December 2016
(Revised December 2023)

Community Source Water Protection Plan

– for –
Public Water Systems in Humboldt County, Nevada

Prepared by:

The Community Source Water Protection Local Planning Team in Humboldt County

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Humboldt County

City of Winnemucca

Golconda GID

McDermitt GID

Paradise Valley

Santa Rosa Station

Valmy Power Station

University of Nevada Reno Cooperative Extension Service

Nevada Division of Environmental Protection

Resource Concepts, Inc.

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Nevada Division of Environmental Protection
Resource Concepts, Inc.

Acknowledgements

The Source Water Protection Team wishes to acknowledge the technical assistance provided by Resource Concepts, Inc. and the U.S. Geological Survey, facility meeting accommodations provided by Humboldt County, and funding and technical assistance from the Nevada Division of Environmental Protection for the 2016 development and 2023 update of the Community Source Water Protection Plan for public water systems in Humboldt County. The Team appreciates the involvement of organizations listed in the following table that made this planning process possible. Contact the Humboldt County Manager's Office, Regional Planning Department, or local public water system for more information about the Community Source Water Protection Plan. Contact the Nevada Division of Environmental Protection, Bureau of Safe Drinking Water for general information about Nevada's Integrated Source Water Protection Program.

Organizations	
Public Water Systems	**Humboldt County**
• City of Winnemucca • CSS Farms LLC • Diamond Plastics • Golconda General Improvement District • McDermitt General Improvement District • Orovada General Improvement District • Paradise Valley (Town Board, Town Park, Community Hall) • Santa Rosa Station • Valmy Power Station	• County Assessor • County Manager's Office • Economic Development • Emergency Management • GIS / Drafting / Mapping • Regional Planning Department • Public Works (Star City Properties & Gold Country Estates Water Systems)
State of Nevada	**Technical Resources**
• Nevada Division of Environmental Protection, Integrated Source Water Protection Program • University of Nevada Reno, Cooperative Extension Service	• Nevada Outdoor School • Nevada Rural Water Association • Resource Concepts, Inc. & Subconsultants • Rural Community Assistance Corp. • SPB Utilities

Acronyms

BHPS	Bureau of Health Protection Services (State/presently Bureau of Safe Drinking Water)
BLM	Bureau of Land Management
BSDW	Bureau of Safe Drinking Water (State/DEP)
BWPC	Bureau of Water Pollution Control (State/DEP)
CSWP	Community Source Water Protection
DCNR	Department of Conservation and Natural Resources (State)
EPA	U.S. Environmental Protection Agency (Federal)
GID	General Improvement District
GIS	Geographic Information System
GPM	Gallons per Minute
GPS	Global Positioning System
ISWPP	Integrated Source Water Protection Program
MCL	Maximum Contaminant Level
NAC	Nevada Administrative Code
NDOT	Nevada Department of Transportation
NDEP	Nevada Division of Environmental Protection (State)
NRS	Nevada Revised Statutes
NTNC	Non-Transient Non-Community
NvRWA	Nevada Rural Water Association
PCSs	Potential Contaminant Sources
PWSs	Public water systems
RMP	Resource Management Plan
RCI	Resource Concepts, Inc.
SWPAs	Source Water Protection Areas
UPRR	Union Pacific Railroad
USGS	U.S. Geological Survey
WHPAs	Wellhead Protection Areas
WHPP	Wellhead Protection Plan

Executive Summary

This Community Source Water Protection Plan documents the public drinking water resources in Humboldt County, and the measures that communities and water systems intend to implement to protect those resources from contamination. This Plan is a tool to facilitate cooperation between water purveyors, local and state agencies, industry, community leaders, and citizens to aid in the water quality protection for public drinking water sources in Humboldt County.

The Local Planning Team (Team) responsible for creating and implementing this document is composed of representatives from the various public water systems in Humboldt County as well as local government agencies (documented in Appendix B). Initiated in 2015, the Team met frequently over the course of fifteen months to develop this plan, which was then adopted in 2016 by the Humboldt County Board of Commissioners and the City of Winnemucca City Council in 2016. In 2020, the plan incorporated by reference as part of the Humboldt County Master Plan. The first plan update was prepared in 2023 to reflect changes at a few of the public water systems, recognize source water protection accomplishments since initial adoption of the plan, and refresh the Action Plan

The Team identified five goals to guide the Plan development and implement local strategies to protect the quality of public drinking water sources:

- **Goal 1:** Develop a readily accessible countywide Community Source Water Protection Plan.
- **Goal 2:** Coordinate and collaborate regarding clean drinking water protection.
- **Goal 3**: Support countywide understanding of and planning for water sources to ensure clean drinking water for future generations.
- **Goal 4:** Increase awareness of drinking water and how to protect it.
- **Goal 5:** Promote compatible economic development within Source Water Protection Areas and identified Areas of Interest.

Public water systems are located in three hydrographic regions: the Humboldt River Basin, the Black Rock Desert Region, and the Northwest Region. The majority of systems occur in the southeastern portion of the County in the Humboldt River Basin. The Plan considered all active community and non-community public water systems, except those operated by and serving only isolated mining facilities. More than twenty-four public water systems are evaluated in the Plan.

Both groundwater and springs are sources of drinking water in Humboldt County. More than thirty-eight wells and three springs were investigated to estimate how far a pollutant might travel to be able to reach an individual well. The technical approach for delineating these well and spring "capture zones" is described in the Capture Zone Evaluation Report provided as Appendix C.

Categories of facilities and activities with a potential risk of polluting public drinking water are designated in State guidelines as "Potential Contaminant Sources." An inventory of such facilities and activities located near public water systems in Humboldt County was prepared by interviewing water system operators, reviewing electronic databases, and conducting field investigations. A summary of

Potential Contaminant Sources is provided in Appendix D. Of primary interest near public water systems are:

- Individual sewage disposal systems (septic systems) in high to moderate density residential developments elevating nitrates in groundwater, where the Team acknowledged the Grass Valley area as the high priority concern;
- Fuel stations, repair facilities, and other commercial operations located primarily along transportation corridors where petroleum products are transferred and stored in underground or aboveground tanks;
- Highway and railroad corridors where transportation accidents could spill hazardous or toxic materials into the environment; and,
- General irrigated agriculture where poor storage or application practices could release chemicals or fertilizers.

Source Water Protection Areas are composed of the land surrounding water supply sources where activities are managed to protect the water supply from becoming contaminated. These management area boundaries were developed by the Team based on evaluation of the capture zones for water supply wells and springs, with relation to locations of potential contaminant sources. The Team also identified Areas of Interest where management of up-gradient watersheds was of interest to local communities for source water protection, groundwater recharge, and compatible access/activities.

Using the information gathered, analyzed, and mapped, the Team developed five categories of management strategies to achieve the Plan goals: 1) education, 2) coordination and collaboration 3) resource investigation, 4) planning, and 5) physical improvements. To implement these strategies, the Team created a broad list of actions that are applicable countywide or more locally for specific source water protection areas or water systems.

The Action Plan, provided in Appendix E, describes these actions and designates: completion status, initial responsibility, the type of assistance needed, priority ranking, and target implementation year(s). Naturally, the actions will continue to be implemented as funding, staff and time allows. As a result of this planning process, many of the highest priority actions have been accomplished or are currently underway.

Education and outreach are the most comprehensive strategies emphasized by the Team. The Education and Outreach Plan, provided in Appendix F, consolidates this information to provide a set of messages and tools that can be used to promote source water protection by a variety of different stakeholders.

Community Source Water Protection will be revisited annually to ensure its continued success. The public water providers may identify updates for new water sources or events that change the characteristics of a water supply. Technical and financial resources for priority actions can be identified and scheduled for completion. Revisions will be documented in the Executive Summary, Revision History.

This Plan is a tool to facilitate cooperation between water purveyors, local and state agencies, industry, community leaders, and citizens to aid in the water quality protection for public drinking water sources in Humboldt County. The Plan identifies goals, drinking water resources, potential contaminant sources, strategies and actions to prevent drinking water contamination, and a path to keep the plan relevant.

Revision History

Revision Date	Description
November 23, 2020	Resolution No. 11-23-20, Approving the Source Water Protection Plan as an update and/or amendment of the County Master Plan Document.
December 2023	General updates to the Plan, include: • Acknowledgements & Executive Summary & Table of Contents • Description of water sources, Table 1.1, Section 1.4 • Description of existing plans, Section 1.5 • Update to local planning team information, Section 2.1 and 2.2 • Add to plan objectives, Section 2.3 • Update source water inventory, Sections 3.1 and 3.2 • Description of potential contaminant sources, Section 3.3 • Update new well siting and new water sources, Section 3.6 • Add to potential funding considerations, Table 4-1 Appendix A, Source Water Protection Area Maps: • Revise maps of Grass Valley 2 SWPA • Add maps of 1000-foot buffer for three new public water system wells Appendix B, Meeting and Public Participation Documentation: • Add key documentation from 2017 to 2023 Appendix C, Capture Zone Evaluation Report: • Update water source inventory (six new well locations) • Add and update corresponding Preliminary Capture Zone Maps Appendix D, Potential Contaminant Source Summary: • Revise to Grass Valley 2 SWPA • Add 1000-foot buffer to three new public water system wells • Update potential contaminant source inventory for new wells Appendix E, Action Plan: • Highlight actions implemented from 2016 to 2023 • Add actions to consider implementing in the future Appendix F, Public Education and Outreach Plan: • Update materials and links

Revision Date	Description
July 2026	Routine update to the Plan; minor updates are now included in a new appendix to the Plan (Appendix G, Plan Update Materials). Updates include the following: • Revised public water system inventory and status • Updated Local Planning Team participation and roles Appendix A, SWPA Maps • Added SWPA map for new water system (P&L Denio Junction RV Park, State ID NV0004051) Appendix B, Documentation • Added 2026 Local Planning Team meeting records Appendix D, Contaminant Source Inventory • Update potential contaminant source inventory to include Tier II reporting facilities located within SWPAs and AOIs Appendix E, Action Plan • Updated the Action Plan to include accomplishments from 2023-2026 • Added several revised and new actions for continued implementation

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Appendices (Provided as Separate PDF Files)

Appendix A Source Water Protection Area Maps
Appendix B Meeting and Public Participation Documentation
Appendix C Capture Zone Evaluation Report *(Contains Sensitive Information*)*
Appendix D Potential Contaminant Source Summary *(Contains Sensitive Information*)*
Appendix E Action Plan
Appendix F Public Education and Outreach Plan
Appendix G Plan Update Materials (July 2026)

** See Humboldt County Manager's Office,*
the Humboldt Regional Planning Department, or
the local public water system for review.

File Doc: 2026-07-27 final Main CSWPP_HM_NDEP_20-158.C40 jls-ac-jm L5-19-updated.docx

1.0 Introduction

1.1 Overview

Community Source Water Protection involves voluntary actions to prevent the pollution of community drinking water sources, including groundwater, lakes, rivers, springs and streams. The Nevada Integrated Source Water Protection Program is a voluntary program, where the Nevada Division of Environmental Protection, Bureau of Safe Drinking Water, provides technical assistance to communities who wish to develop and implement a Community Source Water Protection Plan. Community driven strategies are outlined to manage land uses and "man-made" sources of contamination in the vicinity of public water supplies. Local plans are long-term commitments by the communities to protect their drinking water (NDEP, 2010).

Source Water Protection Areas are comprised of the land surrounding a water supply source where the community has established a precautionary boundary to manage activities and protect their drinking water quality. The Source Water Protection Areas allow communities to plan for and respond to situations before contamination occurs.

1.2 Background

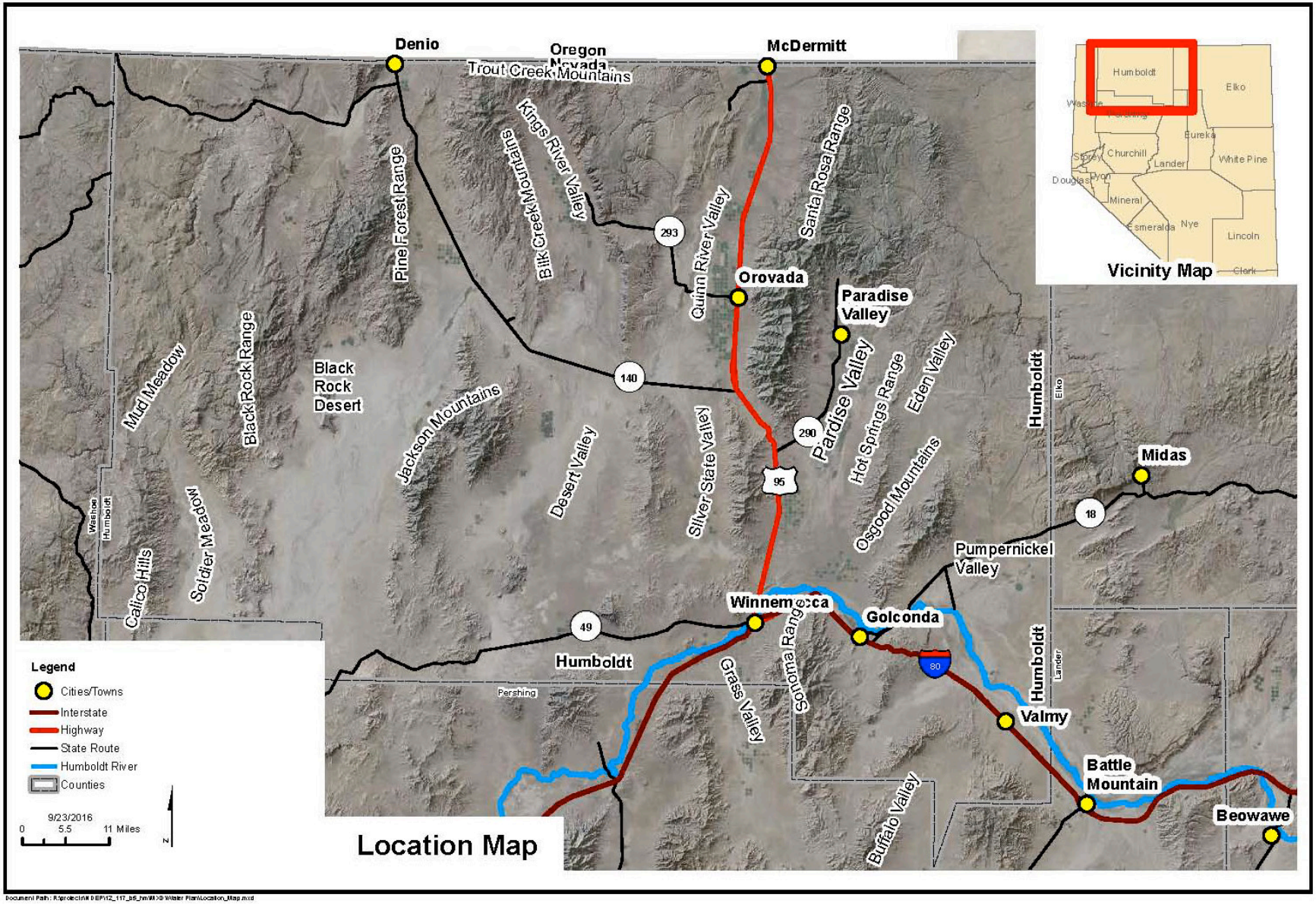
Public water systems in Humboldt County, Nevada, have voluntarily participated in the development of this comprehensive and coordinated Community Source Water Protection Plan in order to protect their drinking water resources, and thereby ensure a high quality, sustainable water supply for their communities. This Community Source Water Protection Plan includes 24 active and 3 inactive public water systems in Humboldt County primarily located in the Winnemucca Area, Golconda, Paradise, Orovada, McDermitt, Valmy, and Denio communities (Figure 1). For purposes of this Plan, the term "Community" collectively refers to the public water systems, residents and local government located within areas of Humboldt County.

The development and update of this plan is based on the guidance document entitled "Nevada Integrated Source Water Protection Program", which was prepared by the Nevada Division of Environmental Protection in February 2010, as an update to the 1994 State Wellhead Protection Program. The guidance document sets the framework for local plan development and outlines the criteria required for a Community Source Water Protection plan to receive State endorsement. With a State-endorsed plan, a local Community may be eligible to receive additional technical assistance from the Nevada Division of Environmental Protection to continue implementing the management strategies outlined in the Community Source Water Protection Plan. This Community Source Water Protection Plan has been developed and updated with the intention of achieving State endorsement.

1.3 Plan Purpose

The purpose of this Community Source Water Protection Plan is to document the public drinking water resources in Humboldt County, and the measures that the public water systems and local government intend to implement to protect those resources from contamination. The Community Source Water Protection Plan is a tool to facilitate cooperation between water purveyors, local and State agencies, industry, community leaders, and citizens to aid in the management and continued quality of the drinking water resources in Humboldt County.

Figure 1. Location Map



1.4 Description of Planning Area and Source Water

1.4.1 Location and Setting

Humboldt County encompasses approximately 9,658 square miles in west-central Nevada. Humboldt County is bordered to the north by Oregon, to the west by Washoe County, to the south by Pershing County, to the east by Elko County, and a small portion of Lander County on the south and west corner of the County (Figure 1).

The City of Winnemucca is the county seat and only incorporated city with a population of approximately 8,399 residents (U.S. Census Bureau, 2022). Census–designated places include Denio, Fort McDermitt, McDermitt, Golconda, Orovada, Paradise Valley and Valmy. The County has a population of about 17,272 residents as of the 2022 census estimate. Humboldt County's population is estimated to increase more than 7% by 2041 based on Nevada's 20-year Population Projections (Lawton, 2022).

1.4.2 Public Water Systems

A public water system is defined by Nevada Revised Statutes (NRS) 445A.235 as "a system, regardless of ownership, which provides the public with water for human consumption through pipes or other constructed conveyances, if the system has 15 or more service connections, as defined in NRS 445A.843, or regularly serves 25 or more persons". There are three types of public water systems in Humboldt County that are regulated by the State of Nevada: Community, Transient Non-Community, and Non-Transient Non-Community.

Community Water Systems

A Community Water System (C) has at least 15 service connections used by year-round residents of the area served by the water system or regularly serves at least 25 year-round residents of the area served by the water system (NRS 445A.808). Examples include municipal water systems operated by a county, town or mobile home parks.

Transient Non-Community Water Systems

A Transient Non-Community Water System (NC) does not regularly serve the same persons (NRS 445A.828). Examples include convenience stores, restaurants, parks, camping resorts, and gas stations throughout Humboldt County.

Non-Transient Non-Community Water Systems

A Non-Transient Non-Community Water System regularly serves at least 25 of the same persons for more than 6 months per year (NRS 445A.829). Examples include schools and manufacturing facilities.

This Community Source Water Protection Plan considers 7 Community, 12 Transient Non-Community, and 8 Non-Transient Non-Community public water systems (Bureau of Safe Drinking Water, 2023). The current and proposed future public wells included in this plan are summarized by the public water system type in the following sections and tables.

Table 1-1. Water System Wells Considered in this Plan

Water System Number and Name[1/]	Local Well Name/ State Identifier	Water System Type
NV0000001 Denio Junction	Well 1 / W01	Transient Non-Community
NV0000162 McDermitt General Improvement District	Well 1 / W01 Well 2 / W02[5/] Well 3 / W03	Community
NV0000248 City of Winnemucca	Railroad Spring / SP05 Well 5 / W03 Well 6 / W04 Well 7 / W06 Well 4 / W07 Well 2A / W08 New Well 8 / W11	Community
NV0000252 Star City Properties	Well 1 / W01 Well 2 / W02	Community
NV0000352 Scott Shady Court[2/]	West Well 1 / W01 East Well 2 / W02 Middle Well 3 / W03	Transient Non-Community
NV0000915 A1 Fuel Stop (Santa Rosa Station)[3/]	Well 1 / W01	Transient Non-Community
NV0001054 NDOT Button Point Roadside Park[4/]	Well 1 / W01	Transient Non-Community
NV0002095 Pilot Travel Center	Well / W01	Non-Transient Non-Community
NV0002102 NDOT Valmy Roadside Park	Well / W01	Transient Non-Community
NV0002106 Paradise Valley Park	Well 1 / W01	Non-Transient Non-Community
NV0002112 Valmy Chevron (Valmy Station)[3/]	Well 2 / W02	Transient Non-Community
NV0002113 Paradise Valley Community Hall	Well 1 / W01	Transient Non-Community
NV0002186 Paradise Valley Elementary School	Well 1 / W01	Non-Transient Non-Community
NV0002198 Kings River Elementary School	Well 2 / W02	Non-Transient Non-Community
NV00002191 Sand Dune Saloon[4/]	Well 1	Transient Non-Community
NV0002220 Lye Creek Campground	Spring / SP01	Transient Non-Community
NV0002513 North Valmy Power Plant	Well GP 3B / W03 Well GP 2R / W04	Non-Transient Non-Community

Water System Number and Name[1/]	Local Well Name/ State Identifier	Water System Type
NV0002542 Royal Peacock RV Park	Well 1 / W01	Transient Non-Community
NV0002543 Virgin Valley Campground	Well 1/W01	Transient Non-Community
NV0003016 Valmy Station Mobile Home Park	Well 1/W01	Community
NV0003032 Orovada Water District	Well 1 / W01 Well 2 / W02	Community
NV0003079 Gold Country Estates	Well 1 / W01 Well 2 / W02 Domestic Well 3 / W03 Fire Well 4 / W04 Future Well 5	Community
NV0005029 Golconda General Improvement District	Pole Spring Pole Creek Well/W01 I-80 (Fire) Well / W03	Community
NV0005069 Humboldt Conservation Camp	Well /W01	Non-Transient Non-Community
NV0001148 Diamond Plastics[6/]	Well 2 / W02	Non-Transient Non-Community
NV0001191 CSS Farms LLC[6/]	Well 1 / W01	Non-Transient Non-Community
NV0002094 Diamond Inn Bar[6/]	Well / W01	Transient Non-Community

[1/]The water system numbers and names are from the Bureau of Safe Drinking Water 2023.

[2/]Active public water system in 2016, but connected to City of Winnemucca system at the time of the 2023 update. The wells have not yet been decommissioned and therefore continue to be included in this plan.

[3/]Updated water system name, with past water system name in 2016 shown in parentheses.

[4/]Active Public Water System in 2016, but not active at the time of the 2023 plan update. The system has the potential to be an active Public Water System in the future, and therefore continues to be included in this plan.

[5/]Active well in 2016, but not active at the time of the 2023 plan update. The well has the potential to be an active public supply well in the future, and therefore continues to be included in this plan.

[6/]Active public water system added in 2023.

1.4.3 Future Wells

Identifying future well locations for source water protection planning can ensure the reliability and sustainability of the water supply. Public water systems work closely with hydrogeologists, engineers, and State regulators to understand the local geology, hydrogeology, environmental impact, and infrastructure and accessibility to make an informed decision about future well locations. In the current plan, there is one future well, Future Well 5, proposed for the Gold Country Estates water system (2023 update) in the Grass Valley Area.

1.4.4 Inactive Wells

Inactive wells are wells that have been taken out of service due to various reasons, or are associated with systems no longer permitted by the Bureau of Safe Drinking Water as "active" public water systems. The Sand Dune Saloon, Scott Shady Court, and the Nevada Department of Transportation Button Point Roadside Station were previously active public water systems (2016), but are not active at the time of the of the current plan update (2023). These systems continue to be included in this plan because they have potential to become active public water systems in the future, or have inactive wells that have not yet been decommissioned (Table 1-1).

1.4.5 Mining Facility Water Systems

Several mining facilities throughout Humboldt County have related public water systems. In 2016, facilities were invited to participate, but in general have isolated locations, manage their water system with oversight by the State of Nevada Bureau of Safe Drinking Water, and manage potential contaminant sources with oversight by the State of Nevada Bureau of Mining Regulation and Reclamation. These water systems are not addressed in the Community Source Water Protection Plan.

1.5 Existing Plans and Studies

There are several existing plans and studies that are relevant to and/or used in the development of this Community Source Water Protection Plan. Key information considered is listed in the following sections.

1.5.1 Humboldt County Regional Master Plan

In November 2020, the Community Source Water Protection Plan was adopted by reference as part of the Humboldt County Regional Master Plan (2012). In addition, it complements the Capital Facilities Element, Statement of Goals and Policies:

> ***Goal #4:*** *To ensure that negative impacts on groundwater resources are minimized.*
>
> *Policy 1: Promote public education and awareness regarding groundwater management issues.*
>
> *Policy 3: Encourage policies that would protect groundwater quality through sound wastewater and solid waste management.*
>
> *Policy 4: Encourage compliance with the City of Winnemucca's Wellhead Protection Plan in land development proposals.*

1.5.2 Water Plan Humboldt County, Nevada

The purpose of the Water Plan for Humboldt County, Nevada (Water Plan, 2020) is to outline opportunities for the people of Humboldt County to enhance and protect water to sustain economic vitality and opportunities for future generations. The Community Source Water Protection Plan coincides with specific Water Plan Goals and Objectives, including:

> ***Goal #3:*** *To protect surface and groundwater quality in the County with a focus on drinking water supplies.*
>
> - *Manage potential sources of groundwater and surface water contamination.*
> - *Manage wastewater for the sustainability of water sources.*
> - *Incorporate water quality protection into land-use planning.*

These plans support one another by outlining ways in which communities can manage water resources at the local level to protect and enhance surface and groundwater quality. Source water protection is the first line of defense a community has to protect drinking water supplies, and the Water Plan recognizes that water use in Humboldt County depends on the quality of water available. The Water Plan addresses planning efforts to avoid potential contamination from inadequate infrastructure and working collaboratively with affected communities to protect and preserve drinking water supplies for future generations.

Additionally, the Water Plan supports for implementation of the Community Source Water Protection Plan as follows:

> ***General Policy 5:*** *The County shall establish density requirements for individual well and septic systems and expand service areas where appropriate and necessary to avoid groundwater contamination and to meet drinking water standards. (In order to achieve this policy, the County must enact an Ordinance.)*
>
> ***Procedure:*** *The County shall implement and abide by the 2016 Community Source Water Protection Plan for Public Water Systems in Humboldt County to establish measures that prevent groundwater contamination.*

1.5.3 Humboldt County Public Lands Policy

"There are 6.2 million acres on Humboldt County of which 80 percent are under public ownership" (Humboldt County Regional Master Plan, 2012). During 2023, Humboldt County has been actively engaged in developing and adopting public lands polices to comprehensively address interaction between local government and the Federal agencies that manage publicly owned lands. Sources of drinking water for communities in Humboldt County can be affected by these management activities, for example: fire and fuels management, access to wells and springs located on public lands, , security of infrastructure near recreation sites, renewable energy development (solar, wind and geothermal projects), and mineral development. The forthcoming public lands policy will provide direction for the protection of drinking water sources for public water systems in Humboldt County.

1.5.4 Natural Resource Conservation Service (NRCS), Source Water Protection Watersheds

The 2018 Farm Bill includes language that requires NRCS programs consider source water protection. "It mandates addressing excessive nutrients and other impairments drinking water sources (groundwater or surface water)" (NRCS, October 2023). Select watersheds in the Grass Valley and Paradise Valley areas have been targeted for agricultural assistance through implementation of "Source Water Protection Priority Practices". Funding incentives for source water protection projects can be applied for by producers through the NRCS Environmental Quality Incentives Program (EQIP). Through annual collaboration between the NRCS (State Office and Winnemucca Service Center) and local source water protection stakeholders, these NRCS designated source water protection priority watersheds can be maintained or changed.

1.5.5 Existing Wellhead Protection Plans

The Nevada Integrated Source Water Protection Program was developed by the Nevada Division of Environmental Protection in February 2010 as an update to the 1994 Nevada Wellhead Protection Program. A Wellhead Protection Plan is similar but more limited scope than a Community Source Water Protection Plan, in that it considers only safeguarding an individual Public Water System's wellheads, and does not address surface water or integration of source water protection strategies into the county-wide planning framework.

Three of the Wellhead Protection Plans in Humboldt County were superseded by the 2016 Community Source Water Protection Plan and the Golconda General Improvement District Wellhead Protection Plan was updated by the Nevada Rural Water Association in 2020. The 2020 Golconda WHPP reflects information and management strategies from the Community Source water Protection Plan and any additional actions have been incorporated into this county-wide update.

1.5.6 Vulnerability Assessment Program and Source Water Assessment Programs

The Vulnerability Assessment Program and Source Water Assessment Program are both programs administered by the State of Nevada Bureau of Safe Drinking Water. The Vulnerability Assessment Program investigates and assesses the vulnerability to contamination of public water system sources, and is used to obtain waivers for various drinking water monitoring parameters. The Source Water Assessment Program is required by the federal Safe Drinking Water Act Amendments of 1996 to analyze existing and potential threats to the quality of the public drinking water throughout the State. Pertinent existing information from these programs was reviewed and used for individual water system investigations (well locations, aquifer properties, and past potential contaminant sources).

1.5.7 U.S. Geological Survey and Nevada Division of Water Resources

There are a number of U.S. Geological Survey studies regarding groundwater hydrology that were used in the development of groundwater models for each well. All studies are referenced at the end of this document. Valley-specific and regional reports for the Humboldt River, Quinn River and tributaries prepared by the U.S. Geological Survey were key in the selection of groundwater parameters such as transmissivity values. The Nevada Division of Water Resources well logs provided useful geology and hydrology information for the modeling in other areas of Humboldt County.

1.5.8 Other Resources

Regulatory and other agencies maintain a variety of electronic databases useful in the mapping considered or developed for this Community Source Water Protection Plan. Publicly available data were used for topography, geology, land ownership, land use zoning/land use, and potential contaminant sources. Mapping data was also provided by the Bureau of Land Management from their Resource Management Plan (RMP, 2015).

2.0 Team Formation & Program Goals

2.1 Team Formation Summary

A local planning Team plays a vital role in source water protection by bringing specialized community knowledge to ensure that Community Source Water Protection Plan strategies are well-thought out and written to satisfy the needs and desires of the community. Community-driven strategies are more likely to engage the public and relevant stakeholders to make certain that everyone is working together to maintain a safe and sustainable drinking water supply.

In June 2015, the Integrated Source Water Protection Program and Resource Concepts, Inc. staff presented the Community Source Water Protection Plan development process and assistance opportunities to the Humboldt County Board of Commissioners, resulting in a letter from Humboldt County to the State requesting participation in the program.

Following this request, the State sent letters inviting participation in the program to all public water system owners (Table 1-1) and many other stakeholders in the community (Appendix B). Resource Concepts, Inc. also phoned and emailed public water system owners or operators to introduce them to Resource Concepts' role in the program and to solicit participation in the Team. The "Kick-Off" meeting was held October 28, 2015 and hosted at the Humboldt County commissioners' chamber. Subsequently, Resource Concepts, Inc. met individually with interested public water systems to discuss the program with them and garner water system information. Owners and operators offered preliminary input about local concerns, which was later used to formulate management strategies.

Team meetings were held from September 2015 through August 2016 to review technical information and to develop the community's strategies for source water protection. Meeting agendas and summaries are provided in Appendix B. Invitations to public water well owners and other stakeholders were provided either via e-mail, regular mail or phone call prior to each meeting. Agendas and meeting materials were typically sent at least one week in advance of the meetings. Resource Concepts, Inc. developed a web page (www.rci-nv.com/source_water_protection) containing all pertinent project information including team members, meeting minutes, working documents, and maps.

On December 12, 2016, the Humboldt County Board of Commissioners and the City of Winnemucca City Council adopted the Humboldt County Community Source Water Protection Plan as an official plan of Humboldt County and the City of Winnemucca (Joint Resolution No. 2016-01). On November 23, 2020, the Humboldt County Commissioners approved, "the Source Water Protection Plan as attached as Exhibit 1 hereto and incorporates this Plan into the Master Plan Document by reference," (Resolution No. 11-23-20) A copy of Resolution No. 11-23-20 is provided in Appendix B.

In July 2023, the Humboldt County Manager's Office reached out to the Nevada Integrated Source Water Protection Program. The Manager's Office expressed interest in updating the 2016 Humboldt County Community Source Water Protection Plan, including:

- Update the Planning Team,
- Update the water source inventory, including new water systems,

- Update Existing Plans and Studies to reference County plans relevant to source water protection,
- Update the Source Water Protection Areas for new water systems and future well locations,
- Update the Action Plan, including a review to highlight ongoing source water protection efforts and achievements, and identify any future source water protection goals and projects, and
- Update the Education Plan.

Public water systems and various stakeholders were contacted individually to gather pertinent information included in this update. Table 2-1 lists the Team members who participated.

2.2 Local Planning Team Members and Roles

The local Team includes experts, stakeholders, and community representatives who collaborated to develop and update this Community Source Water Protection Plan, with one common goal: to safeguard the quality of drinking water sources. Early in the planning process, the Team was formed to update this Community Source Water Protection Plan. All Team members provided technical and planning information regarding their water system or area of expertise as outlined in Table 2-1. Team members, as well as representatives of all of the public water systems, were invited to meetings and kept appraised of the Plan's progress.

Table 2-1. Local Planning Team Members and Roles

Name, Title	Jurisdiction and Role
Alicia Heiser, City Manager/City Engineer	City of Winnemucca coordination and water system review
Alison Cramer, Environmental Specialist	RCI Technical Assistance
Betty Lawrence, Senior Planning Technician	Regional Planning Department (County and City)
Carol Lynn	Humboldt County Emergency Manager
Bronwyn Schofield	Golconda GID Board Member
Dave Mendiola, County Manager	Humboldt County overview and coordination
Don Kalkoske, Public Works Director	Humboldt County water system review
Ethan Mason, ISWPP Coordinator	Nevada DEP, Technical and Funding Assistance
Jessica Smith, GIS Technician	Humboldt County GIS Technician
Jill Sutherland, Engineer	RCI Technical Assistance
Michelle Hammond Allen, Economic Development Officer	Humboldt County overview and coordination

2.3 Source Water Protection Goals

Source water protection goals provide a clear framework for planning and developing community-driven strategies which can help communities ensure the availability of clean and safe drinking water. The Team identified the following local community goals and objectives to protect drinking water during a series of meetings. The goals are numbered for ease of reference and to not imply priority. These goals guided the development of this Community Source Water Protection Plan and tie in with the management strategies described in Section 3.4 and the Action Plan, provided in Appendix E, to achieve source water protection. These goals provided a strong and consistent trajectory to achieve source water protection in Humboldt County, and they continue to align with current and future water quality objectives. These goals are:

Goal 1: Develop a readily accessible countywide Community Source Water Protection Plan.

- Update and incorporate existing Wellhead Protection Plans.
- Include all public water systems and information for those without existing plans.
- Provide hard copies at public offices, availability on the internet, etc.

Goal 2: Coordinate and collaborate regarding clean drinking water protection.

- Adopt the Community Source Water Protection Plan into the County Master Plan.
- Adopt the Community Source Water Protection Plan into the County Emergency Operating Procedure.
- Develop accessible and updatable mapping.
- Improve communication among the Federal, State and local agencies, land managers/owners, and public water systems.
- Implement action items identified by the Plan.

Goal 3: Support countywide understanding of and planning for water sources to ensure clean drinking water for future generations.

- Provide tools for evaluating future development, water needs and potential for drinking water contamination.
- Help decision makers and residents to understand actions that contributed to water quality issues in the past, to avoid these issues in the future.
- Provide guidance to decision makers on the processes available to assist the implementation of actions to protect future use.

Goal 4: Increase awareness of drinking water and how to protect it.

- Identify target audiences.
- Identify knowledge gaps and education needs.
- Reach audiences with effective information.
- Implement the use of social media public service announcements.

Goal 5: Promote compatible economic development within Source Water Protection Areas and identified Areas of Interest.

- Consider the vulnerability of the aquifer or wells to contamination.
- Develop a policy regarding compatible uses so that these uses are allowed on public lands.

3.0 Plan Development

3.1 Drinking Water Source Inventory and Planning

3.1.1 Plan Area Setting

Groundwater is the primary source of drinking water for public water systems in Humboldt County. Public water systems in Humboldt County can be described within three separate Hydrographic Region (State Engineer to describe regional groundwater basins in Nevada):

- The Humboldt River Region, encompassing the southeastern portion of the County and all but seven of the public water systems in the County;
- The Black Rock Desert Region, encompassing over half of the County and three of the public water systems; and
- The Northwest Region, encompassing the northwest quarter of the County and four of the public water systems.

Geologic and hydrologic details for each well are provided in the Capture Zone Evaluation Report provided as Appendix C. Appendix C contains sensitive information. Contact the Humboldt County Manager's Office, Regional Planning Department or the local public water system for review of the Capture Zone Evaluation Report.

3.1.2 Historical, Current and Projected Future Groundwater Conditions

Winnemucca and Grass Valley Area

There are 18 public supply wells, one future well location, and two public supply springs in the Winnemucca Segment-Grass Valley area of the Humboldt River Basin, including:

- Municipal supply wells: six serve the City of Winnemucca, two serve the Golconda General Improvement District, two and four serve Star City Properties and Gold Country Estates respectively (both systems are owned by Humboldt County) with one future well location identified near the airport.
- Privately owned public supply wells: one serves the Pilot Travel Center truck stop, and one serves Diamond Plastics Corporation near Golconda.
- State owned public supply wells: one serving the minimum-security prison approximately ten miles southwest of Winnemucca and one at the I-80 rest stop about seven miles northeast of town (inactive 2023).
- Railroad Spring serves the City of Winnemucca and is approximately three miles southeast of Winnemucca.
- Pole Creek Spring serves the Golconda area and is approximately three miles south of Golconda.

There are three aquifers in the Winnemucca-northern Grass Valley area along and adjacent to the Humboldt River:

1) a confined volcanic-rock aquifer at depths of 300 feet or more;
2) a confined basin-fill aquifer south of and beneath the river flood plain; and
3) the shallow, medial gravel aquifer beneath and adjacent to the Humboldt River floodplain.

With the exception of municipal wells finished in volcanic rocks, the basin-fill aquifer is the main source of water to public supply wells in the area. In addition, this aquifer has been a primary source of water to irrigation wells since the 1950's (Cohen, 1964, p. 22). Groundwater levels in northern Grass Valley and adjacent parts of the Winnemucca Segment have declined as much as 15 to 40 feet during the past 15-25 years (Nevada DWR, 2023).

Paradise Valley Area

Paradise Valley is a north-south trending basin more than 40 miles long in the Humboldt River Basin, extending from the Humboldt River east of Winnemucca north to the east side of the Santa Rosa Range. The small community of Paradise Valley is at the north end of the valley.

There are five public supply wells in Paradise Valley:

- Three wells serve the school, park and community center in town.
- One well serves the A1 Fuel Stop (Santa Rosa Station) and one serves CSS Farms, LLC.

All of these wells are finished in basin-fill deposits that consist of unsorted to sorted gravel, sand, silt and clay (Prudic and Herman, 1996, p.8). Pumping for irrigation in Paradise Valley is extensive, especially in the southern part. Groundwater levels have declined over 80 feet in the center of the agricultural areas from 1991 to 2014. Groundwater levels have since stabilized to approximately 30 feet below the trend levels in the 1990s. (Nevada DWR, 2023).

One of three springs used for public water supply in Humboldt County is at the Lye Creek Campground, located north of Paradise Valley at high altitude in the Santa Rosa Range.

Southeastern Humboldt County

Near Valmy, also in the Humboldt River Region, the Community Source Water Protection Plan considers four public water systems centered along the I-80 corridor, which are served by five wells. Nearby groundwater level data is only available near the Humboldt River, where levels have remained relatively stable since 2005 (NDWR, 2023).

Quinn River and Kings River Valleys

The Quinn River and Kings River Valleys, Black Rock Desert Region, host 5 public water systems:

- Two wells serve McDermitt at the state line.
- Two wells serve Orovada 30 miles to the south.
- One serves the Kings River Elementary School.

In addition to these wells, numerous irrigation wells have been drilled in these valleys and some are near the public supply wells. Near the Orovada and Kings River Elementary School public water system wells, groundwater has declined as much as 30 and 95 feet, respectively, between 1991 and 2021. Near the McDermitt public water system wells, groundwater levels have remained relatively stable (Nevada DWR, 2023).

Northwestern Humboldt County

The Northwest Region hosts four public water systems, including:

- Two wells in the Virgin Valley hydrographic area at the Royal Peacock RV Park and the Virgin Valley campground.
- Two public supply wells in the Denio area are located in the Pueblo Valley hydrographic area.

Groundwater levels in the Pueblo Valley area have dropped roughly 5 feet from 2017 to 2022 (Nevada DWR, 2023). Published groundwater levels for the Virgin Valley were not available.

3.1.3 Current Measures for Protecting Groundwater from Potential Contaminants

Public water purveyors in Humboldt County have implemented a number of measures to protect groundwater and springs from contaminant sources through existing plans and ordinances since 2016 (Section 1.5). The existing WHPPs have been utilized to protect groundwater resources. The various actions of each entity to protect groundwater are summarized in the following tables.

Table 3-1. Actions Implemented by the City of Winnemucca to Protect Source Water

Physical Actions	• Placed Wellhead Protection Area signage and fencing, including six-foot chain-link fencing with locked gates, booster stations, and well buildings.
Education and Outreach	• Provided literature at the Water and Zoning Departments regarding proper well and septic tank maintenance. • Community service announcements in the local paper and radio station, and bills.
Coordination, Ordinances and Other Plans	• Prepared a Wellhead Protection Plan (2000, updated in 2008). • Included groundwater quality protection in the Humboldt County Regional Master Plan (2012). • Prepared land use maps and WHPAs to identify where future types of development could threaten the WHPA. • Adopted a Sewer System Ordinance with criteria for new and existing development to connect to the City's sewer system. • Coordinated with the EPA regarding UST retrofit and closure. • Adopted *Chapter 15.16 - Floodplain Management Plan* into the Code of Ordinances, *Title 15 – Buildings and Construction*. • Updated the Wastewater Treatment Plant in 2017 and decommissioned outdated holding ponds. • Adopted two ordinances related to sewer system connections to reduce individual sewage disposal systems: *Ordinance 13.04.210.A, B – Mandatory Connection and Ordinance 13.04.320 – Abandonment of facilities.* • Developed a hydraulic system model of the system to analyze various situations, including new development, loss of a well or facility, or the addition of a well or facility.

Note: From WCE, 2000, and input from City of Winnemucca Engineer/Manager

Table 3-2. Actions Implemented by Star City Properties and McDermitt GID to Protect Source Water

Physical Actions	• Placed Wellhead Protection Area signage and fencing.
Education and Outreach	• Provided fact sheets and other materials to further the understanding of drinking water vulnerability.

Note: from Star City, 2003, and input from Humboldt County Public Works Director

Table 3-3. Actions Implemented by Golconda General Improvement District to Protect Source Water

Physical Actions	• Improved fencing around both wells and spring. • Improved Pole Creek Spring outflow pipe and overflow area.
Education and Outreach	• Provided flyers in billings regarding wellhead protection areas.

Note: from Farr West Engineering, 2004, NvRWA 2020, and Golconda GID Board Members

Table 3-4. Actions Implemented by Orovada Water District to Protect Source Water

Physical Actions	• Provided secure enclosures for Well 1 and 2.
Education and Outreach	• Reached out to business and property owners to inform them of wellhead protection activities. • Provided groundwater education at the Orovada Public School.
Coordination, Ordinances and Other Plans	• Updated the Land Use Plan for the Town of Orovada to protect the well sites.

Note: from Farr West Engineering, 2007

Table 3-5. Actions Implemented by Humboldt County to Protect Source Water

Humboldt County Code Chapter 17.81 – Interbasin and/or Out-of-County Water Transfer Projects	• The County developed this code to ensure the health, safety and welfare of Humboldt County residents are protected and to ensure an adequate supply of water remains in Humboldt County to serve the needs of its residents. Several sections of this Code include the CSWP Plan by reference to ensure that groundwater quality in addition to quantity, is protected.
Research and Planning	• Included groundwater quality protection in the Humboldt County Regional Master Plan (2012). • Since 1991, Humboldt County has been actively working on solutions to high nitrates in groundwater in the Grass Valley area. Actions include: Numerous Grass Valley Water and Sewer Feasibility Studies. Grass Valley Groundwater Monitoring Program. • Adoption of Humboldt County Water Plan and Community Source Water Protection Plan as part of the Humboldt County regional Master Plan (2020). • Regional Tri-County Hazard Mitigation Plan 2015. • Grass Valley Master Sewer Plan (June 2022). • Humboldt County Community Wildfire Protection Plan (May 2023).

Note: from summary information provided by Humboldt County

Table 3-6. Actions Implemented by the Bureau of Land Management to Protect Source Water

Planning	• Designated Priority Watersheds and Wellhead Protection Zones in the RMP (2015).

3.2 Source Water Protection Areas and Areas of Interest

3.2.1 Source Water Protection Area Development

In Humboldt County, Source Water Protection Areas are the areas of land surrounding wells and springs where activities should be managed to protect the public water supply. The extents of the Source Water Protection Areas for the public water supply wells in Humboldt County were determined through a stepwise process that involved Geographic Information System mapping, Team discussions, and management considerations. The stepwise process, as well as the geologic and hydrogeologic summary of each area, is described in Appendix C. Appendix C contains sensitive information and is not available to the general public. The Humboldt County Manager's Office, Regional Planning Department, or local public water system may be contacted for review of information in Appendix C.

In addition to capture zones and hydrogeology, the Team reviewed and considered the potential impacts of other items such as: zoning, land management, topography, parcel boundaries and potential contaminant sources (see Section 3.3). Both past activities and anticipated future development were considered in setting Source Water Protection Area boundaries.

3.2.2 Source Water Protection Areas Extent and Characteristics

The Team delineated Source Water Protection Areas for current and planned future public wells within Humboldt County. The Team also delineated Areas of Interest for specific areas where the Team identified a concern for long-term drinking water quality protection. The final Source Water Protection Areas were named for ease of reference based on the relative location of the Source Water Protection Area. Table 3-7 describes the Source Water Protection Areas and the maps are provided in Appendix A.

Table 3-7. Source Water Protection Area (SWPA) Descriptions

SWPA Name / Public Water Systems included in SWPA	Description
Winnemucca SWPA City of Winnemucca Scott Shady Court (inactive)	Based on the previously delineated 20-year well capture zones. Scott Shady Court is based on the 20-year capture zone. The public water system is inactive, and currently receives drinking water from the City of Winnemucca. The Team chose to keep the SWPA, because the three wells have not yet been decommissioned.
Winnemucca Railroad Spring SWPA	Based on previously delineated spring watershed.
Grass Valley SWPA 1 Gold Country Estates Wells 1 & 2 Star City Wells	Based on the parcels that intersect the 20-year capture zones with modifications to match parcel lines and include a broader area related to land uses.

SWPA Name / Public Water Systems included in SWPA	Description
Grass Valley SWPA 2 Gold Country Estates Wells 3 & 4 Gold Country Estates Future Well 5	Based on the parcels that intersect the 20-year capture zones with modifications to match parcel lines and include a broader area related to zoning and anticipated land uses.
Golconda Pole Creek Well SWPA	Based on the previously delineated 10-year well capture zone.
Golconda I-80 (Fire Well) SWPA	Based on the previously delineated 10-year well capture zone.
McDermitt SWPA	Based on the 10-year capture zones.
Orovada 1 SWPA **Orovada 2 SWPA**	Based on the previously delineated 10-year capture zone for each well.
Paradise Valley SWPA	Based on the combined 10-year capture zones of three wells.
All Other SWPAs Golconda Pole Creek Spring SWPA Pilot TC SWPA North Valmy PP SWPA Valmy Station SWPA Valmy MHP and NDOT Valmy RS SWPA NDOT Button Pt SWPA Santa Rosa SWPA Denio SWPA Sand Dune Saloon SWPA Lye Creek CG SWPA Royal Peacock RV SWPA Virgin Valley CG SWPA Humboldt DOC SWPA Kings River Elementary School SWPA Diamond Plastics SWPA CSS Farms SWPA Diamond Inn Bar SWPA	Based on a 1000' radius typically larger than the 10-year capture zones or consistent with existing management areas.

3.2.3 Areas of Interest Extent and Characteristics

The Team delineated Areas of Interest that are the watersheds upgradient of the public water system wells. The Areas of Interest are broad recharge areas that the team would like to monitor because these watersheds are important to the long-term (greater than 20-year) groundwater recharge. These areas are different from Source Water Protection Areas or wellhead protection zones and should not be treated as such. Areas of Interest include public land and the Bureau of Land Management should not include these areas as priority watersheds. The team expressed concern that some of these watersheds have burned in the past and had not been restored. Table 3-8 summarizes the Areas of Interest.

Table 3-8. Area of Interest (AOI) Extent and Characteristics

Area of Interest Name	Description
Winnemucca AOI	Watershed above the Winnemucca existing wells.
Kluncy Cyn AOI	Watershed above the new Winnemucca Well 8.
Golconda Pole Creek AOI	Watershed above the Golconda wells. This is similar to the BLM designated Priority Watershed for municipal supply.
Grass Valley AOI	Watershed above the Grass Valley Source Water Protection Area.
Paradise Valley AOI	Watershed above the public wells.
Orovada AOI	Watershed above the public wells.
Thomas Cyn AOI	Watershed upgradient of Grass Valley wells with significant surface water flow into Grass Valley.

3.2.4 *Grass Valley Special Area of Interest Extent and Characteristics*

The Team delineated a Special Area of Interest for the Grass Valley area. The intent of this special Area of Interest is to address the potential for future source water contamination from septic systems. Table 3-9 summarizes the Special Area of Interest.

Table 3-9. Grass Valley Special Area of Interest Extent and Characteristics

Special Area of Interest Name	Description
Grass Valley Special AOI	This comprehensive area includes the neighborhoods surrounding the Grass Valley public water systems from the Humboldt River to the north and the Pershing County line to the south, including an area characterized by high nitrate levels in the groundwater.

3.3 Potential Contaminant Sources

Potential contaminant sources are any facility or human activity that stores, uses, or produces contaminants of concern which, should they find their way into a source of drinking water, are a potential source of contamination.

3.3.1 *Types*

The Team considered the following broad potential contaminant source types within the Source Water Protection Areas delineated for Humboldt County water systems:

- Facilities that store and handle hazardous materials, nutrients, or chemicals. If these materials were spilled onto the ground, then the pollutants could potentially contaminate drinking water sources. Examples of facilities include:
  - manufacturing
  - industrial facilities
  - gas stations
  - automobile maintenance activities
  - research
  - school facilities

- Facilities or activities that are regulated by State or federal permits to release potentially polluting materials to the environment, such as:
  - municipal wastewater disposal systems
  - commercial septic systems
  - storm water systems, etc.
- Facilities or activities that by their nature distribute pollutants to the environment, for example:
  - firefighting chemicals
  - weed and pest control chemicals
  - fertilizers
  - residential septic systems
  - illegal dumping
- Facilities or activities that convey polluting materials from one point to another, or create conduits for contaminants to reach groundwater. Discharge to the environment might occur over time through leakage, spills or accidents. Examples of contaminant conduits include:
  - pipelines and pump stations
  - railways
  - highways
  - irrigation canals/ditches, and wells that are unprotected and unused or poorly constructed

3.3.2 Potential Contaminant Source Inventory and Evaluation

An inventory of potential contaminant sources identified potential hazards to the quality of each community's drinking water supplies. Team members and public water system operators were interviewed to identify their primary concerns. Other potential contaminant sources were identified and mapped using data from existing regulatory databases and digital information. Finally, potential contaminant sources within each Source Water Protection Area were reviewed during several reconnaissance surveys to observe the known and possible new site conditions. Detailed information about the methodology used to develop and evaluate the potential contaminant sources is provided in Appendix D and the following section is a summary. Appendix D contains sensitive information. Contact the Humboldt County Manager's Office, Regional Planning Department, or a local Public Water System to review.

Each Source Water Protection Area, Area of Interest and individual water system capture zone was reviewed for potential contaminant sources. These inventory results assisted the Team in understanding the level of potential threats to the groundwater quality and in designing management tools to prevent future contamination. The following paragraphs summarize the potential contaminant source evaluation findings in Humboldt County by type.

Septic Systems

The most prevalent potential contaminant sources are septic systems in communities not served by wastewater treatment and collection systems. The Grass Valley 1 Source Water Protection Area has over 790 parcels with septic systems (calculated in 2016). A smaller 167-acre subarea of this Source Water Protection Area has roughly 4 septic systems per acre and a 159-acre subarea has one septic system per acre (calculated in 2016). None of the other Source Water Protection Areas have this density or the large numbers of septic systems at this time. The Sand Dune Saloon Source Water Protection Area has 17 parcels served by septic systems within a 1000-foot radius of the public water system (calculated in 2016). Elevated nitrogen levels in groundwater are a primary concern in the Grass Valley area.

Water Wells

Several developed areas in Humboldt County receive drinking water via domestic wells. The Grass Valley 1 Source Water Protection Area includes more than 300 parcels provided by drinking water by on-site domestic wells, and the Paradise Valley Source Water Protection Area has about 50 parcels with domestic wells (calculated in 2016). The Team also discussed that inactive wells are a concern in the community of McDermitt.

An old or poorly constructed well can convey contaminants from the ground surface downward along the outside of the well casing, creating a direct pathway for contaminants to reach groundwater used for public water supplies. The sealing and permanent decommissioning of inactive or unusable wells protects water quality by preventing contamination from the surface and restoring natural hydrogeologic conditions that separate aquifers with variable water quality. Additional information about private drinking water wells can be found at: https://www.epa.gov/privatewells.

Agricultural Activities

Irrigated agriculture occurs in several Source Water Protection Areas. The northeast portion of the Grass Valley and along the border with Pershing County are areas with active agriculture. Source Water Protection Areas in Orovada, McDermitt, Paradise Valley and Kings River also have areas with irrigated agriculture. Potential contaminants associated with irrigated agriculture include pesticides, herbicides, and fertilizers. Excess fertilizer applications can elevate nitrogen in groundwater.

Major Transportation Corridors

Source Water Protection Areas in Winnemucca, Grass Valley, Golconda, Valmy, and Button Point are close to the major transportation corridors of I-80 and the railroad. The primary concern is accidental spills during transportation and subsequent groundwater contamination. Denio, McDermitt, and Orovada also have wells located adjacent to State Highways that pass through their communities.

Residential Land Uses

Residential land uses are dominant in Grass Valley and Winnemucca, as well as the smaller communities of Paradise Valley and McDermitt. Improper storage or application of fertilizers, pesticides, septic systems, cleaners, and the like are all potential contaminants to source water.

Commercial and Industrial Use

Commercial and Industrial land use occurs in the central Winnemucca and northern Grass Valley areas. It is also planned at the Airport Industrial Park in Grass Valley. Valmy, Orovada, and McDermitt also have a few commercial/industrial facilities along the transportation corridors in their communities. The primary threat includes improper storage, disposal and management of fuels or hazardous materials, that could result in accidental spills and releases.

Automotive Activities

Automotive facilities are the most common potential contaminant sources in the Winnemucca Source Water Protection Area. Gas stations and auto repair shops occur along primary commercial corridors in most communities. Highway maintenance staging areas are located near a few water system wells. In general, most underground and aboveground storage tanks have been modernized, though some locations have on-going remediation from past leaks and spills. Improper storage and management of petroleum products or road maintenance materials are concerns with potential automotive sources.

Open Land

Most the public water systems in the County are small and are surrounded by undeveloped public land. The existing threats for these systems are the facility's on-site activities (wastewater disposal, fuel leaks/spills, improper material storage, etc.). Wildland dumping is generally a concern in surrounding open lands. In addition, siting of future minerals and/or renewable energy development projects on public lands in or near Source Water Protection Areas and Areas of Interest could pose both short- and long-term water quality concerns for a community's drinking water sources.

3.4 Source Water Protection Management Strategies

The Team developed management strategies to implement the Community Source Water Protection Plan based on the source water protection goals (listed in Section 2.3), detailed reviews of the potential contaminant sources, an understanding of community needs and the source water protection area boundaries. The management strategies, plan goals, and potential contaminant sources are used to guide the action plan discussed in Section 4.0 and provided in Appendix E. The following sections summarize the management strategies prioritized by the Team for the public water systems in Humboldt County.

3.4.1 Education

Education to raise awareness of where drinking water comes from and how to protect it from becoming polluted is one of the Source Water Protection goals. The following are examples of the types of education programs suggested by the Team. The targeted audiences are the residents and public water systems in Humboldt County.

- **Increase knowledge of septic tank operation and maintenance.** Septic tanks are a source of nitrate contamination to drinking water. Proper operation and maintenance can slow and reduce the contamination. Many parcels are on both septic systems and private wells; therefore, it is important for individuals to understand the link between drinking water and how one uses and maintains their septic system.
- **Increase knowledge of well protection, operation, maintenance, and abandonment.** Wells can provide a direct conduit for potential contamination to community water sources if not properly protected, operated, and maintained. Therefore, it is important for individuals to understand the importance of well protection, operation, maintenance, and abandonment.
- **Increase knowledge of chemical use, storage and disposal.** Chemicals should be used and stored according to their label. Although disposal facilities for minor quantities are available at the Humboldt County landfill near Winnemucca, in appropriate disposal may contaminate drinking water. Therefore, it is important for individuals to understand the importance of and how to use, store and dispose of chemicals correctly.
- **Increase knowledge of pollution in storm water and how to minimize it.** An understanding of storm water runoff and the relationship to pollution, groundwater recharge and source water is an important concept to effectuate positive behavior changes for source water protection.
- **Increase knowledge of source water protection area locations and actions to minimize contamination.** Audiences include residents, businesses, Nevada Department of Transportation and Union Pacific Railroad regarding the Source Water Protection Area locations relative to their land and facilities.

- **Assist with education and training for public water system operation and management**. Improved technology and training are desirable, including computer capabilities.

3.4.2 *Coordination and Collaboration*

Coordination and collaboration regarding clean drinking water protection is a Team goal. There are several types of coordination and collaboration needed to accomplish effective source water protection.

- Develop and implement a City-County-Public Water System Communication process regarding the Source Water Protection Areas and the Areas of Interest.
- Develop and maintain a communication process between entities (i.e., planners, emergency response, land managers and public water systems) to plan for and respond to emergencies within Source Water Protection Areas and Areas of Interest.
- Develop and maintain coordination and collaboration throughout Humboldt County to promote efficiencies, understanding and source water protection.

3.4.3 *Resource Investigation*

Supporting countywide water understanding and planning is a Team goal. Helping to understand actions that contributed to water quality issues in the past, to avoid these issues in the future is a plan objective.

- Help to facilitate investigations and planning to improve understanding and develop solutions for the Grass Valley area.
- Help to facilitate investigations to improve understanding of groundwater water quality influences countywide.

3.4.4 *Planning*

Support countywide water planning to ensure clean drinking water while facilitating economic development to meet Source Water Protection goals. There are several types of planning needed to accomplish efficient source water protection.

- Include source water protection measures in defensible locally adopted plans and policies (Regional Master Plan, County Water Plan, Policy for Public Lands, etc.).
- Invest in maintaining and restoring groundwater recharge capacity in Areas of Interest.
- Promote innovative funding and planning for source water protection and wastewater solutions. Continue consideration of wastewater collection/treatment or septic to sewer conversions, and funding opportunities or mechanisms.

3.4.5 *Physical Improvements*

A variety of physical improvements are beneficial to protect source water from contamination. These are typically identified through the continued investigation and planning process which will keep this plan relevant and useful to the communities in Humboldt County.

- Infrastructure improvements for physical well head protection and security.
- Pollutant source controls to prevent contamination of both ground and surface waters.
- Improve technology and communications systems of public water systems to promote efficiencies, reliability, and transfer of knowledge.

- Invest in well redundancy to assist with contingencies as well as closure of non-functional wells.

3.5 Contingency Plans

Contingency planning within the context of this Community Source Water Protection Plan provides guidance and direction to the local communities and public water systems in the event the aquifer is significantly contaminated. The contingency plan describes the public water system's planning capacity to address a long-term emergency situation. Contingency planning considers the time frames needed for the public water system to switch to an alternate source, the quantity and quality of the alternate water sources, and the local resources. The contingency plan also includes conservation measures intended to prolong the use and availability of water supplies (e.g., during periods of interim decision making, remediation, or new source development).

3.5.1 Existing Plans Relating to Contingency Measures

The Nevada Administrative Code requires public water systems to have plans for short-term and long-term contingencies to protect water quality and quantity. These plans include an emergency plan, cross-connection control plan, operation and maintenance manual, and a water conservation plan. These plans are described in the following paragraphs and will be used in conjunction with this Contingency Plan. These plans are developed and maintained by each public water system.

Emergency Plan

The Emergency Plan contains short-term solutions to an immediate shutdown, either due to quantity problems, response to a contaminant threat, or a natural disaster. Public water systems in Nevada work with the Nevada Division of Emergency Management through County emergency management representatives if an emergency response is required. The Nevada Division of Emergency Management assists with short-term issues, such as spill response and coordinating the trucking of water to the afflicted public water system. The plan contains a list of available resources, emergency notifications, hypothetical scenarios and affected facilities including water sources, distribution systems, pump stations, and storage tanks.

Cross Connection Control Plan

The Cross Connection Control Plan provides information on how to prevent unauthorized connections to the public water system that could potentially contaminate the system during a loss of pressure. The plan identifies the activities needed to ensure that no unprotected service connections exist between the water system and sources of pollution or contamination.

Operation and Maintenance Manual

Each public water system maintains an Operations and Maintenance Manual (O & M Manual) that provides information on the purpose, function, operation and interaction of the system facilities, describes the capabilities and limitations of the system, and identifies procedures to control system processes. This manual is required under NAC 445A, 6667 and is maintained at each public water system facility for use by the operators and other facility personnel.

Water Conservation Plan

The Water Conservation Plans outline procedures to be followed during water shortages due to drought, overuse, or contamination. These plans are maintained by each system and require an analysis of the effectiveness of proposed water conservation measures, as well as an analysis of the effectiveness of utilizing a conservation-based water rate structure. The Water Conservation Plans also outline proposed water conservation enforcement measures.

3.5.2 Short-Term Contingency and Emergency Plans

The Emergency Plans maintained by each public water system describe actions for short-term contingencies in detail to provide temporary relief until permanent solutions can be implemented. Emergency water supply options do not provide permanent solutions for the affected public water system. Potential alternate supply options include the following:

Operational Adjustments

In the event that one of the wells becomes contaminated, some of the public water suppliers could meet system demands by making operational adjustments such as using other wells and stored water.

Boiled Water

Boiled water may be ordered at the discretion of the public water system manager, or as directed by the Bureau of Safe Drinking Water.

Bottled Water or Potable Water Trucks

Bottled water is available throughout the County at local stores. Potable water trucks may be brought in from adjacent public water systems.

Water Conservation and Rationing

In the event that demand cannot be met, conservation and rationing orders may be given.

Backup Generators

In the event of an extended power failure backup generators may be used for wells to meet average-day demand.

3.5.3 Long-Term Contingency

In the event of significant contamination of a drinking water source, the water providers with wells in the contaminated aquifer region may be subject to long-term deficits in their water supplies. The larger public water systems typically have multiple wells that can provide a level of flexibility in pumping from alternate wells. However, water supplies may also have to be supplemented by a new source, requiring an agreement with an adjacent water system or a new replacement well.

3.6 New Well Siting and New Water Sources

Eight of the 24 public water systems active in Humboldt County are served by more than one well. The non-community and some small community systems (such as gas stations), which often serve a single property, control a relatively small land area and new well location options are limited. Therefore, out of necessity, new well siting or water sources would be located near their existing wells and infrastructure. Studies may be needed to identify different well depths and screened intervals for new wells. Improved well construction could, in effect, tap into a new source of clean drinking water.

Studies also may be needed for site-specific aquifer characteristics, including exploration wells and water quality sampling. New well designs would also prevent existing contamination from migrating along the well casing by using appropriate plugs and casing seals. The need for new wells and water sources would be identified on a case-by-case basis for individual water systems.

4.0 Plan Implementation

4.1 Action Plan Goals

The Community Source Water Protection Plan will be implemented through the Action Plan developed and updated by the Team and provided in Appendix E. The Action Plan targets achieving the five goals of this Community Source Water Protection Plan, addresses the identified potential contaminant sources, and is built from the Team's management strategies identified in Section 3.4 of this document.

The Action Plan implementation is dependent upon resource availability, and the actions will be implemented as funding and time allows. The public water systems in Humboldt County need technical and funding assistance in completing the action plan projects. While some actions have a higher priority than others, implementation will depend, to a large extent, on the resources and opportunities that are available. The public water systems will take advantage of grants and other funding sources for implementation as they become available.

4.2 Action Plan Projects

The Action Plan projects described in Appendix E are grouped in three tables:

- Table E1: Education and Outreach Actions
- Table E2: Planning and Funding Actions
- Table E-3: Physical Improvements

4.3 Potential Funding Opportunities

There are a variety of potential funding sources that may be considered to implement the action plan. A key component for most funding sources is to build relationships and leverage resources. The Team benefits from each other's knowledge and contacts. Table 4-1 lists some of the available potential funding sources.

4.4 Community Source Water Protection Plan Updates

The Community Source Water Protection Plan is a dynamic living document. The Team may consider meeting annually to revisit the plan, assess the plan update needs, and follow-up on implementation, coordination and progress. This meeting would be coordinated by the Regional Planning Department with the public water systems, Humboldt County and the City of Winnemucca. The Team will strive to request implementation assistance needs from the Nevada Division of Environmental Protection early in the year, so that complimentary funding from local sources and the Integrated Source Water Protection Program may be included in annual budgeting processes. As incorporated in the Humboldt County Regional Master Plan, the Community Source Water Protection Plan will be reviewed every five years in conjunction with the Master Plan update schedule.

Table 4-1. Potential Funding Considerations

Funding Agency	Program Name
Bureau of Reclamation	• WaterSMART Program • Water Conservation Field Services Program • Small Storage Program • Water Operations
Environmental Protection Agency (EPA)	• Advancing Public Health Protection through Water Infrastructure Sustainability • Water Infrastructure Financing Innovation Act • Pollution Prevention Grant Program • Water Infrastructure Improvements for the Nation • FITS
United States Department of Agriculture (USDA)	• Water and Waste Disposal • Circuit Rider Program • SEARCH – Special Evaluation Assistance for Rural Communities and Households • Community Facilities Loan and Grant Program • Emergency Water Assistance Grants
Federal Emergency Management Agency (FEMA)	• Flood Mitigation Assistance
State of Nevada	• AB 198 Grants • Clean Water State Revolving Fund • Drinking Water State Revolving Fund • Drinking Water State Revolving Fund for Emerging Contaminants • State Water Infrastructure Financing and Innovation Act • CWA 319 NPS Grants • ISWPP Implementation Grants
United States Geological Survey (USGS)	• CFDA 15.981 Water Use and Data Research • CFDA 15.980 National Groundwater Monitoring Network
United States Economic Development Administration	• Planning, Technical Assistance, Research • Public Works and Economic Adjustment Assistance

5.0 Public Participation

Public education is an important tool, as identified in the Plan Goals, Management Strategies and the Action Plan, to increase community knowledge of where their drinking water comes from and how they can help to protect it. Knowledge leads to understanding which may change attitudes and lead to behavior and actions that support source water protection.

During the Plan development and update process, public water systems, local agencies, and other interested parties were engaged in source water protection planning at the local level. Meeting invitations and notes were provided via email to water system contacts, the Team, and other stakeholders. Agendas, notes, and working drafts of the Plan were posted on Resource Concepts, Inc.'s public website, OneDrive, and copies of key documentation are included in Appendix B. In 2016, source water protection presentations were made to water system boards, the Regional Planning Commission, the Rotary Club, the County Board of Commissioners, and the City Council. The County and City also sponsored the Water Quality Summit, an event in March 2016, inviting the general public to an evening focused on source water protection education.

The Community Source Water Protection Public Education and Outreach Plan (provided in Appendix F) has been developed and updated to present water providers, residents, and other stakeholders with a set of tools and tactics that can be used to promote source water protection outreach and education during Community Source Water Protection Plan implementation.

The Action Plan, provided in Appendix E, identifies several specific audiences for targeted education and outreach to promote proper care and maintenance when potential contaminants are involved. The target audiences are the residents and businesses in the County.

The following are the highlights of the public education plan provided in Appendix F:

Primary Messages

What is source water protection?
Source water protection includes actions to prevent drinking water from becoming polluted. Much can be done to prevent pollution, such as the informed use of land and disposal of chemicals.

Why is it important to protect water at the source?
Protecting public drinking water supplies before pollution enters our drinking water supplies lessens potential health issues, and can avoid the high costs associated with water treatment or development of new water sources. People in Humboldt County can help protect our source water by managing land uses and human-caused sources of contamination to prevent pollution before it enters our drinking water supply.

What contaminates the water we drink?
There are numerous pollutants that can contaminate our surface and ground water. Some contaminants are a result of improper disposal of common household and business products, such as cleaning products, waste oil, pet waste, fertilizers and pesticides. These and other harmful products, when improperly used, stored or disposed of, may threaten to contaminate our drinking water.

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Appendices

(Provided as Separate PDF Files)

Appendix A	Source Water Protection Area Maps
Appendix B	Meeting and Public Participation Documentation
Appendix C	Capture Zone Evaluation Report *(Contains Sensitive Information*)*
Appendix D	Potential Contaminant Source Summary *(Contains Sensitive Information*)*
Appendix E	Action Plan
Appendix F	Public Education and Outreach Plan

** See Humboldt County Manager's Office,*
the Humboldt Regional Planning Department, or
the local public water system for review.