

**Appendix 13:**  
**Sample Water and Waste**  
**Water System O&M Plans**

**Dewdrop Recreation Area**  
**Potable Water Supply System**  
**Operations and Maintenance Manual**  
**State Water System ID: PA6620361**

Located in  
Allegheny National Forest  
Warren County, Pennsylvania

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## Section 1.0 Description of System, Basic System Information

### A. General Description

The Dewdrop Recreation Area is located on Forest Road 262 (Longhouse National Scenic Byway) in Mead Township, Warren County, PA. This Recreation Area contains 74 campsites and is located within the Bradford Ranger District of the Allegheny National Forest. The campsite is located along the western shore of Kinzua Bay which extends southwest from the main body of the Allegheny Reservoir. Each campsite contains a picnic table, fire ring, and tent pad. The Recreation Area also contains a concrete boat launch with parking and an interpretive trail.

Drinking water for the recreation Area is supplied by a spring that is located uphill of Forest Road 262, approximate ½ mile above the campground. The Pennsylvania State Water System ID (PWSID) for the Dewdrop Recreation Area water system is PA6620361. This system serves the camping area and includes the following:

1. 1 fire hydrant
2. 13 water fountains
3. 17 flush toilets
4. 6 flush urinals
5. 8 showers
6. 16 sinks
7. 6 hose bibs (inside bathrooms)
8. 5 RV campsite hookups
9. 1 trailer dumping station
10. 1 washing machine
11. The wastewater treatment facility

A map of these facilities is located in Section 2.0 – System Site Plan.

This water system is classified as a Transient Non-Community Public Water System. It regularly serves more than 25 people per day, and it operates more than 60 days per year. It does not regularly serve more than 25 of the same people at least 180 days per year. The population served, as listed in the State water system database, is 582 persons. The normal operating season for this facility is from late May (Memorial Day) to early September (Labor Day). In the off season, the campground is closed and the water system is shut down and drained to prevent damage from freezing.

The Dewdrop Water System typically produces a minimum of 100 gpm or 144,000 gpd. There has never been a shortage of spring water. There are two overflows from the spring that discharge into a headwater channel below the spring. Raw water from the developed Spring Box flows into a 500 gallon covered manhole and then flows via a two inch galvanized steel pipe to a 26,000 gallon concrete finished water storage tank that is located just upgradient of campsite #60

in the Dewdrop campground. An eight inch overflow pipe leaves the spring box and daylights downgradient of the spring. A six inch overflow pipe leaves the collection manhole and also daylights downgradient. Each of the overflow pipes has a screen on the end of the pipe. A pressure reducing valve station is located on the 2" line between the source and the storage tank, just below the Forest Road 262 crossing. The control building for the water system is located on top of the concrete storage tank in a small block enclosure with an asphalt shingled roof. This water system is completely gravity fed and consists of over 7,000 feet of galvanized steel and PVC, and black plastic piping. The water is disinfected with a 12.5% sodium hypochlorite solution injected into the raw water, just prior to the raw water entering the finished water storage tank.

The Dewdrop Water System is composed of the following major components:

#### Water Collection and Storage System

- **Spring Box and Collection Manhole:** A 3' x 3' x 3' concrete box with an 8" overflow pipe and a 2 inch supply pipe which leads to a 500 gallon covered storage manhole with a 6" overflow pipe. A drain is located at the collection manhole. Raw water then flows by gravity into a 26,000 gallon water storage tank. A pressure reducing valve is located on this line. A drain is located at the pressure reducing valve.
- **Treatment and Control Building:** A cement block building that contains the electric panel box, pressure release valve, flow meter, and disinfection equipment is located on top of the storage tank.
- **26,000 Gallon Storage Tank:** This is a round, concrete, partially buried tank, which is a storage tank for treated water. It contains a float system that controls the water level in the tank. The storage tank has a drain at the bottom of the tank, and three overflow pipes near the top of the tank. Water leaves the storage tank and is distributed throughout the campground, as needed.

#### Water Distribution System

The water distribution system at the Dewdrop campground consists primarily of 2 inch black plastic pipe with associated valves. The distribution system includes one shower building, three toilet buildings, 13 drinking fountains/hose bibs, a fire hydrant near the shower building, a trailer dumping station, one washing machine in the shower building, five RV sites with water hookups, and the wastewater treatment plant.

<b>Water System – Basic Information</b>						
<i>Site and System Name</i>	Dew Drop Recreational Area					
<i>Region, Forest, District</i>	Eastern Region, Allegheny National Forest, Bradford District					
<i>Municipality, County, State</i>	Mead Township, Warren County, Pennsylvania					
<i>GPS Coordinates</i>	41.832799, -78.958268					
<b>Water Uses and Connections</b>						
<i>Site Type</i>	Campground, Interpretive Trail, Children's Play Area, Boat Launch					
<i>Number of Sites</i>	74					
<i>Use Period - Campground</i>	May 24 - September 7					
<b>Water System Source Type</b>	<b>Status</b>	<b>INFRA ID</b>	<b>FS Class</b>	<b>Service Connections</b>	<b>Year Constructed</b>	<b>Public Water System ID</b>
<i>Spring</i>	<i>Active</i>	82012	TNC	9	1969	6620361
<b>System Operators &amp; Contacts</b>						
<i>System Operator Name</i>						
<i>System Operator Phone #</i>						
<i>System Operator Certification #</i>						
<i>Backup Operator Name</i>						
<i>Backup Operator Phone #</i>						
<i>Backup Operator Certification #</i>						

## **B. Operator and Managerial Responsibility**

This manual is a working document and should be updated regularly to reflect physical and procedural changes to the water system. Also, this manual is to be used as a training tool for new employees and as a guide for qualified operators.

The operator of this water system is responsible for protecting the public health and safety of recreation area users by insuring that safe water is available throughout the operating season.

Specific responsibilities include:

- Ensure water meets all safe drinking water requirements
- Complete and document all required water quality testing
- Ensure equipment is operating properly and receives required maintenance
- Perform annual startup and shutdown tasks
- Inform appropriate Allegheny National Forest personnel of problems and/or potential problems
- Keep current on procedures and permit requirements
- Perform **DAILY** inspections of all parts of the system to insure all are safe, free of debris and potential contaminants, and in good working condition

The system operator should be knowledgeable in water quality requirements, testing procedures, maintenance and repair procedures, equipment operation, etc.

The system operator should know who to ask for help for various problems and issues that arise. Emergency and other contacts are provided in Section 12 of this Manual.

The system operator needs to consider personnel scheduling to ensure continuous system operation with adequate personnel available to complete seasonal work.

### **C. Manpower and Training**

The operator of this water supply system will need to be able to properly start up the system at the beginning of the season, routinely operate the system throughout the season, and properly shut down the system at the end of the season. The operator needs to have a thorough knowledge of the system layout and equipment, be mechanically inclined, be conscientious and work safely. The operator needs to keep current on state requirements for testing, operations, and reporting. The job may at times require strenuous work, heavy lifting, responding at odd hours, and being available on call to quickly to respond to problems.

### **D. Scheduling**

The system operator should consider employee(s) tour of duty, weekdays, weekends, holidays, vacation and sick leave, and other duties of personnel when planning and scheduling of operation and maintenance of this system.

This water supply system requires daily observation to ensure it is operating correctly. The system operator is responsible for maintaining a schedule of personnel to complete all necessary jobs in a timely manner each day the system is supplying water to public facilities.

### **E. Planning and Budget**

The system operator is responsible for typical operation and maintenance expenses. In addition to operator labor costs, other items may include chlorine, testing equipment, testing lab costs, equipment repairs, electrical and control repairs, etc.

Annual budget items for operating this system include:

- Chemicals: Chlorine
- Utilities: Electricity
- Personnel: Operator, Assistant Operator
- Misc. Supplies: Cleaning supplies, small tools, testing equipment and supplies

The system operator should inform the Forest Service permit administrator of any foreseeable MRRRI budget items for operating this system, (i.e. equipment replacement, control replacements, and/or building maintenance).

**F. Responsibilities of Key Personnel**

The system operator will provide names and responsibilities of staff responsible for managerial decisions, fiscal decision, operations, maintenance, ordering supplies, taking tests, sending test results to the state and Forest Service permit administrator, performing annual inspections, etc.

The “Current Operator and Backup Operator” form at the end of this section should be kept up to date. The facility operator will be responsible for completing and submitting the DEP Form 3800-FM-WSRF0090 – Available Operator Annual Report Form. (Blank form provided in Appendix A). If the operator changes at any time, an Available Operator Annual Report Form shall be completed and submitted to the DEP within 10 days of the change in operators.





## **Section 2.0 System Site Plan**

A Site Plan for the Dewdrop Recreation Area in the Alleghany National Forest is provided in Figure 1. The Site Plan shows the location of the water system within the Recreation Area, in relation to the existing buildings and facilities.

**Figure 1 – Site Plan for Dew Drop Recreation Area**

### **Section 3.0 System Component Schematic**

The following figures are schematics of the water system at Dewdrop Recreation Area. Construction drawings of the Dewdrop Water system are provided in the map pocket at the end of this section. Contract operators should use these drawings to locate valves, drains, and pipes. If components of the system are modified in any way, they should be indicated on the overall construction drawing site plan. As any valves and drains are found that are not on the existing construction drawings, they should be drawn onto the construction plans. At the end of each operating year and copy of the marked up site plan showing any additions, changes or deletions of water system components should be given to the Forest Service Engineer.

Figure 2 – Schematic of water system

## **Section 4.0 Normal Operation and Maintenance Procedures**

Normal operation procedures ensure that the water system functions properly. The future operation and maintenance schedule and procedures are outlined in this and the following sections.

### **Inspections and Surveys**

- The operator shall conduct a condition survey of the entire system every year. For seasonal systems, it is desirable to schedule condition surveys during both the startup and shutdown of the system. This allows time for equipment and materials to be purchased and installed prior to startup the following season. The Forest Service requires that the water system operator to conduct a condition survey in the spring before the water system opens. The system operator may wish to conduct a condition survey in the fall, but this is not required. More information on startup and shutdown procedures can be found in Section 5.0. Conditions surveys shall be inserted into Appendix B of this Operation and Maintenance Manual.
- The Forest Service Inspector will inspect the water supply system on a regular basis. All Inspection Reports and official correspondence shall be inserted into Appendix G
- The Pennsylvania Department of Environmental Protection (DEP) conducts Sanitary Surveys every 5 years on all public water systems. Copies of all Sanitary Surveys shall be inserted into Appendix B.
- Additional condition surveys may be needed to document changed conditions and to collect information on maintenance needs. Condition and sanitary survey records shall be retained in this manual from survey to survey for reference. They are the primary documents for planning, programming, and implementing necessary replacement, repair, and corrective action. All condition surveys should be sent to the Forest Service Engineer. A copy of the condition surveys and sanitary surveys should be inserted in the manual in Appendix B.

### **General Operation and Maintenance Procedures**

- Each area should be inspected daily to insure proper operation of equipment and to insure security is being met. This includes daily inspections of the control building, each of the three bathrooms, the shower building, and each of the water fountains/hose bibs.
- Check for leaks, running water, etc. and fix leaking and dripping faucets in all facilities on a timely basis.
- Maintain a supply of commonly needed maintenance and repair parts for all system components. Any parts and equipment repaired and/or replaced shall be of the same or better quality.
- Keep a log book of all maintenance tasks performed. At the end of the year, make sure that a copy of all maintenance logs are inserted into this Manual in Appendix F.
- Insure that updated manufacturer's literature is filed in this manual when components are replaced. Out-dated manufacturers' literature for equipment that is no longer in use should be discarded. Manufacturers Literature is provided in Appendix C.
- Maintain all distribution line rights-of-way to be free of downed trees and/or debris.



### **Spring Collection Area**

- Maintain the area inside the fencing so that no woody vegetation is allowed to grow.
- Ensure that the seals of the spring box and the storage manhole are tight and that no rainwater or runoff is allowed to enter the system.
- Maintain an area of at least 5 feet outside of the fenced area and ensure that no woody vegetation is allowed to grow.
- Check the spring area at season startup and after heavy rains, and repair any erosion that may allow surface water to enter the collection area, spring box, or collection manhole.
- The concrete spring collection box should be inspected on a routine basis for cracking, spalling and/or differential settlement. Any cracking, spalling and/or settlement can lead to water supply contamination, and should be evaluated and repaired if necessary. Perform this maintenance activity at the beginning and end of the operating season.
- Maintain the collection box and collection manhole overflow piping and sanitary screen. Make sure the screen is in place and has no holes.

### **Concrete Storage Tank**

- The ground around the storage tank should be sloped away from the tank to prevent surface water from collecting around the tank.
- The area around the storage tank should be kept clean and free of any potential contamination sources. The area should be mowed several times during the season to keep the area around the tank neat, to retard the establishment of woody vegetation, and to detect the presence of vectors.
- The inside of the 26,000 gallon storage tank should be pressure washed at the beginning of each operational season. Use all confined space entry precautions.
- The concrete storage tank should be inspected on a routine basis for cracking, spalling, and/or differential settlement. Any cracking, spalling and/or settlement can lead to water supply contamination, and should be evaluated and repaired if necessary.
- A sealant shall be applied to all exposed surfaces of the storage tank and maintained on a regular (annual) basis.
- Maintain the storage tank and its lid and vents to preserve sanitary conditions. The access hole should have a raised lip and the lid should be sealed to keep rainwater, insects, and animals out of the box. The lid should be securely locked. The lid of the storage tank should be inspected at the beginning and end of each season and any damage to seals and gaskets should be repaired or replaced immediately.
- Maintain the storage tank supply piping and associated valves. Exercise the valves annually.

### **Control Building**

- Maintain the chemical solution tanks, including replenishing chemicals, cleaning and maintaining the feed pumps and lines, and replacement of the diaphragms and seals.
- Adjust the controls as needed to provide quality finished water with fluctuating raw water conditions.

- Maintain the delivery pumps, controls, electrical system, and delivery piping.
- Make all required tests and reports
- Record flow and cycle meter data. Maintain flow meter in accordance with manufacturers recommendations.
- Insure that the building is clean, secure and in good repair.

### Water Supply Distribution System

- Maintain the valves, piping, vents, and connections. Inspect for leaks and repair as necessary.
- Air-vacuum valves ordinarily require no scheduled lubrication or maintenance. Periodically inspect them for leakage, tampering, freeze damage, or flooding.
- Locations of valves are shown on the water system construction drawings. Update the drawings as needed if valves are removed or added. Inspect and exercise all valves yearly to insure they can be found, have not been damaged, and will operate when needed during emergency shut-down periods or to isolate pipe sections to repair leaks. Keep a master plan of the distribution system (with and additions or deletions or modifications) and submit a marked up copy of the plan to the Forest Service Engineer at the end of each season. If no modifications have been made in any given year, this requirement is not necessary.
- Water valves are subject to corrosion, build-up of dirt and debris with the passage of time. This restricts water flow through the valve and greatly increases the torque required to open or close that valve. A proper valve maintenance program includes inspection of all of the valves in a water distribution system. The inspection not only includes observing the condition of each valve, but also turning the valve stem of each valve to a fully closed position and a fully open position. Keep a record of the ease with which a given valve stem turns and number of stem revolutions to open and close the valve. All system valves should be inspected annually and schedule the repair of malfunctioning valves.
- Flush water piping monthly to remove any accumulated sediments or other impurities which have been deposited in the pipes.
- Disinfect piping at the start of the season and after opening the piping system for maintenance or repairs.
- Inspect and maintain the water hydrants and building connections.
- Inspect vacuum breakers at all full hook-up sites and any other hose bibs.
- Be aware of any excavation activities that may break the waterlines.
- Flush dead ends to prevent stagnant water.
- When repairing a water line, water pressure is reduced, creating the opportunity for contamination. The following steps protect the campers during a repair:
  - Notify FS Permit Administrator of need to perform necessary repairs to water lines.
  - Notify affected campers of repair and shut down the water system.
  - Make repair.
  - Reestablish pressure after the repair.
  - Disinfect repaired line by adding high levels of chlorine. Operate valves to distribute chlorine throughout the system, and allowing time for chlorine to act.
  - Flush line to remove excess chlorine and debris.
  - Test water for fecal coliform to ensure safety.



**Bathrooms/Bathhouses**

- The Bathrooms and Bathhouse should be inspected on a routine basis to ensure that the sinks, toilets, and showers are functioning property and to identify any necessary repairs, leaks, cracks and/or clogging of the drains. Utility rooms in Bathrooms/Bathhouses should be kept clean and tidy and should not be used for storage.

**Water Fountains**

- Water Fountains should be inspected on a daily basis to ensure that the fountain and spigots are functioning properly and are not leaking. Fix leaks, as necessary. At the beginning of each season inspect each water fountain to identify any cracks in the mortar or concrete base, and/or clogging of the drains.

**Water Spigots**

- Water Spigots located within the Recreation Area should be inspected on a daily basis for leaking, rust and/or deterioration. All water spigots that have hose threads must have vacuum breakers installed on them at all times.

**Maintenance Schedule**

A schedule of monthly, seasonal, annual and as-needed maintenance is provided below.

<b>Inspection Area</b>	<b>Key Inspection Elements</b>	<b>Inspection Rate</b> (D – daily, W – weekly, M – monthly, SS – season start, SE – season end)
<i>General Operation and Maintenance</i>		
Security	Check systems for operation and security	D
Record Keeping	Updated logs, and manufacturer literature	SS, SE
Daily Monitoring	Record chemical usage, free residual chlorine, and flow	D
Housekeeping	Replacement parts and supplies, landscape maintenance	SS, SE
<i>Spring Collection Area</i>		
Landscape & Surrounding Area	Material storage, landscape repair	M and after heavy rains
Spring Collection Box	Structural evaluation (cracking, spalling, settlement)	SS, SE
Spring Collection Tank	Box and lid condition and seal, piping, and valves	SS

<b>Inspection Area</b>	<b>Key Inspection Elements</b>	<b>Inspection Rate</b> (D – daily, W – weekly, M – monthly, SS – season start, SE – season end)
<i>Concrete Storage Tank</i>		
Landscape & Surrounding Area	Material storage, landscape repair, ground slope	SS, SE and after heavy rains
Pressure Washing	Pressure wash exterior	SS
Storage Tanks	Structural evaluation (cracking, spalling, settlement)	SS, SE
Storage Tank Distribution	Box and lid condition and seal, piping, and valves	M
<i>Control Building</i>		
General Equipment Operation	Pumps, piping, and electrical controls for operation	D
Pumps	Noise/vibration, corrosion, leaks	W
Chemical Solution Tanks	Chemical levels, distribution lines, seals and diaphragms	Chemical levels Daily, Distribution lines, seals and diaphragms Monthly
Housekeeping	Security, sanitary concerns, health and safety concerns	D
Water Quality	Raw water vs finished water conditions	D
<i>Water Supply Distribution</i>		
General Equipment Operation	piping, valves, and vents for operation and leaks	D
Air-Vacuum Valves	Overall condition	SS, SE
Water Valves	Valve inspection and operation per maintenance program	SS
Water Piping	Flushing	M
Disinfection		SS, and after pipe opening for maintenance
Fire Suppression	Hydrant	SS
Water Lines	Hook-ups and bibs, dead ends	M
<i>Bathrooms/Bathhouses</i>		
Housekeeping	General operation and tidiness	D
<i>Water Fountains</i>		
Housekeeping	General operation and tidiness	D

## **Section 5.0 Seasonal Startup and Shutdown Procedures**

Due to the seasonal nature of many Forest Service systems, it is important that complete instructions for startup and shutdown be included in the manual. Procedures are described in a step-by-step format covering: Startup sequence, including flushing and disinfection & shutdown sequence, including draining, dismantling, locking and securing.

EPA's Revised Total Coliform Rule (RTCR) takes effect April 1, 2016. Seasonal water systems are required to create and follow start-up procedures approved by DEP. A Seasonal Water System is defined as a non-community water system that is not operated as a public water system (PWS) on a year-round basis and starts up and shuts down at the beginning and end of each operating season.

Every year, a seasonal water system must use their approved start-up procedure as a checklist as they start-up their system and submit a signed Seasonal Certification Form certifying that the system followed the approved start-up procedure. The DEP approved Seasonal Certification Form and the RTCR Seasonal Start-up Annual Certification Form to be used are attached.

A satisfactory bacteriologic sample shall be achieved prior to serving water to the public. The Total coliform sample(s) must be collected at the locations specified in the Site Sampling Plan (See Section 7.0). Samples should be collected 1-3 weeks prior to opening. Confirm with the laboratory that the set of samples was absent of coliform bacteria; if not, collect another set of samples.

Once satisfactory bacteriologic samples are confirmed, submit the RTCR Seasonal Start-up Annual Certification Form to the Forest Service. The Forest Service will forward the forms to the appropriate DEP office. Allow 3 days for the Forest Service to process the forms and forward to DEP.

During the non-use period, care shall be taken to close all openings into the system.

**Season Shutdown:**

1. Survey the system to identify maintenance items that can be corrected before the system is opened for the next season.
2. Shut gate valve at collection manhole.
3. Shut off electric and propane supply to the water heaters.
4. Open all surface drains.
5. Open drain on the 26,000 gallon storage tank.
6. After system is drained, disassemble all plumbing subject to freeze, in the shower building and the bathhouse.
7. Use wet vac to remove all trapped water from toilet tanks, toilet bowls, sinks traps and sloop flush valves. Some sink traps may need to be removed to thoroughly clean them.
8. After giving the system adequate time to drain and evaporate water (2 -3 weeks), apply Methanol or RV anti-freeze to all toilet and sink traps, flush valves, and floor drains.
9. Winterize the control building. Drain chlorine solution tank. Disconnect all plumbing/water lines. Disconnect flow meter and store in a warm area for the winter. Assure that heat remains on at minimal level.

## **Section 6.0 Common Problems and Solutions**

There are no common problems specific to this water system. Since this system is entirely gravity fed, it is not subject to problems associated with power outages. The distribution system is old, and leaks are a problem, especially near valves.

## **Section 7.0 Testing and Monitoring**

The water supply needs to be tested on a routine basis in accordance with Pennsylvania DEP requirements. Sampling, testing and monitoring procedures are outlined below.

### **Water Testing Analyzed by Operator**

The water system operator is responsible for testing the free residual chlorine (FRC) when performing the start-up and shut-down procedures. FRC testing shall be conducted using a digital colorimeter (LaMotte 1200 Colorimeter, or equal). On-site testing shall comply with EPA and Pennsylvania Department of Environmental Protection (PA DEP) regulations and the equipment manufacturer's manual. Documentation of FRC testing results should be included on the Maintenance Log in Appendix F.

At season startup, free residual chlorine should be at least 4 to 5 mg/L. During normal operating season, FRC should be greater than 0.4 mg/L. All testing shall be done with EPA approved equipment. A FRC concentration of over 2.0 mg/L and up to 4.0 mg/L may have an unpleasant taste but is within safe drinking water standards. A FRC concentration over 4.0 mg/L indicates that the chlorine dose is too strong and the system should continue to be flushed out. A FRC concentration under 0.4 mg/l indicates that not enough free chlorine is available to ensure safe drinking water. The residual disinfectant concentration in the water entering the distribution system cannot be less than 0.4 mg/L for more than 4 hours. If this is the case, the USFS Inspector must be contacted.

On-site testing, completed by the Operator, shall comply with U.S. Environmental Protection Agency (EPA) and PA DEP regulations and equipment manufacturer's manual. Free Residual Chlorine (FRC) must be checked daily as finished water leaves the storage area and at the most remote point in the system. FRC testing shall be conducted using a digital colorimeter (LaMotte 1200 Colorimeter, or equal).

### **Water Testing Analyzed by State Certified Independent Laboratory**

Testing analyzed by State Approved laboratories shall be performed according to EPA/DEP Safe Drinking Water Act (SDWA) regulations. The water system shall be tested for total coliform bacteria and nitrate/nitrite as described below. The water system should also be tested for any other contaminants required by the PA DEP for transient, non-community water systems. Monitoring requirements can be obtained by visiting the PA DEP Drinking Water website at <http://www.dep.pa.gov/Business/Water/BureauSafeDrinkingWater/DrinkingWaterMgmt/Pages/default.aspx#.Vt79mXZOmM8>. The Public Water System ID (PWSID) for the spring can be found in Section 1.0.

### **Nitrate/Nitrite**

This test of finished water is required by the PA DEP once per year, during the expected highest quarter of use. Nitrate (and nitrite) are indicators of organic pollution in the water, and can cause methoglobinemia in infants. Take samples in bottles provided by the water analysis lab.

### Total Coliform Bacteria

Collect water samples and have them analyzed for total coliform bacteria on a monthly basis. Sample the finished water at the locations specified in the Total Coliform Sample Siting Plan Form and sampling map included. In the event of a positive test result, complete check samples in accordance with DEP regulations at the designated locations.

### Sampling Procedures

The procedure for collecting samples consists of the following:

1. Obtain sealed sample bottles and forms from the approved laboratory.
2. Wash hands and wear latex gloves if possible.
3. Run the water at the sample location two to three minutes prior to taking the sample.
4. Avoid contamination of the sample during collection. Keep the sample bottle closed until the sample is collected. Do not touch the threads on the cap or the neck of the sample bottle and do not place the cap on the ground. Do not rinse the sample bottle before collecting the sample, as sometimes chemicals are added to neutralize residual chlorine in the sample.
5. Hold the sample bottle near the bottom, fill it  $\frac{3}{4}$  full, and replace the cap immediately.
6. Label the sample bottle, fill out the collection form, and place the sample upright in a refrigerator or on ice in a cooler.
7. Deliver the samples to the laboratory within 4 hours of being collected and before the contract laboratory closes for the day. Coordinate sample times with the contract laboratory. It is best to collect bacteria samples first thing in the morning and deliver them to the laboratory by noon so that all holding times are maintained. The holding time for fecal Coliform bacteria is 6 hours.

Keep records of all tests performed. All test results should be mailed to the FS Water/Wastewater Specialist and should be included in Appendix E. Copies of state required bacteriological analysis shall be kept for a minimum of 5 years. Copies of contaminant chemical analysis shall be kept for the life of the system.

Each owner or operator of a public water system must give notice for all violations of certain rules. Some of the rules requiring public notice are: failure to take required samples, failure to monitor, or upon positive coliform tests. If a Notice of Violation must be posted at the Recreational Area, the operator shall notify the Forest Service Engineer and get approval of the Notice before it is posted.

## **Section 8.0 Recordkeeping and Reporting**

Records and reports are a guide for system operation and control and also serve as a historical record of the performance of a system. They also serve as a memory aid to accomplish routine maintenance operations, testing procedures, and so on. It is important to keep records of all condition surveys and sanitary surveys, DEP inspections, water quality testing, routine maintenance, and equipment repairs/replacements. Updated manufacturer's literature should be added to this manual whenever components are added or replaced. In addition, copies of all reports and tests should be included. Copies of state required parameter testing shall be kept for a minimum of 5 years.

### **Permits and Standards**

The operator must be familiar with permits and/or standards which apply to the system.

Congress has passed a Federal Safe Drinking Water Act (US EPA) which empowers the EPA/DEP to adopt and enforce rules which must be met by each public water system in the nation. By agreement with the EPA, Pennsylvania DEP administers the federal act within the state. Thus, Pennsylvania's laws and rules regarding public drinking systems are in conformity with federal rules. Public water suppliers in Pennsylvania should refer to the Pennsylvania laws and rules. Contact Pennsylvania DEP on construction and operation standards. Required Permits from the Pennsylvania DEP for this system include:

- Plan Approval: Any system modifications must be approved by both the USFS and PA-DEP.
- Operating Permit: An operating permit from the PA-DEP is required for continued operation of the water system.

### **Maintenance Log**

An updated log of all maintenance activities performed should be maintained as part of this manual, including descriptions of any problems encountered and their solutions. A Maintenance Log is provided in Appendix F. All maintenance activities, including start-up and shut-down activities shall be included in this log.

### **Process Control and Daily Operating Log**

An updated log of all day-to-day operation of the water system should be maintained as part of this manual. A form should be prepared to facilitate this activity and copies should be kept in the control building from season startup to season shutdown. At the end of each year, all process control and daily operating log forms should be added to this manual in Appendix F. Use the FS format included in Appendix F.

### **Water Testing and Laboratory Records**

Water testing must be performed according to the requirements of the PA DEP. All water testing results and correspondence regarding water testing should be added to this manual in Appendix E.

### **Correspondence**

All correspondence regarding the water system should be added to this manual. This could include reporting requirements, notices of violations (NOV) and anything from the PA DEP or EPA regarding the system. All DEP and other official correspondence should be included in Appendix G.

### **Operating Costs and Records**

Operators should maintain adequate operation and maintenance cost records for budgeting and historical purposes. Information should be recorded on the cost of labor, utilities, chemicals, supplies, maintenance items, and equipment replacement.

## **Section 9.0 Equipment Details**

The major equipment included in this water system includes the chlorinator pump and this flow meter. There are no pumps in this system.

**Chlorinator** – The chlorinator pump is a Premia 75 Mega Solenoid Metering Pump. See Appendix C for details and operating manual.

**Flow meter** – The flow metering system consists of a Seametrics TX80 series insertion turbine flow sensor connected to a Seametrics FT420 rate/total indicator panel. For details on this equipment see Appendix D. The flow meter shall be calibrated by the manufacturer once every three years. Keep calibration records in this manual by inserting them at the end of this section.

## Section 10.0 Chemicals

### Sodium Hypochlorite Solution

The only chemical used in this system is a NFS approved sodium hypochlorite solution. It contains a solution of approximately 12.5% sodium hypochlorite (NaClO). A diluted solution is used to disinfect drinking water systems when they test positive for fecal coliform. If the operator prefers to use calcium hypochlorite tablets or an alternative disinfectant, the instructions on the packaging should be followed.

Hypochlorite powder, solutions, and vapor are irritating and corrosive to the eyes, skin, and respiratory tract. Ingestion and skin contact produces injury to any exposed tissues. Exposure to gases released from hypochlorite may cause burning of the eyes, nose, and throat; cough as well as constriction and edema of the airway and lungs can occur. Use with adequate ventilation and wash hands thoroughly after handling. Avoid contact with eyes, on skin or clothing. Remove contaminated clothing and wash before reuse. Chlorine is highly toxic to plants, fish and invertebrates.

Hypochlorite solutions may possess a strong chlorine odor, but **odor may not provide an adequate warning of hazardous concentrations**. Calcium hypochlorite is not flammable, but it acts as an oxidizer with combustible material and may react explosively with ammonia, amines, or organic sulfides. Calcium hypochlorite should be stored in a dry, well ventilated area at a temperature below 120°F (50°C) separated from cleaners, acids, ammonia, amines, and other chlorinating or oxidizing agents.

Chlorine decomposes on contact with air and when exposed to sunlight. Store hypochlorite solution in a cool, dry, ventilated area in a tightly closed container. Do not mix with other chemicals.

A Safety Data Sheet (SDS) for sodium hypochlorite is located at the end of this section.

INSERT SAFETY DATA SHEET

## **Section 11.0 Safety and Emergency Response**

Operating and maintaining a water system can be dangerous. It is your responsibility to consider your and others safety at all times when operating and maintaining your water system. This manual can't possibly cover all situations and every safety precaution. If you are in doubt about anything, contact the Permit Administrator.

Emergency telephone numbers can be found in section 12.0. The operator is responsible for updating emergency contacts and phone numbers by making the necessary corrections, additions and/or deletions.

### **General Safety Concerns**

Because the water system is located in an outdoor recreation area, proper apparel for spending time in the outdoors should be worn (long pants, sturdy footwear, etc.). When operating and maintaining the water system, general safety concerns include walking on uneven terrain, falling, cuts from sharp objects, lifting heavy objects, and encounters with animals and insects including animal droppings (hantavirus).

### **Confined Spaces**

Storage tanks, lift stations, and manholes are considered confined spaces and should be labeled as confined spaces on the access manhole or lid. They may be subject to oxygen deficiency and noxious gases. These types of spaces shall be entered only by following the confined space plan requirements (see Appendix J - Confined Space Procedures FSH 6709.11). Use all required protective devices and equipment, ventilation, and safety procedures.

Specific confined spaces in the Dewdrop Water System include the concrete spring box, the 500 gallon storage tank located at the spring site, and the 26,000 gallon storage tank located in the camp ground tanks.

### **Disinfectant Chemicals**

When using sodium hypochlorite or calcium hypochlorite tablets for disinfection of water wells, read and follow the safety instructions on the container's label. It is recommended to use rubber gloves and eye protection. Try not to breathe the fumes. All Federal, local, and Agency requirements must be followed. For more information, see Section 10.0.

### **Hazardous Chemicals or Waste Spills**

Spills of hazardous chemicals or waste can contaminate water supply sources. Check near spring for evidence of spills or contamination daily. Notify the District Ranger, Forest Service Inspector or Forest Service Engineer immediately of any spills.

### **Power Outage**

Power outage is not a major concern for this water system. If the power outage is long-term, the showers and toilets may need to be shut down since wastewater from these facilities flows by gravity to a pump station that delivers the wastewater to the wastewater treatment plant. If the

pump station can not be operated with an emergency generator, or pumped out, then the bathrooms and shower house will need to be closed.

### **Electrical Hazards**

Be on the lookout for exposed or frayed wires, rusted or broken electrical boxes, missing covers or plates, electrical cords or other equipment in poor condition, and similar electrical hazards. Inform the Forest Service Engineer about these hazards immediately and schedule a certified electrician to make required repairs. A Lock out/tag out program shall be used when performing electrical repairs.

### **Man-Made Disasters**

For any man-made disasters, including lack of operator availability, accidental contamination of system, and/or breakdown of major equipment, the Forest Service Engineer must be notified immediately.

### **Sabotage, Vandalism, and Terrorism**

Water systems are vulnerable to acts of vandalism and/or terrorism. Regularly check the water system for signs of being tampered with and to ensure that all components are secure.

The Treatment and Control Building is a vulnerable point in this water system. Keep it securely locked, have patrols check the area.

The storage tanks, spring box, and raw water tank may be vulnerable to vandalism or sabotage. These are located in remote areas not easily observed by the general public. Use secure locks with protector boxes to limit access to the padlocks. Provide strong, secure locking mechanisms.

### **Explosion and Fire Hazards**

Do not allow accumulation of flammable materials. Ensure that recently tested and approved fire extinguishers are available in well marked locations. Possible sources of fire or explosions include petroleum solvents, gasoline powered equipment, accumulation of oily rags or waste paper, poorly maintained electrical equipment, accumulation of animal debris, etc. Do not store flammable liquids in the building unless proper storage and handling precautions are followed.

### **Forest Fires/Wildfires**

Many forest fires are started by people and spread quickly. Be ready to evacuate the campground in case of a forest fire or when instructed to do so by the Forest Service or local officials. The shingled roof on the block building may be especially vulnerable. Alert firefighting crews of vulnerable locations.

### **Duties Requiring Two or More Persons**

Two or more persons are required for confined space entry and/or lifting or moving items that are too heavy or awkward for one person.

### **Safety Equipment Requirements**

Use of Personal Protective Equipment as listed in FSH 6709.11, Chapter 20 is required. This may include a first aid kit, fire extinguisher, respirators, confined space entry equipment, protective clothing, gloves, face shield, and eye protection. The equipment must be available and in good condition. All employees must be trained to use safety equipment. See Appendix H for details

### **Tool Safety**

It is very important to properly use and maintain tools and equipment in order to prevent accidents from occurring. The following basic safety rules should be followed.

1. Maintain tools in proper working order.
2. Use the right tool for the job.
3. Examine tools for damage before use.
4. Operate the tools in accordance with manufacturer's instructions.
5. Use appropriate protective equipment such as safety goggles, gloves, etc.

### **Accident Reporting**

Refer to the requirements listed in FSH 6709.12, Chapter 30 in Appendix I.

## Section 12.0 Contacts, Emergency Contacts

During most emergencies, it will be necessary to quickly notify a variety of parties both internal and external to the water utility. Using the Chain-of-Command Chart and all appropriate personnel from the lists below, indicate who activates the plan, the order in which notification occurs, and the members of the Emergency Response Team. All contact information should be available for routine updating and readily available. The following lists are not intended to be all inclusive — they should be adapted to your specific needs.

**Emergency Contacts:** Include Work (W), Cell (C) & Home (H) telephone numbers.

Emergency Contacts	Name	Phone Numbers
Fire Company	Emergency	911
	Non-Emergency	
Ambulance	Emergency	911
FS Permit Administrator	Mark Conn	W-814-363-6034
FS Water/Wastewater Specialist	Jim McCloskey	W-814-363-6044
		C-814-598-9080
		H-814-837-9341
FS District Ranger	Rich Hatfield	W-814-363-6098
		C-814-706-7054
Marienville District Ranger	Rob Fallon	W-814-927-5799
FS Engineer	Amy Leshar	814-728-6253
FS Law Enforcement	Matt Gearhart	W-814-363-6096
		C-414-232-7233
Pennsylvania State Police Warren	Emergency	911
	Non-Emergency	814-728-3600
Warren County Sheriff		814-723-7553
Pennsylvania Department of Natural Resources (PA DCNR)		717-787-2869
National Poison Control Center		1-800-222-1222
National Response Center - Chemical, Oil Spills & Chemical/Biological Terrorism		1-800-424-8802
State drinking water contact	DEP	814-723-3273
State Drinking Water Program - PA DEP Bureau of Water Supply Management		717-787-5017
Emergency Management Agency	Warren County	814-723-7553 (24 hr)
		814-723-8478 (office)
PA One-Call System	Dig Notification	811
	Admin Offices	1-800-248-1786
System Contacts	Name	Phone Numbers
System Operator		
Backup System Operator		

<b>General Contacts</b>	<b>Name</b>	<b>Phone Numbers</b>
Bradford Ranger Station		814-363-6000
Supervisor's Office - Warren		814-728-6100
Electric Utility Company	Penelec	888-544-4877
Electrician		
Plumber		
Excavator		
Engineer		
PA Certified Testing Laboratory	Analytical Services	
Pump Repair Service		
Lodge Operator		
Campground Concessionaire		
Treatment System Supplier		
Equipment suppliers		
Chemical suppliers		
Equipment Maintenance Service		
Equipment Calibration Service		

**Closest Telephone Locations:** Cell phone coverage is unreliable. There is a land-line telephone at the Kiasutha Campground gate house and at the Kinzua Dam Information center.

## **Appendix A**

### **Available Operator Annual Report Form**

## **Appendix B**

### **Completed Condition Surveys and Sanitary Surveys**

## **Appendix C**

### **Premia 75 Mega Chlorinator Pump Operating Manual**

## **Appendix D**

### **Seametrics TX80 Flow Sensor and FT420 Rate/Total Indicator Panel Operating Manuals**

**Appendix E**  
**Water Testing Results**

**Appendix F**  
**Maintenance Logs**



## **Appendix G**

### **Inspection Reports and Official Correspondence**

## **Appendix H**

### **Forest Service Handbook Chapter 20 – Personal Protective Equipment**

The Forest Service Handbook is relatively large and is not included in this Appendix. A digital version of the Forest Service Handbook is available from the Forest Service Engineer at the Allegheny National Forest Headquarters located in Warren, PA. The phone number is (814) 728-6100. All contractors that are responsible for operating and maintaining Allegheny National Forest water and wastewater facilities are responsible for obtaining and reviewing applicable portions of this document.

## **Appendix I**

### **Forest Service Handbook Chapter 30 – Reporting Accidents**

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## **Appendix J**

### **Forest Service Handbook Confined Space Procedures**

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