Guidance and Suggested Format

For the Development of an

Emergency Response Plan

Revised January 2024

Nevada Division of Environmental Protection

Bureau of Safe Drinking Water

Acronym/Abbreviation		Definition
µg/L		micrograms per liter
AWWA		American Water Works Association
BSDW		Bureau of Safe Drinking Water
BWO		Boil Water Order
CFR		Code of Federal Regulations
CFS		Cubic Feet per Second
CPWS		Community Public Water System
E. coli		Escherichia coli
EPA		United States Environmental Protection Agency
ERP		Emergency Response Plan
GPM		Gallons per Minute
IOC		Inorganic Chemicals
IT		Information Technology
MCL		Maximum Contaminant Level
mg/L		Milligrams per liter
MRDL		Maximum Residual Disinfectant Level
MGD		Million Gallons per Day
NAC		Nevada Administrative Code
NCWS		Non-Community Water System
NDEP		Nevada Division of Environmental Protection
NRS		Nevada Revised Statute
NTNC		Non-transient/non-community
O&M		Operations and Maintenance
OSHA		Occupational Health and Safety Administration
OT		Operational Technology
ppm		parts per million
PWS		Public Water System
SCADA		Supervisory Control and Data Acquisition
SDWA		Safe Drinking Water Act
SMCL		Secondary Maximum Contaminant Levels
SNHD		Southern Nevada Health Department
SOC		Synthetic Organic Chemicals
TT		Treatment Technique
VOC		Volatile Organic Chemicals
WCHD		Washoe County Health Department

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Introduction

Preparing an Emergency Response Plan (ERP) is an essential part of managing a water system. When faced with an emergency, customers expect you to restore and resume normal operation as soon as possible. An ERP should be a helpful tool to achieve this. A water system's ERP is a "living document", modified based on experience and practical application. It should be reviewed and updated annually or when there is a modification to the system's infrastructure or management.

This "Guidance and Suggested Format for the Development of an Emergency Response Plan" (referred to as ERP Guidance from hereon) is to assist in completing the "Template for the Development of an Emergency Response Plan" (referred to as ERP Template from hereon). The ERP Template is intended to provide a consistent format which can be used by small to medium sized drinking water systems. Both the ERP Guidance and ERP Template (in Microsoft Word) are available from the Nevada Division of Environmental Protection, Bureau of Safe Drinking Water's website: https://ndep.nv.gov/water/drinking-water/forms

How to start your Emergency Response Plan

Begin by reviewing this ERP Guidance, with a goal of completing each section of the "Template" as it pertains to your system. Take your time, break the process down into sections and work through each thoroughly.

Consider the first attempts as draft versions of the ERP. Have others review the draft to see if the plan is clear or needs improvement. Eventually, you will have a completed ERP that can be used for working through a tabletop exercise and guide when an emergency response is warranted.

You are required to add the ERP as an appendix to your Manual of Operations and Maintenance (Manual of O&M) but it can also be a standalone document. This will allow the ERP to be easily accessible as a 'grab & go' document in both hard copy and digital formats, which can be quickly distributed to key personnel for reference during an emergency.

There is a suggested narrative format and example "Hazard Responses" for various events that may result in an emergency included in Section 6. These are intended to assist in developing your own response protocols for the ERP.

ERP Template Guidance and Examples

This ERP Guidance discusses key components for an emergency response with suggested formatting of how you may present information. Every water system, physical setting, and climate will be unique in their potential risks to types of emergencies. Use ERP Guidance as a tool to provide an overview of emergency responses to consider then complete or modify the "ERP Template".

The "ERP Template" provides a format to develop your plan; but you should modify it to be specific to your water system and setting – add sections, take them out, as appropriate. Section 6 – Hazard Responses for Specific Events is to include narratives specific to your system and address potential hazards that could directly impact the components of your water system.

Having an ERP in a consistent format assists regulatory agencies conduct their reviews for compliance. Additionally, consistent formatting also aids operators that operate more than one public water system or have experience working elsewhere.

Since your ERP may contain sensitive information, make sure to keep it stored in a safe and secure location. At a minimum, it is recommended you have one copy stored on-site, one master digital version, and one off-site to ensure the document is available in the event you are unable to access your offices or facilities. Regardless of a water system size, it should be protected against possible sabotage, terrorism, or vandalism.

The following sections provide a format and guidance recommendations to help you develop an ERP for your water system.

The ERP Guidance text and examples will be shown in red. Names, locations, water system references, and businesses used in the examples are fictitious. There is no intention to endorse any businesses used in the examples.

The ERP Template is available for your use to customize and complete in Microsoft Word at the NDEP link: **https://ndep.nv.gov/water/drinking-water/forms**

This ERP Guidance document and the associated ERP Template have been prepared and periodically updated under the direction of staff of NDEP BSDW. If you have questions or comments, please call the Facility Manager assigned to your water system. The general number for NDEP BSDW is (775) 687-9521. Feedback is beneficial for future updates of this guidance.

Requirements for an Emergency Response Plan

In Nevada, all public water systems are subject to requirements set forth in the Nevada Administrative Code (NAC 445A). For revised regulations that have not yet been codified, please see the BSDW website.

NAC 445A.6588 "Emergency" defined: "Emergency" means a situation in which an unusual calamity, including a flood, fire, storm, earthquake, drought, civil disturbance, accidental spill of a hazardous material or similar occurrence, disrupts the provision of water by a public water system or endangers the quality of water provided by a public water system.

The section specifically pertaining to an Emergency Response Plan states:

NAC 445A.66665 Plan for restoration of services in emergency. (NRS 445A.860): A supplier of water shall:

1. Develop an organized plan of predetermined activities for the public water system to restore its services in the contingency that an emergency, including any failure of power, mechanical or electrical failure or natural disaster, reduces the capability of the public water system to supply the water demanded by its customers within its area of service. The plan must include any actions necessary for responding to any breaks in a water main of the public water system.

2. Submit a copy of the plan to the Division or the appropriate District Board of Health not later than 18 months after the public water system begins operation.

So, what does that mean and what does it involve?

An ERP assists personnel to respond to a catastrophe, or a civil, mechanical or electrical failure. As the preparer, it's recommended to consult with others familiar with the water system and the area. The ERP should consist of an organized plan of predetermined activities necessary for the system to restore services. Assessing potential emergencies that your water system is more likely to experience can help prioritize your efforts. There are numerous websites that can also assist in identifying the potential hazards and response actions. Some you may consider:

National Weather Service

United States Geological Survey (USGS) Earthquake information

Federal Emergency Management Agency (FEMA) Region 9 – Nevada has information to help prepare for, respond to, and recover from disasters.

Nevada Department of Transportation Road Conditions

State of Nevada Division of Water Resources has information regarding Floodplain Management, Dams, Well Drilling, and water rights.

State of Nevada Division of Environmental Protection has numerous resources pertaining to Air, Water, Land and Environmental Cleanup. NDEP Bureau of Safe Drinking Water (BSDW) has many templates and resources for drinking water systems.

Submitting Documents

After completing your ERP, it must be submitted to the Nevada Division of Environmental Protection, Bureau of Safe Drinking Water or the appropriate District Board of Health for review. Since the ERP and the Cross Connection Control Plan (CCCP) are to be included in the Appendix of your Manual of Operations and Maintenance, it is acceptable to be submitted together.

Submit the following documents:

- Two (2) paper copies of the Application for Approval of a Water Project available at https://ndep.nv.gov/water/drinking-water/engineering-reviews/applications-forms
  - Typically, if submitting just the ERP or Manual of O&M with the ERP and CCCP as attachments, only the first two pages need to be completed.
- 1 USB drive with a complete copy of the documents in PDF format. If that is not possible, Microsoft Word is sufficient.
- Two (2) paper copies of these documents, including appendices.

Deliver the above documents to the Bureau of Safe Drinking Water at the following address:

NDEP Bureau of Safe Drinking Water
Attn: Project Coordinator
901 S. Stewart Street, Suite 4001
Carson City, Nevada 89701

OR to the appropriate District Board of Health.

Section 1: System Information

The system information and mapping should be the same as in the Manual of O&M, so there is duplication, but as described earlier, the ERP is intended to be a “grab and go” document when needed.

1.1 System and Contact Information

To easily identify the system, provide the system identification number, system name and address, and other specific identifiers like city, location, population, and the number of service connections.

System Number or Reference (SDWIS ID)	PWS ID# NV000XXXX
Distribution Classification Required (D1, D2, etc.)	D1
Treatment Classification Required (T1, T2, etc.)	T1
System Name and Address	Nevada Water System
Location/Town	Rural Nevada
Population Served and Service Connections	Population: 200 Connections No. of Residential Connections:____80_____ No. of Commercial Connections:____0_____ No. of Other Connections:_____0___
System Owner	Nevada Public Water System
Name, Title, and Phone Number of Person Responsible for Maintaining and Implementing the Emergency Response Plan	Name: John Doe Title: Operator Phone: (775) Cell: (775) Email: email@email.com
Seasonal Operation? Operational dates?	Year-round operation

1.2 Service Area Map or Vicinity Map

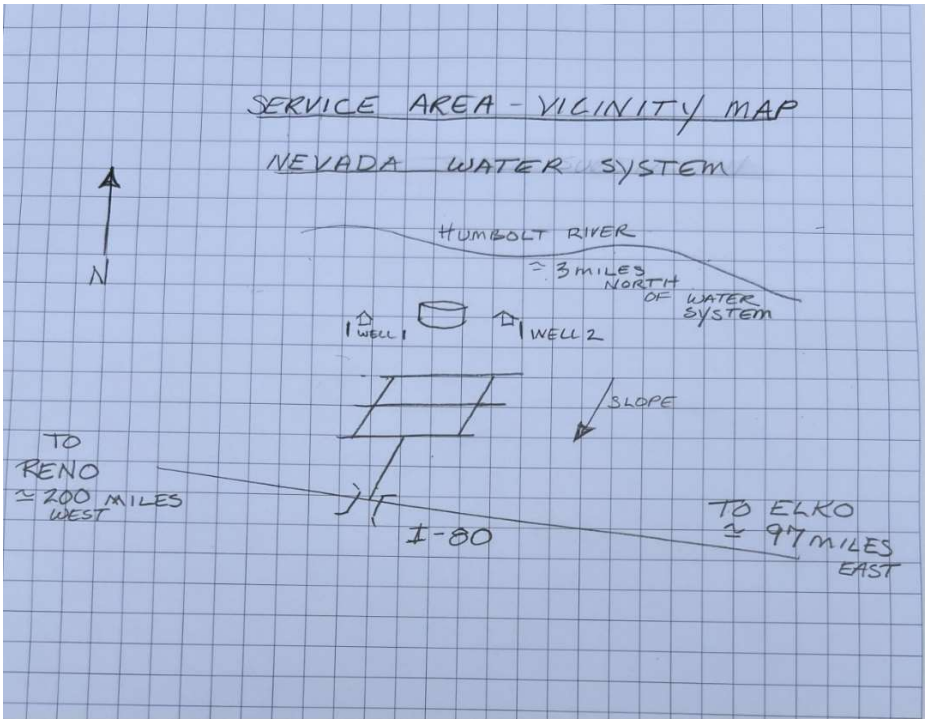
Please include or insert a drawing or attachment that shows the relationship of your system to other nearby communities within the general area to locate and orient your system for reference. Larger maps or schematics can be attached as an appendix with the location referenced in this section.

Service Area / Vicinity Map

For the map of the system service area, consider a single page view or as a fold-out, illustrating primary roadways, geological features such as lakes, rivers or drainages, or other defining properties. For a very small system, a simple graphic in this text box may be sufficient. However, typically larger maps or schematics can be attached as an appendix with the location referenced in this section of the ERP.

(This basic vicinity map is of a fictitious water system

being used as an example for illustration)



1.3 System Overview

Provide a brief narrative overview of the System/Facilities – Describe how the infrastructure components are connected: water sources, treatment, pumps, transmission and distribution system, storage facilities, and other features that would distinguish your system. A consolidated list of primary components and their functions will help to organize system information and allow for timely identification of potential issues.

System/Facilities
Example: “Nevada Water System” a community water system, relies on two groundwater wells for supply. Well #1 is equipped with a submersible pump and has a capacity of 50 GPM. There is a cinder block well house adjacent. In the well house, there is a meter, logbook, and LMI pump used to inject sodium hypochlorite from a 50-gallon drum. It is considered the primary well to meet demand. Well #2 is also equipped with a submersible pump with capacity of 40 GPM. The water exceeds the secondary standard for iron (0.6 mg/L) therefore, the water is treated with a Green Sand Filter to reduce the iron concentration, prior to chlorination. The green sand filter and chlorination equipment are housed in a cinder block well house adjacent to well #2. There is one 500,000-gallon, bolted steel water tank located at an elevation of 4315 feet. The tank is located on the north side of the service area. It is equipped with high level switches to prevent overfilling and a low-level switch to send a signal to Well #1 to come on. When the demand increases and the tank level drops, a signal is sent to Well #2 to come on. The local fire authority has required a fire flow storage of 120,000 gallons. The homes within the service area vary in elevation resulting in water pressures in the distribution system ranging from 50 psi to 95 psi. The distribution piping is principally 10”, 8”, and 6” PVC C900 piping. Isolation valves are located at most fittings. Each residence is metered with remote read capability. Fire hydrants are located throughout the subdivision approx. 400’ apart. The topography is such there are high points equipped with air/vac assemblies and low points are equipped with flush assemblies.

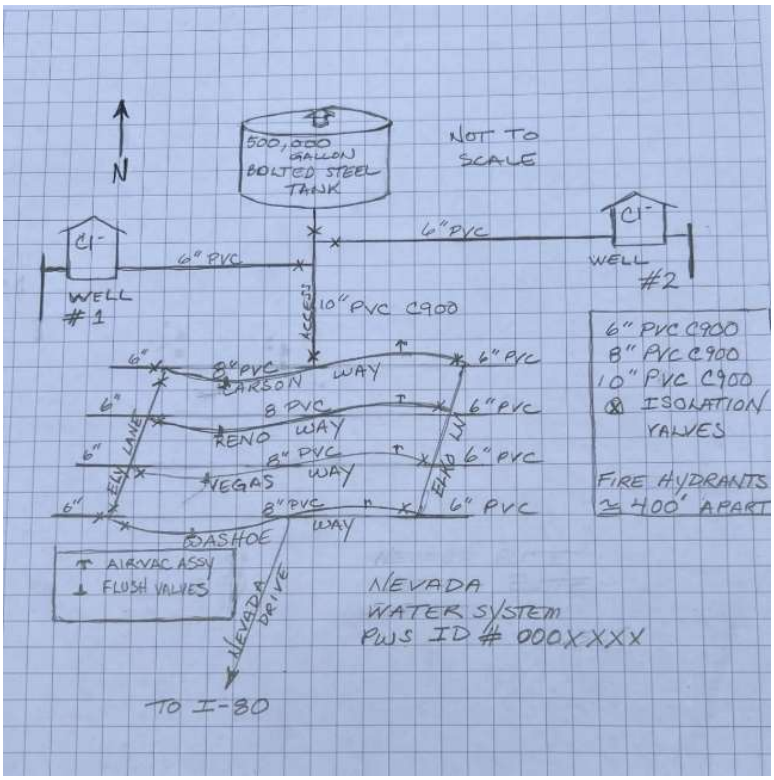
Simplified Graphic or Flow Chart of Water System

For a very small system, a simple graphic in this text box may be sufficient. However, many systems may have maps or schematics 11”x14” or greater providing a general layout of system components. These can be attached as an appendix with the location referenced in this section of the ERP.

Key components include the water sources, storage, treatment, pumps, and distribution. Other appurtenances to emphasize are isolation valves and other controls needed for quick access during emergencies.

Consider descriptions that include ties to larger geological features such as drainages, mountains, and riverine ecosystems.

(This basic schematic is of a fictitious water system being used as an example for illustration)



Section 2: Chain of Command

The first awareness of a potential emergency is likely to be called in by another agency or member of the public. Identify the number that is publicized and provided to agencies. Whoever answers that call, will have the responsibility to document and make the first internal calls to inform the designated responsible person.

Water System Contact to Report of Emergency

Phone Business Hours	Phone After Hours	Website Contact Email
(775) xxx-xxxx	(775) xxx-xxxx	Email@email.com

For the purposes of this guidance, it is assumed the initial call will go to the Owner/manager, who will in turn contact the designated Operator, and then advise the regulatory authority. Each water system must identify the initial response team contacts and sequence depending upon the management and size of the system. Administrative staff are valuable in documenting staff time, requisitions, and expenditures.

2.1 Water System Contacts and Documents

2.1.1 Owner/Manager/Director

Name, Title	Phone	After Hours	Email
John Doe, Manager	(775) *** *****		

2.1.2 System Operators and Certifications

Name, Title	Distribution Grade	Treatment Grade	Phone
John Doe, Designated Operator	D1	T1	(775)

2.1.3 Managerial & Administrative Contacts:

	Contact Name	Title	Phone	Email
Staff/On-Call Engineer	John Doe, P.E.	Engineer	(775)	email@email.com
Administrative Contact	John Doe	Manager/Accounting	(775)	email@email.com
Public Information Officer	John Doe	Spokesperson	(775)	email@email.com
Financial Contact				
Legal Contact				
Other				

2.1.4 Location of documents needed during an emergency.

Document	Physical Location	Digital Location	Duplication
Customer contact list	No physical list	Acct Computer C:/accounts/contacts	Drop box/acct file

Section 3: Notification

3.1 Local Emergency Response and Mitigation

Police	911
Police (non-emergency)	(xxx) xxx-xxxx
Fire	911
Fire (non-emergency)	(xxx) xxx-xxxx
Hazmat	(xxx) xxx-xxxx
NDEP Spill Hotline	(775) 687-9485
Others?	

3.2 Regulatory Agencies and Contacts

NDEP BSDW	**General Phone**	**Website**	
BSDW Front Desk	(775) 687-9521	https://ndep.nv.gov/water/drinking-water	
All contacts for BSDW		Bureau of Safe Drinking Water Contacts | NDEP (nv.gov)	
Contact Title	**Name**	**Email**	**Phone**
BSDW Facility Manager	John Doe	doe@NDEP.nv.gov	(775) 687-
Health District Facility Manager (if applicable)			

Section 4: Effective Communication

Communication with staff, customers, the news media, and the public is a critical part of emergency response. It is important to recognize that staff and their families may be impacted by the emergency as well. Staff may not be effective or available if their homes or family are at risk of being harmed. Strategies to provide employee coverage or safety may need to be developed.

When emergencies arise, it is stressful and mixed messages can complicate and confuse the situation. Therefore, designate a spokesperson as the primary utility contact. The spokesperson should collaborate with others, to develop the desired key messaging about the emergency. Small water systems may not have experienced staff, but the designated spokesperson should strive to remain calm and convey the facts concisely. An alternate spokesperson should also be identified and will be especially needed during a multiple day emergency. Field staff should be able to direct people (residents, reporters, etc.) with questions to the designated spokesperson.

The spokesperson will be responsible for communicating updates for ongoing emergency events, response and recovery actions, and estimated time requirements before returning the system to normal operations. Spokespersons may also need to collaborate with local, State, and Federal agencies and communicate loss of water service with priority water users such as hospitals and schools.

4.1 Designate a Spokesperson

Designate one person to be responsible for communicating the details of emergency events to customers, priority customers, and media.

Spokesperson Name	Phone	Email
John Doe (Primary)	(775) XXX-XXXX	
Jane Doe (Secondary)	(775) XXX-XXXX	

4.2 Suggested Considerations for Emergency Communications:

Do:

- Designate a spokesperson,
- Be prepared with concise key messages,
- Provide complete, accurate, and timely information,
- Acknowledge uncertainty and offer to get back with more information later, and
- Document your communications.

Do not:

- Speculate on the cause or outcome of an incident,
- Blame or debate,
- Minimize or brush off concerns of customers, or
- Treat inquiries from interested parties as an annoying distraction from the real business of emergency response.

4.3 Priority Customer Contact List:

Agency/Organization	Name and Position	Contact Info
Hospital/Clinic		
Schools		
Convalescent Hospitals or Similar		
Health Compromised Customers		

4.4 Media Contact List:

Agency/Organization	Name and Position	Contact Info
Local Newspaper		
Local Radio Station		
Local TV Station		

4.5 Notification Types:

When it comes to water quality impacts, there are different types of required minimum notifications depending upon the potential degree of hazard.

Tier 1 - Notify within 24 hours. Any time a situation occurs where there is the potential for human health to be immediately impacted, water suppliers have 24 hours to notify the public of the situation. Water suppliers must use media outlets such as television, radio, and newspapers, post their notice in public places, or personally deliver a notice to their customers in these situations.

Tier 1 violations are:

- E. coli MCL violations; failure to test for E. coli.
- Nitrate/Nitrite MCL violation; failure to take confirmation.
- Chlorine Dioxide MRDL violation; failure to take repeat.

- Exceedance of maximum turbidity level, where NDEP BSDW determines Tier 1 is required.
- Nitrate exceedances for NCWS allowed to exceed standard.
- Waterborne disease outbreak or another waterborne emergency
- Other situations as determined by the NDEP BSDW

Tier 2 - Notify as soon as possible, but within 30 days of the violation. Any time a water system provides water with levels of a contaminant that exceed EPA or state standards or that has not been treated properly, but that does not pose an immediate risk to human health, the water system must notify its customers as soon as possible, and no later than, within 30 days of the violation. Notice may be provided via the media, posting, or through the mail.

Tier 2 violations are:

- All other MCL, MRDL, and TT violations that are not Tier 1.
- Monitoring and testing procedure violations, where NDEP BSDW requires a Tier 2 (rather than Tier 3) notice.
- Failure to comply with variance and exemption (V&E) conditions

Tier 3 - Notify within one year of the violation. When water systems violate a drinking water standard that does not have a direct impact on human health (for example, failing to take a required sample on time) the water supplier has up to one year to provide notice of this situation to its customers. The extra time gives water suppliers the opportunity to consolidate these notices and send them with annual water quality reports (consumer confidence reports).

Tier 3 violations are:

- All other monitoring or testing procedure violations not already requiring a tier 1 or tier 2 notice.
- Operation under a Variance or Exemption
- Special public notices:
  - Exceedance of Fluoride SMCL
  - Announcing the availability of unregulated monitoring results

Notification Resources:

Boil Water Orders are available at Do Not Drink & Boil Water Orders | NDEP (nv.gov) and include;

- E. coli Present samples
  - Precautionary Boil Water Order Public Notice
  - Official Boil Water Order Public Notice English
  - Official Boil Water Order Public Notice Spanish
- Other Boil Water Order Events Boil Water Rescind Notice
  - Precautionary Boil Water Order Guidance for Public Water Systems
  - Loss of Pressure Boil Water Order Public Notice
  - Boil Water Order Rescind Notice Template
- Do Not Drink Orders

- Nitrate Public Notice Template
- Unknown Water Quality Public Notice Template
- Do Not Drink Notice Rescind Template

Section 5: Events that May Cause Emergencies & Resources

5.1 Event Impacts

Your water system may be more vulnerable to one or the other, due to locale, climate, or geology. For each type of event, there is a potential impact on your water system components.

Consider the potential water system impacts:

Wells

- Ground water contamination
- Pump or power failure
- Vandalism
- Natural disasters; floods, earthquakes
- Declining yield/water levels

Water Treatment

- Surface water impacts from high turbidity or drought
- Power failure
- Natural disasters; floods, earthquakes
- Chemical spill
- Treatment mechanical failure

Storage Tanks

- Natural disasters; earthquakes, deep snow, ice, high winds
- Vandalism

Distribution System

- Water main breaks
- Low pressure
- Water conservation/ rationing programs
- Backflow events
- Pump stations – mechanical or power failures
- Pressure reducing valves – failure causing high pressures

Other infrastructure

- Pump houses – impacts from natural disasters
- Chlorination system failures
- Offices, warehouses, maintenance buildings
- Computer systems, cyber-attacks
- Access roads impeded by heavy, deep snow or washed out by flooding

This worksheet lists events applicable to Nevada that can cause emergencies. Contemplate how these events may impact each component of your water system. For each impact directly affecting a water system component, a Hazard Response must be prepared specific to your system and included in Section 6 of the ERP. **A suggested format is provided and included in Section 6 – Response Actions to Specific Events.**

Event	Water Source & Treatment	Treatment & Disinfection	Pump Stations	Storage Tanks	Distribution, System PRVs
Distribution Line Break	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*
Loss of Power	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*
Drought	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*
Earthquake	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*
High Winds	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*
Flood	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*
Extended Freezing Temperatures	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*

Deep or Heavy Snow	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*
Fire / Wildfire	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*
Epidemic/Pandemic	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*
Hazardous Materials	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*
Cyber Attack / Terroristic Threat	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*
Vandalism/ Security Threat	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*
Pump Failures	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*
(Other)	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*	☐ *Directly* ☐ *Indirectly* ☐ *Not Applicable*

5.2 Service Contact List:

Agency/Organization	Name and Position	Contact Info
Engineering Firm	SGA Engineers	John Doe, P.E. (775) *** ****
Electric Utility	E Energy	John Doe
Gas/Propane Supplier	Gobane Gas	
Phone Providers	MCI	
Chlorine/ Other Chemical Supplier	Place Chemicals	
Rental Equipment. Supplier	Place Rentals	

5.3 Laboratories

Name	Address	Phone	Lab Capabilities
Nevada State Health Lab	1660 N. Virginia St. Reno, NV 89503	Daytime: (775) 688-1335 Emergency: Same	Coliform and Inorganic

5.4 Suppliers and Vendors

	Name	Phone
Pipe Supply	Eastern Nevada	(775)
Chemicals	B-#4 Chemical	(775)
Pumps / Motors	Esmeralda Seal & Pump	(775)
Safety	Brainger Industrial Supply	(800)
Others?		

5.5 Contractors / Repair Services

	Name	Phone / Emergency Phone
Pipe Repairs	A&D Construction	(775)
Electrician	JB Electric	(775)
Plumber	Best Service Plumbing	(775)
Well Driller	Pleasant Valley Water Well Services	(775)
SCADA.	ControlPoint Engineering	(916)
Tank Divers	Conrady Consultant Services	(205)
Others?		

5.6 Emergency Equipment, Safety Materials, and Spare Parts

All utility personnel should know the location of all equipment and safety materials needed during emergencies. Inventory should be recorded and restocked as supplies are depleted. A spare parts inventory must be maintained in your Manual of O&M. Ideally, your utility should maintain a single web based Spare Parts Inventory that could be easily referenced and updated.

Item(s)	Location	Amount Available in Stock	Restock Date
PPE (hard hats, gloves, flashlights, safety glasses, coveralls)	Ex. Maintenance Room	Ex. Box of hard hats, box of gloves, five safety glasses	Xx/xx/20XX
Flares			
Traffic Cones			
Pagers/ Walkie-Talkies (alternative communication)			
Batteries			
Chlorine			

5.7 Detection and Mitigation Strategies

Detection strategies can help prevent, detect, and minimize the severity of line breaks, loss of power, mechanical failures, natural disasters, or malevolent acts. Preventative actions are generally preferable to reactive responses to emergency events because they save time and resources and limit potential exposures to hazards. With time, experience, and events, you may identify additional means to detect and/or mitigate a potential problem. If implemented, the practice should be added to your routine Manual of Operations and Maintenance.

Section 6: Hazard Responses for Specific Events

6.1 Core Response

The core response is required of all systems. These are the events likely to occur at any system and should be updated accordingly. These include water main breaks, power outages, mechanical failures, weather related impacts, accidental or intentional malevolent acts that adversely affect the ability to produce or deliver water that meets requirements.

For any emergency event, there are a series of general steps to take:

- Analyze the type and severity of the emergency
- Take immediate actions to save lives
- Take action to reduce injuries and system damage
- Prepare key messages to notify customers and media
- Make repairs based on priority demand
- Return the system to normal operation
- Post emergency review – these have a threefold purpose. They provide an opportunity for everyone involved in an event to: 1) identify areas in the current emergency response plan that need improvement; 2) make recommendations to improve it; and 3) debrief and capture key lessons learned.

The following table is provided as a format for a Hazard Response narrative describing a potential event and actions. **COPY FORMAT AND ADD AS MANY EVENTS AS NECESSARY**

Nature of the Event/Emergency	Basically, what is the emergency.
Assess the Immediate Emergency	Describe the conditions, what is going on and the potential aspects to prepare for.
Immediate Actions	Identify actions to mitigate the emergency and contend with potential or impending conditions
Assess the impacts to the entire system (Water source, pumping systems, storage, distribution components)	It is important to evaluate the potential impacts of the emergency event on other components of the system, as this may result in the need for additional emergency measures.
Notifications	Identify the notifications that will be needed for the various emergency events.
Mitigations	Identify the mitigations in place to avert the emergency. Will these be sufficient? Do they need to be updated? This is particularly important to review after an emergency event.
Follow-up Actions	• Some things can be said over and over again! Verify your equipment and safety devices are reset and ready for proper operation. • Conduct a post emergency review. • Update ERP as needed

Examples of several specific events have been provided. Narratives for the identified hazards, how they may impact your system's components, and your system's response must be prepared and included in Section 6 of your ERP. All information should be customized to reflect your system's needs. Templates for common water system emergencies are provided. In the event any of these do not apply to your system, please note it is not applicable. Consider providing a rationale as to why it does not apply to your system.

6.2 Water Main Break

Nature of the Event/Emergency	Evidence of a Water Main Break reported.
Assess the Immediate Emergency	What steps will the person onsite take to determine what the first actions should be? Determine severity and type of break. Is it in the street section? Is the leaking water causing a hazard for vehicles driving through? If so, traffic control must be put into place. Is the line break flowing like a geyser or seeping? Is it night or will the repair go into the night? Identify the location of the nearest shut-off valves to isolate the section of pipe with the line break.
Assess impacts to the entire system for secondary impacts (Water source, pumping systems, storage, distribution components)	• Check storage levels. Depending upon the line size, much of the stored water could be depleted. • Check water pressures in the system. • Has any segment of the distribution system had a loss of all pressure? • Is there any evidence of cross connection back siphonage or back pressure? These conditions could lead to the need of secondary emergency responses.
Immediate Actions	• Provide appropriate traffic control to protect the public and employees. Coordinate Crews/Contractor to repair pipe, as needed. Line up construction lighting if the work is going into the night. Use your emergency disinfection plan or AWWA Standard C651 (most current version) and consult with the Bureau of Safe Drinking Water. The following is language from the standard AWWA procedures. **a) For controlled, pressurized breaks** i) Excavate below break. ii) Disinfect exterior of pipe. iii) Repair while pressurized. iv) Backfill and compact. v) Sample for bacteriological contamination. b) **For controlled break with loss of pressure** (possible contamination) i) Provide appropriate customer notice (Standard templates are available at NDEP BSDW and should be downloaded). ii) Isolate appropriate section of pipe.

	iii) Test for bacteriological contamination iv) Follow steps ii and iii above. v) Repair pipe vi) Flush pipe (3 ft/sec to scour) vii) Disinfect. (Refer to AWWA Standard C651) viii) Flush ix) Test for residual and bacteriological contamination x) Return to service and notify customers. **c) For catastrophic break** i) Notify customers of water outage and issue appropriate advisory. ii) Sample for bacteriological contamination. iii) Excavate below break. iv) Isolate appropriate section of pipe. v) Repair pipe. vi) Flush pipe (3 ft/sec to scour) vii) Disinfect (Refer to AWWA Standard C651) viii) Flush ix) Test for residual and bacteriological contamination x) Return to service and notify customers.
Notifications	• Notify NDEP BSDW at the outset of the event, during to update if any conditions change, then again, when the emergency has been mitigated and ready to return to normal operations. • Notify impacted customers per NDEP requirements. • Follow-up with the media
Mitigations	Review existing mitigations. Were they effective? Could they be improved upon? How? Are they improvements that could be easily added or must you wait for budgeting?
Follow-up Actions	• Verify your equipment and safety devices are reset and ready for proper operation. • Conduct a post emergency review. • Update ERP as needed

6.3 Loss of Power

Nature of the Event/Emergency	Regional power outage due to a blown transformer or other cause.
Assess the Immediate Emergency	Verify power is out at the wells. No water production until power is restored unless back-up generator or alternative source of power can be applied.
Immediate Actions	• Communicate with the power company to get an estimate of how long the outage is expected to last. • Verify storage quantity. Based upon typical consumption, estimate how long the stored water (over and above the fire flow quantity) will last.
Assess impacts to the entire system for secondary impacts (Water source, pumping systems, storage, distribution components)	• Check the availability of alternative water supplies such as bottled water. • If there is risk of the storage water level dropping below the required fire flow quantity, notify the fire authority. • When power supply is restored, confirm wells pumps, treatment equipment, and distribution pumps are functioning. Some electrical components may need to be reset. • Check water pressures in the system. If pressures fall below 20 psi follow the procedures outlined in the Water Main Break Hazard Response.
Notifications	• Notify NDEP BSDW at the outset of the event, during if any conditions change, then again when the emergency has been mitigated and ready to return to normal operations. • When notifying electrical utility provider – let them know that a public water system is experiencing an outage. • Notify customers of the outage and expected return to service. • Notify customers and media of the need to cut unnecessary water usage (such as lawn watering) to reserve water for critical usage. Customer notifications may be hindered by the regional power outage. Multiple means of communication should be used, including the media. • If there is risk of the storage water level dropping below the required fire flow quantity, notify the fire authority. • Notify customers and the media when power is restored and it is safe to resume normal water usage.
Mitigations	Review existing mitigations. Do you think they are sufficient? After an emergency event, look back; were they effective? Could they be improved

	upon? How? Are they improvements that could be easily added or must you wait for budgeting?
Follow-up Actions	• Verify your equipment and safety devices are reset and ready for proper operation. • Conduct a post emergency review. • Update ERP as needed.

6.4 Mechanical Failure

Nature of the Event/Emergency	Well Pump Failure.
Assess the Immediate Emergency	Confirm there is power to the pump.
Immediate Actions	• Attempt to start the pump by hand. • Review system controls for possible source of malfunction. • Contact plumbing or electrical contractor as needed for repairs. • Contact pump supplier as needed for repairs.
Assess impacts to the entire system for secondary impacts (Water source, pumping systems, storage, distribution components)	Check water storage quantity. Verify other water sources are functioning. Assuming the well pump will be out of service for several days, estimate the demand for water by the customers.
Notifications	• Notify NDEP BSDW at the outset of the event, during if any conditions change, then again when the emergency has been mitigated and ready to return to normal operations. • Notify customers and media of the need to cut unnecessary water usage (such as lawn watering) to reserve water for critical usage. Customer notifications may be hindered by the regional power outage. Multiple means of communication should be used, including the media. • If there is risk of the storage water level dropping below the required fire flow quantity, notify the fire authority. • Notify customers and the media when power is restored, and it is safe to resume normal water usage.
Mitigations	Review existing mitigations. Were they effective? Could they be improved upon? How? Are they improvements that could be easily added or must you wait for budgeting?
Follow-up Actions	• Verify your equipment and safety devices are reset and ready for proper operation. • Conduct a post emergency review. • Update ERP as needed.

6.5 Hazards Resulting from Accidental or Malicious Events

When it comes to emergency preparedness for a water system, it's critical to consider the possibility of man-made calamities, such as hazardous material spills, vandalism, cyber-attacks, and other malicious actions. These events can have severe consequences on the safety and reliability of the system, as well as the health and well-being of those who rely on it. Therefore, it's essential to have a robust emergency response plan in place that accounts for these potential scenarios and outlines specific procedures for mitigating their impacts. Your Hazard Response for these emergencies will assist in minimizing damage, protect public health and safety.

6.5.1 Hazardous Materials

Nature of the Event/Emergency	An adjoining property has discovered an underground storage tank of fuel that has been leaking for an undetermined period.
Assess the Immediate Emergency	It is not known if the nearest well has been impacted. Sampling will need to be conducted to determine if the water has already been impacted.
Immediate Actions	Isolate the well from the distribution system. Properly collect samples for Total Petroleum Hydrocarbon (TPH) analysis or other recommended analysis that will screen for the potential contaminants.
Assess impacts to the entire system for secondary impacts (Water source, pumping systems, storage, distribution components)	Check the storage tank using caution. If there has been hydrocarbon contamination, the volatiles could be releasing in the air space. A sheen may also be visible on the surface. This would warrant isolation of the tank as well. If the tank has been impacted, it may need to be drained and cleaned before returning to service.
Notifications	• Notify NDEP BSDW initially, and during if any conditions change, then again when the emergency has been mitigated and ready to return to normal operations. • If the well or tank shows evidence of contamination, notify customers and the media that the facilities have been taken offline. • If water delivery is necessary, identify how it will be delivered and in what quantity. • When fully confirmed the well and tank are safe to bring back into service, notify customers and the media.

Mitigations	• Review existing mitigations. Will they be effective? Could they be improved upon? How? Are they improvements that could be easily added or wait for budgeting? • If the well is not affected, consider groundwater flow modeling to estimate the contaminant flow path and lead time. • Consider implementing a Wellhead Protection Program or Source Water Assessment Plan. • Learn of the remediation plans of neighboring properties.
Follow-up Actions	• Inspect all equipment and safety devices for proper operation. • Conduct a post emergency review. • Update ERP as needed.

6.6.2 Vandalism / Security Threat

Nature of the Event/Emergency	The storage tank gate, ladder access and access hatch are open. Locks have been cut.
Assess the Immediate Emergency	Other than the access being open, there is no visible evidence of contamination. No unusual odors. Could be teens going for a swim, or someone wanting to cause harm to the people. Be very vigilant and cautious.
Immediate Actions	Isolate the tank from the distribution system and at a minimum, collect samples for bacterial analysis.
Assess impacts to the entire system for secondary impacts (Water source, pumping systems, storage, distribution components)	Check other facilities for vandalism.
Notifications	• Notify NDEP BSDW initially, and during if any conditions change, then again when the emergency has been mitigated and ready to return to normal operations. • Notify customers and the media that the tank has been taken offline. • If water delivery is necessary, identify how it will be delivered and in what quantity. • Notify customers of the planned course of action to disinfect the tank per AWWA standards. • When fully confirmed the tank is safe to bring back into service, notify the customers and the media.
Mitigations	Review existing mitigations. Were they effective? Could they be improved upon? How? Are they improvements that could be easily added or must you wait for budgeting? Consider adding security cameras or electronic lock detection.
Follow-up Actions	• Inspect all equipment and safety devices for proper operation. • Conduct a post emergency review. • Update ERP as needed.

6.6.3 Cyber Security Breach

Cybersecurity is an increasing hazard for utilities. More and more utilities are the target of ransomware or facility disruption. You may think a small water system in rural Nevada would not be at risk. There is always the risk of a disgruntled employee or hacker starting small looking to go big.

Nature of the Event/Emergency	Chlorination remotely turned up resulting in excessive residual levels at 5 mg/l.
Assess the Immediate Emergency	A hacker logged into the SCADA system, increased the chlorine injection to high levels, then deleted programming.
Immediate Actions	Reinstall programs, load back-ups and change passwords. Reset chlorinator manually. Initiate chlorine residual monitoring throughout the distribution system. Prepare key messaging for media and customers.
Assess impacts to the entire system for secondary impacts (Water source, pumping systems, storage, distribution components)	Check other connected facilities for proper operation including office computers.
Notifications	• Notify NDEP BSDW initially, and during if any conditions change, then again when the emergency has been mitigated and ready to return to normal operations. • Notify customers and the media of the event and actions being taken. While chlorine residuals at those levels should not pose serious health effects, short term exposure may cause minor irritation to eyes, nose, or throat particularly for those with asthma. Suggest flushing their household lines to sinks in open areas rather than confined spaces like bathrooms. • When fully confirmed the chlorine residuals have returned to expected levels, notify the customers and the media and return to normal operations. • Report the incident to the Federal Bureau of Investigations (FBI) or Cybersecurity and Infrastructure Security Agency (CISA) or to the US EPA

Mitigations	Review existing mitigations. Will they be effective? Could they be improved upon? How? Are they improvements that could be easily added or must you wait for budgeting? When it comes to cybersecurity, a small water system may be at greater risk. Is there a single point of contact responsible for cyber activities for information technology (IT) and operational technology (OT)? Do you have a Cybersecurity Policy that addresses Remote Access, Access Control, Data Protection or Acceptable Use? The USEPA has created a Cybersecurity Self-Assessment Tool for public water systems. This may assist in identifying gaps in your cybersecurity.
Follow-up Actions	• Conduct a post emergency review. • Update ERP as needed.

6.6 Natural Disasters

There are many natural disasters that can impact your water system facilities. An event may impact facilities in multiple ways.

6.6.1 Drought

Nature of the Event/Emergency	Drought – lack of recharge
Assess the Immediate Emergency	Well water levels dropping
Immediate Actions	Call in a well driller to deepen the well (or intake level in the case of surface water).
Assess impacts to the entire system for secondary impacts (Water source, pumping systems, storage, distribution components)	Deepening the well may result in a change in water quality. Testing will be necessary. Consulting with a hydrogeologist may be warranted to identify alternative depth or aquifer.
Notifications	• Notify NDEP BSDW initially, and during if any conditions change, then again when the emergency has been mitigated and ready to return to normal operations. • Seek permitting through Division of Water Resources for well deepening. • Notify customers and the media of the need to cut unnecessary water usage (such as lawn watering) to reserve water for critical usage. • Notify customers and the media of any changes in water resources or need for treatment.
Mitigations	• Review existing mitigations. Were they effective? Could they be improved upon? How? Are they improvements that could be easily added or must you wait for budgeting?
Follow-up Actions	• Inspect all equipment and safety devices for proper operation. • Conduct a post emergency review. • Update ERP as needed.

6.6.2 Earthquake

Clearly a major earthquake near the epicenter may have significant impacts on the water system. However, earthquakes miles away can have an impact on your system depending upon soils and geology. Check your system for impacts such as: cracks, shifts in foundations, change in water quality or line breaks.

Nature of the Event/Emergency	Earthquake.
Assess the Immediate Emergency	6" PVC water line break.
Immediate Actions	See 6.2 Water Main Break.
Assess impacts to the entire system for secondary impacts (Water source, pumping systems, storage, distribution components)	• Inspect well and pump house for any damage to the structures, chlorinator or treatment facilities. • Check storage tank and foundation for any visible damage. • Check office, maintenance shop and other structures for damage. • Check distribution system for any other breaks or damage.
Notifications	• Notify NDEP BSDW initially, and during if any conditions change, then again when the emergency has been mitigated and ready to return to normal operations. • Notify impacted customers per NDEP BSDW requirements. • Follow-up with the media
Mitigations	Review existing mitigations. Were they effective? Could they be improved upon? How? Are they improvements that could be easily added or must you wait for budgeting?
Follow-up Actions	• Inspect all equipment and safety devices for proper operation. • Conduct a post emergency review. • Update ERP as needed.

6.6.3 High Winds

Nature of the Event/Emergency	High winds causing a dust storm.
Assess the Immediate Emergency	Dust and debris impacting vents on the storage tank.
Immediate Actions	Isolate the tank from the system. When safe, inspect the extent of impact and collect water samples to be analyzed for bacterial contamination. Chlorinate per AWWA C652 standards.
Assess impacts to the entire system for secondary impacts (Water source, pumping systems, storage, distribution components)	High winds and dust may impact other water system facilities. Inspect buildings to verify integrity. Check mechanical and electrical facilities that may be adversely impacted by fine dust.
Notifications	• Notify NDEP BSDW initially, and during if any conditions change, then again when the emergency has been mitigated and ready to return to normal operations. • Notify customers and the media of the event and ramifications. Bottled water will be supplied until such time as the storage tank is confirmed clean and bacteriologically absent of contamination.
Mitigations	Review existing mitigations. Were they effective? Could they be improved upon? How? Are they improvements that could be easily added or must you wait for budgeting?
Follow-up Actions	• Inspect all equipment and safety devices for proper operation. • Conduct a post emergency review. • Update ERP as needed.

6.5.4 Flood

Nature of the Event/Emergency	Rising flood waters impacting the well and pump house.
Assess the Immediate Emergency	Flood water entering the casing and pump house. Damage is likely to the chlorinator.
Immediate Actions	Isolate the well and pump house from the distribution system.
Assess impacts to the entire system for secondary impacts (Water source, pumping systems, storage, distribution components)	Check other facilities for damage due to flood water or runoff. Tank foundations, other wells, and pump houses. Check if access roads to facilities are passable.
Notifications	• Notify NDEP BSDW initially, and during if any conditions change, then again when the emergency has been mitigated and ready to return to normal operations. • Notify customers and the media that the flooded well is taken offline. • Notify customers of the planned course of action to disinfect the well per AWWA standards. • When fully confirmed the well and pump house are safe to bring back into service, notify the customers and the media.
Mitigations	Review existing mitigations. Were they effective? Could they be improved upon? How? Are they improvements that could be easily added or must you wait for budgeting?
Follow-up Actions	• Inspect all equipment and safety devices for proper operation. • Conduct a post emergency review. • Update ERP as needed.

6.6 Other Events to Address at a Minimum

- Extended Freezing Temperatures
- Deep or Heavy Snow
- Fire / Wildfire
- Epidemic/pandemic

Section 7.0 Alternative Water Sources

Alternative water sources should be identified to ensure a safe and continuous supply of drinking water will be available to customers in the event of an emergency. If another water utility is located nearby, an opportunity for interconnection may exist. When no possibility for an intertie exists, arrangements should be made to purchase water from a water hauler or from a bottled water supplier.

Water Source	Supplier Name	Contact Info
Interconnection w/ Partner Utility	None available	
Approved Water Hauler	Contact the NDEP BSDW for permitted water haulers	
Bottled Water Supplier		

Section 8.0 Returning to Normal Operations

In the conclusion of any emergency event, identify the general and specific steps to take:

Consider:

- Consult with the NDEP BSDW or appropriate District Health Department
- Notify and thank staff
- Notify customers and the media
- Summarize actions and associated costs in preparation for audits or submission for reimbursement
- Check gates and locks, operational settings, and return the system to normal operation
- Update ERP if warranted