Phone</b>	<b>Email</b>	
<b>Designated spokesperson:</b>	Tina Meyers	(304)947-7476	all@townofpawpaw.com	
<b>Alternate spokesperson:</b>	Steven Bowers	(304)947-5548	bowersbackflow@gmail.com	
<b>Designated location to disseminate information to media:</b>	Town of Paw Paw City Hall 122 Winchester St			
<b>Method of Contact:</b>	word of mouth newspaper posted notices radio			
<b>Media Contacts:</b>	<b>Name</b>	<b>Title</b>	<b>Phone Number</b>	<b>Email</b>
	Kate Shunney	Editor	(304)258-1800	editor@morganmessenger.com
Hugh Breslin	General Manager	(301)797-440_	news@whag.com	Stacy Drake

**Emergency Service Contacts**

	Name	Emergency Phone	Alternative Phone	Email
Police	Paw Paw Police Dept.	(911)____-____	(304)947-7476	
Fire	Paw Paw Volunteer Fire & Rescue	(911)____-____	(304)947-7644	
Ambulance	Paw Paw Volunteer Fire & Rescue	(911)____-____	(304)947-7644	
Hazmat	Paw Paw Volunteer Fire & Rescue	(911)____-____	(304)947-7644	
Other				
Other				
Other				

**Sensitive Populations**

Other Communities that are served by the Utility:	None				
Major User/Sensitive Population Notification	Name	Emergency Phone	Alternative Phone	Email	
	Mountaineer Community Health Center	(304)947-5500			
	Paw Paw Elementary School	(304)304-7425			
	Paw Paw High School	(304)947-7425			
EED District Office Contact	Name	Phone	Email		
	Alan Marchun	(304)725-9453	alan.f.marchun@wv.gov		
OEHS Readiness Coordinator	Lee Orr	(304)356-4290			
Downstream Water System Contacts	Water System Name	Contact Name	Emergency Phone	Alternate Phone	Email
	Berkeley County PSWD	Steve DeRidder	(304)274-5801	(304)876-2394	
	Berkeley County PSWD	Chris Thiel	(304)267-4600	(107)____-____	
Are you planning on implementing the TIER Communications plan?:			Yes		



**Emergency Service Key Staff Members**

	Name	Title	Phone	Email
Key Staff Responsible for Coordinating Emergency Response Rrocedures:	Steven Bowers	Chief Operaor	(304)947-5548	bowersbackflow@gmail.com
Staff Responsible for Keeping Confidential PSSC Information and Releasing to Emergency Responders.	Steven Bowers	Chief Operator	(304)947-5548	bowersbackflow@gmail.com

**Emergency Response Information**

List Laboratories available to perform sample analysis in case of emergency.	<b>Name</b>	<b>Phone</b>
	REI Consultants	(304)255-2500
	WV Office of Lab Services	(304)558-3530
Has utility developed a detailed Emergency Response Plan in accordance with the Public Health Security Bioterrorism preparedness and Response Plan Act of 2002 that covers the following areas?:	Yes	
When was the emergency response plan developed or last updated?:	2016	



## EMERGENCY CONTACT INFORMATION

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**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](http://www.wvdhhr.org/oehs)

Readiness Coordinator - Lee Orr

Phone: 304-356-4290

Cell: 304-550-5607

E-mail: [Lee.E.Orr@wv.gov](mailto:Lee.E.Orr@wv.gov)

Environmental Engineering Division Staff

Charleston, Central Office (304) 558-2981

Beckley, District 1 (304) 256-6666

St. Albans, District 2 (304) 722-0611

Kearneysville, District 4 (304) 725-9453

Wheeling, District 5 (304) 238-1145

Fairmont, District 6 (304) 368-2530

**National Response Center - Chemical, Oil, & Chemical/Biological Terrorism**

1-800-424-8802

**WV State Fire Marshal's Office**

1-800-233-3473

**West Virginia State Police**

1-304-746-2100

**WV Watch – Report Suspicious Activity**

1-866-989-2824

**DEP Distance Calculator**

<http://tagis.dep.wv.gov/pswcheck/>

## PRESS RELEASE ATTACHMENTS

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

**UTILITY ISSUED NOTICE – LEVEL A  
PUBLIC WATER SYSTEM ANNOUNCEMENT  
A WATER SYSTEM INVESTIGATION IS UNDERWAY**

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

The incident involves the following situation at this location:

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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.

**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 \_\_\_\_\_.

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 D  
"DO NOT USE" WATER NOTIFICATION  
A LEVEL D WATER ADVISORY IS IN EFFECT**

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

Entire Water System or  Other: \_\_\_\_\_  
\_\_\_\_\_

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

**What should I do?**

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

**What happened?**

- The problem is related to \_\_\_\_\_

**What is being done?**

- The water system is taking the following action: \_\_\_\_\_  
\_\_\_\_\_

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

- \_\_\_\_\_

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

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

This notice was distributed by \_\_\_\_\_

State Water System ID# \_\_\_\_\_ Date Distributed: \_\_\_\_\_

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

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

Entire Water System or  Other: \_\_\_\_\_  
\_\_\_\_\_

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

**What should I do?**

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

**What happened?**

- The problem is related to \_\_\_\_\_

**What is being done?**

- The water system is taking the following action: \_\_\_\_\_  
\_\_\_\_\_

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

- \_\_\_\_\_

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

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

This notice was distributed by \_\_\_\_\_

State Water System ID# \_\_\_\_\_ Date Distributed: \_\_\_\_\_

## APPENDIX D. SINGLE SOURCE FEASIBILITY

### Water Source Alternative:

Back up intake	
Name of Alternative:	No feasible back up
Brief Description of the Alternative:	No feasible back up
Feasible?:	No
Provide Cost Estimate:	\$0
Would this alternative supply 100% of your needs?:	No
Economic Criteria - Operation and Maintenance Costs:	0
Economic Criteria - Capital Cost:	0
Technical Criteria - Permitting:	0
Technical Criteria - Flexibility:	0
Technical Criteria - Resilience:	0
Technical Criteria - Institutional Requirements:	0
Environmental Criteria - Environmental Impacts:	0
Environmental Criteria - Aesthetic Impacts:	0
Environmental Criteria - Stakeholder Issues:	0
Final Score:	0.00%
Interconnection	
Name of Alternative:	No feasible interconnection
Brief Description of the Alternative:	No feasible interconnection
Feasible?:	No
Provide Cost Estimate:	\$0
Would this alternative supply 100% of your needs?:	No
Economic Criteria - Operation and Maintenance Costs:	0
Economic Criteria - Capital Cost:	0
Technical Criteria - Permitting:	0
Technical Criteria - Flexibility:	0
Technical Criteria - Resilience:	0
Technical Criteria - Institutional Requirements:	0
Environmental Criteria - Environmental Impacts:	0
Environmental Criteria - Aesthetic Impacts:	0
Environmental Criteria - Stakeholder Issues:	0
Final Score:	0.00%
Treated water storage	
Name of Alternative:	Treated water storage

Brief Description of the Alternative:	Treated water storage
Feasible?:	Yes
Provide Cost Estimate:	\$0
Would this alternative supply 100% of your needs?:	Yes
Economic Criteria - Operation and Maintenance Costs:	3
Economic Criteria - Capital Cost:	3
Technical Criteria - Permitting:	3
Technical Criteria - Flexibility:	3
Technical Criteria - Resilience:	2
Technical Criteria - Institutional Requirements:	3
Environmental Criteria - Environmental Impacts:	3
Environmental Criteria - Aesthetic Impacts:	3
Environmental Criteria - Stakeholder Issues:	3
Final Score:	96.00%
<b>Tank for Raw Water Storage</b>	
Name of Alternative:	Raw Water Storage
Brief Description of the Alternative:	Raw Water Storage
Feasible?:	Yes
Provide Cost Estimate:	\$564,125
Would this alternative supply 100% of your needs?:	No
Economic Criteria - Operation and Maintenance Costs:	3
Economic Criteria - Capital Cost:	2
Technical Criteria - Permitting:	3
Technical Criteria - Flexibility:	3
Technical Criteria - Resilience:	2
Technical Criteria - Institutional Requirements:	3
Environmental Criteria - Environmental Impacts:	3
Environmental Criteria - Aesthetic Impacts:	2
Environmental Criteria - Stakeholder Issues:	2
Final Score:	83.22%



## Feasibility Study Narrative

**SINGLE SOURCE FEASIBILITY STUDY**

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

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

Paw Paw evaluated the technical and economic feasibility of the following four (4) alternatives to provide continued safe and reliable public water service in the event the Potomac River is detrimentally affected by contamination, release, spill or other reason.

***Backup Intake***

Paw Paw currently uses the Potomac River intake as their primary source of surface water. Bullet Run, Dawson Run, and Dawson Run again after the convergence of the two (2) streams were considered as alternative sources of surface water supply for the system; however, it was determined none of these streams has adequate stream flow to provide the average pumping capacity of the Paw Paw treatment facility. The construction of a backup intake was not evaluated in the feasibility matrix.

***Interconnection***

Paw Paw is currently not interconnected with another utility. The Town of Bath Water Department (Berkeley Springs Water Works) system is located approximately 105,600 feet (20 miles) from the Paw

<sup>†</sup> A secondary water source would draw water supply from a substantially different location or water source.

Paw system. It was concluded the span of water line necessary to complete the interconnection would not be cost efficient. The construction of an interconnection was also not evaluated in the feasibility matrix.

#### ***Treated Water Storage***

Paw Paw currently maintains 450,000 gallons of treated water storage comprised of two (2) storage tanks. Senate Bill 373 requires that each utility maintain two (2) days of storage based on the maximum amount of water produced in a 24 hour period. Paw Paw's peak production experienced within the past year was 128,000 gallons, therefore 256,000 gallons of total water storage is required to comply with Senate Bill 373. Therefore, Paw Paw meets the minimum required water storage capacity. The use of existing treated water storage was analyzed in the feasibility matrix.

#### ***Raw Water Storage***

Paw Paw currently does not retain any raw water storage. As described above, Chester maintains 450,000 gallons of treated water storage capacity, satisfying the two (2) day storage requirement described in Senate Bill 373. The system meets the minimum required system storage capacity. The construction of raw water storage to alternatively satisfy the two (2) day storage requirement was evaluated in the feasibility matrix.

#### **Recommended Alternative**

Based on the evaluation of the water system, Paw Paw Water Works is in very good shape for a short period of time (less than one week) if an emergency or contamination event were to occur. As shown in the Feasibility Matrix in **Appendix D**, the most feasible option to continue water service in the event the Potomac River is contaminated or degraded by spill release or other reason is the use of existing treated water storage. Paw Paw currently maintains 3.51 days of treated water storage based on maximum production, complying with the two (2) day storage requirement described in Senate Bill 373.

If additional measures were required, raw water storage could be constructed; however, due to the amount of Paw Paw's existing water storage, the high cost constructing raw water storage would not be cost effective.

The recommendation that would allow the utility to be more prepared in the event of an emergency or contamination event would be as follows: the installation of an early warning monitoring system upstream of the surface water intake on the Potomac River as detailed in **Appendix B**. An early warning monitoring system shall allow the treatment facility to detect potential contaminants in the event a

contamination event was to occur. A cost estimate of the recommended alternatives is provided below. Further explanations of the costs are provided in **Appendix E**.

**Recommended Alternative Cost Estimate**

Description	Qty.	Unit Price	Total Cost
Early Warning Detection Equipment	1 LS	\$50,000.00	\$50,000.00
Operation & Maintenance for Early Warning System	1 LS	\$750.00	\$750.00
<b>TOTAL</b>			<b>\$50,750.00</b>

**COMMUNICATION PLAN**

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

Procedures should be in place for the kinds of catastrophic spills that can reasonably be predicted at the source location or within the SWPA. The chain-of-command, notification procedures and response actions should be known by all water system employees. The WVBPH has developed a recommended communication plan template that provides a tiered incident communication process to provide a universal system of alert levels to utilities and water system managers. The comprehensive Communication Plan for Paw Paw is attached as **Appendix C** for internal review and planning purposes only.

The West Virginia Department of Environmental Protection is capable of providing expertise and assistance related to prevention, containment, and clean-up of chemical spills. The West Virginia Department of Environmental Protection Emergency Response 24-hour Phone is 1-800-642-3074. The West Virginia Department of Environmental Protection also operates an upstream distance estimator that

**APPENDIX D. SINGLE SOURCE FEASIBILITY STUDY**

Paw Paw currently has sufficient water storage capacity to continue service in the event the primary water source becomes contaminated.

#### 1. Backup Intake

The Paw Paw Water Works surface water intake located on the Potomac River is currently the primary source of water supply. There are two sources of water supply located near the treatment facility – Bullet Run and Dawson Run. Bullet Run and Dawson Run combine approximately 4,550 feet upstream of where Dawson Run empties into the Potomac River.

Paw Paw produces an average of 73,500 GPD. As such the minimum required capacity for the treatment facility is 55 gallons per minute (gpm). Backup intake sites were considered on the individual streams and at a location after the convergence of Bullet Run into Dawson Run. The table below lists the stream flows for the two (2) streams.

**Stream Flow of Proposed Intake Sites**

Stream	Flow (cfs)	Flow (gpm)	Required Flow (gpm)
Bullet Run	.004	1.8	55
Dawson Run #1	.004	1.8	
Dawson Run #2 (Combined)	.012	5.39	

As can be seen above Bullet Run, Dawson Run, nor the combined streams could supply the average demand of the treatment facility. There are no other sources of water supply in close proximity large enough to supply sufficient capacity to the water treatment facility. Thus, the construction of a backup intake was not evaluated in the feasibility matrix. Maps of the proposed intake locations as well as correspondence with the WV DEP regarding stream discharge are included in **Appendix E**.

## 2. Interconnection

Paw Paw Water Works is not currently interconnected with another utility. The consideration of an alternative source of water could be determined using one other utility – the Berkeley Springs Water Works. The Berkeley Springs Water Works system is located approximately 105,600 feet (20 miles) from the Paw Paw Water Works system (see map in **Appendix E**).

Examining the Berkeley Springs Water Works system as an interconnection is not a feasible alternative for Paw Paw Water Works due to its significant distance from the end of their system. Paw Paw Water Works does not have another reasonable alternative source of water supply. Thus, this alternative will not be considered in the feasibility analysis.

## 3. Treated Water Storage

Paw Paw currently has 450,000 gallons of system water storage consisting of two (2) treated water storage tanks. According to the most recent monthly operating reports provided by the utility, the water treatment facility produces an average of 73,500 gallons per day and the maximum quantity produced by the treatment facility from October 2014 to September 2015 was 128,000 gallons, produced in a ten (10) hour period.

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

$$128,000 \text{ gallons per day} \times 2 \text{ days} = 256,000 \text{ gallons}$$

Therefore, the system currently meets the minimum required system water storage capacity. Paw Paw's days of water storage is calculated to be:

$$\frac{450,000 \text{ gallons}}{128,000 \text{ gallons per day}} = 3.51 \text{ days}$$

The use of existing treated water storage providing Paw Paw with approximately 3.51 days of water storage based on maximum production was analyzed in the feasibility matrix.



#### **4. Raw Water Storage**

Paw Paw does not maintain any raw water storage; however, as previously demonstrated Paw Paw's existing 450,000 gallons of treated water storage capacity complies with the requirements stated in Senate Bill 373. For additional protection, the utility could construct raw water storage to independently fulfill the requirements of the Senate Bill without regard to treated water storage.

The construction of a 297,000 gallon raw water storage tank to alternatively satisfy the required 256,000 gallons was evaluated in the feasibility analysis. A cost analysis is provided in **Appendix D**.

Matrix Document

Feasibility Matrix	Town of Paw Paw Water Works				PWSID#: WV 3303308				Dates: June 2016				Completed By: The Thresher Group, Inc.			
	Criteria	Options	Backup Needs	Feasibility	Interconnect	Feasibility	Treated Water Storage	Feasibility	Raw Water Storage	Feasibility	Other	Feasibility	Other			
Operational	What is the total current budget year cost to operate and maintain the PWSU (current budget year)?	\$63,947.00			\$63,947.00		\$63,947.00		\$63,947.00		\$63,947.00					
	Describe the major O&M cost requirements for the alternative?	N/A			N/A		No additional cost	3	545,947.00		545,947.00					
Capital Costs	What is the incremental cost (\$/gal) to operate and maintain the alternative?	50,000.00			50,000.00		-	3	50,000.00		-					
	Cost comparison of the incremental O&M cost to the current budgeted cost (%)	0.00%			0.00%		-	3	0.00%		-					
Describe the capital improvements required to implement the alternative.	What is the total capital cost for the alternative?	N/A			N/A		N/A		Construction of a new 207,000 gallons raw water storage tank.		N/A					
	What is the annualized cost for the alternative (including land and equipment costs, competing the line, etc. (\$/gal)?	\$0.00			\$0.00		\$0.00		\$646,125.00		\$0.00					
Capital Costs	Cost comparison of the alternative annualized capital cost to the current budgeted cost (%)	0.00%			0.00%		0.00%		0.00%		0.00%					
	Capital Cost Feasibility Score															
Permitting	Provide a listing of the expected permits required and the permitting agencies involved in their approval.	N/A			N/A		N/A		WV DEP, WV DNR, AOCES, WV SUPD, US FWS, Hancock County		2					
	What is the timeframe for permit approval for each permit?	N/A			N/A		N/A		WV DEP (30 days), WV DNR (30 days), AOCES (30 days), WV SUPD (30 days), US FWS (30 days), Hancock County (30 days)		2					
Feasibility	Describe the major requirements in obtaining the permits (environmental impact studies, public hearings, etc.)	N/A			N/A		N/A		Environmental Impact Studies		3					
	What is the likelihood of successfully obtaining the permits? Over the implementation of the alternative require regulatory requirements or variances?	Good				N/A		N/A		Good		3				
Feasibility	What is the likelihood of successfully obtaining the permits? Over the implementation of the alternative require regulatory requirements or variances?	N/A			N/A		N/A		No		3					
	Will the alternative be based on a regular basis or only used infrequently?	N/A			N/A		Intermittently		Intermittently		2					
Feasibility	How will implementing the alternative affect the PWSU's current method of treating and delivering water when existing meeting S&M drinking water production and distribution needs? (Consider the likelihood of distribution from outside)	N/A			N/A		No Impact		The alternative will add 207,000 gallons of raw water storage to the system, and will not have any other impacts.		3					
	Feasibility Feasibility Score															
Reliability	Will the alternative provide any advantages or disadvantages to meeting the current demand for drinking water?	N/A			N/A		No		Yes		3					
	How reliable will the alternative be during emergency conditions such as drought, flood, and flooding?	N/A			N/A		Drought may limit availability of water		Drought may limit the availability of water.		2					
Reliability	Will the alternative be appropriate to meet the growing needs of the community?	N/A			N/A		Yes		Yes		2					
	Reliability Feasibility Score															
Institutional Requirements	Identify any agreements or other legal instruments with governmental entities, private institutions or other PWSU required to implement the alternative.	N/A			N/A		N/A		None		3					
	Are any institutional requirements in place that may act as a barrier to the implementation of the alternative?	N/A			N/A		N/A		No		3					
Institutional Requirements	Identify potential land acquisition and easements requirements.	N/A			N/A		N/A		Property acquisition available		2					
	Institutional Requirements Feasibility Score								Available for the tank.		2					
Environmental Impacts	Identify any environmentally protected areas or habitats that might be impacted by the alternative.	N/A			N/A		N/A		None are known.		3					
	Environmental Impacts Feasibility Score								Construction would cause temporary noise, dust, and some visual impact. The construction would need to be in compliance with all applicable laws.		2					
Aesthetic Impacts	Identify any visual or noise issues associated with the alternative that may be addressed by the alternative?	N/A			N/A		N/A		Construction would cause temporary noise, dust, and some visual impact. The construction would need to be in compliance with all applicable laws.		2					
	Aesthetic Impacts Feasibility Score								Water customers and land owners. A rate increase may be required to implement construction and maintenance.		2					
Social/Policy Issues	Identify the potential issues with stakeholders for and against the alternative.	N/A			N/A		N/A		Water customers and land owners. A rate increase may be required to implement construction and maintenance.		2					
	Will stakeholder concerns represent a significant barrier to implementation of the alternative?	N/A			N/A		N/A		No		3					
Social/Policy Issues	Stakeholder Issues Feasibility Score								Utilize existing water storage to intermittently continue service during an emergency.		2					
	Comments	There are no known barriers that can supply adequate capacity for the treatment facility.														
Comments																
This alternative was not evaluated.																

PWSID#: WY 300308 Date: June 2018 Completed By: Project Engineer - The Thrasher Group, Inc.

Feasibility Matrix	Town of Paw Paw Water Works										Environmental Criteria					Total Capital Cost	Final Score	Comments
	Economic Criteria					Technical Criteria					Total	Weighted Total	Total %					
	Operation & Maintenance Costs	Capital Costs	Total	Total %	Weighted Total	Permitting	Flexibility	Resilience	Instrumental Requirements	Total				Total %	Weighted Total			
Backup Intake	-	-	0.6	0.0%	0.0%	-	-	-	0.0	0.0%	0.0%	-	-	0.0	0.0%	0.0%	-	There are no known streams that can supply adequate capacity for the treatment facility.
Inferconnect	-	-	0.0	0.0%	0.0%	-	-	-	0.0	0.0%	0.0%	-	-	0.0	0.0%	0.0%	-	There are no utilities in close proximity to the treatment facility that can supply adequate capacity.
Treated Water Storage	3.0	3.0	6.0	100.0%	40.0%	3.0	2.5	3.0	10.8	90.0%	56.0%	3.0	3.0	9.0	100.0%	20.0%	96.0%	Utilize existing water storage facilities to store water in emergency.
Raw Water Storage	2.7	2.3	5.0	83.3%	35.5%	2.6	2.5	2.3	10.1	84.2%	39.7%	3.0	2.0	7.3	61.1%	16.3%	83.3%	
Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	If alternative was not evaluated.

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

### **Matrix Explanation**

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

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

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

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

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## APPENDIX E. SUPPORTING DOCUMENTATION