Community Source Water Protection Plan for the Lower Virgin River Valley Clark County, Nevada

Prepared By:

The Lower Virgin River Valley Source Water Protection Local Planning Team:

Virgin Valley Water District
City of Mesquite Development Services Department
City of Mesquite Geographic Information System Services
City of Mesquite Public Works
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NDEP Bureau of Safe Drinking Water, ISWPP Coordinator
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Executive Summary

The Community Source Water Protection Plan for the Lower Virgin River Valley, Clark County, Nevada (CSWP Plan) was prepared for the northeast region of Clark County, Planning Area 3, as outlined in the Clark County 208 Area-Wide Water Quality Management Plan. This CSWP Plan is a community-driven effort completed by the local planning team, with technical help from the Nevada Integrated Source Water Protection Program. Source water protection planning is a voluntary approach for communities to identify and manage potential water quality risks to their sources of drinking water.

The local planning team's purpose and goals to guide the planning process are:

Plan Purpose:	
Create a community-wide plan to help protect drinking water sources and maintain water quality.	
Community Goals for Source Water Protection	
Goal 1: *Identify the sources of and potential risks to drinking water and consider them in the local planning framework.*	Goal 2: *Ensure that clean and safe drinking water is available for future generations.*
Goal 3: *Integrate source water protection and conservation into local planning and zoning documents to ensure that the quality of drinking water matches the goals of the community.*	Goal 4: *Educate the community about what is being accomplished to achieve source water protection and conservation.*

A community's source of drinking water can be groundwater, lakes, rivers, streams, or springs. In the northeastern part of Clark County, the Virgin Valley Water District (VVWD) is the only public water system. The VVWD relies on groundwater from the Muddy Creek formation to supply drinking water to the City of Mesquite and the town of Bunkerville. The VVWD water source inventory includes nine active wells, two wells drilled but not equipped, and three future wells located in Clark County, Lincoln County, and the City of Mesquite.

Source water protection is the first line of defense to reduce the chance that contaminants will end up in a community's drinking water. Human activities can pollute sources of water when contaminants move from urban, industrial, and agricultural areas into surface water, recharge areas, and groundwater. Managing human activities to reduce the possibility of contaminants from entering a drinking water source is source water protection.

For this CSWP Plan, the local planning team considered an inventory of "potential contaminant sources", which were mapped around well locations to determine "source water protection areas" (SWPAs). A SWPA represents an area of land where the community establishes a precautionary boundary around a drinking water source, where water quality is potentially more vulnerable to contamination. The technical appendices of this CSWP Plan describe the methods used to delineate the SWPA boundaries and the management strategies that may be used to protect and conserve community water supplies.

A practical Action Plan (Appendix F of this CSWP Plan) has been compiled by the local planning team, outlining steps and tasks needed to achieve the CSWP Plan goals. Key management strategies include public education and outreach, planning agency coordination, collaboration with local and regional partners, and securing locations for current and future water sources. With community approval, this CSWP Plan will meet the criteria for endorsement by the Nevada Integrated Source Water Protection Program, which makes implementing the action plan eligible for continuing assistance. This CSWP Plan will be revisited on a regular basis to ensure its relevance and success. Updating the CSWP Plan will maintain the community vision for source water protection and provide a decision-making tool to help realize that vision.

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Acronyms

ABREVIATION	DEFINITION
AWWA	American Water Works Association
CSWP Plan	Community Source Water Protection Plan
GIS	Geographic Information System
ISWPP	Integrated Source Water Protection Program
NDEP	Nevada Division of Environmental Protection
NDWR	Nevada Division of Water Resources
NvRWA	Nevada Rural Water Association
NvWARN	Nevada Water/Wastewater Agency Response Network
RCI	Resource Concepts, Inc.
SNWA	Southern Nevada Water Authority
SWPA	Source Water Protection Area
VVWD	Virgin Valley Water District
WQMP	Water Quality Management Plan

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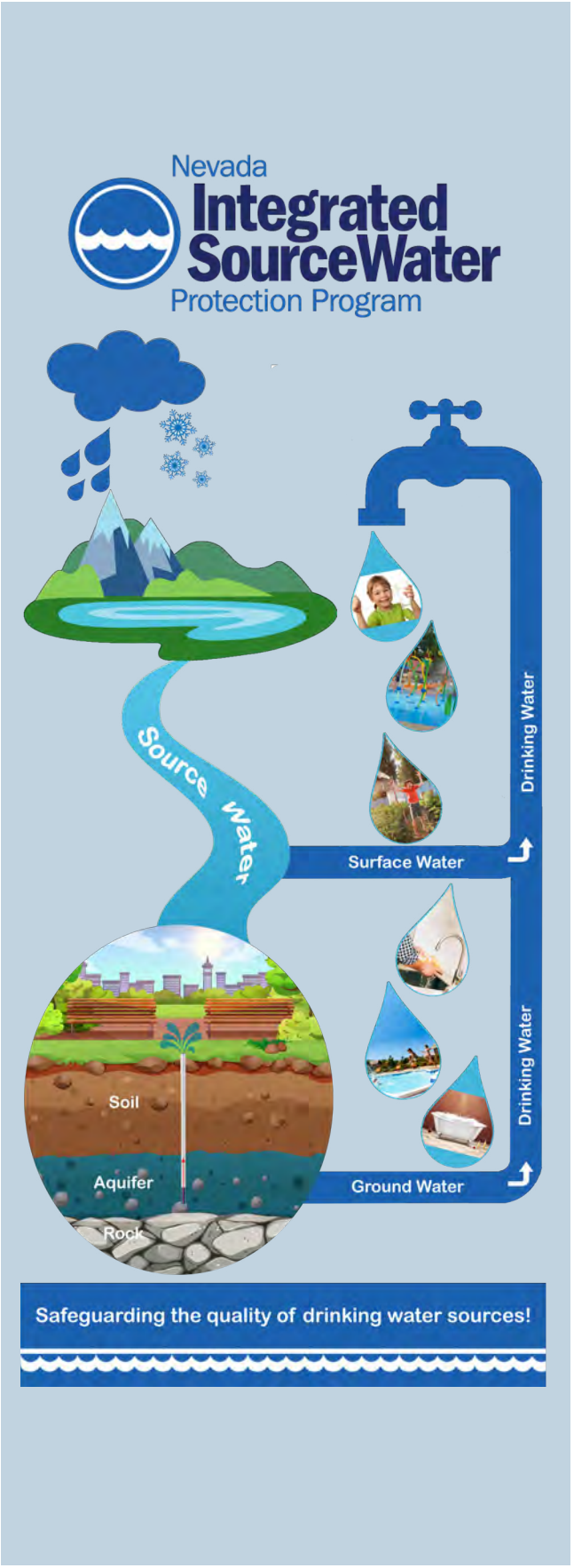
1.0 Introduction

Water is the most precious and important resource for any community. The Earth is unlike any other planet in the solar system; covered with water and full of life. Water is required for the existence of all life on Earth, and it is an essential component of all the biological processes which occur in plants and animals. Source water is used to define drinking water in its natural environment (surface or groundwater) before it is withdrawn, treated, and distributed to the public by a regulated water system. Whether a community obtains its drinking water from groundwater, rivers, lakes, or springs, the journey of water from source to tap is long. Protecting and conserving drinking water sources (source water), and the land and aquifers by which water travels, is the first step in safeguarding the health and future of any community.

The purpose of this community-focused plan is to:

Create a community-wide plan to help protect drinking water sources and maintain water quality.

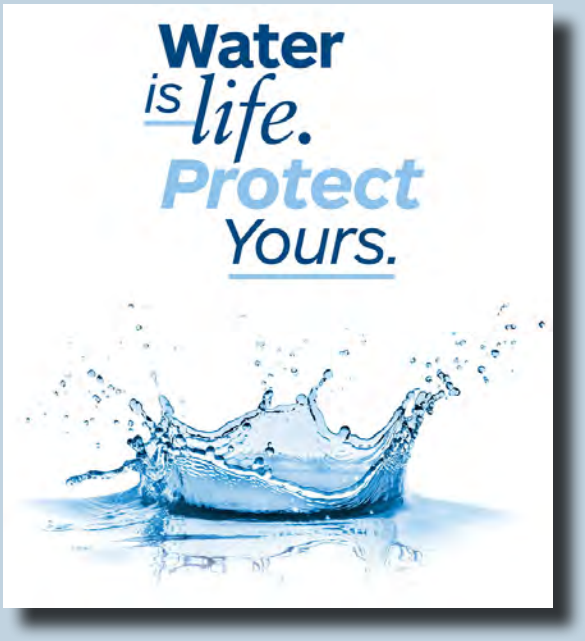


1.1 Source Water Protection

Source water protection in Nevada is a voluntary program which strives to protect sources of drinking water by supporting local partnerships to develop community-driven strategies which can prevent the contamination of drinking water sources. A Community Source Water Protection Plan (CSWP Plan) unites local water purveyors, stakeholders, and the public as they embark on a long-term journey to prevent the pollution of community drinking water sources. A CSWP Plan can help local representatives manage land usage and acts as a proactive defense against potential "man-made" contamination in the vicinity of public water sources. Additionally, a CSWP Plan works as a planning tool to mitigate impacts from drought to maintain public drinking water supplies for generations to come. This CSWP Plan was developed for the only regulated Nevada public water system in the Lower Virgin River Valley, the Virgin Valley Water District (VVWD), to maintain drinking water quality and protect and conserve drinking water sources for generations to come.

Source water protection is the first line of defense a community has to reduce the chance that contaminants will end up in water that comes from their tap. A Source Water Protection Area (SWPA) represents an area of land where the community has established a precautionary boundary around a drinking water source, where water quality is potentially vulnerable to contamination. Community-driven strategies for the Lower Virgin River Valley were developed to help implement source water protection and safeguard water supplies from becoming contaminated or depleted. The SWPAs in the Lower Virgin River Valley are described in Section 3.3 and presented as maps in Appendix A of this CSWP Plan.

The development and content in this CSWP Plan are based on the guidance document entitled Nevada Integrated Source Water Protection Program (ISWPP). The ISWPP was prepared by the Nevada Division of Environmental Protection (NDEP) in February 2010 as an update to the State Wellhead Protection Program developed in 1994. The guidance document sets the framework for local plan development and outlines the criteria required for a CSWP Plan to receive State endorsement. With a State-endorsed plan, the local community may be eligible to receive additional technical assistance from NDEP to continue implementing the management strategies outlined in Section 3.4. This CSWP Plan has been prepared with the intention of achieving NDEP endorsement.



1.2 CSWP Plan Goals

This CSWP Plan is a locally driven plan intended to facilitate cooperation and education between water purveyors, local and State agencies, industry, community leaders, and citizens to ensure the preservation, protection, and continued safety of public drinking water sources in the Lower Virgin River Valley. The Local Planning Team, described in Section 1.3, has established four plan goals, which will serve to guide the development and support the long-term vision and implementation of this community specific CSWP Plan.

Those goals are:

1. Identify the sources of, and potential risks to drinking water, and consider them in the local planning framework.
2. Ensure that clean and safe drinking water is available for future generations.
3. Integrate source water protection and conservation into local planning and zoning documents to ensure that the quality of water matches the goals of the community.
4. Educate the community about what is being accomplished to achieve source water protection and conservation.

1.3 Team Formation Summary

1.3.1 Initial Outreach

In November 2021, an overview of Nevada's ISWPP was presented to the VVWD Board by Nevada's technical assistance contractor, Resource Concepts, Inc. (RCI). The Board unanimously approved a motion to proceed in preparing a CSWP Plan for local water sources in conjunction with RCI (Appendix B of this CSWP Plan). The ISWPP staff presented the plan development process and assistance opportunity to the Mesquite City Council on June 14, 2022. The City of Mesquite provided a letter to NDEP requesting participation in the program. The City of Mesquite committed to providing a liaison to facilitate city involvement and to work with RCI, NDEP, the local community, and the water service provider toward successful completion of the CSWP Plan (Appendix B of this CSWP Plan).

1.3.2 Meetings and Workshops

Meetings with individuals and the local planning team were organized to introduce the source water protection planning process, garner information, and discuss preliminary management strategies. Invitations were provided via e-mail and telephone calls prior to meetings, which were held both virtually and in-person. Agendas and materials were typically provided at least one week in advance. Meeting documentation is provided in Appendix B of this CSWP Plan.

1.4 Local Planning Team Members and Roles

Forming a collaborative local planning team who understands the needs and priorities of the community helps ensure that the CSWP Plan will be supported and adopted by the community. The local planning team included active participation from technical staff at the VVWD, the City of Mesquite Development Services Department, Department of Geographic Information System Services (GIS), Public Works, the Fire Department, the Nevada Rural Water Association, RCI, and the Nevada Bureau of Safe Drinking Water. The local planning team consisted of a passionate group of local representatives who cherish their community and worked together to develop a plan to protect and conserve their community's most precious resource, water. All local planning team members were invited to each meeting and kept apprised of CSWP Plan progress. The members and their roles are described in Table 1.

Table 1. Lower Virgin River Valley Local Planning Team

Team Member	Jurisdiction/Title	Roles
Natalie Anderson	Virgin Valley Water District, Conservation Specialist	Public education and outreach related to source water protection and conservation in the community.
Travis Anderson, PE	City of Mesquite, Public Works Director	Public works, wastewater treatment, storm water, and development.
Jayson Andrus	City of Mesquite, Fire Chief	Emergency response and hazardous waste contingency plan.
Christopher Berkey	Nevada Rural Water Association, Source Water Protection Specialist	Technical assistance, potential contaminant source field survey, and outreach support.
Kevin Brown	Virgin Valley Water District, General Manager	Water district operations and administration.
Aaron Bunker	Virgin Valley Water District, Water Resource Manager	Source water protection, hydrogeology, water source inventory, and water resource planning.
Dan Catron	City of Mesquite, Senior Planner	Source Water Protection Planning, land-use planning, development review.
Alison Cramer	Resource Concepts, Inc., ISWPP Contractor	Plan coordination and technical assistance.
Steven Hall, PE	Virgin Valley Water District, District Engineer	Water system design, operations, and source water protection implementation.
Ryan Kammerer	City of Mesquite, GIS Specialist	Digital mapping, database coordination, and GIS services.
Ethan Mason	NDEP Bureau of Safe Drinking Water, ISWPP Coordinator	Plan development and guidance.
Richard Secrist	City of Mesquite, Development Services Director	Source water protection planning, land use planning, and development review.
Erin Smith	Resource Concepts, Inc., ISWPP Contractor	Plan coordination and technical assistance.
Jill Sutherland, PE	Resource Concepts, Inc., ISWPP Contractor	Plan coordination and technical assistance.

Lower Virgin River Valley Community Source Water Protection Plan Team

1.5 Description of Planning Area and Source Water

1.5.1 Location and Source Water

The VVWD serves the City of Mesquite, and Bunkerville (Figure 1). The VVWD service area includes approximately 205,000 acres of land, bordering Lincoln County to the north, the state of Arizona to the east, Gold Butte National Monument to the south, and the Moapa Valley Water District to the west. The VVWD delivers drinking water to an estimated 25,000 people and provides services to golf courses, casinos, and commercial, industrial, and institutional facilities.

Source water in Nevada is defined as untreated water which comes from rivers, lakes, streams, springs, or underground aquifers. Source water supplies the water which is used in public drinking water systems, as well as private wells. All water sources currently used for drinking water purposes are groundwater sources. There are no plans to utilize surface water in the near future. The VVWD utilizes groundwater from the semi-confined Muddy Creek Formation aquifer, located in the Nevada Division of Water Resources (NDWR) Hydrographic Area 222 (Figure 2).

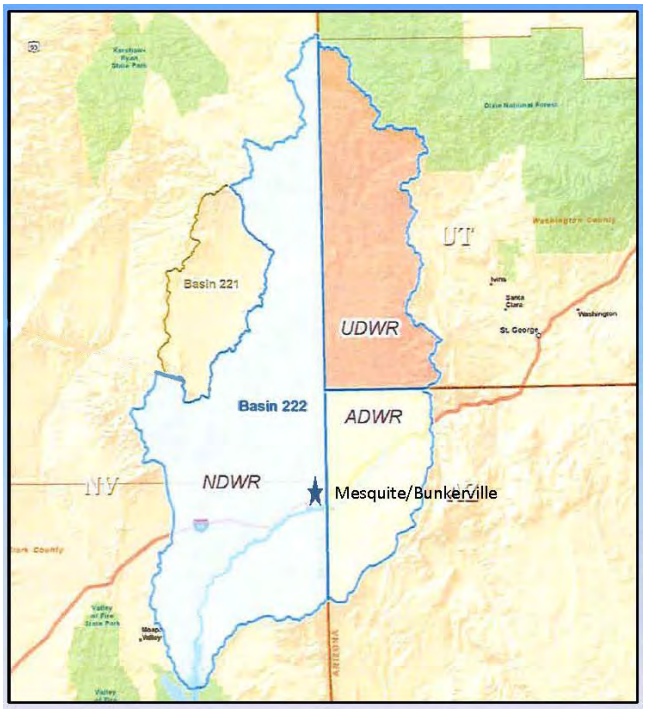


Figure 2. Hydrographic Area 222

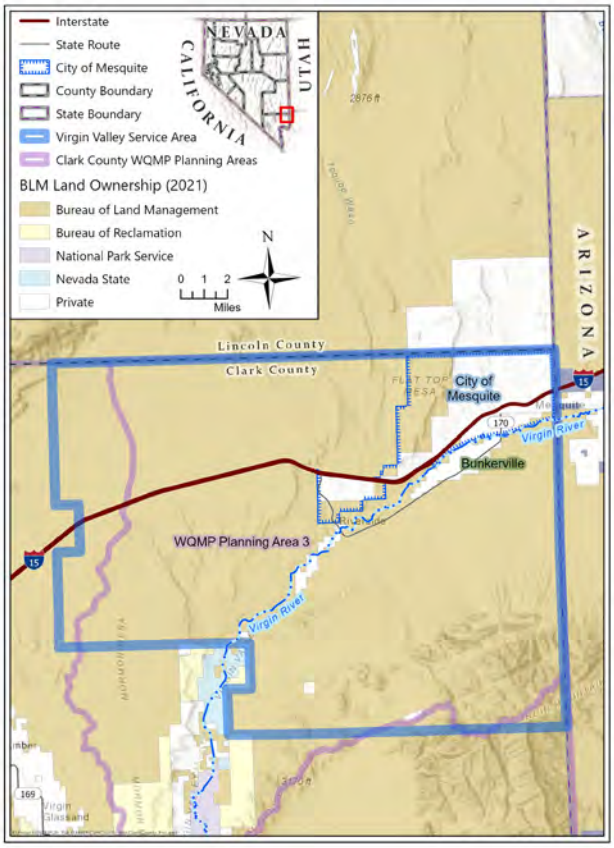


Figure 1. Virgin Valley Water Dist. Service Area
WQMP: Clark County 208 Area-Wide Water Quality Management Plan

The Colorado River Basin

Naturally occurring arsenic and high total dissolved solids are currently the only contaminants of concern in the Lower Virgin River Valley. All groundwater sourced from the Muddy Creek Formation, excluding water from Well 2, requires arsenic removal to meet state and federal drinking water standards. A detailed description of the geographic, geologic, and hydrologic setting of the Lower Virgin River Valley is presented in Appendix C of this CSWP Plan. Additional arsenic background data and treatment system information can be found on the VVWD website.

1.5.2 Public Water Source Inventory

The public water source inventory for this CSWP Plan includes active, newly constructed inactive, and potential future water sources managed by the VVWD. Information about the well network, water source jurisdictions, and arsenic treatment plant data used for the purpose of this CSWP Plan are detailed in Table 2. A system overview is presented as Figure 3. Additional well network and water system details are provided in Appendix C of this CSWP Plan. Two newly constructed inactive and three proposed future wells have been incorporated into this CSWP Plan to address source water protection future operations.

Water storage tank adjacent to arsenic treatment plant.

Treatment Plant

Table 2. Virgin Valley Water District Well Network

Water Source	Jurisdiction	Status	Arsenic Treatment Plant
Well 1A	Bunkerville	Active	No. 1A
Well 2	Bunkerville	Active	NA
Well 26A	Mesquite	Active	No. 27
Well 27A	Mesquite	Active	No. 27
Well 28	Mesquite	Active	No. 28
Well 29	Bunkerville	Active	No. 29
Well 31	Bunkerville	Active	No. 31
Well 32	Lincoln County	Active	No. 32
Well 33	Lincoln County	Active	No. 32
Well 35	Lincoln County	New-Inactive	Future No. 35
Well 36	Mesquite	New-Inactive	Future No.35
Well 37	Lincoln County	Future	NA
Well 38	Mesquite	Future	NA
Well 39	Mesquite	Future	NA
NA = Not Applicable			

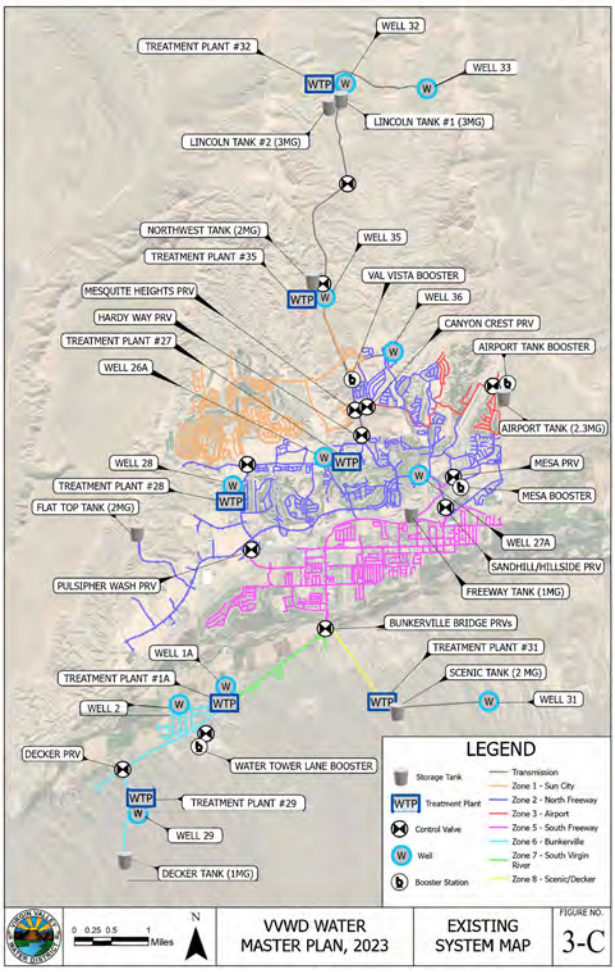


Figure 3. Virgin Valley Water District System Overview

2.0 Existing Plans and Studies

In the nation's driest state, planning for Nevada's water future is essential. There are several existing studies and planning efforts which contribute to source water protection and conservation in the Lower Virgin River Valley. This CSWP Plan was cultivated to fit into the local and regional framework which aims to maintain and protect the quality, supply, and reliability of water resources for current and future residents.

2.1 Regional Plans

Regional Plans can bring local governments together to protect natural resources and prevent potential source water contamination; a challenge which can transcend municipal boundaries. The Clark County 208 Area-Wide Water Quality Management Plan and the Clark County Sustainability and Climate Action Plan outline regional goals which serve to protect and conserve source water. Table 3 highlights how this CSWP Plan is consistent with the goals of both regional plans.

Table 3. Regional Plan Goals and Lower Virgin River Valley CSWP Plan Goals

Clark County 208 Area-Wide Water Quality Management Plan	Lower Virgin River Valley CSWP Plan
Wellhead Protection: *Coordinate and assist with developing wellhead protection plans (now referred to as CSWP Plans) and public outreach programs about groundwater protection for communities that rely on groundwater supplies for potable water.* **Planning Recommendations/Implementation:** *Expand educational programs that encourage conservation and protection of water resources.*	**Goal 3:** *Integrate source water protection and conservation into local planning and zoning documents to ensure that the quality of drinking water matches the goals of the community.* **Goal 4**: *Educate the community about what is being accomplished to achieve source water protection and conservation.*
Clark County Sustainability and Climate Action Plan	**Lower Virgin River Valley CSWP Plan**
Water Conservation and Protection Goals: *Improve area water quality by reducing impacts from County operations.* *Support policies, programs, and regional collaboration for improved water quality, water conservation, and drought.*	**Goal 1:** *Identify sources of and potential risks to drinking water and consider them in the local planning framework.* **Goal 3:** *Integrate source water protection and conservation into local planning and zoning documents to ensure that the quality of drinking water matches the goals of the community.* **Goal 4:** *Educate the community about what is being accomplished to achieve source water protection and conservation.*

2.2 County and City Plans

Protecting water resources takes collaboration and planning. It is easier and more cost effective to protect groundwater from potential contamination, than to "clean-up" a polluted source. Future generations rely on the ability of counties and local municipalities to support one another and work together to safeguard the sources of public drinking water from degradation. Table 4 highlights similar goals of the Clark County Master Plan, the City of Mesquite Master Plan (currently undergoing an update), and this CSWP Plan, which support the preservation and protection of public drinking water supplies.

Table 4. County, City Wide, and Lower Virgin River Valley CSWP Plan Goals and Policies	
Clark County Master Plan	**Lower Virgin River Valley CSWP Plan**
Goal 3.3: *Maintain and protect the quality, supply, and reliability of Clark County's water resources for current and future residents.* **Policy 3.3.2:** *Coordinate with partner agencies on educational, programmatic, and regulatory strategies to increase water conservation projects and programs throughout Clark County.* **Policy 3.3.3:** *Continue to implement an integrated, area-wide water quality management program in accordance with Clark County 208 Area-Wide Water Quality Management Plan (208 WQMP) and related plans and studies.* **Policy 3.3.9:** *Explore land use and vegetation management practices that protect from aquifer contamination, support the proper abandonment of water wells, coordinate the implementation of the 208 WQMP, and support source water protection.* **Goal NE-5:** *Balance opportunities for future growth in the Northeast County with infrastructure and environmental constraints.* **Policy Ne-5.2:** *Promote connection to municipal water and wastewater service wherever available. Elsewhere, ensure septic systems, corrals, feed lots, and underground fuel tanks are installed a safe distance from drinking water wells to ensure protection of public health and water supplies. Support development and implementation of well head protection and source water plan's including MVWD's Well Head Protection Plan.*	**Goal 1:** *Identify the sources of, and potential risks to drinking water, and consider them in the local planning framework.* **Goal 2:** *Ensure that clean and safe drinking water is available for future generations.* **Goal 3:** *Integrate source water protection and conservation into local planning and zoning documents to ensure that the quality of water matches the goals of the community.* **Goal 1:** *Educate the community about what is being accomplished to achieve source water protection and conservation.*
City of Mesquite Master Plan	**Lower Virgin River Valley CSWP Plan**
Policy LU.2.2: *Consider new development in locations which will minimize the impact on city services.* **Policy WW.1.9:** *Cooperate with the Virgin Valley Water District to provide water service to existing residents, and plan for expansion of facilities to support new development.*	**Goal 1:** *Identify sources of and potential risks to drinking water and consider them in the local planning framework.* **Goal 3:** *Integrate source water protection and conservation into local planning and zoning documents to ensure that the quality of drinking water matches the goals of the community.*

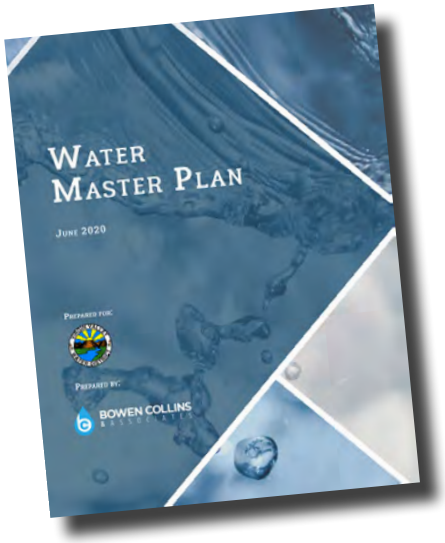
2.3 Virgin Valley Water District Technical Reports

The VVWD has been successfully managing, protecting, and preserving public drinking water supplies in the Lower Virgin River Valley for the last 30 years. There are several existing VVWD technical reports and plans which are relevant to their ongoing water quality management and conservation achievements. Several of these reports were used in the development of this CSWP Plan, including:

- The 2018 Well Sustainability Study (Bowen Collins & Associates, 2018): primary source for specific well information, such as perforated screen lengths, and aquifer parameter and stability data.
- The VVWD 2020 Water Master Plan (Bowen Collins & Associates, 2020): primary information source for the public water system description, pumping rates, and raw water quality information.
- The 2022 Coliform and Triggered Source Water Monitoring Plan (VVWD, 2022): provided detailed information used in this CSWP Plan regarding the VVWD's water infrastructure, including all active and newly constructed inactive wells, water treatment facilities, and storage tanks.
- The VVWD: 2023 Water Conservation Plan (VVWD, 2023): primary information source for current water usage and projected supply needs, as well as decision-making guidelines for local and state officials regarding the smart, water-wise use of water in the Lower Virgin River Valley.

2.4 The Vulnerability Assessment 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. The local planning team utilized a risk ranking system consistent with the vulnerability assessment program while evaluating potential contaminant sources in this CSWP Plan development.



3.0 Plan Development

3.1 Existing Source Water Protection Measures

Protecting the Muddy Creek Formation aquifer from potential contamination is important for the local and regional communities in Southern Nevada. Reducing the risk of aquifer contamination from human activities can defer the need for expensive and complex groundwater treatments and can secure and preserve water sources for the future. The VVWD, City of Mesquite, and the regional community have implemented several measures to protect source water from potential sources of contamination using existing plans and ordinances, summarized in Table 5.

Table 5. Current Measures to Protect and Conserve Source Water

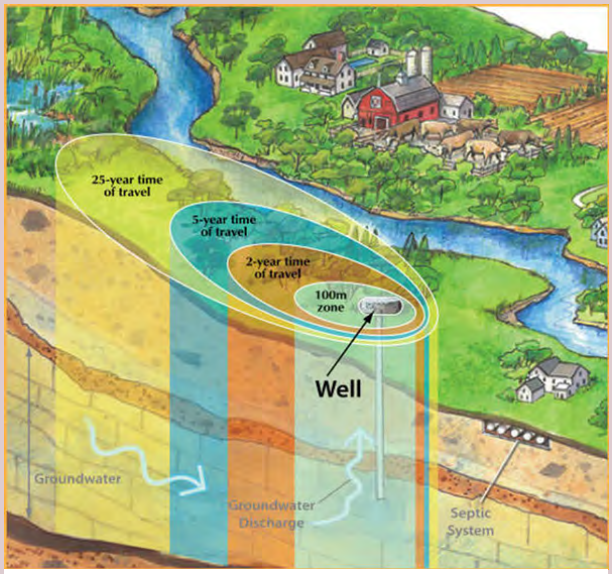
Current Measures	Source for Information
Physical Actions	>Described on the VVWD website.
Education and Outreach	>Described in Appendix G and Section 5.0.
Regional Plans and VVWD Technical Reports	>Described in Section 2.1 and Section 2.3.
Coordination	>Coordination with AWWA, SNWA, NvWARN, NvRWA, and WaterSense.
City and Regional Ordinances and Programs	>City of Mesquite House-hold Hazardous Waste Program. >City of Mesquite Grading and Excavation Standards and Motor Vehicle Aban-donment Ordinance. >Clark County Title 30.44 Underground Storage Tank Regulations.

3.2 Source Water Protection Area Development

The development of SWPAs for this CSWP Plan involved several steps taken by the local planning team to consider where precautionary SWPA boundaries should be established in the community. This section describes how the local planning team developed SWPAs to ensure that clean and safe drinking water will be available for future generations.

3.2.1 Buffer Zone Calculations

Buffer zones are useful for delineating and visualizing an area of land around a well which should be safeguarded from surface and subsurface sources of man-made pollution. Buffer zones can be determined with hydrologic characteristics using simple or complex analytical and numerical models to estimate "time-of-travel" for a contaminant to reach a groundwater well.



Example of time-of-travel buffer zones around a water source.

The VVWD is pursuing an integrated "Perennial Yield Groundwater Model" to determine how groundwater can be used over the long-term without depletion. Once the study is complete, it will include a detailed groundwater flow model and important groundwater recharge information. For the purpose of this CSWP Plan, the local planning team decided that a calculated fixed radius with a specified time-of-travel would be the most effective way to conceptualize the buffer zones, which can be modified if needed with the results of anticipated studies.

The time-of-travel buffer zones were based on the ISWPP guidelines for buffer zone calculations and by specific request from the Team with regard to future needs of the community. The Arbitrary Fixed Radius method (Figure 4) and the Calculated Fixed Radius method (Figure 5) are both approved methods within the ISWPP (NDEP, 2010) for determining buffer zones.

The key criteria selected by the local planning team for the time-of-travel buffer zone calculations for each wellhead included:

- 100-foot arbitrary fixed radius,
- 250-day time-of-travel calculated fixed radius,
- 2-, 5-, and 10-year time-of-travel calculated fixed radius, and
- 30-year time-of-travel calculated fixed radius.

Calculation methods, individual well parameters, and pertinent aquifer lithology are presented in Appendix C of this CSWP Plan.

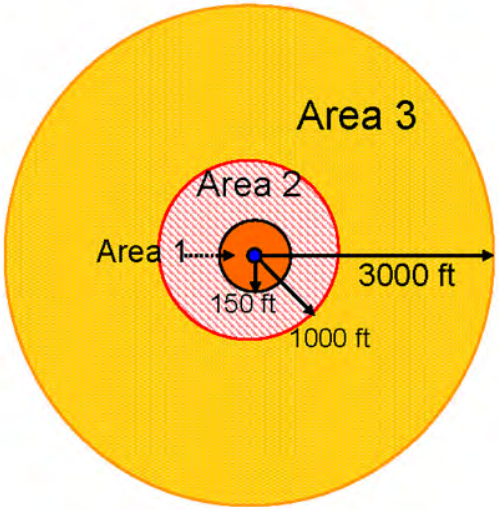


Figure 4 - Arbitrary Fixed Radius

The Arbitrary Fixed Radius method uses a distance criterion to define a circle around a well and was selected based on the desire to closely monitor existing and proposed activities adjacent to water supply wells to ensure that contaminants are managed to prevent releases to the environment and protect water sources.

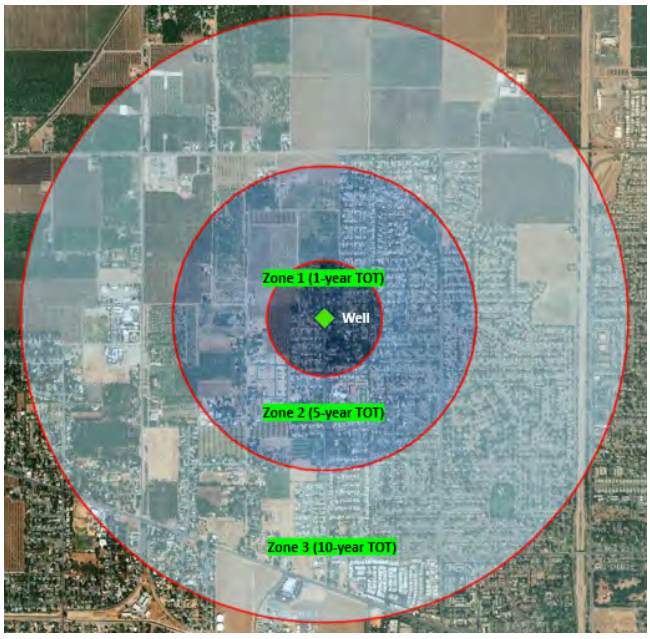


Figure 5 - Calculated Fixed Radius

The Calculated Fixed Radius method uses a volumetric flow equation and a specified time-of-travel threshold to calculate the radius of a circle which represents the groundwater contributing to a well over time. The method considers pumping data, aquifer/well characteristics, and time-of-travel.

3.2.2 Potential Contaminant Source Inventory and Evaluation

Human activities which can result in the pollution of drinking water sources are typically derived from urban, industrial, and agricultural activities (Figure 6). Potential contaminant sources are current and prospective activities that have the potential to release contaminants to the environment. If the activities release contaminants which migrate to ground or surface water, a community's source of drinking water could be affected.

The local planning team conducted an inventory of existing activities to identify potential contaminant sources throughout the City of Mesquite, Bunkerville, and Southeast Lincoln County, near well locations. The potential contaminant source inventory development and evaluation involved iterative steps which included data collection and review, map presentations and discussions, field review, and Geographic Information System map and data preparation for future updates. The local planning team developed the potential contaminant source inventory between August 2022 and December 2022 by utilizing electronic databases, existing documents, interviews with local planning team members, and field surveys. Field surveys were performed by Nevada Rural Water Association (NvRWA) to verify potential contaminant sources identified in the desktop search, to add any additional potential contaminant sources, and to take additional relevant notes.

Data gathered for the potential contaminant source inventory was assembled and formatted using a variety of methods, including digital mapping and spreadsheets. The evaluation conducted during local planning team meetings characterized the types and locations of activities in the community that might currently, or in the future, warrant a source water protection concern. A detailed summary of the inventory, data collection methods, analysis approach, and results are provided in Appendix D of this CSWP Plan.

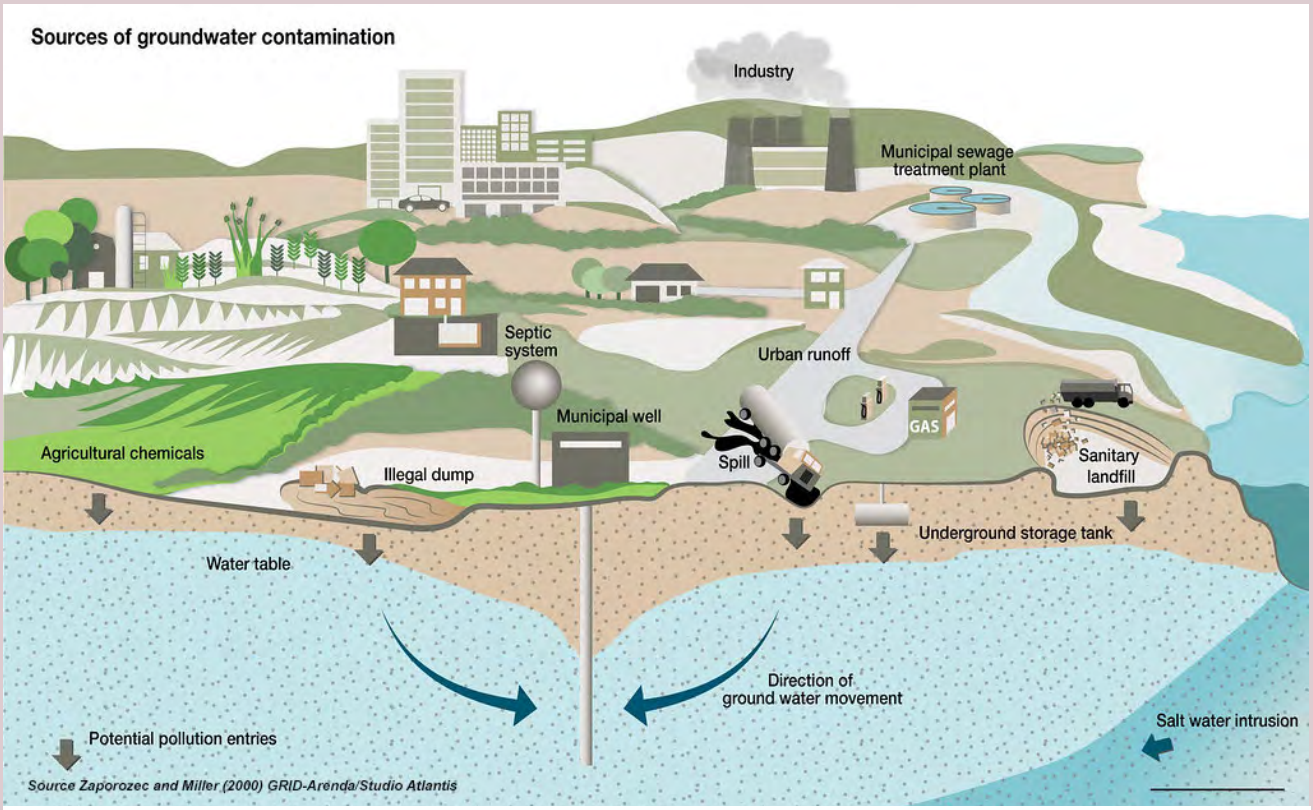


Figure 6. Potential Contaminant Source Activities

3.3 Source Water Protection Area Characteristics

Managing human activities to reduce the possibility of contaminants from entering a drinking water source is source water protection. SWPAs represent areas where the community has established a boundary to safeguard the water quality of drinking water sources. Within these boundaries, education, monitoring, and land use planning can provide more comprehensive management of water resources. The estimated "time-of-travel" buffer zones and potential contaminant source inventory, outlined in Appendix C and Appendix D of this CSWP Plan, respectively, drove the SWPA delineation efforts by the local planning team. Throughout the development of this CSWP Plan, the local planning team reviewed mapping which illustrated the potential contaminant sources, land usage, and parcel boundaries within the buffer zones. These maps facilitated discussions that established which time-of-travel buffer zones aligned best with the achievement of the plan purpose and goals.

Designation of SWPA boundaries is a planning tool which can help the community protect and conserve their drinking water sources and maintain water quality for future generations. The local planning team delineated four levels of SWPAs around the existing and planned future wells (Figure 7). The Team also chose to include a placeholder for groundwater recharge areas, which will be determined following the completion of the VVWD's anticipated perennial yield groundwater model. The final SWPA Zones, associated characteristics, and relative management needs are outlined in Table 6. The Zones were named for ease of reference in anticipation of future changes. The SWPA delineation map is presented as Figure 7 and jurisdictional SWPA delineation maps for the City of Mesquite, Bunkerville, and Lincoln County are presented in Appendix A of this CSWP Plan. Detailed SWPA delineation methods are provided in Appendix E of this CSWP Plan.

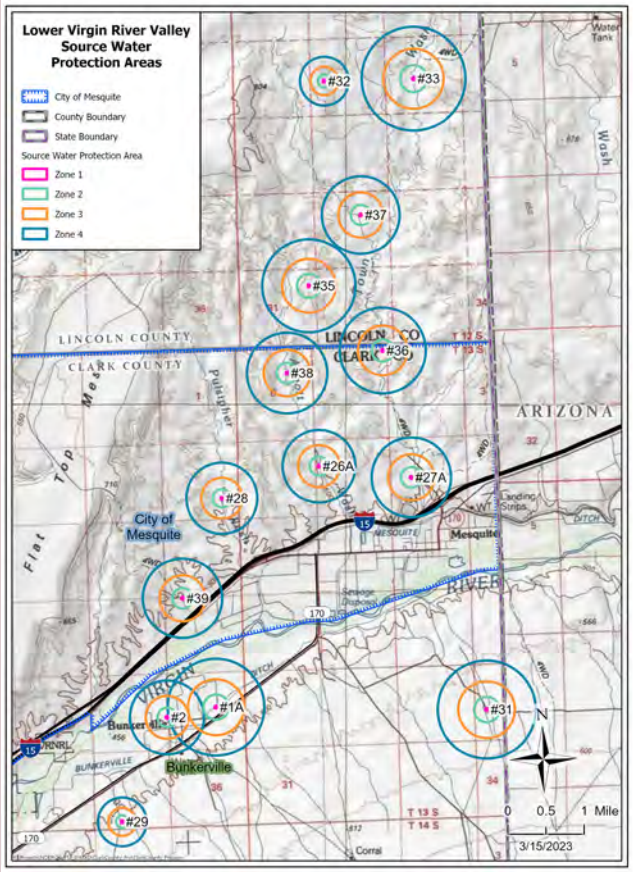


Figure 7. Source Water Protection Area Map Overview

Table 6. Source Water Protection Area (SWPA) Descriptions	
SWPA Name	**Descriptions**
Zone 1	100-ft Arbitrary Fixed Radius: Within a 100-ft radius, the VVWD is concerned about the risk posed by activities adjacent to their wells. Zone 1 is a reasonably confined area to closely monitor existing and proposed activities to ensure that contaminants are suitably managed to prevent releases to the environment and protect water sources. This is consistent with the 100-ft radius management area outlined in the Clark County 208 Area-Wide Water Quality Management Plan (2009) for the Las Vegas Valley Groundwater Management Program. Given the harmful and costly consequences of potential contaminants occurring adjacent to their wells, the VVWD would like to consider control or ownership of lands within a 100-ft radius around their wells.
Zone 2	2-Year Calculated Fixed Radius: Within the calculated 2-year time-of travel to a PWS well, uses identified as potential contaminant sources, particularly those with a "high" risk ranking (See Appendix D of this CSWP Plan), are a high priority for local source water protection management. Establishing Zone 2 will support management of potential contaminant sources and education of property owners about source water protection in close proximity to water sources.
Zone 3, Zone 4	10-, 30-Year Calculated Fixed Radius: Activities occurring in Zone 3 and Zone 4, the calculated 10-year and 30-year time-of-travel, respectively, represent the broader occurrence of potential contaminant sources within the community. Depth of the local water aquifer and complexity of contaminant transport warrants reducing long-term risks to water quality from release on the ground surface. These SWPAs will give the community references to identify, and more comprehensively, manage potential contaminant sources within the local planning framework. Public education about source water protection and conservation will encourage community involvement within Zones 3 and 4 to ensure that clean and safe drinking water is available for future generations.
Zone 5	Zone 5: A place-holder in this CSWP Plan to be consistent with the Water Master Plan and VVWD's on-going water planning phases. The VVWD has started the development of a comprehensive groundwater model to identify aquifer properties and recharge areas for their water supply source. They anticipate this study will be completed in the next three years and results can be incorporated in the next update of the CSWP Plan.

Identifying potential contaminant sources within SWPAs can help communities identify potential risks to the aquifer and plan for the future. Maps and datasets of potential contaminant source locations and land use in relation to SWPAs can be useful for the community to protect and conserve their source water. They help the community work together to achieve CSWP Plan goals. The final mapped inventory of potential contaminant sources within SWPAs are included in Appendix E of this CSWP Plan.

3.4 Source Water Protection Management Strategies

Source Water Protection management strategies incorporate SWPAs, potential contaminant source inventory and evaluation, and community change and growth to ensure that CSWP Plan goals are met. The following sections summarize the management strategies prioritized by the local planning team for the water sources considered in this planning effort (Section 1.5.2 - Table 2). These strategies were designed to be simple and easy to implement, and to reduce the potential of source water contamination within the Lower Virgin River Valley. The management strategies described below are broad and will be implemented using the Action Plan detailed in Appendix F of this CSWP Plan.

Public Education and Outreach

Communication to the public about source water protection and conservation is emphasized in Goal 3 and continues to be a key component of this CSWP Plan for the Lower Virgin River Valley. Public education and outreach programs apply to many aspects of this CSWP Plan. Key audiences will include source water and conservation education for students, residents over 55, local professional organizations, and the general population. The Education Plan developed by the local planning team is provided in Appendix G of this CSWP Plan.

Planning Agency Coordination

Successful source water protection and conservation engages the agencies that regulate land use in and around public drinking water sources. SWPAs and potential contaminant sources can be readily incorporated into the local planning agency review processes. Incorporating measures from this CSWP Plan into the City of Mesquite Master Plan, the VVWD Water Resources Plan and Well Sustainability Plan, and the Clark County Master Plan, can ensure that the quality and quantity of drinking water matches the goals of the community.

Collaboration with Local and Regional Partners

The VVWD and the City of Mesquite have worked to create a strong local partnership regarding water quality and conservation. This plan recommends strengthening collaboration with regional partners such as Lincoln County, the Bureau of Land Management, and the NvRWA, among others. Continued collaboration and communication between entities within and surrounding the Lower Virgin River Valley will maximize the effectiveness of CSWP Plan implementation to help ensure that clean and safe drinking water remains in abundance and is available for future generations.

Secure Locations for Current and Future Water Sources

Human activities in the immediate vicinity of a water source are typically viewed as the most likely sources of potential contamination. Establishing source water protection buffers within at least 100-feet of a well increases a public water system's ability to manage wellhead security and potential contaminants. Additionally, land use and zoning in and around existing and proposed well sites is an important consideration for protecting source water quality.

3.5 Contingency Plan

3.5.1 Existing Short- and Long-Term Contingency Plans

A contingency plan focuses on how to prepare the community for long-term contamination or loss of quality or quantity of source water. The goal of a contingency plan is the immediate and long-term protection of the public water supply system for the community. The identification of personnel, testing equipment, procedures, and materials can be used to correct or mitigate environmental accidents that constitute a water supply emergency. Generally, these plans include response protocols, notification procedures, and methods of containment for accidents which may directly impact a source water supply.

There are several short- and long-term contingency plans required by the Nevada Administrative Code that address impacts to water quality and quantity. The contingency options outlined in each plan are designed to provide temporary relief for public water systems in an emergency, until permanent solutions can be implemented. Local and regional contingency plans are listed in Table 7.

Table 7. Local and Regional Contingency Plans

Contingency Plans	
VVWD 2023 Water Conservation Plan	VVWD 2018 Sustainability Study
VVWD 2021 Emergency response Plan	VVWD Cross Connection and Back-Flow Control Program
VVWD Operations and Maintenance Manual	VVWD 2020 Water Master Plan
Clark County Hazardous Materials Emergency Response Plan	

3.5.2 New Well Siting and New Water Sources

The VVWD's projected annual growth in the service area is 3.35% (Bowen Collins & Associates, 2020). Maintaining reliable water sources and developing new water sources as necessary are essential to the success of the VVWD's system. To address these impacts the VVWD has developed a Capital Improvements Plan which includes improvement recommendations for new well siting and water sources, and improvements to the conveyance system, water storage, and treatment facilities. The Capital Improvements Plan serves as a guideline to budget and implement the recommendations out to 2033.

Based on the Capital Improvements Plan recommendations, the VVWD has plans to construct three new wells for its system, as listed in Table 2. These well locations have been included in this CSWP Plan as though they are in operation, and they are depicted on all the appropriate maps. Management strategies developed in this CSWP Plan, including SWPA delineations around these future wells, were designed by the local planning team to protect future source water locations. Future well location details can be found in the Capital Improvements Plan outlined in Chapter 8 of the 2020 Water Master Plan.

Drilling a new well.

Installing tanks in new building.

Well 31 Building

4.0 Action Plan

Development of an Action Plan is an essential part of the CSWP planning process, as it outlines the steps and tasks needed to achieve the CSWP Plan goals (Section 1.2). Management strategies (Section 3.4) support the goals developed by the local planning team, and the Action Plan outlines how CSWP Plan goals and strategies will be implemented. The Action Plan was developed by the local planning team throughout CSWP Plan development to create manageable action projects with real-world applications that are easy and reasonable to implement.

The projects outlined in Appendix F of this CSWP Plan were identified and compiled by the local planning team during regular meetings and are organized by management strategy. Thoughtful considerations were made based on potential contaminant sources, land use and zoning, planning, regional collaboration, public education and outreach, and hazard mitigation. Each action project includes a description, priority and cost, project lead, type of assistance needed, and expected implementation year.

Action Plan implementation is dependent upon funding, priority, and resource availability. Actions will not necessarily be fulfilled based on priority, but as funding and time allows. Technical or funding assistance will be needed to complete many of the projects and the local planning team will take advantage of various grants and funding opportunities. The community benefits from building relationships and leveraging resources with source water protection partners. A list of potential funding sources is detailed in Appendix F of this CSWP Plan.

Snow on the Virgin Mountains

4.1 CSWP Plan Updates

This CSWP Plan was developed to be flexible, involving the community stakeholders, who can jointly help bring source water protection to fruition. The decision to develop the Lower Virgin River Valley CSWP Plan was initiated to build interest within the community to protect and conserve drinking water sources. This CSWP Plan aims to create a common vision to ensure drinking water is available for future generations, and to establish a practical set of goals and strategies that incorporate source water protection and conservation into the local planning framework. Updating a CSWP Plan is important for maintaining a community vision that is useful to decision-makers. Updates can keep the VVWD, the City of Mesquite, and the community on-track for implementation. The local planning team determined that CSWP Plan updates will coincide with updates to the VVWD Water Master Plan and Well Sustainability Study (typically every three to five years), or as needed to include new information (water source locations, hydrogeologic information, etc.).

Virgin Valley Water District Hydrogeologist performing water monitoring activities.

Nickel Creek Spring with Tiers

5.0 Public Participation

Public participation in the planning, development, and implementation stages of a CSWP Plan ensures that community representation is achieved. The local planning team for this CSWP Plan represents various factions of the community, as outlined in Section 1.3 and Table 1. The public water system and local agencies were engaged as they learned about source water protection, taught each other about water sources and local planning development and zoning practices, and collaborated on strategies which work toward achieving the CSWP Plan Purpose:

Create a community-wide plan to help protect drinking water sources and maintain water quality.

The local planning team consisted of local representatives who care about the future of their community, which is centered around ensuring that clean and safe drinking water is available for future generations. Meetings generally began with an overview of technical documents and were driven by local planning team input derived from the community's needs. The participants engaged in active collaboration regarding community involvement to protect source water and facilitate CSWP Plan implementation. Agendas, notes, and working drafts were shared electronically. Copies of meeting agendas, notes, and presentations are included in Appendix B of this CSWP Plan.

Implementation began during the development of this CSWP Plan with a "Source Water Protection and Conservation" presentation to local 5th grade students and teachers (January 3, 2023). The VVWD and the NvRWA utilized a "Sand Box" groundwater model to introduce source water and source water protection to students and teachers. Additional community specific source water protection and conservation educational opportunities are detailed in Appendix G of this CSWP Plan.

Public education is an important tool, as identified in the management strategies and Action Plan, to promote voluntary source water protection actions and to build public support for CSWP Plan implementation. The CSWP Education Plan (Appendix G of this CSWP Plan) aims 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. Additional action projects which identify several key audiences for targeted education and outreach to promote proper care and maintenance when potential contaminants are involved are outlined in Appendix F of this CSWP Plan.

Virgin Valley Water District Conservation Specialist promoting water conservation at the annual Mesquite Days celebration.

The public education and outreach implementation projects have been developed to educate the community about what is being accomplished to achieve source water protection and conservation, outlined in Appendix F of this CSWP Plan. The following messages were developed by the local planning team to bring source water protection and conservation messages to those served by the VVWD, however, they may be slightly adapted to accommodate various audiences.


Nevada Rural Water Association introducing source water and source water protection to a local group of 5th Grade students.

Have you ever wondered where the water in your tap comes from?

100% of drinking water in the City of Mesquite and Bunkerville comes from groundwater. Groundwater is underneath the Earth's surface, and your groundwater is stored in a large underground aquifer that we can't see. The mountains which surround your community feed the aquifer as rain and snow-melt percolates into the soil and down into the aquifer. The VVWD, your community public water system, pumps the water out of the aquifer, cleans it, and sends it right to your tap.

Why is it important to protect drinking water at the source?

Groundwater sources can be polluted by various human activities. Your groundwater aquifer is thousands of feet deep, and once your aquifer becomes polluted, it is extremely costly and difficult to remove those contaminants. You have the power to support the VVWD and the City of Mesquite as they integrate strategic safeguards, such as source water protection and conservation ordinances, to avoid and/or control contamination threats and incidents which may pollute your drinking water.

What is your public water system doing to provide clean drinking water?

The VVWD, your public water system, maintains comprehensive analyses of your drinking water supplies, and gives you the most up-to-date information regarding your water news on their website. The groundwater in your community contains naturally occurring arsenic.

The VVWD, has installed arsenic treatment plant systems at many of its well sites, to bring you fresh drinking water that is 100% safe for consumption. Additionally, the VVWD tests your drinking water for over 130 contaminants. The VVWD makes sure your water is 100% safe to drink, right from the tap!

What can you do to protect your drinking water?

Protecting your drinking water from contamination or overuse is a huge challenge, but nothing we can't overcome if we band together as a community. Protecting your drinking water sources starts right here, with awareness and education. We can take everything we've learned today home with us, educate our friends and families, and change our behaviors to limit our effects on groundwater. All the water in the world won't be enough if it's contaminated, and if we waste it, there will be nothing left to protect.

Dove Creek in Cabin Canyon

How does water conservation support source water protection?

Excess watering of the land surface can cause leaching of fertilizers or other potential contaminates into your groundwater. The City of Mesquite is currently looking into code and ordinance changes to limit landscape turf in the hope it will motivate the community to conserve groundwater resources. These changes can help you protect your sources of drinking water by reducing the use of fertilizers and potentially hazardous runoff, which could contaminate the groundwater and surface water.

Example of Water Wise landscaping.

The Lower Virgin River Valley CSWP Plan has been developed by the local planning team to protect and conserve drinking water supplies for future generations. This CSWP Plan was written to facilitate cooperation between local and regional partners to protect and conserve our critically important resource: drinking water. Throughout the development process, the local planning team understood that the community needs to work together to ensure that drinking water supplies stay clean, safe, and plentiful. All the water in the world won't be enough if it's contaminated, and if it's wasted, there could be nothing left to protect.

Virgin Valley Water District mascot.

"An ounce of prevention is worth a pound of cure!"

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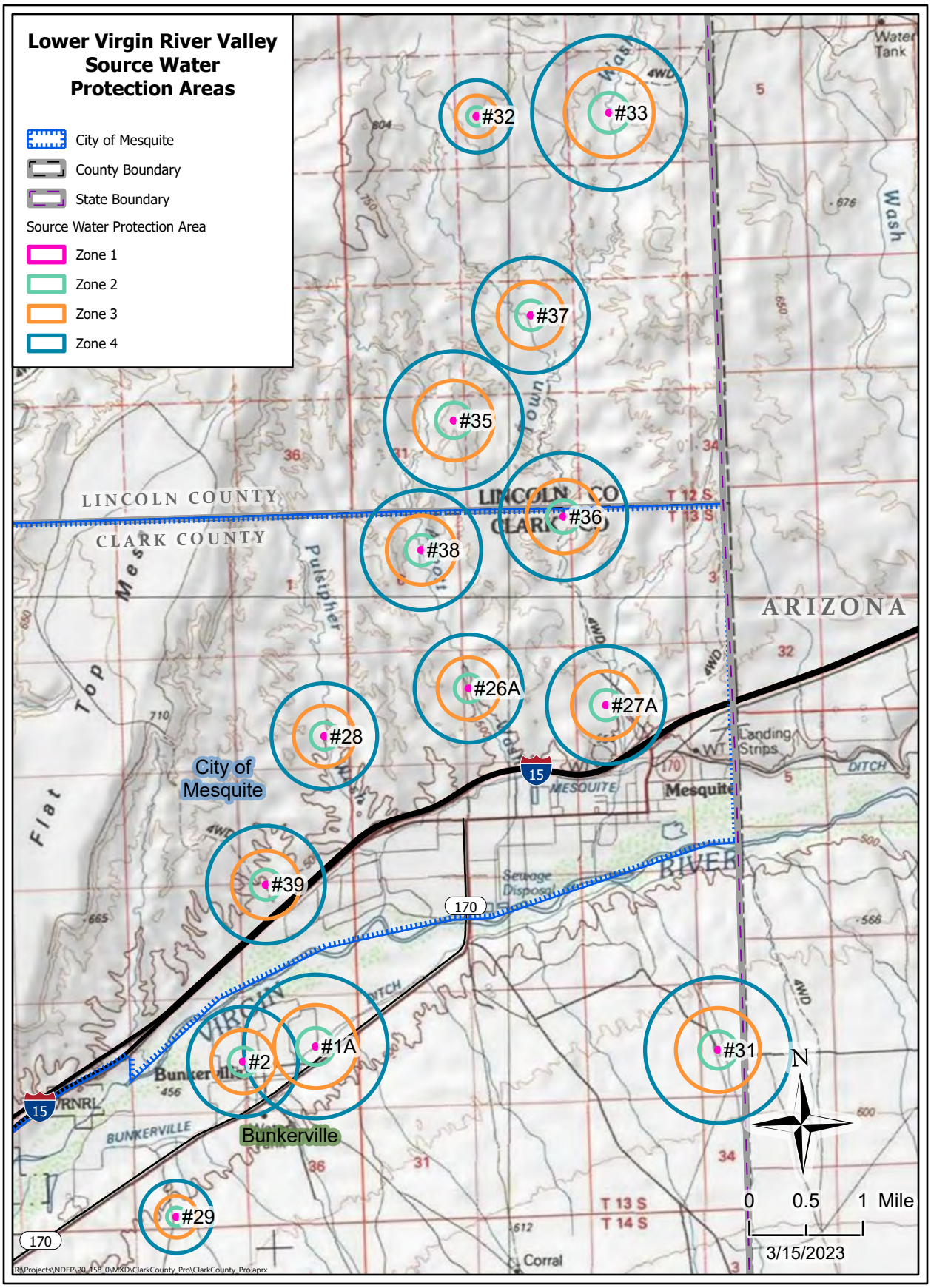
Appendix A

Source Water Protection Area Maps


Lower Virgin River Valley
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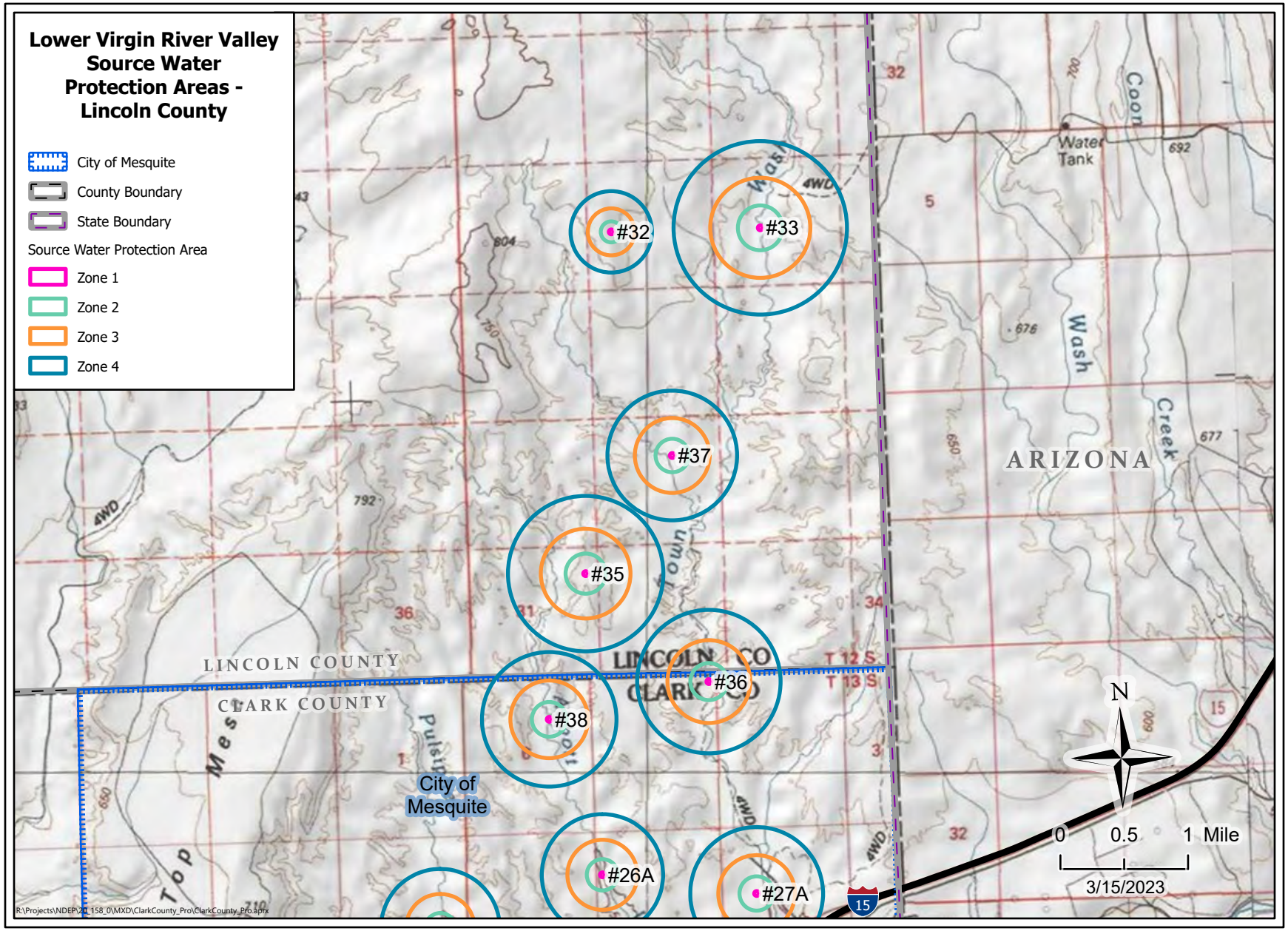
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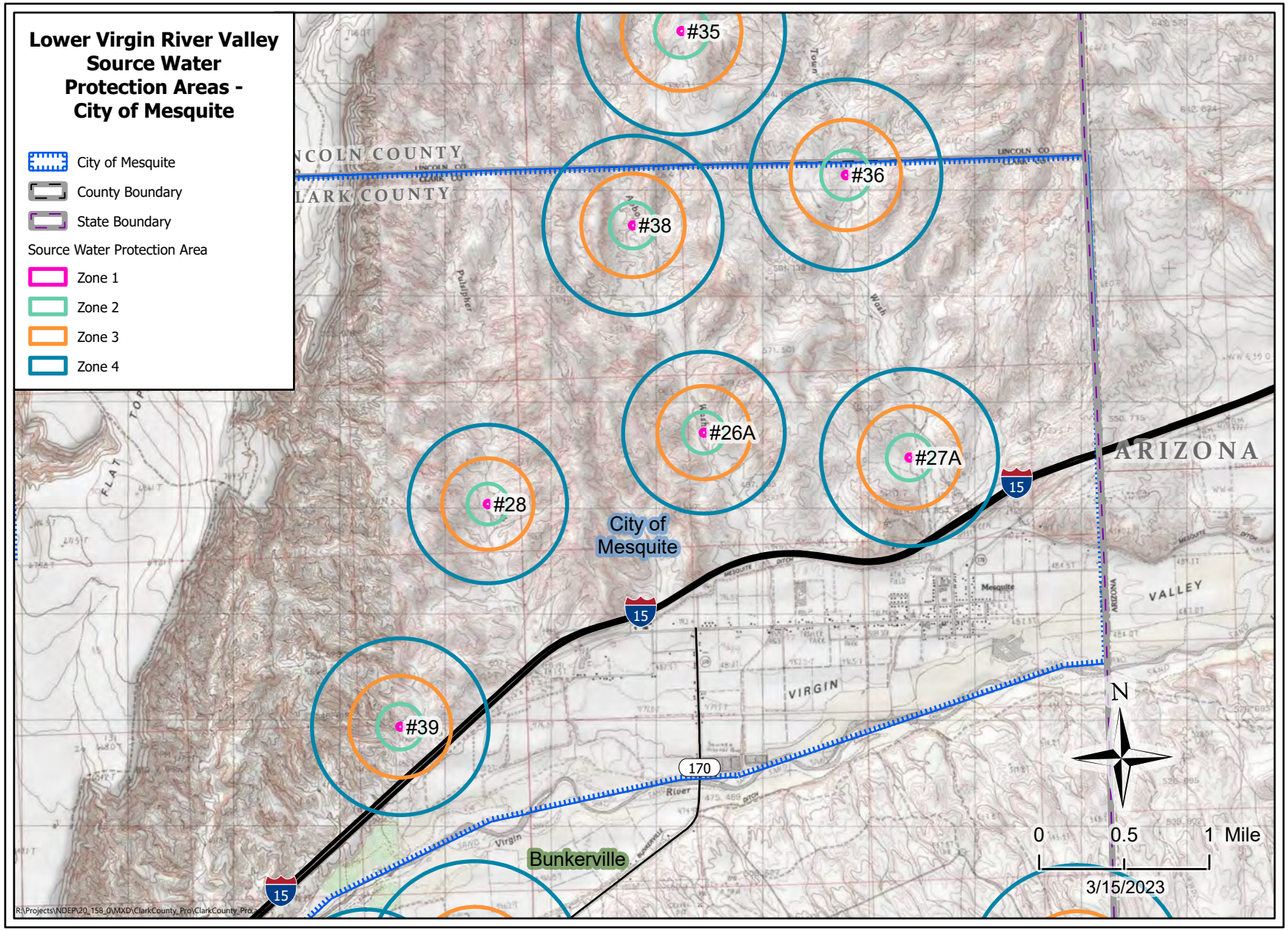
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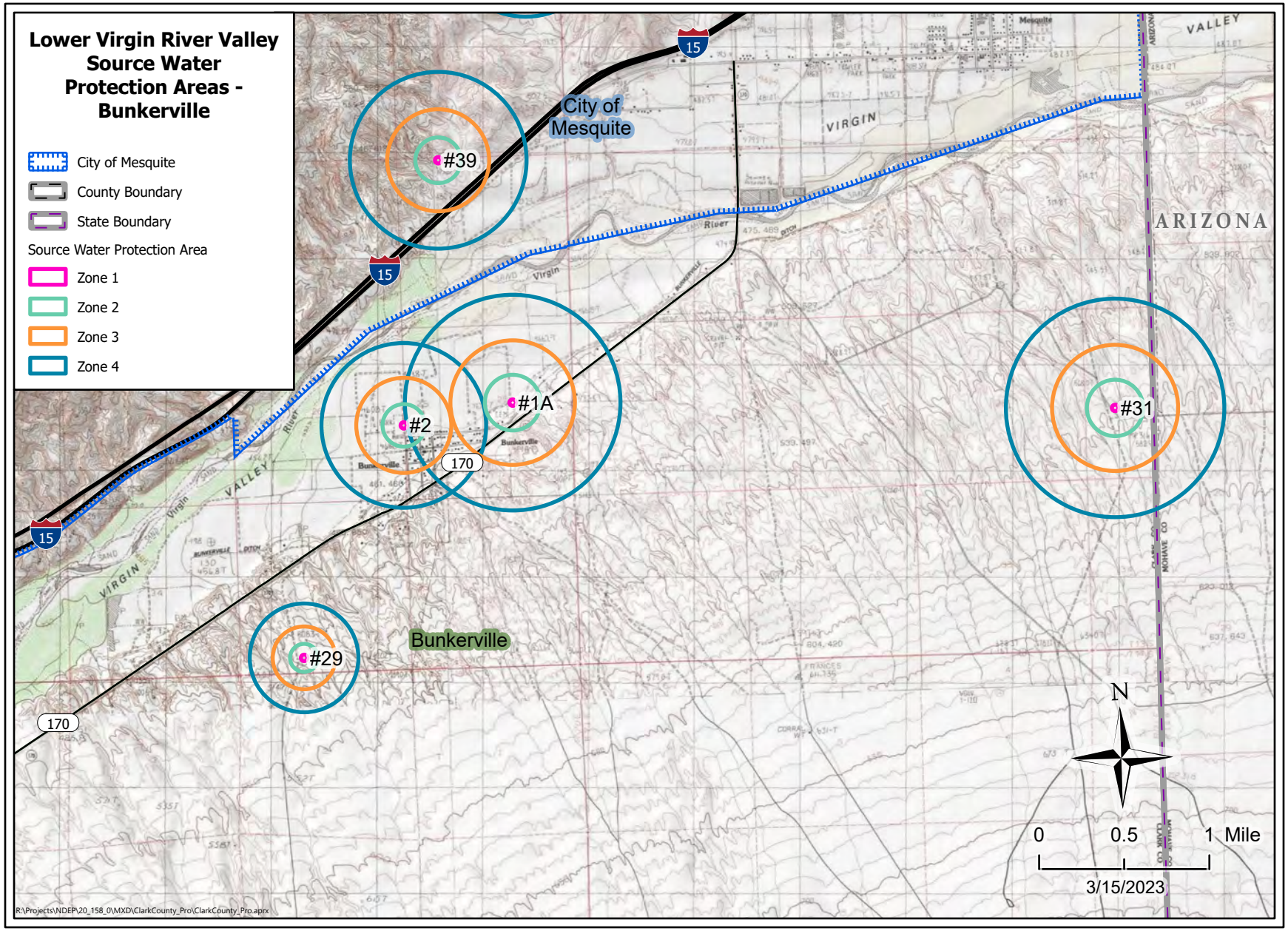
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Appendix B

Meeting and Public Participation Documentation

1. Meeting Notes
2. VVWD Board Approval
3. Mesquite City Council Adoption
4. NDEP Endorsement

Meeting Notes

VIRGIN VALLEY WATER DISTRICT REGULAR BOARD MEETING
VIRGIN VALLEY WATER DISTRICT OFFICE
NOVEMBER 16, 2021

Minutes of a Regular Board Meeting of the Virgin Valley Water District Board held on November 16, 2021, at the Virgin Valley Water District Office at 5:00 p.m. Attending were Vice-President John Burrows, and Board Members Randy Laub and Brian Bingham. Board member Richard Bowler participated via telephone. President Ben Davis was not present. Also present were District General Manager Kevin Brown, District Water Resource Manager Aaron Bunker, District Legal Counsel Bo Bingham, District CFO/Accountant Wesley Smith, District Water System Engineer Steve Hall, District Secretary-Treasurer Mary Johnson and other interested parties of agenda items.

- **Vice-President John Burrows called the meeting to order at 5:03 p.m.**
- **Brian Bingham offered a Prayer**
- **Randy Laub led the pledge**
- **Public Comment** – There was no public comment at this time.
- **Board Comments –** None
- **President of Board Comments –** None

CONSENT AGENDA:

Brian Bingham moved to approve the agenda and consent agenda as listed below. Randy Laub seconded the motion and it was unanimously carried. 4-0

1. For Possible Action – Approve **Agenda**

2. For Possible Action – Approve **Minutes from 10/05/21 Annual Meeting**

3. For Possible Action – Approve **Financial Statement for August 2021**

4. For Possible Action – Approve **Financial Statement for September 2021**

5. For Possible Action – Approve **Bills Paid since last public meeting $2,121,271.62**

**** END OF CONSENT AGENDA ****

6. For Discussion & for Possible Action – Consideration to approve additional engineering costs to redesign Treatment Plant 35 to enable the ability to treat more water than expected with the drilling of Wells 35 and 36.

Steve explained that at the June 16, 2020 board meeting, the board authorized Task Order #20-02 with Sunrise Engineering for the design of Treatment Plant 35 (TP 35) and the Well 35 outfitting project in the amount of $215,300. The assumption at that time was that TP 35 would handle up to 3,000 gpm from the two wells. Since the drilling of Wells 35 and 36 has been completed, and the production rate is much more than expected, TP 35 will be modified to a

plant production of 4500 gpm. Sunrise Engineering submitted a proposal and has requested additional compensation for the redesign in the amount of $70,700. This amount includes the additional design and permitting with the State which will be billed hourly. The amount could be cheaper by billing hourly, but will not exceed the $70,700 proposal.

Brian Bingham moved to approve additional engineering costs to redesign Treatment Plant 35 in an amount not to exceed $70,700.00. Randy Laub seconded the motion and it was unanimously carried. 4-0

7. For Discussion & for Possible Action – Source Water Protection Presentation – Presented by Jill Sutherland with Resource Concepts. Possible action may include the board's direction to staff to proceed in preparing source water protection plans for the District's sources.

Jill Sutherland with Resource Concepts, Inc. (RCI) explained what Resource Concepts does and how the Integrated Source Water Protection Program (formally known as the Wellhead Protection Program) works and why it is important. Jill stated that the protection program is a non-regulatory program and totally voluntary. The state is required by federal regulations to have some sort of source water protection program. A slide presentation was presented. Jill reviewed what the program would not address and the steps on how the program works and the roles of the District and RCI in the development of the plan.

Jill answered questions regarding funding, participation, timeframe and land use issues.

Brian Bingham moved to direct staff to proceed in preparing a source water protection plan for the District's sources in conjunction with RCI. John Burrows seconded the motion and it was unanimously carried. 4-0

8. CFO/Accountant's Report

Wes had included a written report with his activities since his last report and heard no questions.

9. Water System Engineer's Report

Steve had included a written report and updated the board on the Airport Pipe Replacement Project stating the project is essentially complete. The asphalt patches were completed last week; the last airvac valve has been piped out; and work on the last bit of landscaping is being completed.

10. Water Resource Manager's Report

Aaron had included a written report. Aaron stated that this was the first time in probably over three years that all wells are functioning.

11. General Manager's Report

Kevin had included a written report. Kevin stated that since 2011, the District's service area population has grown 44% while the District's water production over the same period has only increased 10%.

Kevin informed the board that he received an email approval to start working with the developer in Lincoln County for the District's Well 37 site.

Kevin further informed the board that over 5,000 Sensus meters have been installed. Kevin had made a commitment to staff that when the District closes in on 6,000 Sensus meters installed (estimation April 2022), staff will work on rolling out the customer portal to start allowing customers with the Sensus meters to be able to log into the customer portal and view their metered data and receive usage alerts. Starting later this month/early December, staff will be rolling out a trial run of the customer portal with all staff, board members, and a few select other customers to start working out the wrinkles.

12. Public Comment

There was no public comment at this time.

13. Adjournment

Vice-President John Burrows adjourned the meeting at 6:00 p.m.

(NOTE): The minutes of this meeting have been recorded and will remain on file in the District office for a five-year period for public examination.

CITY OF MESQUITE
10 E Mesquite Blvd
Mesquite, NV 89027

June 15, 2022

Mr. Brendon Grant, PE
Integrated Source Water Protection Program
Nevada Division of Environmental Protection
901 South Stewart Street, Suite 4001
Carson City, Nevada 89701-5249

RE: Participation in the Integrated Source Water Protection Program

Dear Mr. Grant,

Consistent with the motion made during the regular meeting of the Mesquite City Council on June 14, 2022, The City of Mesquite hereby requests participation in the State of Nevada Integrated Source Water Protection Program (ISWPP).

The City Council considers the quality of drinking water sources to be a critical consideration for our community. We understand the Nevada Division of Environmental Protection (NDEP), Bureau of Safe Drinking Water, administers the ISWPP for the purpose of providing technical assistance to public water systems and communities throughout Nevada for drinking water quality protection and preservation.
The City supports staff participation in developing a community source water protection plan. We will provide a liaison to facilitate City involvement and work with Resource Concepts, Inc. (RCI), NDEP, local communities and the water service provider toward successful completion of this plan.

Sincerely,

Allan S. Litman, Mayor

CC: Jill Sutherland Resource Concepts, Inc.

Mesquite Regular City Council Meeting
City Council Chambers – City Hall
10 E. Mesquite Blvd.
Tuesday, June 14, 2022 – 5:00 PM

Minutes of a scheduled meeting of the City Council held Tuesday, June 14, 2022 at 5:00 pm at City Hall. In attendance were Mayor Allan S. Litman, Council members Wes Boger, Karen Dutkowski, George Gault, and Brian Wursten. Also in attendance Deputy City Manager Martine Green; City Attorney Bryan Pack; Finance Director Nikki Thorn; City Clerk Tracy E. Beck, other city staff and approximately 59 citizens.

Mayor Litman called the meeting to order at 5:00 PM. (Note: This meeting was recorded and will be retained in the City Clerk's Office for one year).

Invocation was offered by Pastor Michael Quinton, Mesquite Baptist Church and followed by the Pledge of Allegiance

Below is an agenda of all items scheduled to be considered. Unless otherwise stated, items may be taken out of the order presented on the agenda at the discretion of the Mayor and Council. Additionally, the Mayor and Council may combine two or more agenda items for consideration, and may remove an item from the agenda or delay discussion relating to an item on the agenda at any time. Public comment is limited to three minutes per person.

1) Public Comments

1.1 Public Comments

Minutes;
Mayor Litman: Opened the meeting and excused Council member Ramaker.

Minutes;
Mayor Litman Opened the meeting to Public Comment.

Minutes;
Dottie Golden and I am the president of the Virgin Valley Artist Assoc. and beside me is Rita Fulmer. Rita is our invaluable board member. Summer heat does not slow us down at the Mesquite Fine Art Gallery. This month's exhibit is your favorite song title. Hip hop and pop into the gallery. This show will rock your world. I had many jazzed artists telling me they were in the rhythm getting ready for this competition. You will get the blues if you miss it. Be sure to join us for the awards reception this Thursday the 16th at 4:00 p.m. The pottery studio is heating up with Clay Art for Kids summer youth classes. Beginning in July, kids will learn the fine art of hand building. Only two more palette and pour parties before the summer break. June 24th is Western Boots with Vanessa Temple and on July 1st, Patriotic Gnome with Aida Bryant. The Virgin Valley

Artists Association is excited to announce our venture into podcast land. What is a podcast you ask? Well, podcasts are widely popular programs similar to the radio, but digitally streamed through providers such as Spotify or Apple. Anyone can have a podcast. Our podcast is the Art Box, hosted by Steve Pedro and Rachelle Knight. Our first guest was Tyler Roylance, who is the art teacher for Virgin Valley High School. What a great time I had listening in on their conversation. Stay tuned for a lineup of interesting guests and I would also like to say that our second podcast is here. Dana is the president of Love Family Nevada. As always, thank you to our Mayor, Council members, and community for your continued support of the arts.

Minutes;
Wende Wolfe-Killinger: I am the Director for the Youth Summer Stock Theater players. And we have brought some of our cast members for Beauty and the Beast. I have my music director, Mitzi Binder back there and I have two of our wonderful parent volunteers, Bethany Green and Mekesha Boger who have given up lots of hours and time and dedication to this program. So, the kids would just like to give you a little bit more information.

Minutes;
Carly Toutant: I am the president of RAISE Mesquite Nevada, first off, we would like to present to Jayson Andrus, who is the President of Mesquite Virgin Valley Little League, a check in the amount of 510 dollars, which is 10% of the profits that we earned running the concession stand for Mesquite Virgin Valley Little League.

Minutes;
Sheila Gustaveson: Treasurer of Raise and I am really excited to announce our “Wheely” great event on July 4th in conjunction with the City of Mesquite and the Department of Leisure Services. We are hosting a patriotic bike decorating contest at 8:00 a.m. in the west field of the Rec Center before the free pool and Fun Day. Kids of all ages. If it is on wheels, including skates, skateboards, wagons, scooters, decorate it and come on down. Great prizes such as two full-sized bikes that are from All Cycles, also kites, scooters, wagon, roller skates, etc. We would like to thank All In Cycles, Aravada Springs, Mr. Taco, Heavenly Gift Shoppe, Angel Whispers Spa, Jackson Contracting, and H&H Framing for their generous donations. Pre-registration can be found at All Cycles, Mr. Taco, Heavenly Gift Shoppe, and the Rec Center.

Minutes;
Carly Toutant: And also, we would like to thank Dana Long from Love Family for putting together our flyer and our registration form in two days. She is awesome.

2) Consent Agenda

2.1 Consideration for approval of the Tuesday, June 14, 2022 Regular City Council Meeting agenda and the April 26, 2022 City Council Meeting minutes; the May 10, 2022 City Council Meeting minutes; May 17, 2022 Technical Review Meeting minutes and the May 17, 2022 Redevelopment Agency Meeting minutes.

- Public Comment
- Discussion and Possible Action

Minutes;

Mayor Litman read Items 2.1 and 2.2 by their titles.

Minutes;
Mayor Litman asked Council if they had any questions or comments on Items 2.1, 2.2. There were no speakers.

Minutes;
Mayor Litman opened Items 2.1 and 2.2 to Public Comment. There were no speakers.

Council member Boger moved to Approve the Tuesday, June 14, 2022 Regular City Council Meeting agenda and the April 26, 2022 City Council Meeting minutes; the May 10, 2022 City Council Meeting minutes; May 17, 2022 Technical Review Meeting minutes and the May 17, 2022 Redevelopment Agency Meeting minutes. Council Member Gault seconded the motion.

Passed For: 4; Against: 0; Abstain: 0; Absent: 1 Council member Ramaker

2.2 Consideration of approval of:
a) Notification of Budget Transfers
b) Notification of Budget Amendments
c) Notification of Bills Paid
d) Purchase Orders

- Public Comment
- Discussion and Possible Action

3) Special Items

3.1 Presentation by Jill Sutherland, PE, Resource Concepts, Inc. regarding the Integrated Source Water Protection Program (ISWPP).

- Public Comment
- Discussion and Possible Action

Minutes;
Mayor Litman read this item by its title.

Minutes;
Jill Sutherland: I am with Resource Concept Inc. and we are the contractor for the Nevada Intergraded Source Water Protection Program, and I would also like to introduce Brennan Grant. Brennan is with the State of Nevada and he was able to come and show his support this evening. …

Minutes;
Brennan Grant: I am the engineering supervisor for the Bureau of Safe Drinking Water, under me is the Source Water Protection Program. As Jill said, RCI resource concepts is our technical contractor for the implementation and development of Source Water Protection plans. It is

important for everybody to understand that Source Water Protection plans are 100% voluntary. So, that means that you will not find a requirement for implementation and development of such plans in Nevada Administrative Code or Nevada Revised Statutes. Each plan is uniquely tailored to fit the needs of each individual public water system for the protection of their portable water sources. It is much easier and cheaper to be proactive and protect source water, than it is to clean up contamination. So, please reach out to me if you have any questions, or Jill Sutherland, and we would greatly appreciate your support for these plans.

Minutes;
Jill Sutherland: As Brennan said these plans are voluntary, so it is a non-regulatory planning process. Nevertheless, it is very important and proactive for the community to engage and we reached out to the Virgin Valley Water District and made a presentation to them probably last November and they said, yes, we would like to participate and we normally don't come into a community unless we are invited to bring the program. So, I am here to give you all a little overview of the program and invite any questions you might have about participating. So, what is Integrated Source Water Protection? It is quite a little mouthful, but it is a planning process to empower local communities to implement local measures to protect your own drinking water sources. So, why is protecting drinking water and source water important? So, source water is the source of your drinking water, the well, the aquifer that supplies the water to the well or the spring, the river that supplies the water to the diversion, and right up on our slide here you see some extreme examples, there are plenty of them of how source water has become contaminated. We have the classic Love Canal in the 1960s. where it mowed a whole community ill and it became the first superfund site. We have Times Beach, Missouri, a little later, where the EPA ended up having to buy the whole town that was contaminated from dioxin because they used waste oil to oil their roads. Right? PG&E Hinckley, you know, the movie Erin Brockovich, that is not that long ago, affected a population of 800 and they are still trying to clean that up today, and more locally in Nevada, in Reno & Sparks, the TMWA, the Truckee Meadows Water Authority has two wells solely devoted to groundwater remediation where they are pumping continuously and treating groundwater to control the PCE Plume in downtown Reno & Sparks. And then there is the normal ones that we are pretty familiar with, nitrate contamination, there is underground storage tanks, PFAS, some new emerging contaminants in groundwater. So, the idea is with this program you can be proactive and work locally to protect your aquifers, some of them. So, how does the program work. So, resource concepts has a contract with the Bureau of Safe Drinking Water and we are available to kind of do the heavy lifting on the planning process, schedule meetings, create maps, write up documents for review and comment. First we, there is kind of the normal steps, we form a local planning team and mostly we look for the stakeholders and invite people to join the planning process, then we sort of do an inventory of the water sources for the Virgin Valley Water District, which remain water purveyor here. Then we look at what are the potential sources of contamination that you might have in your community. Not just now, but in the future. What are you planning in your community that might be a risk in the future and what do you want to do about it, and then that leads us to the really fun part; we get to kind of sit back and talk with you about what strategies and actions you would want to put into place in community to develop local measures. Then we bring the plan typically back to the boards, to the city, to the Virgin Valley Water District for approval once we have got a plan put together, and then RCI can also assist with implementation of the plan. So, what would that mean. So, examples of source water protection strategy, these are the types of things you might see as outcomes to the plan, but it would be unique to what is important to your community. We have done inventories of unused wells, which are a conduit for contaminants from the surface to get to our aquifers and assist with plugging those. We have helped people put together septic management systems, where they have issues with older septic systems that are nitrate problem in groundwater. We

can assist with studies for infrastructure improvements or leveraging funding for projects. Updates of operating standards spill an emergency response coordination, so that if you have an accident in the vicinity of one of the Virgin Valley Water District wells, you would have something on the books to help respond to those, where there is a water quality risk. One of the things that normally we really enjoy that comes out of these programs is public education and awareness. We can provide training and also equipment to bring like a water quality message, watershed protection to the schools, if you have environmental outreach and education, a lot of library programs. Whatever the community has, we can help get that drinking water message into what is available for educating both kids and parents and businesses throughout the community. That's just one approach that a lot of communities have used. We have successfully completed plans statewide. We try and do a countywide basis for Washoe County, Carson City, Humboldt County, Nye County, White Pine, Churchill, and Lyon Counties. They all have completed plans. We are currently working with the folks in Lincoln County and we are about 75% done with their planning process and we are looking at what could we do in Clark County and we have been working with Joe Davis over with the Moapa Valley Water District to kind of update his existing Wellhead Protection Plan and we are hoping that the Virgin Valley Water District and the City of Mesquite will help do a source water protection plan for this area. So, that wraps it up for my presentation. It is a locally driven process, so there are very few requirements in terms of what the state looks for in a plan. For the state to endorse the plan, it has to have a planning team and a final outcome approved by the community. One of the things that it does take however is an invitation from the community, and that's why we are here this evening, to ask you to make a commitment to participate in the plan and invite us here to bring the program here. And also, some staff commitment. Though RCI is available to do the heavy lifting for this, it does take some staff time to review the documents and attend meetings and we usually, I don't know, it seems like we have an average of probably six teams and meetings over a period of about six months to really pull all the information together and with that I invite you to ask any questions you might have.

Minutes;
Mayor Litman asked Council if they had any questions or comments. There were no speakers.

Minutes;
Mayor Litman opened the Item to Public Comment. There were no speakers.

Minutes;
Mayor Litman: Thank you, we will move forward with your recommendations.

Minutes;
Jill Sutherland: Will you be making a motion tonight?

Minutes;
Mayor Litman: No, it's not agenized. Well, it is, we could.
Ms. Beck: You could always do that Mayor, because we give you that power to do that and possible action.

Minutes;
Council member Dutkowski: My question is do you work with the Health District, Southern Nevada Health District, in any way? Because they do testing of water and reporting.

Minutes;
Jill Sutherland: With the Southern Nevada Health District we haven't really met with them formally. We usually start at the local level with the public water systems, then the city, but certainly we do reach out to them on what source water protection concerns they might have and try and bring them in as a stakeholder if it fits with what the local community is interested in.

Minutes;
Council member Dutkowski: Can you tell me of any experiences with any other health departments that you would have, anymore experience with other health departments that you have worked with in Nevada?

Minutes;
Jill Sutherland: We just finished the plan in Washoe County in 2021, and we did work with the Washoe County Health District, which is the regional health district and they were really an important team member because they represented the sort of very, very small public water systems like the gas stations and the restaurants, you know, that are along the highway and those types of facilities.

Minutes;
Council member Dutkowski: So, you do collaborate with them? Okay. Thank you.

Minutes;
Council member Gault: I think this is very important, I am not aware of any particular threat at the moment, although that's probably a lack of my education. The last threat that I recall was from our friendly federal government, the Bureau of Land Management trying to sell oil leases on top of our aquifer. I do think this is a bit of planning that we need to do and my question I guess is, does it also address anything to do with conservation? Does your planning process address conservation at all?

Minutes;
Jill Sutherland: It addresses conservation sort of in the larger picture of source water protection, it really focuses on water quality and not water quantity, because water quantity is, you know, very well regulated by the division of water resources already. Right? So, we kind of step back from some of the water quantity issues, but certainly if the community wants to look at water conservation. We can bring that into your plan for sure.

Minutes;
Council member Gault: That is a particular concern of mine and I think some of the other Council members as well, but I would be very interested to pursue this and see, try to head off any threats that we might have.

Council Member Gault moved to approve the presentation of Resource Concepts, and pursue the plan. Council member Boger seconded the motion.

Passed For: 4; Against: 0; Abstain: 0; Absent: 1 Council member Ramaker

Minutes;

Jill Sutherland: Thank you very much and don't hesitate to reach out to us if you have any further questions.

Nevada Integrated SourceWater Protection Program

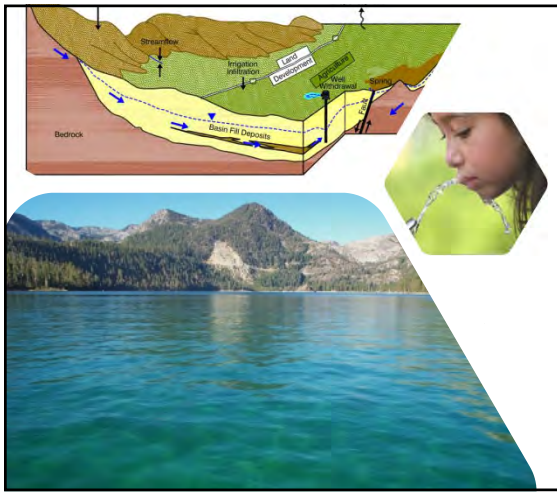
https://ndep.nv.gov/water/source-water-protection

Presentation by

RCI Resource Concepts Inc

Contractor for the Nevada Integrated Source Water Protection Program

1



What is the Integrated Source Water Protection Program?

ISWPP is ***voluntary*** approach…

to empower communities to develop and implement a local plan to protect their sources of drinking water

Your community protecting your drinking water.

2

Niagara Falls -LOVE CANAL TRAGEDY
99 homes in which 230 adults and 134 children

Times Beach Missouri
(Population 2200) Dioxin Contamination

PG&E Hinckley
(Population 800)
Chromium Contamination

Reno & Sparks
PCE Contamination (Remediation District)

Why is protecting source water quality important?

3

How does the program work?

- **Local Team**
  - Develop a Local Planning Team
- **Water Sources**
  - Identify where your drinking water comes from
- **Potential Contaminants**
  - Inventory potential sources of contamination including present and future facilities and land uses
- **Strategies & Action Plan**
  - Develop local source water protection measures
- **Implementation**
  - Assistance to implement the action plan

4

What are some examples of source water protection strategies?

- Unused well inventories and plugging
- Septic management systems
- Studies for infrastructure improvements/ funding
- Updates for design & operating standards
- Spill/emergency response coordination

5

Public Education and Awareness

6

RCI provides technical assistance under the Integrated Source Water Protection Program

In Clark County
- 85 Public Water Systems with wells
- 179 active water supply wells
- 13 Source Water/Wellhead Protection Plans

State-wide
- Washoe County
- Carson City
- Humboldt County
- Nye County
- White Pine County
- Churchill County
- Lyon County

7

For More Information:

Jill Sutherland, P.E.
- 775-883-1600
- jill@rci-nv.com

Bureau of Safe Drinking Water
- 775-687-9524
- NDEPSourceWater@ndep.nv.gov

8

Agenda

Source Water Protection Program

Virgin Valley Team Meeting

Date: September 9, 2022
Time: 10 to Noon
Where: Virtual

1. **Welcome & Introductions**
2. **Brainstorm Source Water Protection Goals**
3. **Water Sources & "Capture Zone" Mapping**
   Review existing & probable future sources
   Conceptual model approach
4. **Potential Sources of Contaminants**
   Review types
   Preliminary mapping & DWMaps https://geopub.epa.gov/dwwidgetapp/
5. **Revisit Community Goals**
6. **Schedule and Next Steps**
   Next meeting scheduled for Monday Sept. 29

Meeting Notes

Virgin Valley Source Water Protection Planning – Team Meeting 1

Thursday, September 1, 2022
10:00am-12:00pm (Pacific)
Virtual meeting on Teams

Attending

NAME	*CONTACT INFORMATION*		*AFFILIATION*
Richard Secrist	702-346-2835	rsecrist@mesquitenv.gov	City of Mesquite - Building Division
Kevin Brown	702-533-1892	kbrown@vvh2o.com	Virgin Valley Water District (VVWD)
Aaron Bunker	702-461-8451	abunker@vvh2o.com	Virgin Valley Water District (VVWD)
Steve Hall	702-346-5731	shall@vvh2o.com	Virgin Valley Water District (VVWD)
Jayson Andrus	702-346-2690	jandrus@mesquitenv.gov	City of Mesquite - Fire Department
Travis Anderson	702-346-5237	tanderson@mesquitenv.gov	City of Mesquite - Public Works
Christopher Berkey	702-540-6107	christopherb@nvrwa.org	Nevada Rural Water Association (NvRWA)
Alaina Russky	775-883-1600	alaina@rci-nv.com	Resource Concepts, Inc. (RCI)
Alison Cramer	775-883-1600	alison@rci-nv.com	Resource Concepts, Inc. (RCI)
Erin Smith	775-301-4168	erin@rci-nv.com	Resource Concepts, Inc. (RCI)
Jill Sutherland	775-883-1600	jill@rci-nv.com	Resource Concepts, Inc. (RCI)

Purpose & Overview

The purpose of this meeting was to bring together a local planning team to discuss the development of a Community Source Water Protection Plan (CSWP Plan). The meeting addressed community goals, interests, and concerns for future planning purposes. The development of a fully adopted CSWP Plan will offer resources for communities to make informed decisions regarding the protection of their drinking water sources.

Discussion

Introductions and Welcome

The meeting began with a brief introduction and overview of the Nevada Integrated Source Water Protection Program (ISWPP, 2010). The overarching goal of the ISWPP is to help local communities protect the quality of their drinking water resources. The ISWPP has no regulatory requirements and is indeed a community driven, voluntary program, tailored specifically to each community's unique source water protection needs

The Community Source Water Protection Plan (CSWP Plan) includes time-of-travel buffer zone estimates for public wells. These calculations are used to advise stakeholders in the decision-making process when establishing a Source Water Protection Area and developing a CSWP Plan.

Brainstorm Source Water Protection Goals

RCI invited the group to think about the "best possible outcome" for this planning process, then share outcomes with the planning team.

Interest from the group involved developing tangible solutions with real world applications to minimize potential contamination to groundwater resources, creating a safer community whilst protecting source water in the Virgin Valley Water District. Desired outcomes included:

- Help inform developers about water sources and provide direction to engage with the different entities to achieve source water protection.
- Help identify infrastructure improvements that protect source water and encourage economic development.
- Identify and delineate key resource protection areas, identify potential contaminant sources near the protection areas, and develop a process to minimize potential for contamination in the protection areas.
- Expand the delineation of key resource protection areas to include future proposed groundwater well locations.
- Facilitate communication within the community about the importance of source water protection.
- Collaborate, employ a fresh approach, and look for new opportunities to protect human health and reduce human caused risk to water supply.
- Protect the future of the Virgin Valley's groundwater resources by incorporating the CSWPP into the other Plans (City Master Plan, VVWD Water Resources Plan, County Master Plan).

Multiple options were discussed for encouraging source water protection within the existing planning framework:

- Opportunity to include in the current Master Plan update. How to make this a meaningful updateable plan.
- Opportunity to consider elements in the CSWPP while conducting the on-going VVWD groundwater resources planning effort.
- Consider strategies which have worked for other communities, such as delineation of source water protection areas which include time-of travel calculations, recharge areas, and watersheds.

Water Sources & "Capture Zone" Mapping

The team reviewed RCI's preliminary information and mapping of water sources:

- Calculated Fixed Radius (CFR) Method "time of travel" (TOT) capture zones for water sources 2, 5, 10, 25, and 50 years.
- VVWD managers will review the CFR parameter information, mapping, and future well locations with RCI after the meeting. VVWD to provide RCI with updated pumping rates for the 11 operating wells, and the 3 proposed future wells, in addition to anticipated screen lengths and well depths.
- The VVWD have completed the Phase 1 of water resource sustainability studies. Phase 2, evaluating recharge areas, is about 3 years away. All are comfortable using the CFR approach for this planning process because VVWD anticipates updating the CSWP Plan when their Phase 2 investigations are complete.
- A 30-year better than 50-year TOT with local plan updates (City Master Plan 20 year and 35-year windows, Public Works CIP 3 years for implementation, 10 for mid-range, and 30 for long-range planning). WWTP has capacity available in foreseeable future (6 MGD). Storm Drain/Flood Control updated every 3 years.

Potential Contaminant Sources

The team reviewed ISWPP Guidance list of Potential Contaminant Sources and RCI's preliminary desktop search.

- The Team decided to exclude NPDES Expired Stormwater Construction Permits and underground storage containers (USTs) which are no longer in use, from the PCS list.
- No significant transportation related hazmat incidents. Fir Dept. has planning in place for spill to channels and river. May be able to hazard mitigation plan for chemicals with this team. VVWD could be looped into spill notifications by local hazmat response.
- City operates WWTP with 6 MGD capacity and 2 MGD current flows. No discharge to the river. Existing and future recycled water can be accommodated by golf course irrigation. Multiple golf course ready to use recycled water. No current plans for indirect potable reuse.
- There are 3 major washes with detention basins for the 500-year event. Not covered under an MSS permit. Emergency management Plan has flood control.
- Only septic systems in County (Bunkerville). Highest nitrate found by VVWD is 1.5 mg/L.
- VVWD water quality challenges not anthropogenic (TDS, arsenic, Fluoride). No known occurrence of emerging contaminants.

Revisit Community Goals

Each team member provided feedback on the "desired outcomes" or goals offered at the beginning of the meeting. The team identified some additional contacts to potentially join the source water protection discussions:

- Coordinate with Lincoln County – Cory Lytle
- Coordinate with the City of Mesquite GIS Coordinator, Ryan Kammerer

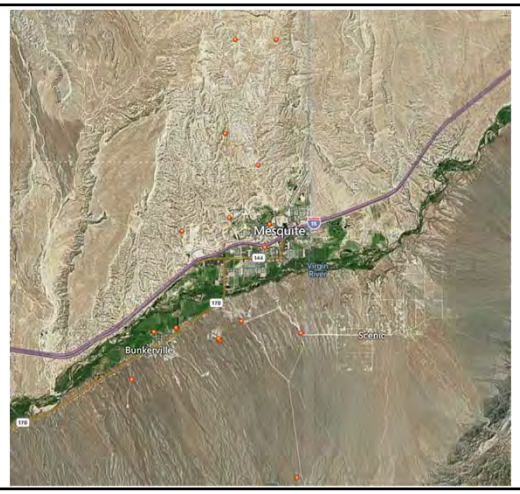
Next Steps

An updated conceptual CFR model will be run for wells prior to next meeting which has been set for: Monday, September 26, 2022 @ 1:15PM. With a third meeting tentatively scheduled for Thursday, November 3, 2022 @ 10AM.

Other follow up items:

- VVWD – Review and update water source information (locations, well production rates, etc.).
- RCI – Update the CFR model for each well with VVWD information and the new well TOTs.
- RCI – Contact VVWD regarding ways reach out to the community.
- RCI/NvRWA – RCI to update desktop PCS inventory and provide to NvWRA who will conduct the windshield survey.
- Fire Dept. – Review hazardous materials use/storage in the City and provide RCI with additional PCS locations.
- Public Works – Provide RCI with GIS layers pertaining to: washes, detention basins, irrigation structures, stormwater system, and sanitary sewer systems. (lift stations, etc.).
- VVWD/ Community Planning – Reach out to additional contacts for team participation and/or input.

Virgin Valley Water District



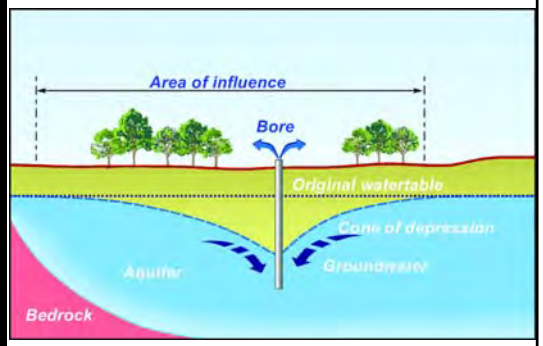
1

Well No. 27A

2

Capture Zone

- Region from which water is drawn from a well



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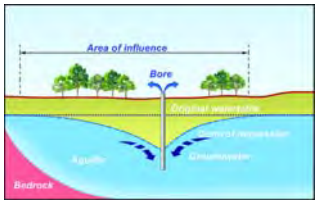
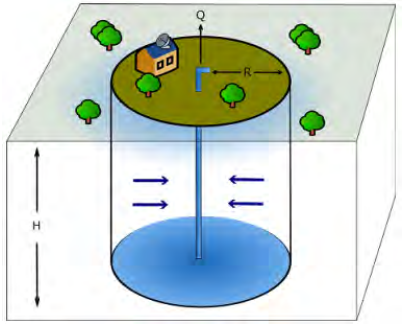
Capture Zone

- Region from which water is drawn from a well



Calculated Fixed Radius

- A volumetric flow equation which calculates a radius which represents the groundwater contributing to the well over a designated time period



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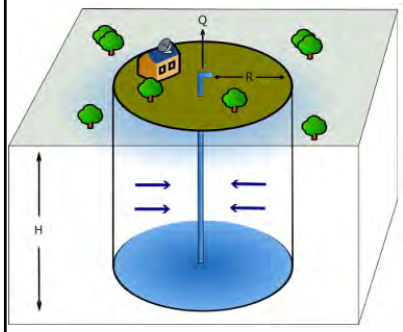
Calculated Fixed Radius



$$r = \sqrt{\frac{Qt}{\pi n b}}$$

Q = Pumping Rate of the Well (ft^3/day)

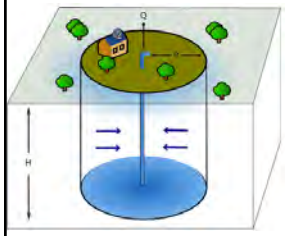
t = Travel time to the Well (day)

n = Porosity

b = Length of the Well Screen (ft)

5

Calculated Fixed Radius



Time-Related Capture Zone

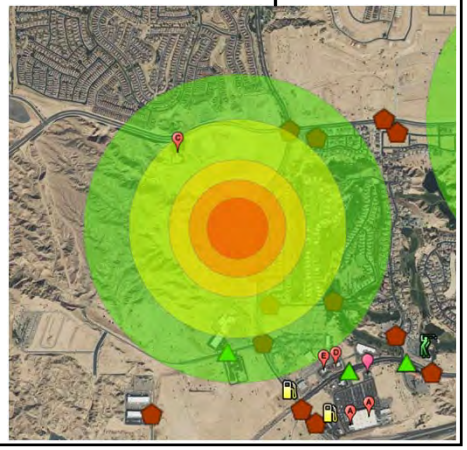


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Table 1. Suggested Risk Rankings for Potential Contaminant Sources DRAFT 8/31/2022

CLASS	#	SOURCE	CATEGORY A	B	C	D	E	RISK RANKING
Agricultural	1	Animal burial areas			X	X		High
	2	Animal feedlots		X	X	X		Mod to High
	3	Chemical application (e.g., pesticides, fungicides, & fertilizers)		X	X			High
	4	Chemical mixing & storage areas (including rural airports)	X	X	X			High
	5	Irrigated fields & irrigation ditches		X	X			Moderate to High
		Irrigation ditches			X			High
	6	Manure spreading & pits	X		X			Moderate
	7	Unsealed irrigation wells	X		X			High
Industrial	8	Chemical manufactures, warehousing/distribution activities	X	X	X			High
	9	Electroplaters & fabricators			X			High
	10	Electrical products & manufacturing			X			High
	11	Machine & metalworking shops	X					High
	12	Manufacturing sites	X	X	X			High
	13	Petroleum products production, storage, & distribution centers	X					High
Commercial	14	Dry cleaning establishments	X					High
	15	Furniture & wood stripper & refinishers	X					High
	16	Jewelry & metal plating			X			High
	17	Laundromats						Low
	18	Paint shops	X					High
	19	Photography establishments & printers			X			High
Automotive	20	Auto repair shops	X					High
	21	Car washes	X		X	X		Moderate
	22	Gas stations	X					High
	23	Road deicing operations: storage & application			X			Moderate
	24	Road maintenance depots	X		X			High
Residential	25	Household hazardous products	X	X	X			Moderate
	26	Private wells	X	X		X		Moderate
	27	Septic systems, cesspools		X	X	X		Mod to High
Medical/ Educational	28	Educational institutions (labs, lawns, & chemical storage)		X	X			Moderate
	29	Medical institutions (medical, dental, vet offices)				X		Low
	30	Research Laboratories	X	X		X		High

CLASS	#	SOURCE	CATEGORY A	B	C	D	E	RISK RANKING
Storage	31	Above ground storage tanks	X					High
	32	Underground storage tanks	X					High
	33	Public storage	X					Low
	34	Radioactive materials storage					X	High
Municipal	35	Dumps and landfills (historical/active)	X	X	X	X	X	High
	36	Municipal incinerators		X	X	X		Moderate
	37	Recycling & reduction facilities			X			High
	38	Scrap & junkyards	X		X			High
	39	Wastewater reclamation facilities		X	X	X		High
	40	Sewer lift stations		X	X	X		High
Miscellaneous	41	Airports	X					High
	42	Asphalt plants	X					High
	43	Boat yards	X					High
	44	Cemeteries				X		Moderate
	45	Construction areas	X			X		Moderate
	46	Dry wells	X					High
	47	Fuel storage systems	X					High
	48	Golf courses, parks & nurseries (chemical application)		X	X			High
	49	Mining (surface & underground)	X		X			High
	50	Pipelines (oil, gas, coal slurry)	X					High
	51	Railroad tracks, yards & maintenance	X	X	X	X		High
	52	Surface water impoundments, streams, ditches				X		High
	53	Storm water drains & retention basins	X	X	X	X		High
	54	Unplugged abandoned well	X	X		X		High
	55	Well – operating	X	X	X	X		Low to High
	56	Other	X	X	X	X	X	Low to High

Contaminant Categories:
A = Volatile Organic Compounds
B = Synthetic Organic Chemical
C = Inorganic Compound
D = Microbiological
E = Radionuclides

7

Agenda

Source Water Protection Program

Virgin Valley Source Water Protection Planning Team Meeting 2

Date: September 26, 2022
Time: 1:15 to 2:45 p.m.
Where: Virtual

1. **Welcome & introductions**
2. **Finalize plan goals**
3. **Review updated information and mapping**
   Water sources
   "Capture Zone" mapping
   Desktop survey of potential sources of contaminants
4. **Discuss how to form the Source Water Protection Areas**
   Examples of different types
   Discuss local criteria
5. **Schedule and Next Steps**
   Next meeting scheduled for Thursday November 3, 10 a.m. to Noon

Meeting Notes

Virgin Valley Source Water Protection Planning – Team Meeting 2

Monday, September 26, 2022
1:15pm-3:00pm (Pacific)
Virtual meeting on Teams

Attending

NAME	*CONTACT INFORMATION*		*AFFILIATION*
Richard Secrist	702-346-2835	rsecrist@mesquitenv.gov	City of Mesquite - Building Division
Kevin Brown	702-533-1892	kbrown@vvh2o.com	Virgin Valley Water District (VVWD)
Aaron Bunker	702-461-8451	abunker@vvh2o.com	Virgin Valley Water District (VVWD)
Steve Hall	702-346-5731	shall@vvh2o.com	Virgin Valley Water District (VVWD)
Travis Anderson	702-346-5237	tanderson@mesquitenv.gov	City of Mesquite - Public Works
Christopher Berkey	702-540-6107	christopherb@nvrwa.org	Nevada Rural Water Association (NvRWA)
Alaina Russky	775-883-1600	alaina@rci-nv.com	Resource Concepts, Inc. (RCI)
Alison Cramer	775-883-1600	alison@rci-nv.com	Resource Concepts, Inc. (RCI)
Erin Smith	775-301-4168	erin@rci-nv.com	Resource Concepts, Inc. (RCI)
Jill Sutherland	775-883-1600	jill@rci-nv.com	Resource Concepts, Inc. (RCI)

Purpose

The purpose of this meeting was to bring together the local planning Team to discuss the development of a Community Source Water Protection Plan (CSWP Plan). The meeting was intended to solidify community goals addressed during the first kick-off meeting, review revised capture zone maps, answer questions regarding potential contaminate source inventory, and introduce reasons to establish Source Water Protection Areas (SWPAs).

Discussion

Introductions and Welcome

The meeting began with a brief round of introductions and overview of the Nevada Integrated Source Water Protection Program (ISWPP, 2010). The larger goals of the ISWPP are to help local communities protect the quality of their drinking water resources by developing a local CSWP Plan.

Finalize CSWP Plan Goals

The CSWP Plan is intended to set goals that are unique to each community, as such, the Team must be the propelling force behind the setting of the CSWP Plan purpose and goals. RCI reviewed the summarized comments that the Team shared during the Kick-off Meeting (9/01/2022) and invited the Team to share their thoughts. The Team agreed that keeping the message clear and simple was important to achieving the best possible outcomes with the CSWP Plan goals.

The summary included the following initial statements to help the Team craft final goals:

- Develop a process to minimize contamination
- Protect drinking water resources for future generations
- Plan for community growth and future development

- Understand the importance of communication with various agencies and the public

Following Team collaboration, a statement which represents the Purpose of the Plan was developed:

- *Create a community-wide plan to help protect drinking water sources and maintain water quality*.

The community and CSWP Plan goals were discussed by the Team, who refined the initial statements to the following goals:

- *Goal 1: Identify the sources of and potential risks to drinking water and consider them in the local planning framework.*
- *Goal 2: Ensure that clean and safe drinking water is available for future generations.*
- *Goal 3: Integrate source water protection into local planning and zoning documents to ensure the quality of drinking water matches the goals of the community.*
- *Goal 4: Educate the community about what is being accomplished to achieve source water protection.*

Water Sources & "Capture Zone" Mapping

The Team reviewed the updated water sources and capture zone mapping. They agreed to the water sources and capture zone mapping criteria to be considered in the CSWP Plan.

- The Virgin Valley Water District provided the Team with a brief overview of two new wells (presently inactive) and three proposed future well locations. These water sources will be included in the CSWP Plan.
- The Team agreed that the conceptual model for capture zones including a 100-foot fixed radius, 250-day, 2-, 5-, 10-, and 30-year calculated fixed radii were appropriate.
- The Team chose to only address groundwater sources in the CSWP Plan, as surface water and spring sources have uncertainty surrounding their future status.

Potential Contaminant Sources

The Team reviewed the results of the potential contaminant sources "desktop" survey via the interactive online mapping application, DWMAPS. The purpose of this review process was to eliminate irrelevant data and confirm that all the information important to the Team would be included in the inventory. The Team made the following determinations:

- The Team decided that storm drain and sewer information was not necessary to show, however, that two older lift stations may be worth including.
- Active or past construction sites (represented by active and inactive coverage under the Construction Stormwater general permit) were not necessary to include, as the turnover rate is high and disturbance temporary.
- Keep the active and inactive RCRA sites because sites could become active in the future or have residual concerns.
- The Team decided to keep Bureau of Corrective Action (BCA) sites with "no further action", including past sites mapped by the City of Mesquite (i.e., Mesquite Blvd, next to the elementary school). These site might be concerns for residual contaminants.
- The Team was undecided on whether to include the old "mill sites"; RCI will do more research on this matter and NvRWA can investigate during the windshield survey.

- The Team agreed that the two wells located near the FEMA 100-year flood zone, were not a concern. A previous 500-year flood in 1989 reached Mesquite on January 1, 1990, and did not present a risk at that time.
- The risk of wildfire shows that several wells were in locations with "moderate" risk. The Team had a concern about loss of power and damage to infrastructure rather than contamination of source water. The Team felt that response to wildfire was already addressed in emergency response plans and did not need to be included in the CSWP Plan.

Introduction to Source Water Protection Area Delineation

RCI presented the preliminary mapping of the potential sources of contamination overlaid with the 250-day and 10-year "capture zone" areas to the Team. Map layers also included land use zoning, private and public land, and parcel boundaries. The Team was asked to consider various methods that might be selected for delineating community Source Water Protection Areas (SWPAs).

- Time-of-Travel Capture Zone Delineation (all or a select few: 100-feet, 250-day, 2-, 5-, 10-, and 30-year)
- Watershed Delineation
- Land Use and Zoning

Questions which were posed to the Team regarding SWPA delineation methods and how SWPAs will align with the plan goals included:

- What makes the most sense for SWPA delineation in terms of City Planning and future development?
- Does it make sense to delineate SWPAs differently for wells within the City versus wells in rural areas?
- Is the Team interested in including watershed boundaries in the SWPA delineation?
- Does the Team consider residential and/or public land to be a risk which will be included in SWPA delineation?

Next Steps

The next meeting has been tentatively scheduled for: Thursday, November 3, 2022 @ 10AM.

Other follow up items:

- City of Mesquite – Send RCI locations of past BCA sites for City of Mesquite
- RCI – Investigate the old mill sites
- NvRWA – Perform the windshield survey of potential contaminant sources

Attachments

- Table of Plan Purpose and Goals
- Goals PowerPoint
- Water source, Capture Zone, and PCS PowerPoint

Purpose of the Plan

- Create a community-wide plan to help protect drinking water sources and maintain water quality.

2

GOALS

3

Develop A Process to Minimize Contamination

- Identify PCS near protection areas
- Include future well locations in the Source Water Inventory
- Quantify the location and amount of hazardous material in the District
- Consider land use and zoning when delineating SWPAs
- Include future well locations in the Source Water Inventory
- Identify the processes already in place to protect water quality and build on these measures to minimize the risk of contamination
- Consider developing an online viewer for the Source Water Planning Team which can be updated and includes the most current source water protection areas, well locations, and PCS

4

Protect Drinking Water Resources for Future Generations

- Tangible solutions with real world applications
- New opportunities to protect human caused risk to water supply
- Incorporate the CSWPP into other Plans (City Master Plan, VVWD Water Resources Plan, County Master Plan)
- Look for new opportunities and new models to protect human caused risk to water supply
- Consider strategies which have worked for other communities, such as delineating recharge areas and watersheds as SWPAs
- Set clear goals and expectations
- Wastewater treatment and reuse in the future

5

Plan for Community Growth and Future Development

- **Identify infrastructure improvements which protect source water**
- **Consider CSWPP while updating City Master Plan, County Master Plan, VVWD Water Resources Plan**
- **Inform developers about public water sources and SWPAs**
- **Consider developing an online viewer which includes source water protection areas and can be made available to city planners and developers**
- **Make the CSWPP readily available to any developer, engineer, planner, project manager, environmental group, the City of Bunkerville, Lincoln County, etc.**
- **Consider the CSWPP as the Capitol Improvement Plan, Stormwater Plan, and Wastewater Treatment Plans get updated**

6

Understand the Importance of Communication with Various Agencies and the Public

- **Communication with the Virgin Valley landfill operator**
- **Communication with Lincoln County and Bunkerville**
- **Increase the communities' awareness of drinking water sources by keeping the VVWD website up to date**
- **Promote actions which will allow the Community to participate in the protection of their drinking water supply via the VVWD and City websites**
- **The VVWD website has some great information!! Very thorough and easy to navigate and access information**
- **Consider developing an online viewer which includes source water protection areas and can be made available to the public**

7

Develop a Process to Minimize Contamination

Protect Drinking Water Resources for the Future Generations

Plan for Community Growth and Future Development

Understand the Importance of Communication with Various Agencies and the Public

8

Develop A Process to Minimize Contamination

Identify the sources of and potential risks to drinking water and consider them in the local planning framework.

- **Identify PCS near protection areas**
- **Include future well locations in the Source Water Inventory**
- **Quantify the location and amount of hazardous material in the District**
- **Consider land use and zoning when delineating SWPAs**
- **Include future well locations in the Source Water Inventory**
- **Identify the processes already in place to protect water quality and build on these measures to minimize the risk of contamination**
- **Consider developing an online viewer for the Source Water Planning Team which can be updated and includes the most current source water protection areas, well locations, and PCS**

9

Protect Drinking Water Resources for Future Generations

Ensure that clean and safe drinking water is available for future generations.

- **Tangible solutions with real world applications**
- **New opportunities to protect human caused risk to water supply**
- **Incorporate the CSWPP into other Plans (City Master Plan, VVWD Water Resources Plan, County Master Plan)**
- **Look for new opportunities and new models to protect human caused risk to water supply**
- **Consider strategies which have worked for other communities, such as delineating recharge areas and watersheds as SWPAs**
- **Set clear goals and expectations**
- **Wastewater treatment and reuse in the future**

10

Plan for Community Growth and Future Development

Incorporate source water protection into local planning and zoning documents to ensure/sustain the quality of drinking water sources.

Ensure that the quantity and quality of source water matches the goals of the community.

- **Identify infrastructure improvements which protect source water**
- **Consider CSWPP while updating City Master Plan, County Master Plan, VVWD Water Resources Plan**
- **Inform developers about public water sources and SWPAs**
- **Consider developing an online viewer which includes source water protection areas and can be made available to city planners and developers**
- **Make the CSWPP readily available to any developer, engineer, planner, project manager, environmental group, the City of Bunkerville, Lincoln County, etc.**
- **Consider the CSWPP as the Capitol Improvement Plan, Stormwater Plan, and Wastewater Treatment Plans get updated**
- **Incorporate the source water protection plan into the community public facilities element of the master plan.**

11

Understand the Importance of Communication with Various Agencies and the Public

Educate the community about what is being accomplished to achieve source water protection.

- **Communication with the Virgin Valley landfill operator**
- **Communication with Lincoln County and Bunkerville**
- **Increase the communities' awareness of drinking water sources by keeping the VVWD website up to date**
- **Promote actions which will allow the Community to participate in the protection of their drinking water supply via the VVWD and City websites**
- **The VVWD website has some great information!! Very thorough and easy to navigate and access information**
- **Consider developing an online viewer which includes source water protection areas and can be made available to the public**

12

Goal 1: Identify the sources of and potential risks to drinking water and consider them in the local planning framework.

Goal 2: Ensure that clean and safe drinking water is available for future generations.

Goal 3: Incorporate source water protection into local planning and zoning documents to ensure/sustain the quality of drinking water sources.

Ensure that the quantity and quality of source water matches the goals of the community.

Goal 4: Educate the community about what is being accomplished to achieve source water protection.

13


W12 WELL 32
W14 WELL 33
W8 WELL 37-Proposed
W8 WELL 35
W8 WELL 36-Proposed
W6 WELL 26
W08 WELL 27A
W09 WELL 28
W8 WELL 38-Proposed
W13 WELL 31
W16 WELL 01A BUNKERVILLE
W09 WELL 02 BUNKERVILLE
W10 WELL 29

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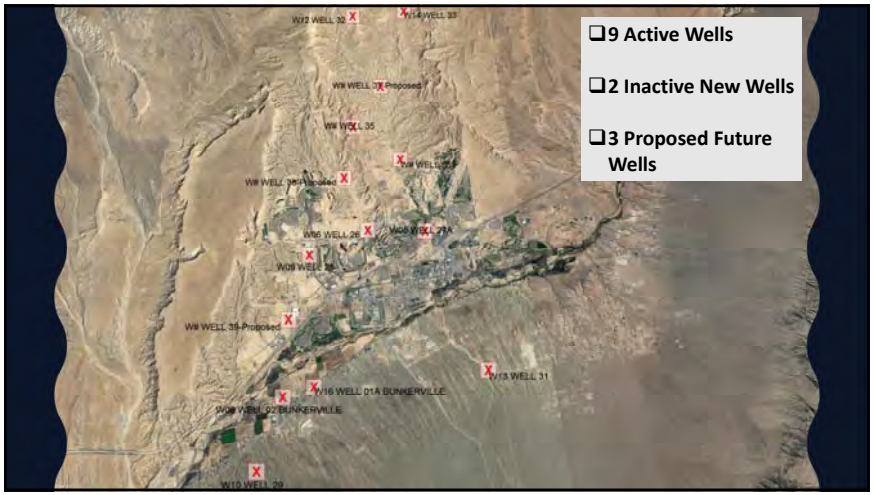
❑9 Active Wells
❑2 Inactive New Wells
❑3 Proposed Future Wells
W12 WELL 32
W14 WELL 33
W8 WELL 37-Proposed
W8 WELL 35
W8 WELL 36-Proposed
W6 WELL 26
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W13 WELL 31
W16 WELL 01A BUNKERVILLE
W09 WELL 02 BUNKERVILLE
W10 WELL 29

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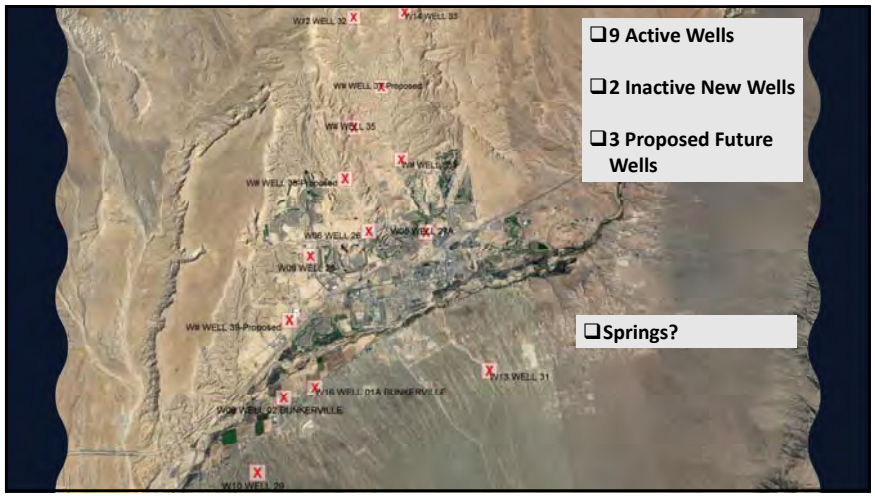
❑9 Active Wells
❑2 Inactive New Wells
❑3 Proposed Future Wells
❑Springs?
W12 WELL 32
W14 WELL 33
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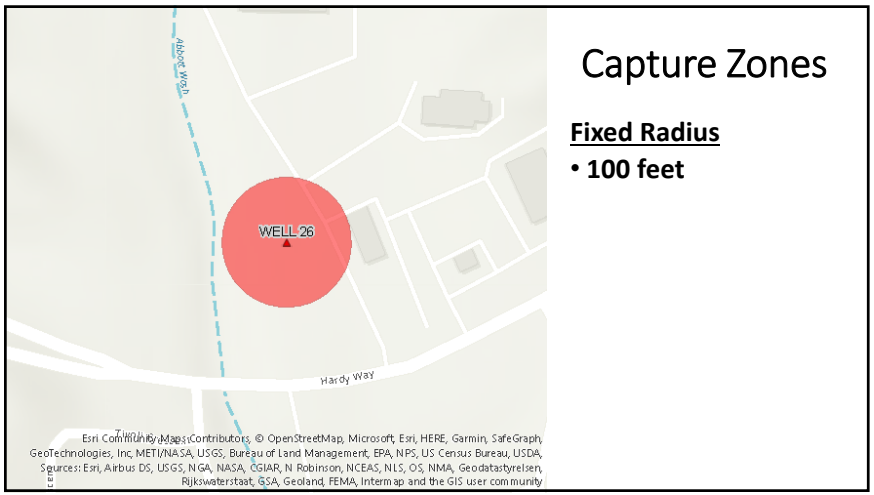
Capture Zones
Fixed Radius
• 100 feet
WELL 26
Abbott Wash
Hardy Way
Esri Community Maps Contributors, © OpenStreetMap, Microsoft, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA, Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

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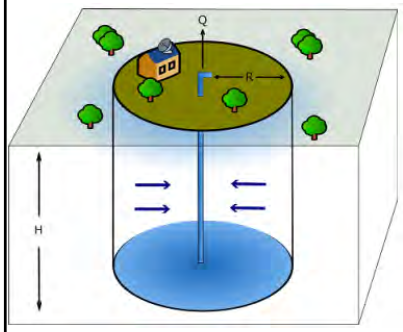
Calculated Fixed Radius



$$r = \sqrt{\frac{Qt}{\pi nb}}$$

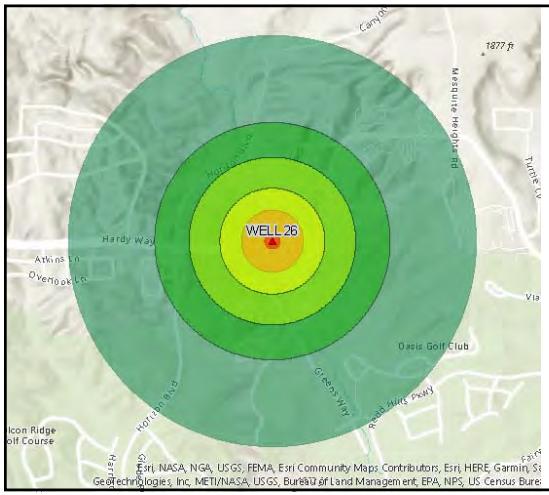
Q = Pumping Rate of the Well (ft^3/day)

t = Travel time to the Well (day)

n = Porosity

b = Length of the Well Screen (ft)

5



Capture Zones

Fixed Radius

- **100 feet**

Calculated Fixed Radius

- **250 Day**
- **2 Year**
- **5 Year**
- **10 Year**
- **30 Year**

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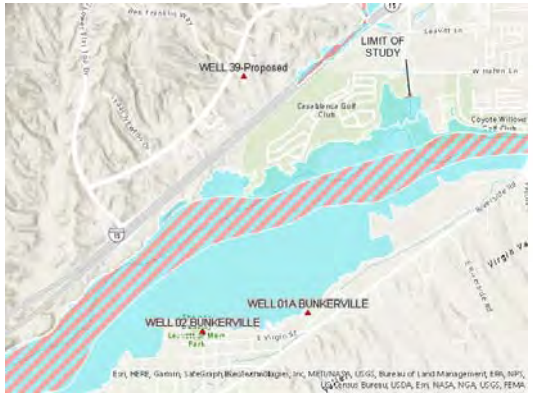
Potential Contaminant Sources (PCS)

Windshield Survey

Christopher Berkey
Nevada Rural Water Association

7

Potential Natural Hazards



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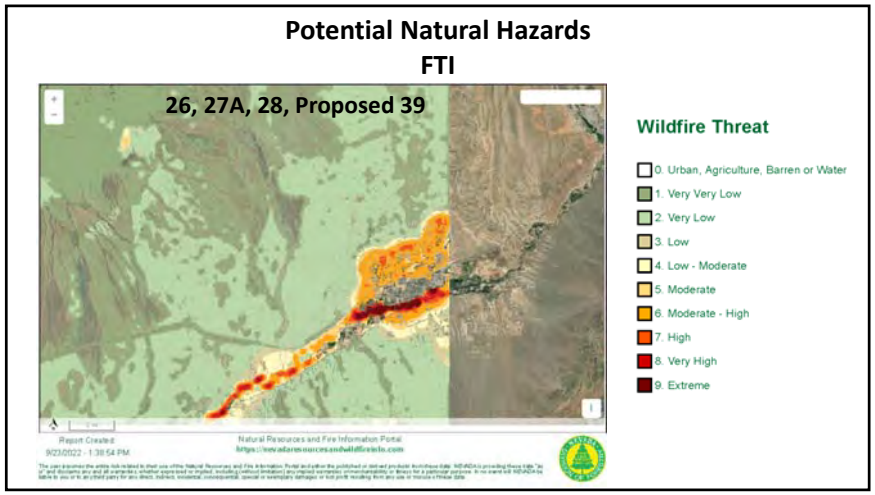
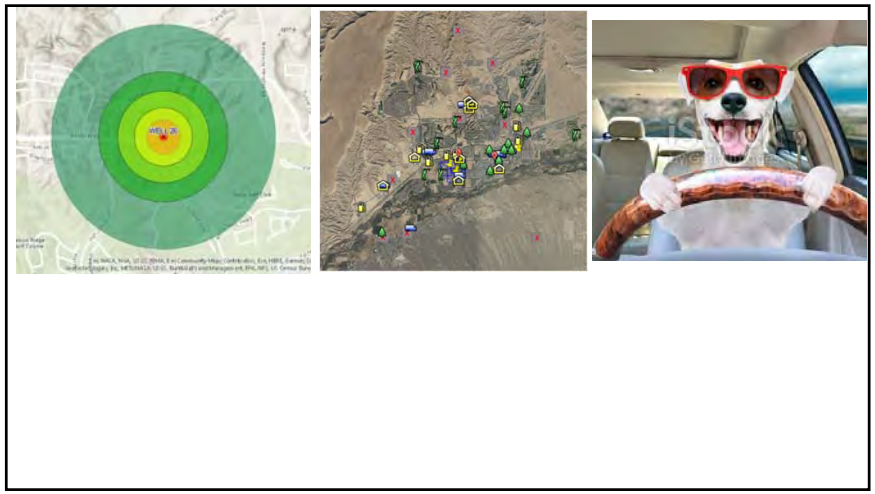

Potential Natural Hazards
FTI
26, 27A, 28, Proposed 39
Wildfire Threat
0. Urban, Agriculture, Barren or Water
1. Very Very Low
2. Very Low
3. Low
4. Low - Moderate
5. Moderate
6. Moderate - High
7. High
8. Very High
9. Extreme

9


Potential Future Hazards:
Zoning and Land Use

10



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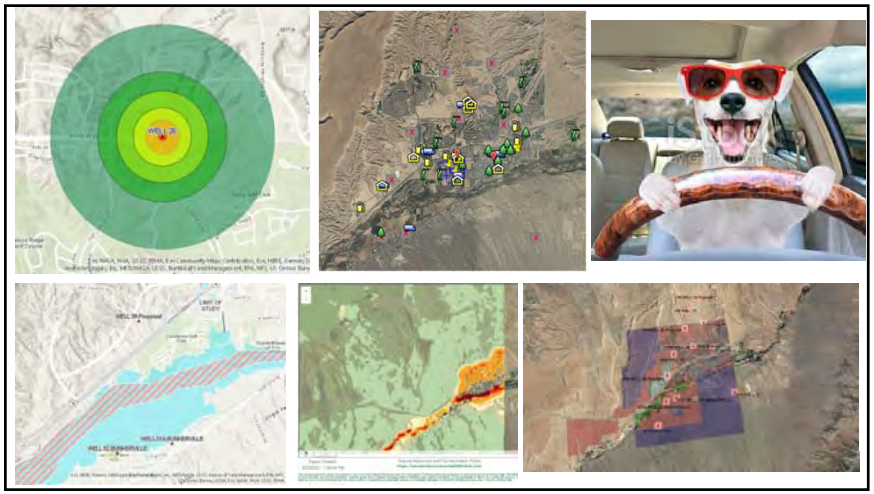

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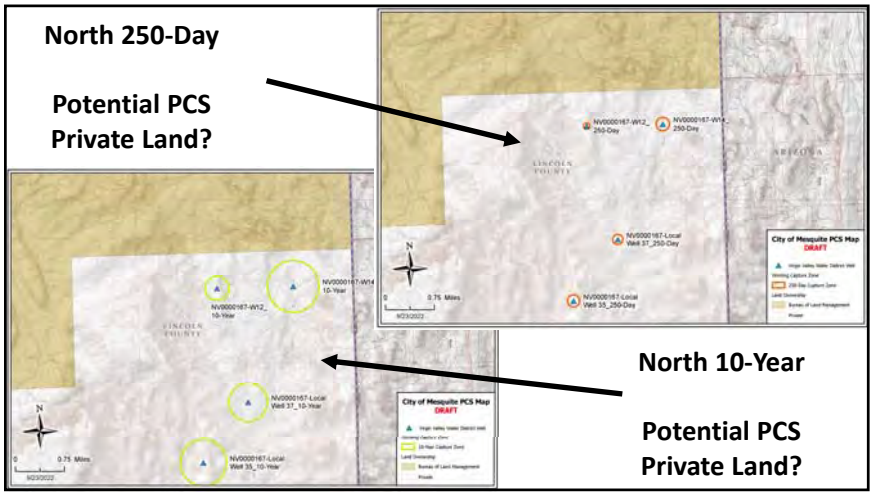
Analysis

- ❑ Time of Travel (TOT) Buffer Zones
  - Looked at 250-Day and 10-Year
- ❑ PCS – Well By Well
  - Land Use within a TOT Radius
  - Number and Type of PCS within a TOT Radius
- ❑ Jurisdiction
  - Jurisdictional agency with control

13



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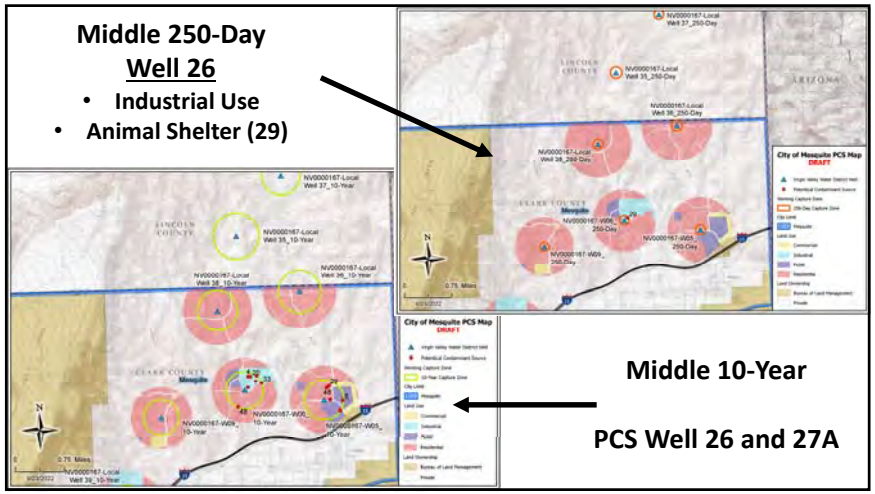

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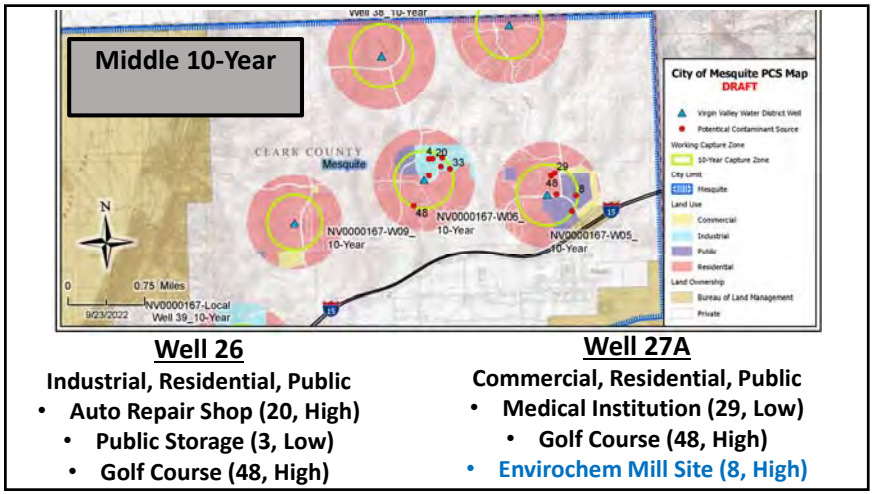

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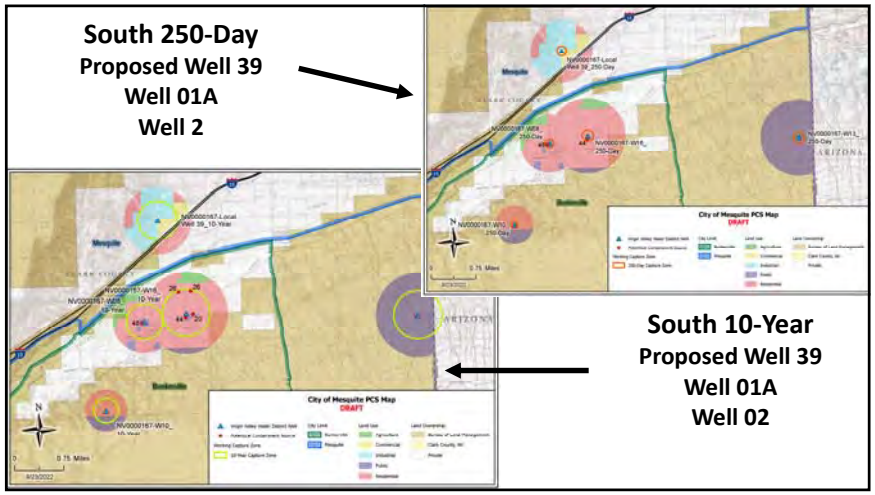

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Analysis

- ❑ Time of Travel (TOT) Buffer Zones
- ❑ PCS – Well By Well
  - Land Use within a TOT Radius
  - Number and Type of PCS within a TOT Radius
- ❑ Jurisdiction
  - Jurisdictional agency with control
  - Strategy to communication with those agencies

Community Source Water Protection Areas

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Analysis

Community Source Water Protection Areas

- ❑ Delineate areas based off parameters YOU chose
  - TOT Buffer Zones?
  - Watershed? – (HUC-12)
  - Land Use?

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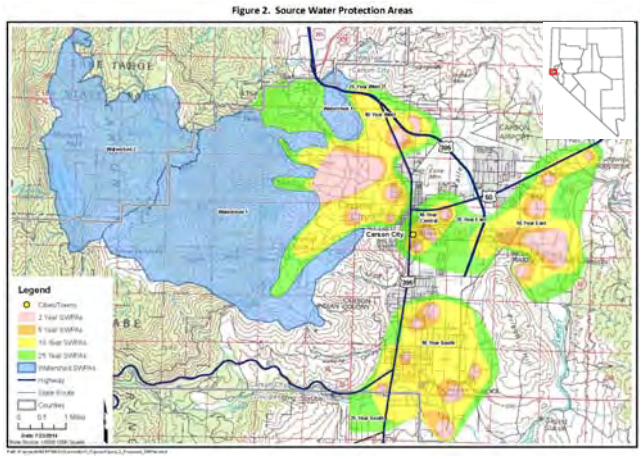
Carson City SWPAs

Groundwater : Capture Zones

Surface Water: Watersheds



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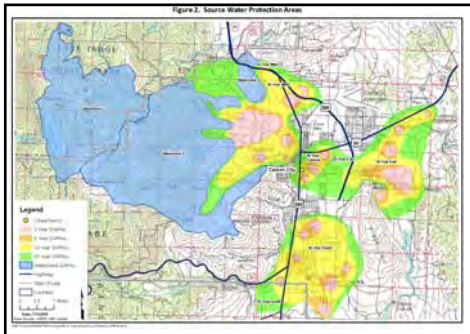

Carson City SWPAs

Groundwater TOT:

- **2, 5, 10, 25-Year Well Capture Zones**

Hydrogeology:

- **Reviewed Faults and Geologic Characteristics to Delineate 2 and 5-Year Zones**

Watershed:

- **Watershed /Recharge Areas**

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NEXT TIME……

Analysis

Community Source Water Protection Areas

- Delineate areas based off parameters chosen
  - TOT Buffer Zones?
  - Watershed? – (HUC-12)
  - Land Use?
  - Different Delineations for City versus Rural?
  - **Other Concerns/Ideas for YOUR SWPAs?**

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Agenda

Source Water Protection Program

Virgin Valley Source Water Protection Planning Team Meeting 3

Date: November 3, 2022
Time: 8:30 – 10:30 am
Where: Virtual

1. **Welcome & introductions**

2. **Review updated information and mapping**
   Results of the PCS Windshield Survey
   Discuss PCS which fall within the Capture Zones

3. **Discuss how to form the Source Water Protection Areas**
   These are areas on the ground surface which surround your wells. We will review examples of different types.

4. **Delineate the Source Water Protection Areas**
   How will YOU manage these areas to protect YOUR public drinking water sources from contamination for future generations?

5. **Management Strategies and Actions**
   Management strategies to protect YOUR sources of drinking water are locally driven. Get Creative! What strategies can be easily put into action to implement YOUR community goals?

Link to OneDrive: Lower Virgin Valley CSWP Plan OneDrive

Meeting Notes

Virgin Valley Source Water Protection Planning – Team Meeting 3

Thursday, November 3, 2022
8:30am-10:30am (Pacific)
Virtual meeting on Teams

Attending

NAME	*CONTACT INFORMATION*		*AFFILIATION*
Richard Secrist	702-346-2835	rsecrist@mesquitenv.gov	City of Mesquite - Building Division
Steve Hall	702-346-5731	shall@vvh2o.com	Virgin Valley Water District (VVWD)
Jayson Andrus	702-346-2690	jandrus@mesquitenv.gov	City of Mesquite - Fire Department
Travis Anderson	702-346-5237	tanderson@mesquitenv.gov	City of Mesquite - Public Works
Christopher Berkey	702-540-6107	christopherb@nvrwa.org	Nevada Rural Water Association (NvRWA)
Natalie Anderson		nanderson@vvh20.com	Virgin Valley Water District (VVWD)
Alison Cramer	775-883-1600	alison@rci-nv.com	Resource Concepts, Inc. (RCI)
Erin Smith	775-301-4168	erin@rci-nv.com	Resource Concepts, Inc. (RCI)
Jill Sutherland	775-883-1600	jill@rci-nv.com	Resource Concepts, Inc. (RCI)

Purpose & Overview

The purpose of this meeting was to bring together a local planning team (Team) to discuss the development of a Community Source Water Protection Plan (CSWP Plan). The meeting was intended to solidify Source Water Protection Area (SPWA) delineations and develop management strategies and action items that will be used to implement the CSWP Plan.

Discussion

Introductions and Welcome

The meeting began with a brief overview of the CSWP Plan purpose and goals decided by the Team in previous meetings. RCI outlined management strategies and action items and their use to support the CSWP Plan goals. The outline was supported by a PowerPoint presentation which provided examples of management strategies and action items the Team had formulated in previous meetings.

Nevada Rural Water Association Windshield Survey

The Nevada Rural Water Association (NvRWA) conducted a potential contaminant source (PCS) windshield survey to field verify the PCS desktop survey. RCI provided GIS files containing the PCS inventory, capture zones, and well locations. The "windshield survey" performed by NvRWA found the desktop survey was fairly accurate and comprehensive, and made a few recommendations that include:

- Keep the entire PCS inventory, as the Team may edit the list following the completion of the Perennial Yield Study
- Business addresses given are home addresses rather than facilities should be removed from the PCS inventory, these include mobile mechanics and cleaners
- Remove PCSs which are not pertinent/high risk, such as administrative offices and cardboard-only recycling facilities

- Consider adding a new RV storage facility and dry cleaner to the PCS list
- Consider adopting the use of a polygon feature rather than single points for some PCSs
- Add the Mesa View Reginal Hospital to PCS inventory

PCS-Driven SWPA Delineations and Management Strategies

RCI provided a brief description of methods used to develop SWPAs with distinct management boundaries, general examples include:

- Type 1 - Broader areas where the community has established a precautionary boundary to safeguard water quality at the water source. Within these boundaries, education, monitoring, and land use planning can be tools to provide more comprehensive management of surface water and groundwater resources vulnerable to human activity.
- Type 2 - Land more closely surrounding an individual well or stream, where source water is potentially most vulnerable to contamination from human activities. Within these areas, contaminated ground or surface water is more likely to reach the drinking water supply system. The community and PWS can focus on these boundaries to develop specific management strategies that will protect their water supply from becoming contaminated.

RCI used a PowerPoint presentation to represent the capture zones and PCSs for each well, and/or groups if wells in similar locations. The Team was invited to discuss possible management strategies for each location. Specific items mentioned by the Team included:

- VVWD interested in potential occurrences of PFAS in the community, particularly past and present locations where PFAS may have had the potential to occur.
    - NvRWA noted that Federal regulations, standards, testing, and treatment will be becoming clearer soon. Additionally, testing for PFAS by public water systems usually occurs following treatment and not on the source water. Metering of water use during testing might be beneficial to identify potential contaminants.
    - VVWD indicated they perform extensive water quality testing and are working on the PFAS question.
- City of Mesquite has obligated all treated effluent to golf courses for reuse and does not anticipate any direct or indirect potable recycled water in the foreseeable future.
    - NvRWA noted that greenspaces and golf courses are a great way to advertise what the community is doing for source water protection.
    - VVWD will coordinate with golf courses to receive annual water quality testing results.
- Land north of Well No. 28 was recently sold for development, most likely residential. Some of the property is still owned by the City. The Team discussed how to build source water protection into the conversation for future development.
- Proposed Well No. 39 is in a zoned industrial area near a freeway corridor. NvRWA mentioned that the geotechnical reports for development are a practical way to require assessment of impact to water sources. The VVWD mentioned that this is a proposed location, and that land use and zoning could play an important role in the final decision of well location.
- Coordination between the City and Lincoln County regarding future development in the Tuquop PUD is a high priority for the City of Mesquite. Source water protection should be included in that discussion.

- Illegal dumping around rural wells was not deemed a concern of the Team. Current security measures are effective.
- Targeted public education regarding proper disposal of hazardous substances, household hazardous waste, and proper fertilizer and pesticide management is an important strategy for source water protection.
- Public education and outreach might include the Bunkerville area regarding safe septic practices as they relate to source water protection.
- Coordination with the Clark County Planning Department regarding potential for future development outside of the City of Mesquite boundary.
- 41% of residents in the City of Mesquite are over 65, and proper disposal of pharmaceuticals is an important issue. Support of public education and outreach about proper disposal of medications was strong amongst the Team.
- Consider how to engage the City of Mesquite so that future land uses take SWPAs into account.
- Consider how to engage with Virgin Valley Disposal to receive notification of any spills or changes to disposal practices which may affect source water.
- A SWPA placeholder for recharge areas might be included in the Plan if appropriate and consistent with the Water Master Plan.
- VVWD already communicates with Virgin River water purveyors and conservation groups upstream. They may be interested in VVWD's source water protection message.
- SWPAs might facilitate coordination with Bureau of Land Management in relation to the development of land in Arizona, near Well No. 31.

SWPA Delineations

Each team member present provided feedback on the SWPA delineations. Team recommendations include:

- Public Works: Keeping all capture zone buffers would maintain flexibility, without limiting future development options for the city of Mesquite.
- VVWD: Keep 100-ft, 250-day, 10-, and 30-year capture zone buffers
    - 100-ft: Ownership/control of all property within a 100-ft radius of each wellhead is important to the VVWD.
    - 250-day: Location of certain potential contaminant sources (higher hazard) are a concern of the VVWD.
    - 10- and 30-year: These buffer zones reflect the broader goals and risks to the aquifer.
    - A placeholder for watershed and recharge areas might be added for consistency with the Water Master Plan and long-range plans.
- NvRWA: 2- and 5-year buffer zones may not be critical based on current PCS inventory. Consider upstream user coordination for any surface water source.

Next Steps

The next meeting has been set for: Thursday December 1, 2022, from 8:30-10:30am (Pacific).

Follow-up items:

RCI -

- Circle back with stakeholders on PFAS information, sampling, and potential past use.
- Send out a Poll to the Team for final input on SPWA delineation options.
- Formalize SWPAs following Team Input.
- Meet with NvRWA to discuss the results of the PCS windshield and desktop survey.
- Polish the PCS inventory to include recommendations from the Team and the windshield survey conducted NvRWA.
- Draft the Management Strategies, Action items, and Public Education and Outreach sections of the Technical Report for Team review.
- Work with VVWD to reach out to the middle school science teachers about opportunities for education that includes a drinking water message. Coordinate with RCI to do an introduction/presentation with the Awesome Aquifer and Enviroscape Models.
- Meet with the City of Mesquite to discuss future development locations and land uses and requirements related to source water impacts.

NvRWA -

- Distribute materials to the Team regarding the proper disposal of pharmaceuticals and public education and outreach at golf courses.

Mesquite Fire Dept. –

- Review hazardous materials use/storage in the city and provide RCI with additional PCS locations as appropriate.

VVWD & Mesquite Planning –

- Reach out to additional contacts on the Bunkerville Town Council.

Purpose of the Plan

- Create a community-wide plan to help protect drinking water sources and maintain water quality.

2

Goal 1
Identify the sources of and potential risks to drinking water and consider them in the local planning framework.

Goal 2
Ensure that clean and safe drinking water is available for future generations.

Goal 3
Integrate source water protection into local planning and zoning documents to ensure that quality of drinking water matches the goals of the community.

Goal 4
Educate the community about what is being accomplished to achieve source water protection.

3

4

Goal 1:

Identify the sources of and potential risks to drinking water and consider them in the local planning framework.

Management Strategy:

Collaboration with Regional Partners

Possible Actions

- Meet with Virgin Valley Disposal to develop communication regarding any changes related to disposal practices or spills

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Goal 2:

Ensure that clean and safe drinking water is available for future generations.

Management Strategy:

Secure locations for future water sources.

Possible Actions

- Closed on land for Well No. 37✓
- Continue to work with landowners to secure enough land for future Well No. 38 and the Arsenic Treatment Plant
- Continue to work with landowners on a purchase or land swap near future Well No. 39

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Goal 3:

Integrate source water protection into local planning and zoning documents to ensure that quality of drinking water matches the goals of the community.

Management Strategy:

Planning and Agency Review

Possible Actions

- Incorporate CSWP Plan into the Public Services and Facilities section of the City of Mesquite Master Plan
- Incorporate CSWP Plan into the VVWD Water Master Plan

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Goal 4:

Educate the community about what is being accomplished to achieve source water protection.

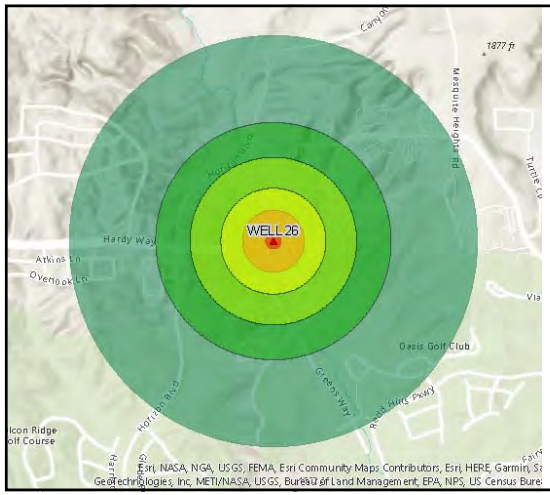
SWPA Management Strategy

Public Education and Outreach

Possible Actions

- Increase the communities' awareness of drinking water sources by putting CSWP Plan on VVWD website
- *Future development* of a Public Online Viewer which includes source water protection areas

8



Capture Zones

Fixed Radius

- **100 feet**

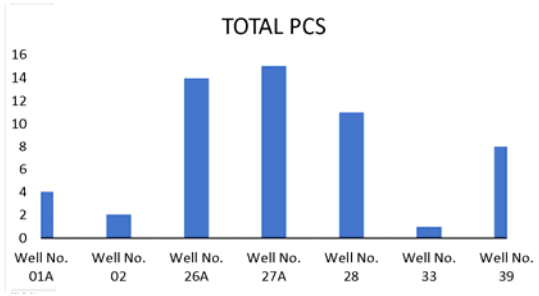
Calculated Fixed Radius

- **250 Day**
- **2 Year**
- **5 Year**
- **10 Year**
- **30 Year**

1

Which Wells have PCSs within the Capture Zones?

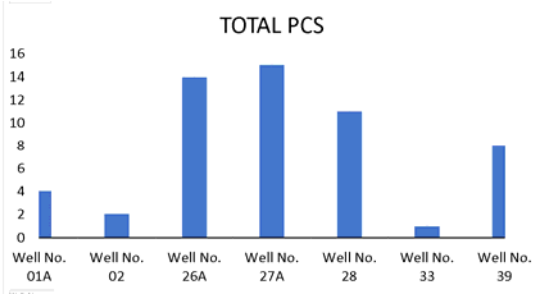
Well Name	Count of PCS
Well No. 01A	4
Well No. 02	2
Well No. 26A	14
Well No. 27A	15
Well No. 28	11
Well No. 33	1
Well No. 39	8
Grand Total	55



2

Which wells have PCSs within the Capture Zones?
7/14 Wells

Well Name	Count of PCS
Well No. 01A	4
Well No. 02	2
Well No. 26A	14
Well No. 27A	15
Well No. 28	11
Well No. 33	1
Well No. 39	8
Grand Total	55



Wells 29, 31, 32, 35, 36, 37, and 39 do not have any PCS within the 30-year Capture Zone at THIS TIME.

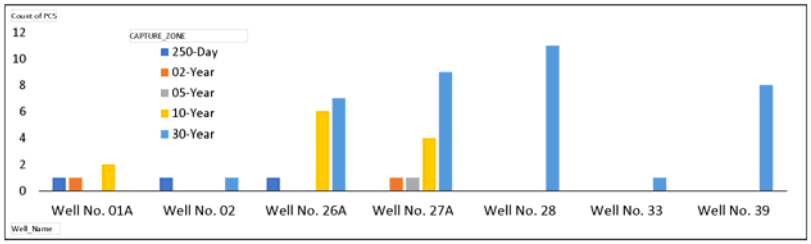
3

Count of PCS	CZ					
Well Name	250-Day	02-Year	05-Year	10-Year	30-Year	Grand Total
Well No. 01A	1	1		2		4
Well No. 02	1				1	2
Well No. 26A	1			6	7	14
Well No. 27A		1	1	4	9	15
Well No. 28					11	11
Well No. 33					1	1
Well No. 39					8	8
Grand Total	3	2	1	12	37	55

Where do PCSs occur in the CZs?

There are no PCSs within 100 ft.

What Type?



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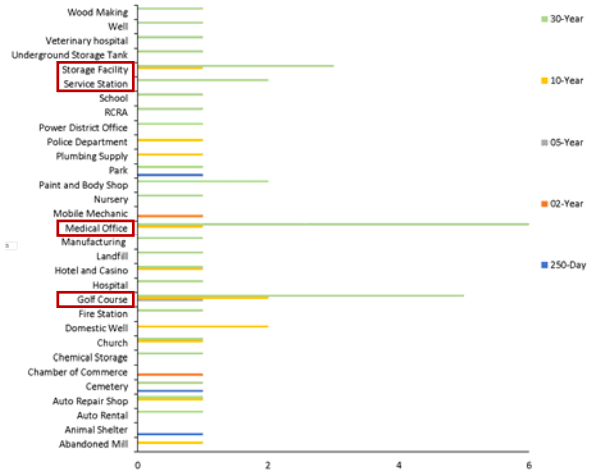
What is the most frequent type of PCS in the 30-Year Capture Zones?

- Medical Offices,
- Golf Course,
- Storage Facilities,
- Service Stations (there are only 2!)



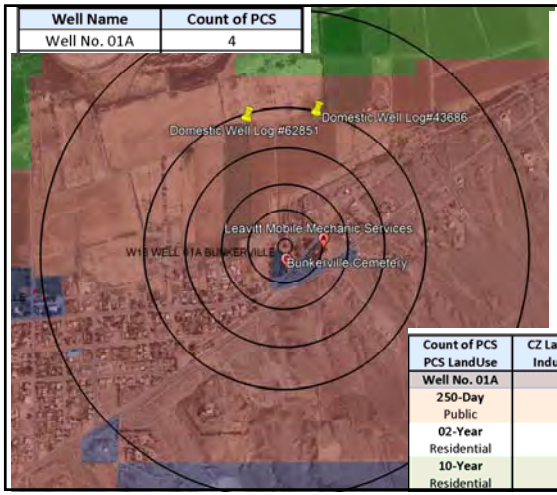
5

NDEP Category	Count of PCS
Agricultural	**3**
Chemical Storage	1
Nursery	1
Park	1
Automotive	**8**
Auto Repair Shop	1
Auto/Truck Rental Shop	1
Car Wash	1
Dealer	1
Gas Station	1
Paint and Body Shop	1
RV Site	1
Truck Stop	1
Commercial	**5**
Dry Cleaner	1
Jewelry Making	1
Laundromat	1
Printing	1
Wood Making	1
Industrial	**2**
Chemical Manufacture	1
Welding	1

NDEP Category	Count of PCS
Medical/Educational	**2**
Hospital	1
Medical Institution	1
Miscellaneous	**12**
Airport	1
Animal Hospital	1
Animal Shelter	1
Asphalt/Concrete	1
Cemetery	1
Church	1
Education	1
Fire Stations	1
Golf Course	1
Hotel, Casino, Motel	1
Police Stations	1
RCRA Active/Inactive	1
Municipal	**3**
Landfill	1
Recycling	1
Wastewater Treatment	1
Residential	**3**
Dewatering Well	1
Irrigation Well	1
Well-Other	1
Storage	**2**
Public Storage	1
Usts	1

6

Well Name	Count of PCS
Well No. 01A	4

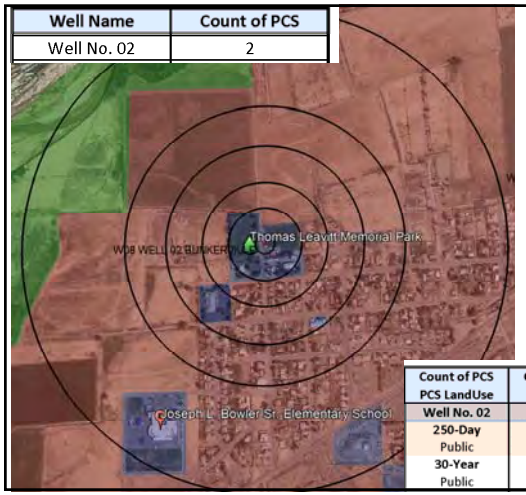


Management Strategies & Actions
Area Wide Strategy-
Proper disposal of hazardous substances
Education-
Coordinate with Bunkerville Town Council about SWPAs
Develop a clear path with Bunkerville
Targeted education outreach- household hazardous waste flyer – target toward area PCS

Count of PCS PCS LandUse	CZ LandUse Industrial	Public	PUD - Tuquop	Residential
Well No. 01A				**4**
250-Day				**1**
Public				1
02-Year				**1**
Residential				1
10-Year				**2**
Residential				2

7

Well Name	Count of PCS
Well No. 02	2



Management Strategies & Actions

Area Wide- Provide information on proper fertilizer and pesticide management

Water conservation and SWPA – overwatering

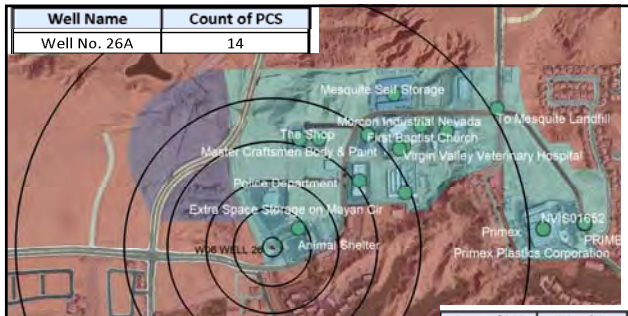
Coordinate with the County Planning Department – future development

Coordinate with residents for safe septice

Count of PCS PCS LandUse				
Well No. 02				
250-Day		**1**		
Public		1		
30-Year				**1**
Public				1

8

Well Name	Count of PCS
Well No. 26A	14



Count of PCS PCS LandUse	CZ LandUse Industrial	Public	PUD - Tuquop	Residential
Well No. 26A	1			13
250-Day	1			
Industrial	1			
10-Year				6
Industrial				5
Residential				1
30-Year				7
Industrial				5
Residential				2

Management Strategies & Actions

PFAS Contamination – Coordinate with Fire Department – training locations

Additional monitoring/inventory of industrial zones

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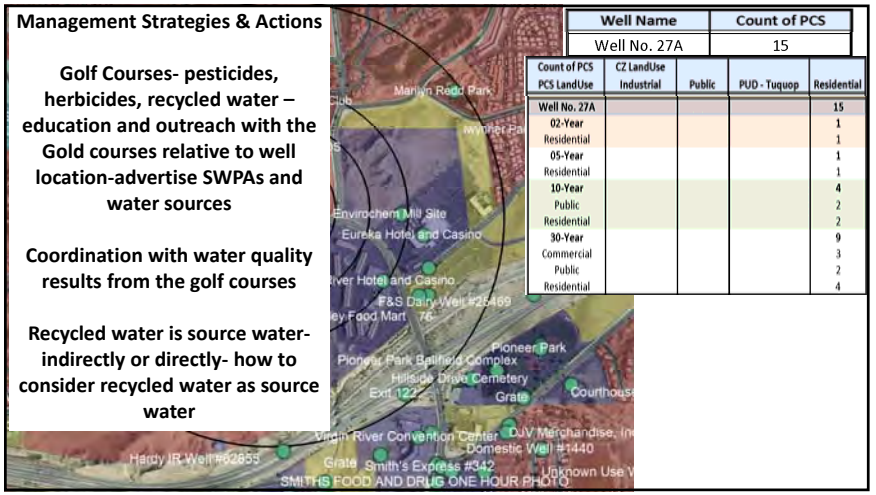
Management Strategies & Actions

Golf Courses- pesticides, herbicides, recycled water – education and outreach with the Gold courses relative to well location-advertise SWPAs and water sources

Coordination with water quality results from the golf courses

Recycled water is source water- indirectly or directly- how to consider recycled water as source water

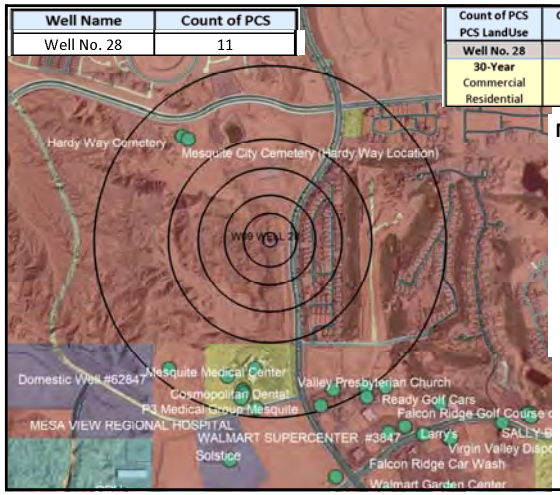
Well Name	Count of PCS
Well No. 27A	15



Count of PCS PCS LandUse	CZ LandUse Industrial	Public	PUD - Tuquop	Residential
Well No. 27A				15
02-Year				1
Residential				1
05-Year				1
Residential				1
10-Year				4
Public				2
Residential				2
30-Year				9
Commercial				3
Public				2
Residential				4

10

Well Name	Count of PCS
Well No. 28	11



Count of PCS PCS LandUse	CZ LandUse Industrial	Public	PUD - Tuquop	Residential
Well No. 28				11
30-Year				11
Commercial				5
Residential				6

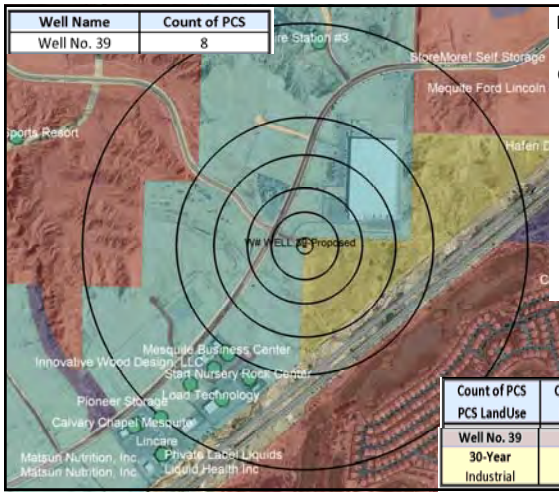
Management Strategies & Actions

Coordinate with City so that future land use changes take SPWAs into account – development code!!!

Public education and outreach regarding medication flushing

11

Well Name	Count of PCS
Well No. 39	8



Count of PCS PCS LandUse	CZ LandUse Industrial	Public	PUD - Tuquop	Residential
Well No. 39				8
30-Year				8
Industrial				8

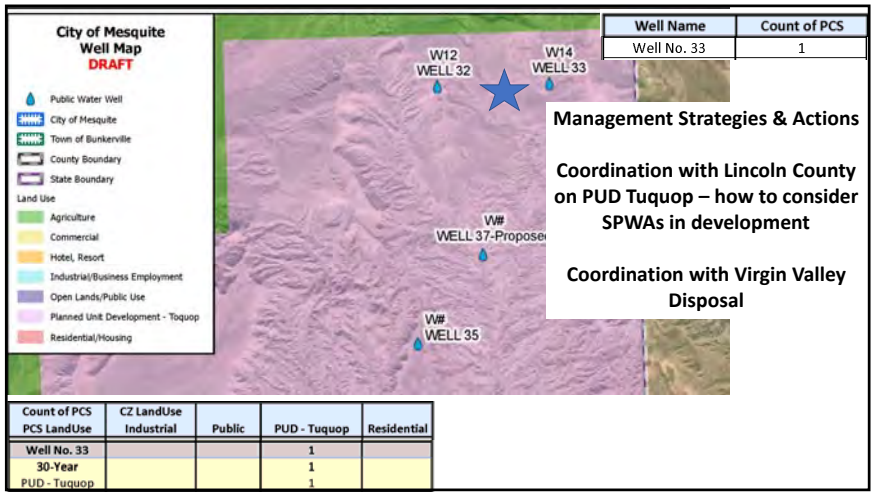
Management Strategies & Actions

Coordinate with Fire Department- Close to training area

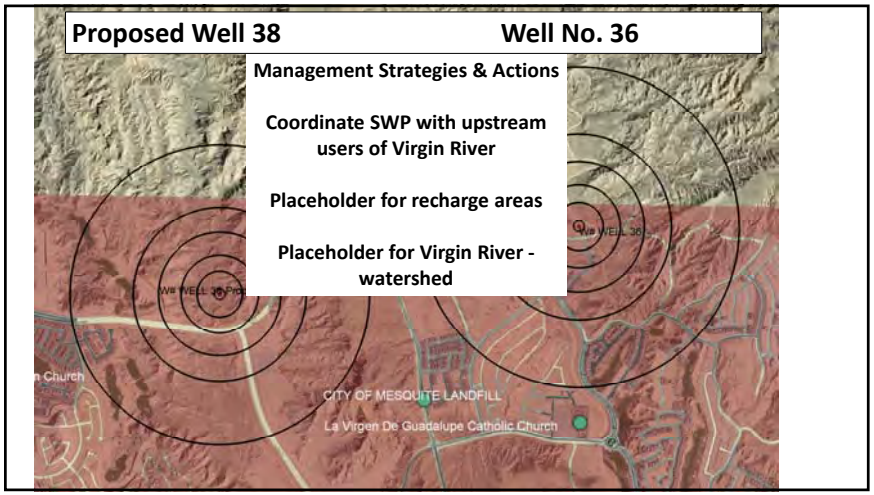
Coordinate with City of Mesquite for future development- development code!

Make CSWP Plan available to developers and engineers

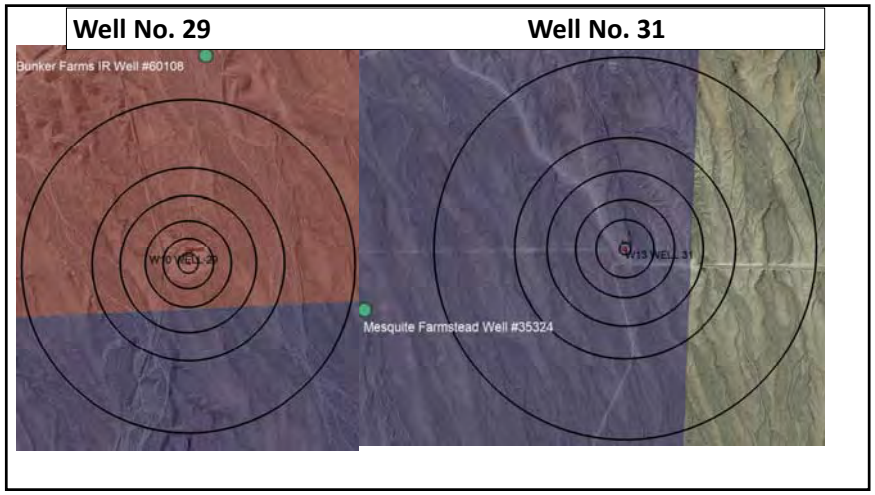
12


City of Mesquite
Well Map
DRAFT
Public Water Well
City of Mesquite
Town of Bunkerville
County Boundary
State Boundary
Land Use
Agriculture
Commercial
Hotel, Resort
Industrial/Business Employment
Open Lands/Public Use
Planned Unit Development - Toquop
Residential/Housing
W12
WELL 32
W14
WELL 33
W#
WELL 37-Propose
W#
WELL 35
Well Name
Count of PCS
Well No. 33
1
Management Strategies & Actions
Coordination with Lincoln County on PUD Tuquop – how to consider SPWAs in development
Coordination with Virgin Valley Disposal
Count of PCS
PCS LandUse
CZ LandUse
Industrial
Public
PUD - Tuquop
Residential
Well No. 33
1
30-Year
PUD - Tuquop
1

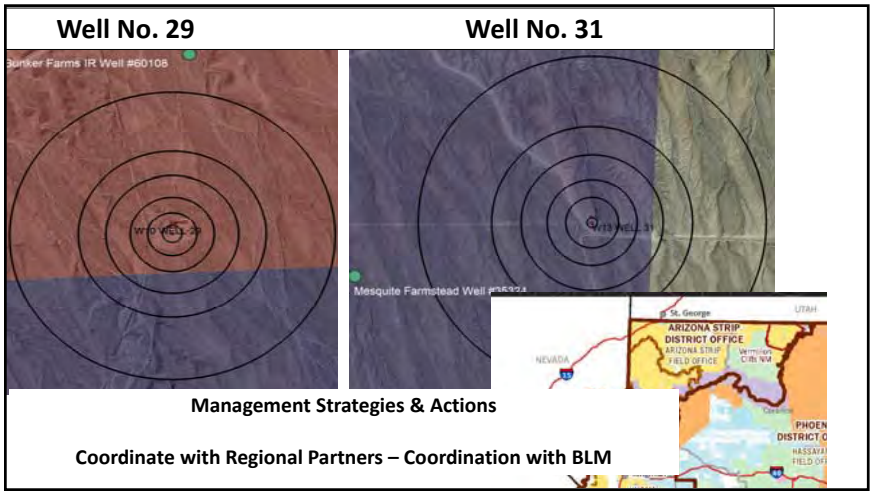
13


Proposed Well 38
Well No. 36
Management Strategies & Actions
Coordinate SWP with upstream users of Virgin River
Placeholder for recharge areas
Placeholder for Virgin River - watershed
CITY OF MESQUITE LANDFILL
La Virgen De Guadalupe Catholic Church

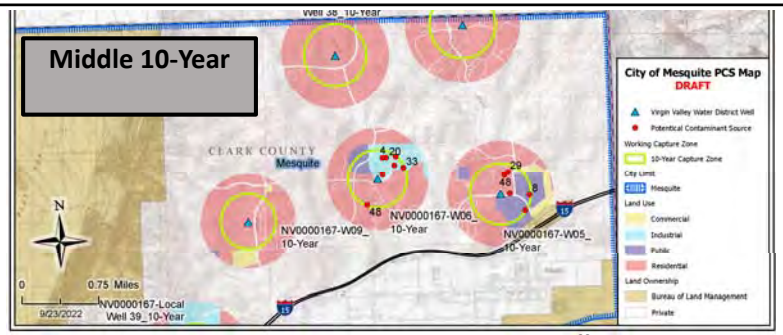
14


Well No. 29
Well No. 31
Bunker Farms IR Well #60108
Mesquite Farmstead Well #35324

15


Well No. 29
Well No. 31
Bunker Farms IR Well #60108
Management Strategies & Actions
Coordinate with Regional Partners – Coordination with BLM
ARIZONA STRIP
DISTRICT OFFICE

16



Well 26

Industrial, Residential, Public

- **Auto Repair Shop (20, High)**
- **Public Storage (3, Low)**
- **Golf Course (48, High)**

Well 27A

Commercial, Residential, Public

- **Medical Institution (29, Low)**
- **Golf Course (48, High)**
- **Envirochem Mill Site (8, High)**

17

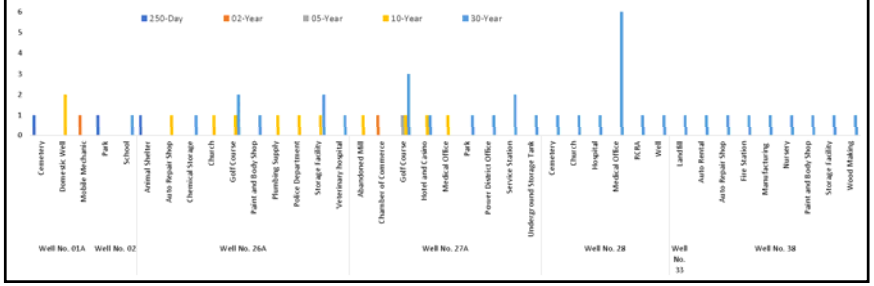
Analysis

Community Source Water Protection Areas

- ❑ Delineate areas based off parameters YOU chose
  - TOT Buffer Zones?
  - Watershed? – (HUC-12)
  - Land Use?

18

Count of PCS	CZ					
Well Name	250-Day	02-Year	05-Year	10-Year	30-Year	Grand Total
Well No. 01A	1	1		2		4
Well No. 02	1				1	2
Well No. 26A	1			6	7	14
Well No. 27A		1	1	4	9	15
Well No. 28					11	11
Well No. 33					1	1
Well No. 39					8	8
Grand Total	**3**	**2**	**1**	**12**	**37**	**55**



19

RCI – VVWD Meeting
Thursday November 17, 2022
3pm-4pm (Pacific)

Meeting Notes

Attending

Natalie Anderson – VVWD
Jill Sutherland, Erin Smith, Alison Cramer – RCI

Purpose

The purpose of this meeting was to discuss public education and outreach approaches and goals for the Virgin Valley Water District (VVWD) supplied areas of Mesquite and Bunkerville. Public participation, through education and public outreach, is an important part of developing a Community Source Water Protection Plan (CSWP Plan).

A good way to approach public education and outreach is to identify important community messages which enable source water protection. The meeting was intended to solidify the key public audiences and key messages that will be used to help implement the CSWP Plan. The Source Water Protection message can be a nice complement to the water conservation outreach the VVWD is actively pursuing.

Discussion

Introductions and Welcome

The meeting began with a brief overview of public education and outreach activities RCI has participated in as part of the ISWP Program. RCI reviewed Carson City's 1st Annual Source Water Assessment Day, Snapshot day, and the Carson City Household Hazardous Waste Collection Flyer.

Key Audiences

Key Audiences for Public Education and Outreach for the Lower Virgin Valley CSWP Plan included:

- Senior Citizens
- 5th Grade through High School Students
- Parents at school events
- Town of Bunkerville and/or Sun City

Public Education and Outreach Brainstorm for Lower Virgin Valley

The group discussed various Public Education and Outreach activities which were mentioned in previous Team meetings and thought through during the meeting. Ideas and important dates included:

Important dates from VVWD:

- December 8th, 2022 – meeting/presentation to Colonial Property Management Homeowners Association to include a SWP and drinking water message as well as to introduce the ISWP Program and the CSWP Plan.
- January 3rd, 2023 – kids get back from winter break and VVWD has presentation time scheduled. This is an opportunity to integrate SWP and a drinking water message to the students using the Awesome Aquifer and/or the Enviroscape.
- End of April/beginning of May annually – Mesquite Days and Water Camp with Virgin River Coalition. Opportunity to have a SWP booth and demonstrate the Awesome Aquifer and/or Enviroscape.

RCI – VVWD Meeting
Thursday November 17, 2022
3pm-4pm (Pacific)

- July 3rd – 4th annually – Bunkerville celebration and Water Fight and Community Casino Events. Consider a SWP booth and incorporate a drinking water message.

Organizations for potential outreach/education events:

- Local schools – great way to reach young people and their families and include a source water presentation with the Awesome Aquifer and/or the EnviroScape.
    - 5/6 grade science and social studies curriculum up to high school level
    - Summer school for middle school age kids
    - High school geology and/or environmental science classes
    - Field trips/site visits – visit the VVWD or Public Works
    - STEM theme nights at local schools
- Virgin River Coalition (VRC) – Coordinate with VRC to possibly participate in the bi-annual meetings every October and April and bring a drinking water message to the meeting.
    - Potentially work together/collaborate for events, such as Water Camp
- Rotary Clubs (Mesquite and Sunrise) and Elk's Club
    - Possible luncheon speaker
    - Opportunity to have a SWP booth at an event
- Community Casinos – Reach out to casino partners to include a larger demographic, especially senior citizens.
    - Email blasts, pamphlets, other messaging
    - Opportunity to have a booth with a combined water conservation and drinking water message during various community events
- Retirement communities and other HOAs
    - Create flyer(s) which outline where citizens can dispose of medications. Locations may include police departments, fire departments, and Walgreens
    - Reach out to the Sun City Retirement Community for a presentation discussing various aspects of SWP in the community, and how they can participate
    - Opportunity for a SWP Booth at community events
- Bunkerville Town Board
    - Present the CSWP Plan to the Bunkerville Town Board for support and/or endorsement.
- City of Mesquite programs
    - Senior Newsletter – Submitting a flyer to the City's Senior newsletter to outline how proper disposal of medications protects source water and where citizens may dispose of their medications

RCI – VVWD Meeting
Thursday November 17, 2022
3pm-4pm (Pacific)

- Community volunteer position – Public Works volunteer might help with the outreach/education effort
- Pamphlets in English and Spanish made available at meetings or next to offices
- Mesquite Night Out – possibly add a booth in the future, last year only a safety focus.

Virtual Outreach and Education Ideas

- Press releases to celebrate water conservation and/or source water protection
  - American Water Works Association (AWWA) has a national Source Water Protection week, typically the last week in September
  - VVWD Facebook campaigns such as, "Imagine a Day Without Water," to promote what the VVWD is doing to protect source water for the community and generations to come
  - State groundwater protection slogan/logo: "Groundwater -protect it today, you may drink it tomorrow." – available in electronic form from the Nevada Division of Environmental Protection (NDEP)
  - National water saving week is May 22-26, 2023, and this is a good opportunity to promote SWP along with water conservation measures.
- Create a website or add a Source Water Protection page to the VVWD and City of Mesquite websites.

Next Steps

- RCI will investigate the location of the nearest Farm Bureau office
  - Potential to coordinate with the Department of Agriculture i.e., Ag in the Classroom
- RCI will follow-up with locations which accept expired medications within the community
- VVWD will provide RCI with a brief write-up of how an EnviroScape Model or the Awesome Aquifer Kits will be used for education purpose
  - How many people/kids?
  - Where will it be used: school, events, etc.?
  - What will people/kids learn about their own source of water?
- With NDEP concurrences, purchase of the Enviroscape Model or Awesome Aquifer Kits for VVWD could be done through RCI's Contract funds for implementation. If possible, new equipment could be used for the Jan. 3, 2023, presentations. RCI also has equipment that we could bring to the event.
- RCI and VVWD will work on developing key messages for the community, and present ideas to the Local Planning Team on December 1, 2022

Agenda

Source Water Protection Program

Virgin Valley Source Water Protection Planning Team Meeting 4

Date: December 1, 2022
Time: 8:30 – 10:30 am
Where: Virtual

1. **Welcome & introductions**
2. **Review updated information and mapping**
   Results of the "Final" PCS Survey
3. **Review the "Final" Source Water Protection Areas**
   These are areas on the ground surface which surround your wells. We will review results of the Poll and finalize the SWPAs for the CSWP Plan.
4. **Review the CSWP Plan Management Strategies and Actions**
   Review and finalize the management strategies and actions which protect your sources of drinking water. Do these CSWP Plan strategies implement YOUR community goals, and can they be easily put into action?
5. **Public Education and Outreach**
   Review and discuss public education and outreach activities to be completed during and/or following CSWP Plan development.

Link to OneDrive: Lower Virgin Valley CSWP Plan OneDrive

Meeting Notes

Virgin Valley Source Water Protection Planning – Team Meeting 4

Thursday, December 1, 2022
8:30am-10:30am (Pacific)
Virtual meeting on Teams

Attending

NAME	*CONTACT INFORMATION*		*AFFILIATION*
Aaron Bunker	702-346-5731	abunker@vvh2o.com	Virgin Valley Water District (VVWD)
Steve Hall	702-346-5731	shall@vvh2o.com	Virgin Valley Water District (VVWD)
Natalie Anderson	702-346-5731	nanderson@vvh20.com	Virgin Valley Water District (VVWD)
Richard Secrist	702-346-2835	rsecrist@mesquitenv.gov	City of Mesquite – Develop. Services
Travis Anderson	702-346-5237	tanderson@mesquitenv.gov	City of Mesquite – Public Works
Ryan Kammerer	702-345-8080	rkammerer@mesquitenv.gov	City of Mesquite – GIS Specialist
Christopher Berkey	702-540-6107	christopherb@nvrwa.org	Nevada Rural Water Assoc. (NvRWA)
Ethan Mason	775-687-9311	e.mason@ndep.nv.gov	NDEP Integrated Source Water Protection Program (NDEP ISWPP)
Alison Cramer	775-883-1600	alison@rci-nv.com	Resource Concepts, Inc. (RCI)
Erin Smith	775-301-4168	erin@rci-nv.com	Resource Concepts, Inc. (RCI)
Jill Sutherland	775-883-1600	jill@rci-nv.com	Resource Concepts, Inc. (RCI)

Purpose & Overview

The purpose of this meeting was to bring together a local planning team (Team) to discuss the draft Virgin Valley Community Source Water Protection Plan (CSWP Plan). The draft Potential Contaminant Source (PCS) inventory, Source Water Protection Area (SWPA) delineations, and general management strategies were commented on and approved by the Team. A preliminary draft of the Action Plan to implement CSWP Plan goals and a preliminary schedule for completion of the plan were introduced by RCI and discussed by the Team.

Discussion

Welcome and Introductions

The meeting began with a brief introduction of the Team to the new Integrated Source Water Protection Plan (ISWPP) Coordinator with the Nevada Department of Environmental Protection (NDEP), Bureau of Safe Drinking Water (BSDW).

PCS Inventory

RCI used a PowerPoint presentation to present changes to the PCS inventory since the last meeting, which included:

- Review of the preliminary PCS inventory analysis from the meeting on November 3, 2022,
- Addition of Interstate-15 points to the 30-Year Capture Zone for Well No. 39 and Well No. 27A,
- Addition of the Pulsipher Wash Detention Basin to the 10-Year Capture Zone, Well No. 28, and
- Utilization of assessor parcel information for Golf Courses and businesses to include them in the most appropriate Capture Zone.
- RCI is looking into mapping parcels with septic systems and domestic wells, which may further inform the team about these PCSs.

The Team had no comments and accepted the proposed changes to the PCS inventory.

RCI reviewed the PCS deliverables which will be included in the CSWP Plan and submitted to the Team once finalized, which will include:

- KML, KMZ, and Shapefiles; Geospatial data to be synchronized between RCI, the VVWD, the City of Mesquite, and NDEP,
- Tables including the PCS inventory and sources used,
- Tables and Graphs of PCS within SWPAs for the Technical Report, and
- Tables with Facility Registry Service (FRS) and underground storage tank (UST) data, which will include web-links to each permit and/or UST.

The Team supported receiving the PCS inventory as an interactive GIS dataset.

SWPA Delineations

RCI reviewed the SWPA delineation poll results and descriptions for each SWPA based on previous Team meetings. The Team discussed the Poll results and SWPA recommendations provided by the ISWPP (NDEP, 2010) guidance documents. The Team decided to delineate the following SWPAs:

- Zone 1: 100-ft Arbitrary Fixed Radius (AFR) - Establishing ownership/control of all property within a 100-ft radius of each wellhead is important to the VVWD and consistent with the 100-ft buffer outlined in the Clark County 208 Area-Wide Water Quality Management Plan for other jurisdictions.
- Zone 2: 2-Year Calculated Fixed Radius (CFR) - The location of high hazard PCSs within the 2-Year CFR are a concern for the VVWD. The Team agreed that the use of a 2-Year CFR would be more consistent with the ISWPP state guidance.
- Zone 3, Zone 4: 10-, 30-Year CFR - Reflect broader community goals and risks over the long term to the deep aquifer and facilitate communication and coordination on future development in SWPAs.
- Zone 5: Placeholder for watershed and recharge areas to be consistent with the Water Master Plan and additional long-range plans.

Management Strategies and Action Plan

RCI reviewed the Management Strategies and Goals developed in previous meetings. The Team supported the draft strategies as proposed:

1. Public Education and Outreach
2. Planning Agency Coordination
3. Collaboration with Local and Regional Partners
4. Secure Locations for Current and Future Water Sources

RCI reviewed examples from the Draft Action Plan which will be used to implement Management Strategies. The Team agreed to review and comment on the Action Plan before the next meeting scheduled for Wednesday January 4, 2023.

NvRWA suggested regional meetings and collaboration with other Clark County organizations, public water systems, and agencies. Additionally, NvRWA can offer support in these collaborations and in other public outreach and education endeavors. The Clark County Water Reclamation District “Pain in the Drain” website has nice outreach materials that could be expanded locally.

Public Education and Outreach is the overarching strategy for any community plan. The Team recognizes that the success of this CSWP Plan depends on the willingness of the community to participate and regulate itself. The VVWD Conservation Specialist expanded on public education and outreach actions specific to community groups of special interest identified by the Team. The VVWD asked RCI to

continue working with their Specialist on this component of the CSWP Plan. The community outreach opportunities outlined by the VVWD included:

- Seniors 65+
  - Connect with the senior center - interested in hosting a booth, and/or a "lunch-n-learn" combining messaging about source water protection (SWP) and conservation,
  - Planning to take place in early 2023.
- Students
  - Participate in STEM night at local elementary schools - utilize the Enviroscape Model,
  - 5th Grade SWP presentation - scheduled for January 3, 2022, at 10:45am and 11:35am,
  - Promote the Awesome Aquifer groundwater model in 6th Grade summer school science curriculum,
  - Work with the High School agriculture teacher and Soils Team on a SWP presentation, and
  - Reach out to Virgin River Coalition (VRC) to incorporate a conservation and SWP message at the summer camp.
- Homeowner's Associations (HOAs)
  - Possibly incorporate a SWP message into presentation with Colonial Property Management and Terra West, scheduled for mid-December, and
  - Schedule future SWP and conservation presentations with HOAs and Sun City.
- General Population
  - Combine the conservation and SWP messages at Mesquite Day events on May 1, 2022,
  - Participate in the America Water Works Association (AWWA) "SWP Week", "Imagine a Day Without Water", and "Fix a Leak Week" via social media,
  - Facilitate virtual tours and/or have a QR code available outside facilities or wells where community members can learn about the VVWD and view SWPAs,
  - Make available courses such as Qualified Efficient Landscaping to promote water use efficiency, pesticide management, and proper chemical disposal,
  - Reach out to the Bunkerville Town Council to educate the community about what is being done to protect their source water, and
  - Deliver proper septic maintenance flyers to applicable areas.

A public online viewer has the ability to capture public attention and foster public engagement for protecting source water. The City of Mesquite GIS Specialist reviewed his ideas and goals related to creating and housing an online public viewer to identify SWPAs for the Lower Virgin Valley area, ideas considered included:

- City of Mesquite to host GIS data from the CSWP Plan,
- Publish data that does not include sensitive information (locations of wells and PCSs would not be displayed to the public), and
- Create an online public viewer on the City of Mesquite website where users can search an address to see if their business, future business, or residence is located in a SWPA.

The Team was enthusiastic about moving forward with the City developing an internal and future public viewer. The VVWD approved RCI sharing the data layers used in developing the CSWP Plan with the City GIS Specialist. The VVWD has some in-house GIS capabilities, but generally has a consultant who maintains their GIS databases.

Preliminary Schedule

RCI presented the preliminary DRAFT CSWP Plan outline, review, and presentation schedule for the Team, which included:

- RCI OneDrive Uploads
  - DRAFT Appendices C, D, E, and G by end of December 2022
  - DRAFT CSWP Plan main body by end of January 2023
- Team Review
  - Review DRAFT Appendix F – Action Plan by end of December 2022
  - Review DRAFT Appendices C, D, E, and G by end of January 2023
  - Review DRAFT CSWP Plan main body by end of February 2023
- Board Presentations April, May, or June
  - Presentation to the VVWD board for CSWP Plan adoption
  - Presentation to the Mesquite City Council for CSWP Plan adoption

Next Steps

Next meeting scheduled: Wednesday, January 4, 2023, 1:30 – 3:30pm (PST)

Future meetings scheduled: Tuesday, February 7, 2023, 8:30 – 10:30am (PST)

Tuesday, March 7, 2023, 8:30 – 10:30am (PST)

Follow-up items:

All Team Members –

- Review and comment on the DRAFT Action Plan, target date December 23, so results can be compiled for the January meeting.

NvRWA -

- Coordinate with the VVWD Conservation Specialist on Awesome Aquifer kits, a groundwater model for presentations, outreach methods, and educational materials.

VVWD & City of Mesquite –

- VVWD to send the City of Mesquite the VVWD boundary in the form of a geospatial file.

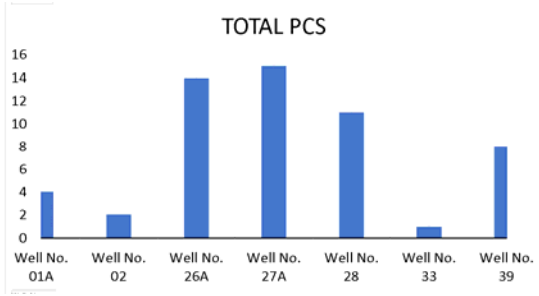
RCI -

- Provide DRAFT SWPA maps and technical reports for Team review.
- Coordinate with VVWD to bring the Enviroscape model and attend 5th Grade presentation on January 3, 2023.
- Meet with the City of Mesquite GIS specialist to coordinate data collection and sharing.
- Prepare draft mapping of parcels with septic tanks and domestic wells.
- Follow up with the City of Mesquite to discuss incorporating Source Water Protection into the Mesquite Master Plan.
- Coordinate with VVWD Conservation Specialist to draft public participation component of the CSWP Plan.

1

Which wells have PCSs within the Capture Zones?
7/14 Wells

Well Name	Count of PCS
Well No. 01A	4
Well No. 02	2
Well No. 26A	14
Well No. 27A	15
Well No. 28	11
Well No. 33	1
Well No. 39	8
Grand Total	55



Wells 29, 31, 32, 35, 36, 37, and 38 do not have any PCS within the 30-year Capture Zone at THIS TIME.

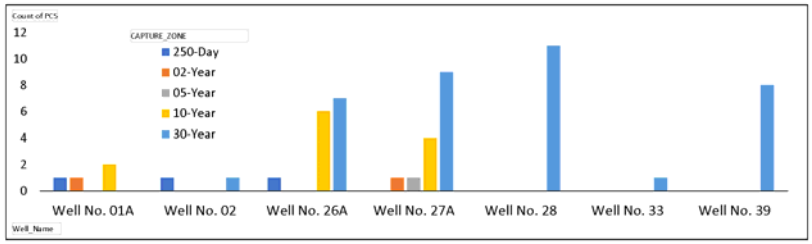
2

Count of PCS	CZ					
Well Name	250-Day	02-Year	05-Year	10-Year	30-Year	Grand Total
Well No. 01A	1	1		2		4
Well No. 02	1				1	2
Well No. 26A	1			6	7	14
Well No. 27A		1	1	4	9	15
Well No. 28					11	11
Well No. 33					1	1
Well No. 39					8	8
Grand Total	3	2	1	12	37	55

Where do PCSs occur in the CZs?

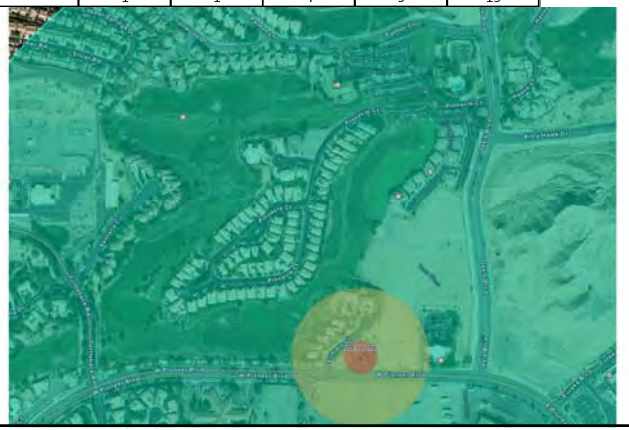
There are no PCSs within 100 ft.

What Type?



3

Count of PCS	CZ					
Well Name	250-Day	02-Year	05-Year	10-Year	30-Year	Grand Total
Well No. 27A		1	1	4	9	15



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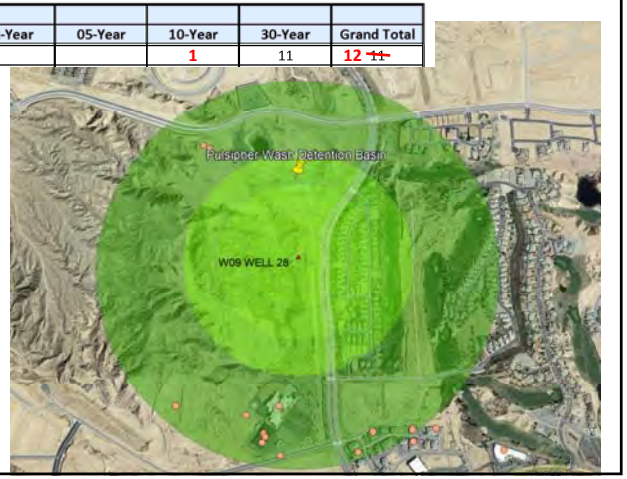
Count of PCS	CZ					
Well Name	250-Day	02-Year	05-Year	10-Year	30-Year	Grand Total
Well No. 27A	2	1	1	4	7 ~~9~~	15

- Added Palmer Golf Course and Oasis Golf Club to different CZ

5

Count of PCS	CZ					
Well Name	250-Day	02-Year	05-Year	10-Year	30-Year	Grand Total
Well No. 28				1	11	12 ~~11~~

- Added Pulsipher Wash Detention Basin



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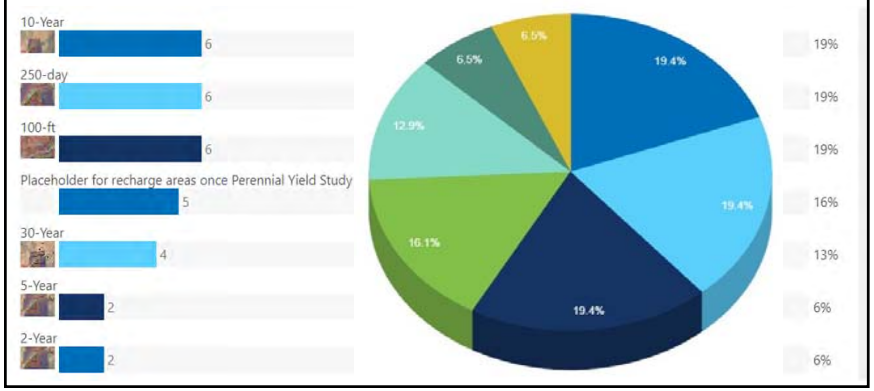
PCS Deliverables

- ***KML, KMZ, Shapefiles (Inter-Agency Coordination)***
- ***Tables of ALL PCS and Utilized Sources***
- ***Tables and Graphs of PCS within Source Water Protection Areas for the Technical Report***
- ***Tables with Web Sources will include:***
  - ***UST and LUST***
  - ***NPDES Facilities***
  - ***RCRA – Active, Inactive, No-Further Corrective Action***
  - ***TRI***

7

SWPA POLL RESULTS



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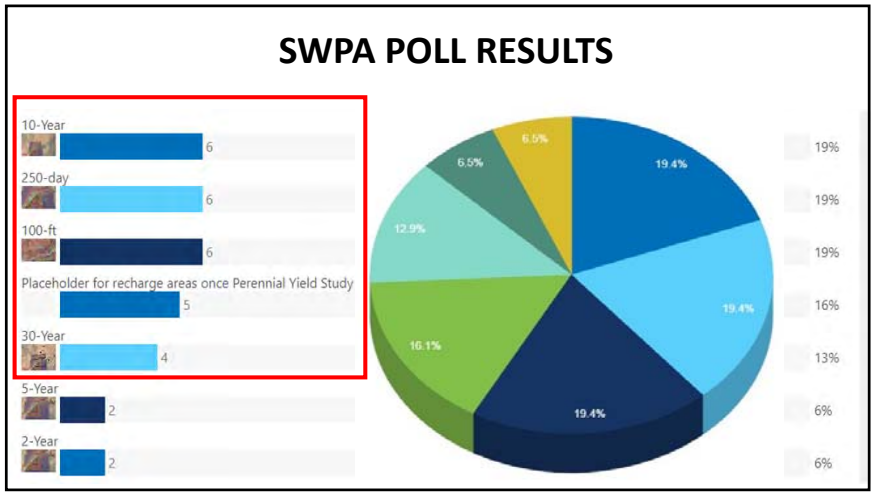

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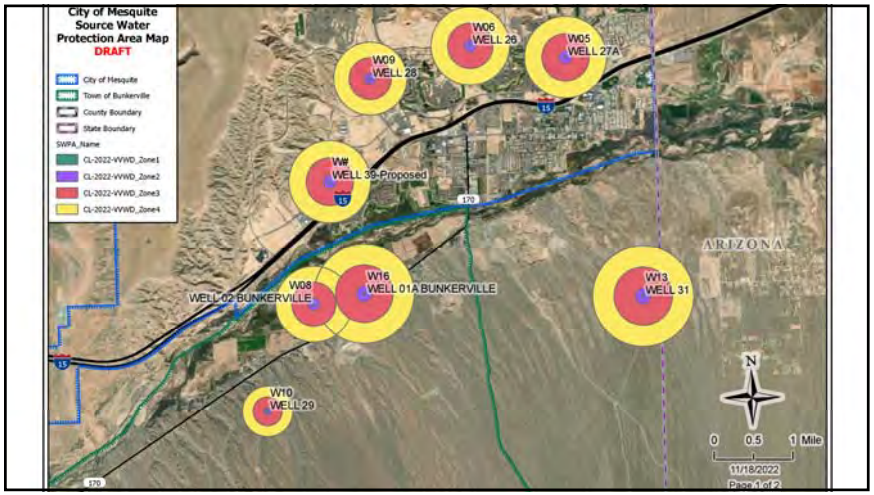

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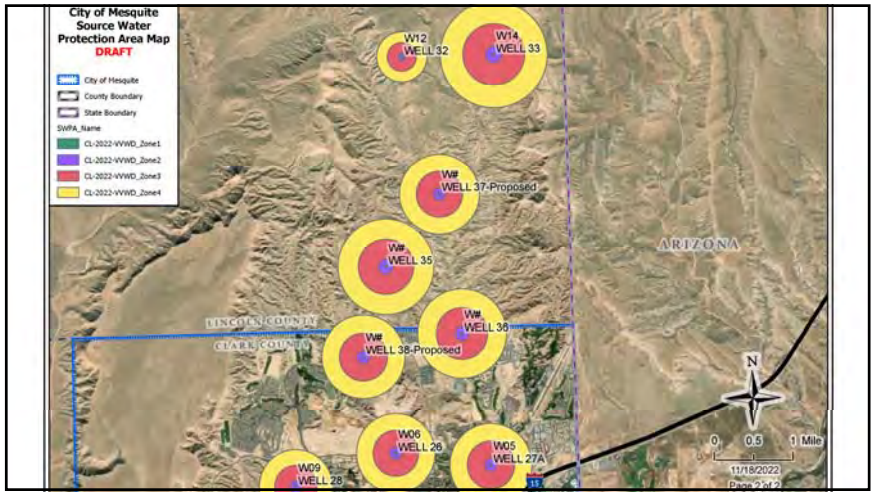

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SWPA Name	Descriptions
Zone 1	100-ft AFR: Establishing ownership/control of all property within a 100-ft radius of each wellhead is important to the VVWD and consistent with the 100-ft buffer outlined in the Clark County 208 Area-Wide Water Quality Management Plan for other jurisdictions.
Zone 2	250-Day CFR: The location of high hazard PCSs within the 250-Day CFR are a concern for the VVWD.
Zone 3, Zone 4	10-, 30-Year CFR: Reflect broader community goals and risks over the long term to the deeper aquifer.
Zone 5	Placeholder for watershed and recharge areas to be consistent with the Water Master Plan and additional long-range plans.

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Purpose of the Plan: *Create a community-wide plan to help protect drinking water sources and maintain water quality.*	
Community Goals for Source Water Protection	
Goal 1: *Identify the sources of and potential risks to drinking water and consider them in the local planning framework.*	***Goal 2:*** *Ensure that clean and safe drinking water is available for future generations.*
Goal 3: *Integrate source water protection into local planning and zoning documents to ensure that quality of drinking water matches the goals of the community.*	***Goal 4:*** *Educate the community about what is being accomplished to achieve source water protection.*

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What are Source Water Protection Management Strategies?

- Incorporate SWPAs, PCS inventory and evaluation, and community growth
- Ensure that CSWP Plan goals are met
- Prioritized by the Team for the water sources considered in this Plan
- Designed to be simple and easy to implement
- Work to reduce the potential of source water contamination
- Broad and can be implemented using project specific action plans

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Source Water Protection Management Strategies

1. Public Education and Outreach (*Goal 4*)
2. Planning Agency Coordination (*Goals 1* and *3*)
3. Collaboration with Local and Regional Partners (*Goals 1* and *3*)
4. Secure Locations for Current and Future Water Sources (*Goal 2*)

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Goal 1:

Identify the sources of and potential risks to drinking water and consider them in the local planning framework.

Goal 3:

Integrate Source Water Protection into local planning and zoning documents to ensure that quality of drinking water matches the goals of the community.

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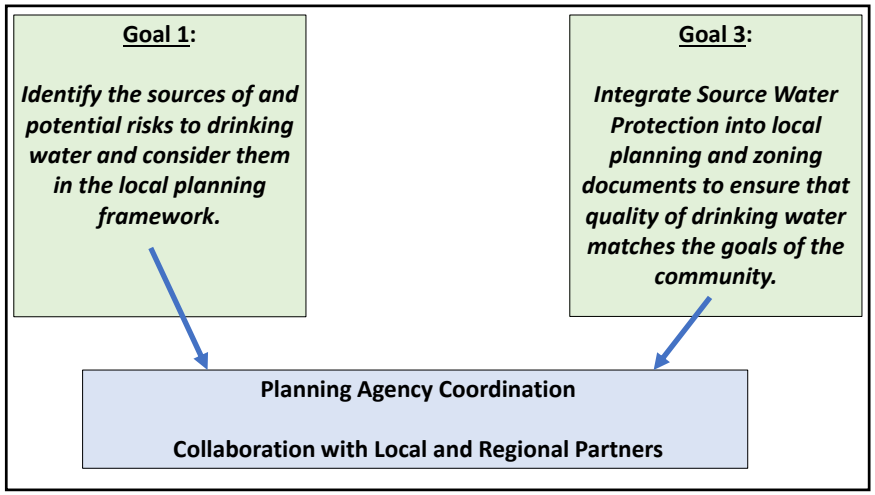
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Planning Agency Coordination
Collaboration with Local and Regional Partners

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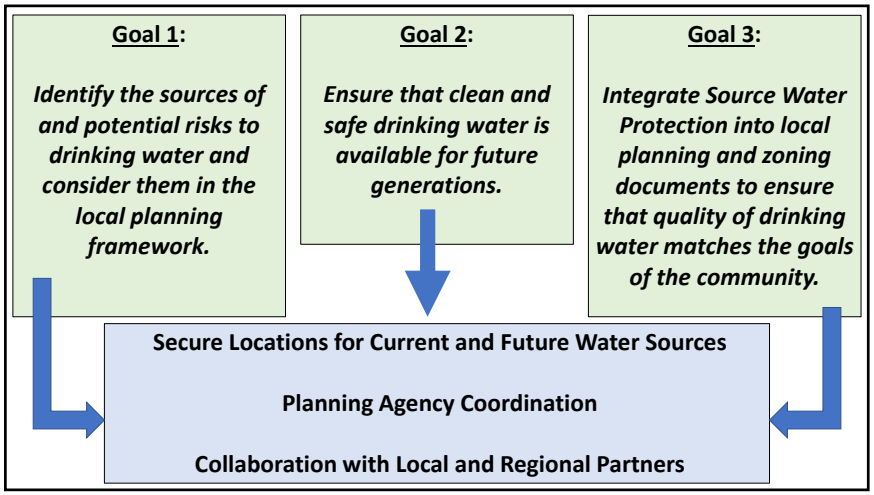
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Goal 3:
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Secure Locations for Current and Future Water Sources
Planning Agency Coordination
Collaboration with Local and Regional Partners

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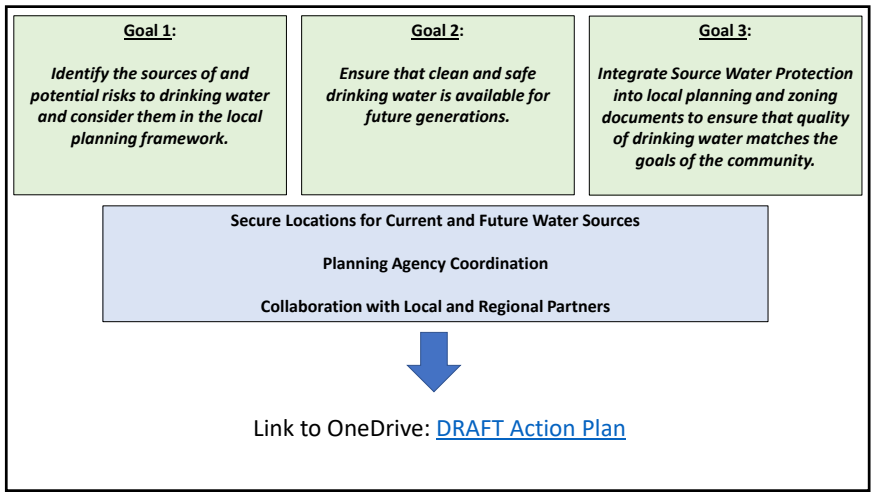
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Secure Locations for Current and Future Water Sources
Planning Agency Coordination
Collaboration with Local and Regional Partners
Link to OneDrive: DRAFT Action Plan

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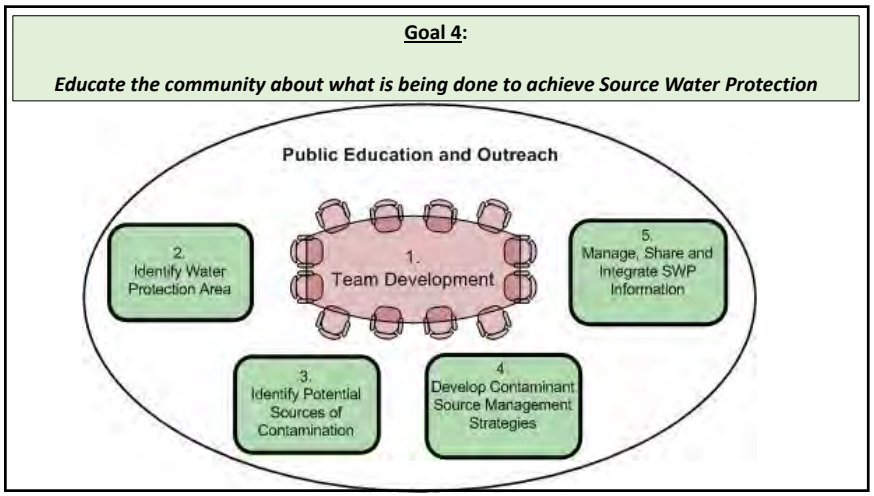
Goal 4:
Educate the community about what is being done to achieve Source Water Protection
Public Education and Outreach
1. Team Development
2. Identify Water Protection Area
3. Identify Potential Sources of Contamination
4 Develop Contaminant Source Management Strategies
5. Manage, Share and Integrate SWP Information

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1.13 *Consider working with property owners to promote proper septic tank maintenance as it relates to source water protection.*

Goal 4:
Educate the community about what is being done to achieve Source Water Protection

Management Strategy
Public Education and Outreach

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1.14 *Expand information and support public education and outreach about proper disposal of chemicals, pharmaceuticals, and household hazardous materials.*

Goal 4:
Educate the community about what is being done to achieve Source Water Protection

Management Strategy
Public Education and Outreach

22

1.14 *Expand information and support public education and outreach about proper disposal of chemicals, pharmaceuticals, and household hazardous materials.*

Goal 4:
Educate the community about what is being done to achieve Source Water Protection

Management Strategy
Public Education and Outreach

23

1.14 *Expand information and support public education and outreach about proper disposal of chemicals, pharmaceuticals, and household hazardous materials.*

Goal 4:
Educate the community about what is being done to achieve Source Water Protection

Management Strategy
Public Education and Outreach

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1.16 *Broaden community public education and outreach by producing Source Water Protection pamphlets and outreach materials in both English and Spanish.*

Goal 4:
Educate the community about what is being done to achieve Source Water Protection

Management Strategy
Public Education and Outreach

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1.6 *Promote Source Water Protection and obtain resources to purchase watershed and groundwater models. For example, the Awesome Aquifer and Enviroscape Models.*

Goal 4:
Educate the community about what is being done to achieve Source Water Protection

Management Strategy
Public Education and Outreach

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1.1 *Promote Source Water Protection on the VVWD website. For example, provide a link to the CSWP Plan or a public online viewer.*

1.3 *Promote Source Water Protection on the City of Mesquite website. For example, create a public online viewer which includes Source Water Protection Areas. The City of Mesquite has license to create and house a public Source Water Protection Viewer.*

Goal 4:
Educate the community about what is being done to achieve Source Water Protection

Management Strategy
Public Education and Outreach

https://city-of-mesquite-map-gallery-mesquitenv.hub.arcgis.com/

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Management Strategy

Planning Agency Coordination

2.9 Facilitate the exchange and maintenance of map layer updates between the VVWD and the City of Mesquite. For example, a shared ESRI viewer could include the most current Source Water Protection Areas, well locations, and PCSs.

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Source Water Protection Management Strategies

1. Public Education and Outreach (*Goal 4*)
2. Planning Agency Coordination (*Goals 1* and *3*)
3. Collaboration with Local and Regional Partners (*Goals 1* and *3*)
4. Secure Locations for Current and Future Water Sources (*Goal 2*)

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NEXT STEPS…..

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Appendices

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NEXT STEPS…..

Appendices

Comments By Next Meeting on…….. January?

USE YOUR ONEDRIVE

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NEXT STEPS…..

Appendices

RCI Will Post in the ONEDRIVE end of December

COMMENTS By Meeting on…… February?

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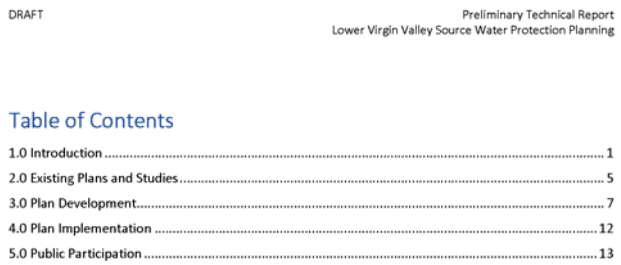
NEXT STEPS…..


DRAFT

Preliminary Technical Report
Lower Virgin Valley Source Water Protection Planning

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RCI Will Post in the ONEDRIVE end of January

COMMENTS By Meeting on…… March?

33

NEXT STEPS….. April, May, or June

- Presentation to VVWD Board for approval
- Presentation to the Mesquite City Council for approval

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Agenda

Source Water Protection Program

Virgin Valley Source Water Protection Planning Team Meeting 5

Date: January 4, 2023
Time: 1:30 – 3:30 pm
Where: Virtual

1. **Welcome & introductions**

2. **Review Action Plan Implementation**
   - City of Mesquite walk-through the Draft Source Water Protection Viewer
   - VVWD and NvRWA update on school presentations
   - City of Mesquite combining source water protection and water conservation

3. **Review the Action Plan (Appendix F of the CSWP Plan)**
   We will review all Team updates and comments to the Action Plan.

4. **Education Plan Highlights (Appendix G of the CSWP Plan)**
   Review and discuss the Education Plan purpose and goals, and key messages.

5. **CSWP Plan Outline**
   Review the CSWP Plan Outline and walk-through the available appendices and maps (highlighted below) ready for Team review on OneDrive.

Appendices

Appendix A	SWPA Maps
Appendix B	Public Meetings
Appendix C	Capture Zone
Appendix D	Potential Contaminant Source Inventory
Appendix E	SWPA Delineation Method
Appendix F	Action Plan
Appendix G	Public outreach

6. **Next Steps**

Link to OneDrive: Lower Virgin Valley CSWP Plan OneDrive

Meeting Notes

Virgin Valley Source Water Protection Planning – Team Meeting 5

Wednesday, January 4, 2023
1:30pm-3:30pm (Pacific)
Virtual meeting on Teams

Attending

NAME	*CONTACT INFORMATION*		*AFFILIATION*
Aaron Bunker	702-346-5731	abunker@vvh2o.com	Virgin Valley Water District (VVWD)
Steve Hall	702-346-5731	shall@vvh2o.com	Virgin Valley Water District (VVWD)
Natalie Anderson	702-346-5731	nanderson@vvh20.com	Virgin Valley Water District (VVWD)
Richard Secrist	702-346-2835	rsecrist@mesquitenv.gov	City of Mesquite – Develop. Services
Travis Anderson	702-346-5237	tanderson@mesquitenv.gov	City of Mesquite – Public Works
Ryan Kammerer	702-345-8080	rkammerer@mesquitenv.gov	City of Mesquite – GIS Specialist
Christopher Berkey	702-540-6107	christopherb@nvrwa.org	Nevada Rural Water Assoc. (NvRWA)
Jayson Andrus	702-346-2690	jandrus@mesquitenv.gov	City of Mesquite – Fire Department
Ethan Mason	775-687-9311	e.mason@ndep.nv.gov	NDEP Integrated Source Water Protection Program (NDEP ISWPP)
Alison Cramer	775-883-1600	alison@rci-nv.com	Resource Concepts, Inc. (RCI)
Erin Smith	775-301-4168	erin@rci-nv.com	Resource Concepts, Inc. (RCI)
Jill Sutherland	775-883-1600	jill@rci-nv.com	Resource Concepts, Inc. (RCI)

Purpose & Overview

The purpose of this meeting was to bring together the local planning team (Team) to discuss the draft Lower Virgin Valley Community Source Water Protection Plan (CSWP Plan). The updated draft CSWP Plan Goals and Action Plan were commented on and approved by the Team. A preliminary draft of the Education Plan to implement CSWP Plan goals and a preliminary schedule for completion of the plan were discussed and approved by the Team.

Discussion

Welcome and Introductions

The meeting began with a brief introduction of the CSWP Plan and accomplishments achieved to begin implementation.

CSWP Plan Implementation

The Team has begun CSWP Plan implementation, and RCI invited individual Team members to talk about their CSWP Plan implementation achievements.

Draft Source Water Protection Viewer

RCI invited the City of Mesquite (COM) to walk-through the draft Source Water Protection Viewer (Viewer). The COM reviewed the layers available on the Viewer, and the Team made comments, including:

- Data Layers: The Team agreed to keep all existing data layers in the Viewer, each layer having a different significance to the community.
    - "Mesquite City Limits", "VVWD Service Area", and "Lower Virgin Valley Planning Area" are relevant to the Clark County 208 Area-Wide Water Quality Management Plan.
    - "Local Tributaries/Washes" can be used for educational purposes.

  - Major Roads", "Parcels with Septic Systems", "Parcels with Private Wells", " and "VVWD Area Land Use" are anticipated to be used to inform future development within SWPAs.
  - "Local Watersheds" (HUC 12 hydrologic boundaries), "Virgin River Basin", and "NDWR Groundwater Basin" provide local and regional hydrologic information that can be used for educational purposes.
  - "VVWD Source Water Protection Areas (SWPA)", "Critical 10-Year SWPA", and "VVWD Critical Zones" have data in each layer that can be used to inform and educate the community about SWPAs in the simplest way. These layers may be reworded to match terms and language in the CSWP Plan.
- Address Search: The Team agreed to keep this feature with the following modifications:
  - Reset the default zoom so that developers and residents can see where they are in relation to a SWPA, and
  - Set up so that if a development is within a SWPA boundary, they can contact the VVWD or the COM and become educated about source water protection, and
  - Include additional base map options (e.g., satellite, hybrid).
- The Team agreed to add a splash screen upon entering the Viewer to provide a disclaimer giving an overview of the Integrated Source Water Protection Program (ISWPP), Viewer instructions, and affiliations.
- The Team suggested creating pop-up windows that have additional information or links to be more user-friendly and informational for the public.
- The Team agreed with keeping VVWD and COM website links, and is considering the addition of links to the following:
  - ISWPP Program Overview,
  - Lower Virgin Valley CSWP Plan (once finalized and adopted by Mesquite City Council, VVWD Board, and endorsed by NDEP), and
  - The VVWD 2022 Water Conservation Plan.
- The Team reviewed the default layers and agreed to include the following: "VVWD Source Water Protection Areas (SWPA)" (30-year SWPA, Zone 4), "Mesquite City Limits", "VVWD Service Area", "Local Tributaries/Washes", and "Nevada Counties".

On-going Education Implementation

RCI invited the VVWD and the NvRWA to review their Source Water Protection presentation to 5th Grade students on January 3rd, 2023. The VVWD and the NvRWA utilized a "Sand Box" groundwater model to introduce source water and source water protection to the students and teachers. During the 30-min. presentation students were engaged and asked excellent quests; teachers thanked the VVWD and were pleased with the material covered.

Source Water Protection and Water Conservation

RCI invited the COM to share their Source Water Protection and Water Conservation Action Items (see Attachment). In addition to the attachment, the COM offered information and ideas about:

- Amending COM development applications to encourage review of SWPAs and the CSWP Plan with the VVWD,
- Adding a Conservation Element to the City of Mesquite Master Plan that would perpetuate the source water and conservation messages developed in the CSWP Plan, and

- Implementing water conservation through COM Title 9 regulations.

Review of Draft Action Plan

RCI reviewed the draft Action Plan with the Team, who requested:

- Revising the *Estimated Implementation Year* on several action items from *2023*, to *2023 and Forward*, and to expand the timeline for various Public Education and Outreach and Planning Agency Coordination activities.
- Adding the Well Sustainability Study into action items that refer to the VVWD Water Master Plan (e.g., incorporating Source Water Protection Planning into updates).

The Team discussed and agreed with adding the following action items that include water conservation into the CSWP Plan:

- Broaden community public education and outreach by producing source water protection and conservation pamphlets and outreach materials in both English and Spanish.
- Reach out to community and non-profit organizations about what is being done to protect and conserve their source water. For example, the Rotary Club, Elks Club, and HOAs.
- Consider preparation of a Conservation Element for the City of Mesquite Master Plan that incorporates source water protection and water conservation goals and policies.
- Consider revising development code and standards to improve protection and conservation of source water, for example:
    - Low impact development (LID) standards,
    - Stormwater best management practices (BMPs),
    - Geotechnical study elements for source water protection areas,
    - Landscaping BMPs or standards.
- Continue to detail a crosswalk between the Potential Contaminant Sources (PCSs) identified in the ISWPP guidance and "Use Types" identified in local codes and ordinances.
- The City of Mesquite Fire Department discussed adding an action item to recognize businesses in the community participating in water conservation. This would be a program aimed at highlighting water conservation achievements and promoting positive reinforcement surrounding water conservation, which works to achieve CSWP Plan goals.

The draft Action Plan will be updated with comments from the meeting and posted for additional review and comment by the Team.

Draft Education Plan Highlights

RCI reviewed the outline of Appendix G of the CSWP Plan, the Education Plan. The Team supported education targeting the following community groups:

- Seniors 65+
- Students
- Homeowner's Associations (HOAs)
- General Population
    - City of Mesquite, and
    - Unincorporated Clark County

The Team was presented with the following Education Plan Purpose and Goals:

- Education Plan Purpose: *Educate the community about their drinking water sources and how they can protect and conserve them.*
- Goal 1: *Educate multiple facets of the community about source water.*
- Goal 2: *Participate in two community/school events per year.*
- Goal 3: *Continue to reach out and identify community partners.*
- Goal 4: *Utilize innovative technical resources to promote Source Water Protection and Conservation.*
- Goal 5: *Incorporate a Source Water Protection message into Conservation activities.*

The following Education Plan Source Water Protection messages were presented from the draft Education Plan:

- *Have you ever wondered where the water in your tap comes from?*
- *Why is it important to protect drinking water at the source?*
- *What is your public water system doing to provide clean drinking water?*
- *What can you do to protect your drinking water?*
- *How does water conservation support source water protection?*

The draft Education Plan will be updated with comments from the meeting and posted for additional review and comment by the Team.

CSWP Plan Outline

RCI presented the CSWP Plan outline, informed the Team about Draft Appendices ready for Team review and comment, and discussed the CSWP Plan completion and presentation schedule, as follows:

- Documents Ready for Team Review and Comment (electronically on OneDrive)
    - DRAFT Appendices Uploaded:
        - Appendix A – Draft SWPA Maps,
        - Appendix C – Draft Buffer Zone Calculation Summary,
        - Appendix D – Draft Potential Contaminant Source Inventory, and
        - Appendix F – Draft Action Plan,
    - DRAFT Appendices Uploaded by week of January 9, 2023
        - Appendix E – Draft SWPA Delineations
        - Appendix G – Draft Education Plan
    - DRAFT CSWP Plan main body by end of January 2023
- Schedule for Team Review and Comment
    - Review DRAFT Appendices A, C, D, E, and G by end of January 2023
    - Review DRAFT CSWP Plan main body by end of February 2023
- Board Presentations April, May, or June
    - Presentation to the VVWD board for CSWP Plan adoption
    - Presentation to the Mesquite City Council for CSWP Plan adoption

Next Steps

Next meeting scheduled for: Tuesday, February 7, 2023, 8:30 – 10:30am (PST)

Future meetings scheduled for: Tuesday, March 7, 2023, 8:30 – 10:30am (PST)

Follow-up Items:

All Team Members –

- Review and comment on the DRAFT CSWP Plan Appendices, target date January 31, so results can be compiled for the February meeting.
- Review the Source Water Protection Viewer.

RCI -

- Send Education Plan to Natalie for edits, then the rest of Team
- Add action item to Action Plan to include City of Mesquite Fire Department's suggestion.
- Provide Draft Appendices E and G for Team review.
- Prepare a Draft CSWP Plan Main Body.
- Follow up with the City of Mesquite and VVWD to discuss the Source Water Protection Viewer.

Source Water Protection / Conservation Action Items

Water Protection

1. Share overview of program w/ developers

2. Share Source Water Protection Viewer w/developers

3. Modify Development Applications to request source water info

4. Modify Standard Conditions to require developers to contact VVW for guidance

5. Prepare education materials for developers on how to minimize contaminants

Water Conservation

1. Put water conservation goals and policies in Source Water Plan

2. Adopt Source Water Plan by reference in Public Services & Facilities Element of the Master Plan

3. Amend Title 9 Unified Development Ordinance to add regulations for source water protection & conservation.

4. Develop enforcement procedures to prohibit water waste.

Community Goals for Source Water Protection	
Goal 1: *Identify the sources of and potential risks to drinking water and consider them in the local planning framework.*	***Goal 2:*** *Ensure that clean and safe drinking water is available for future generations.*
Goal 3: *Integrate source water protection into local planning and zoning documents to ensure that quality of drinking water matches the goals of the community.*	***Goal 4:*** *Educate the community about what is being accomplished to achieve source water protection.*

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Community Goals for Source Water Protection	
Goal 1: *Identify the sources of and potential risks to drinking water and consider them in the local planning framework.*	***Goal 2:*** *Ensure that clean and safe drinking water is available for future generations.*
Goal 3: *Integrate source water protection into local planning and zoning documents to ensure that quality of drinking water matches the goals of the community.*	***Goal 4:*** *Educate the community about what is being accomplished to achieve source water protection.*

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Goal 3:
Integrate source water protection into local planning and zoning documents to ensure that the quality of drinking water matches the goals of the community.

3

Goal 3:
Integrate source water protection into local planning and zoning documents to ensure that the quality of drinking water matches the goals of the community.

Goal 3:
Integrate source water protection *and conservation* into local planning and zoning documents to ensure that the quality of drinking water matches the goals of the community.

4

Goal 4:
Educate the community about what is being accomplished to achieve source water protection.

5

Goal 4:
Educate the community about what is being accomplished to achieve source water protection.

Goal 3:
Educate the community about what is being accomplished to achieve source water protection *and conservation*.

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Action Plan Review

Link

7

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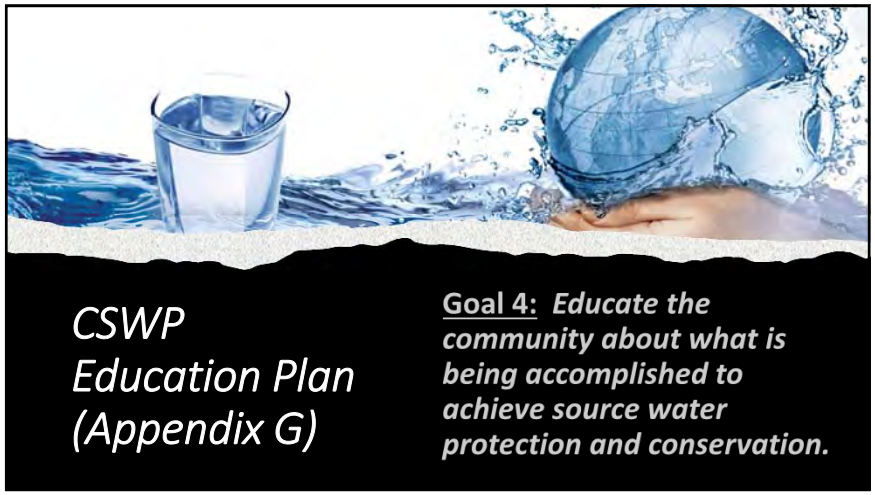

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Public Education
Minimum Requirements for NDEP Endorsement

The Plan identifies all source water protection public education activities (presentations, handouts, flyers, workshops, events, etc.) which the community has or plans to coordinate during program development and implementation planning phases.

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Target Audiences

- Seniors 65+
- Students
- HOAs
- General Population
  - City of Mesquite
  - Unincorporated Clark County

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Education Plan Purpose:
Educate the community about their drinking water sources and how they can protect and conserve them.

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Education Plan Purpose:
Educate the community about their drinking water sources and how they can protect and conserve them.

Goal 1:	Goal 2:
Educate multiple facets of the community about source water.	*Participate in two community/school events per year.*

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Education Plan Purpose: **Educate the community about their drinking water sources and how they can protect and conserve them.**	
Goal 1: *Educate multiple facets of the community about source water.*	Goal 2: *Participate in two community/school events per year.*
Goal 3: *Continue to reach out and identify community partners.*	Goal 4: *Utilize innovative technical resources to promote source water protection and conservation.*

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Education Plan Purpose: **Educate the community about their drinking water sources and how they can protect and conserve them.**	
Goal 1: *Educate multiple facets of the community about source water.*	Goal 2: *Participate in two community/school events per year.*
Goal 3: *Continue to reach out and identify community partners.*	Goal 4: *Utilize innovative technical resources to promote source water protection and conservation.*
Goal 5: *Incorporate a source water protection message into conservation activities.*	

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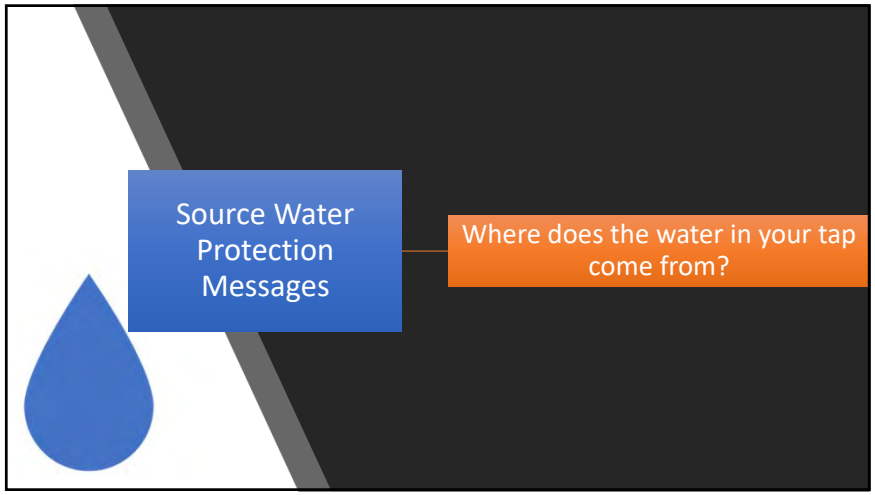

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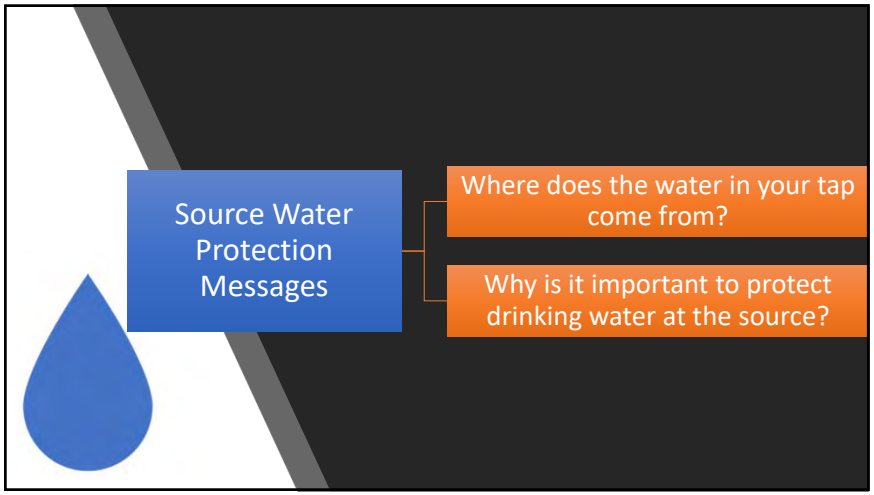

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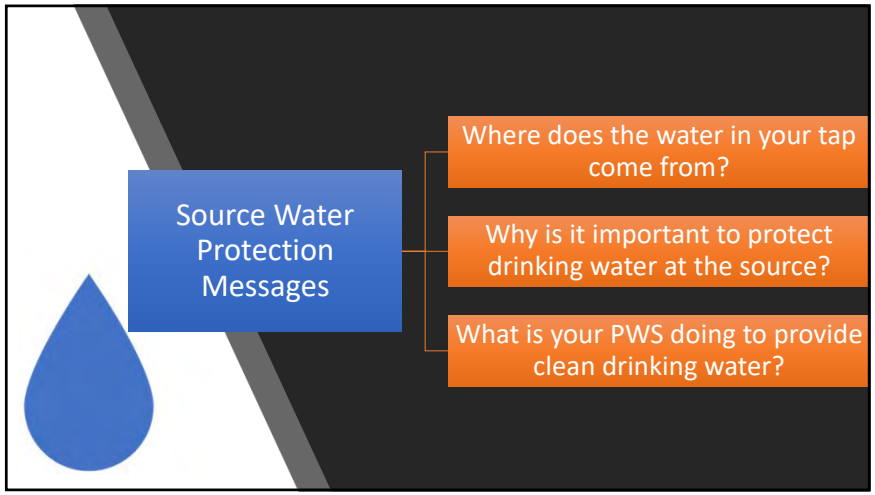

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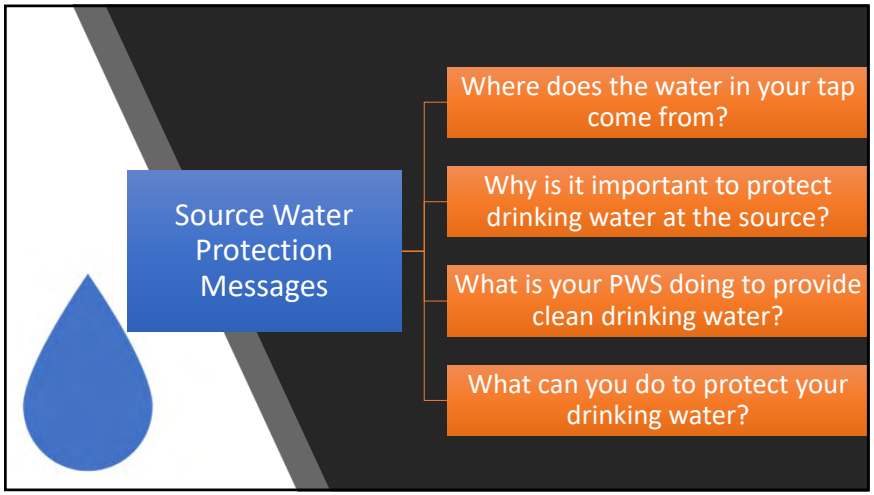

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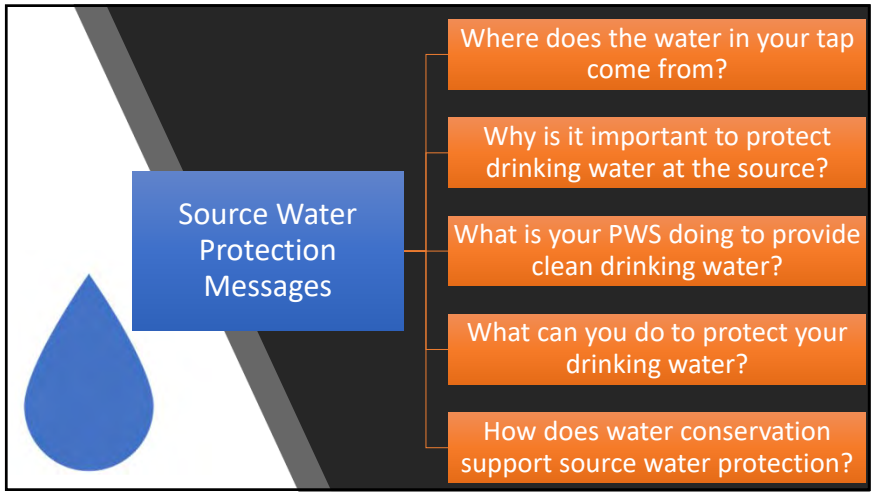

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NEXT STEPS…

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Appendices

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NEXT STEPS… Appendices

Appendix A	Source Water Protection Area Maps
Appendix B	Meeting Notes
Appendix C	Buffer Zone Calculation Summary Report
Appendix D	Potential Contaminant Source Inventory
Appendix E	Source Water Protection Area Delineations
Appendix F	Action Plan
Appendix G	Education Plan

Final edits will be uploaded THIS WEEK! GREAT JOB!!!

USE YOUR ONEDRIVE

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NEXT STEPS… Appendices

Appendix A	Source Wat
Appendix B	Meeting No
Appendix C	Buffer Zone
Appendix D	Potential Co
Appendix E	Source Wat
Appendix F	Action Plan
Appendix G	Education P

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NEXT STEPS… Appendices

Appendix A	Source Water Protection Area Maps
Appendix B	Meeting Notes
Appendix C	Buffer Zone Calculation Summary Report
Appendix D	Potential Contaminant Source Inventory
Appendix E	Source Water Protection Area Delineations
Appendix F	Action Plan
Appendix G	Education Plan

RCI Has Posted these on ONEDRIVE for your REVIEW.

COMMENTS Prior to Meeting on February 7, 2023.

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NEXT STEPS… Appendices

Appendix A	Source Water Protection Area Maps
Appendix B	Meeting Notes
Appendix C	Buffer Zone Calculation Summary Report
Appendix D	Potential Contaminant Source Inventory
Appendix E	Source Water Protection Area Delineations
Appendix F	Action Plan
Appendix G	Education Plan

RCI will Post these on ONEDRIVE for your REVIEW.

COMMENTS Prior to Meeting on February 7, 2023.

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NEXT STEPS…..

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RCI Will Post on ONEDRIVE end of January.

COMMENTS By Meeting on March 7, 2023.

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NEXT STEPS….. April, May, or June

- Presentation to VVWD Board for approval
- Presentation to the Mesquite City Council for adoption

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Agenda

Source Water Protection Program

Virgin Valley Source Water Protection Planning Team Meeting 6

Date: February 7, 2023
Time: 8:30 – 10:30 am
Where: VVWD Board Room: 500 Riverside Road, Mesquite Nevada

1. **Welcome & Introductions**
2. **Review Updated Source Water Protection Viewer**
   Review and discuss updates to the Source Water Protection Viewer.
3. **Review Comments from the Draft CSWP Plan Appendices**
   We will review Team updates and comments to the Draft CSWP Plan Appendices.
4. **Introduce the Main Body of the CSWP Plan**
   Review and discuss ideas on how to develop the Main Body of the CSWP Plan to captivate and engage the community.
5. **CSWP Plan Outline and Schedule**
   Review the CSWP Plan Outline and walk-through available documents and maps ready for Team review on OneDrive (linked below).
6. **Next Steps**
7. **Team Picture for the CSWP Plan Main Body**

Link to OneDrive: Lower Virgin Valley CSWP Plan OneDrive

Meeting Notes

Virgin Valley Source Water Protection Planning – Team Meeting 6

Tuesday, February 7, 2023
8:30am-10:30am (Pacific)
In-Person Meeting Virgin Valley Water District

Attending

NAME	*CONTACT INFORMATION*		*AFFILIATION*
Aaron Bunker	702-346-5731	abunker@vvh2o.com	Virgin Valley Water District (VVWD)
Steve Hall	702-346-5731	shall@vvh2o.com	Virgin Valley Water District (VVWD)
Natalie Anderson	702-346-5731	nanderson@vvh20.com	Virgin Valley Water District (VVWD)
Kevin Brown	702-533-1892	kbrown@vvh2o.com	Virgin Valley Water District (VVWD)
Richard Secrist	702-346-2835	rsecrist@mesquitenv.gov	City of Mesquite – Develop. Services
Dan Catron	702-345-7945	dcatron@mesquitenv.gov	City of Mesquite – Senior Planner
Ryan Kammerer	702-345-8080	rkammerer@mesquitenv.gov	City of Mesquite – GIS Specialist
Christopher Berkey	702-540-6107	christopherb@nvrwa.org	Nevada Rural Water Assoc. (NvRWA)
Jayson Andrus	702-346-2690	jandrus@mesquitenv.gov	City of Mesquite – Fire Department
Ethan Mason	775-687-9311	e.mason@ndep.nv.gov	NDEP Integrated Source Water Protection Program (NDEP ISWPP)
Brendon Grant	775-687-9524	bgrant@ndep.nv.gov	NDEP Bureau of Safe Drinking Water, Engineering Branch Supervisor
Alison Cramer	775-883-1600	alison@rci-nv.com	Resource Concepts, Inc. (RCI)
Erin Smith	775-883-1600	erin@rci-nv.com	Resource Concepts, Inc. (RCI)
Jill Sutherland	775-883-1600	jill@rci-nv.com	Resource Concepts, Inc. (RCI)

Purpose & Overview

The purpose of this meeting was to bring together the local planning team (Team) to discuss the draft Lower Virgin Valley Community Source Water Protection Plan (CSWP Plan). The Team provided comments on the draft CSWP Action Plan (Appendix F of the CSWP Plan) during Team Meeting 5. Team Meeting 6 is being held to discuss the Team's review and comment on the remaining Technical Appendices, as well as introduce the draft CSWP Plan Main Body, and review the schedule for approval of the draft CSWP Plan.

Discussion

Welcome and Introductions

The meeting began with a brief introduction of the CSWP Plan and accomplishments achieved thus far that implement action items addressed in Appendix F of the CSWP Plan.

Review Updated Source Water Protection Viewer

Local team members have already begun CSWP Plan implementation. RCI invited the City of Mesquite (COM) to talk about their education and outreach achievements in further detail . The COM went through the revisions made to the draft Source Water Protection Viewer (Viewer) following comments from Team Meeting 5 and meetings with the COM, RCI, and the Virgin Valley Water District (VVWD). The COM reviewed the updated layers available on the Viewer and the Team made comments, including:

- Address Search – The Team reviewed and approved updates to this feature, as follows:
    - Default zoom set in such a way that developers and residents can see where they are in relation to a SWPA,
    - Updating the Source Water Protection Point of Contact to be the VVWD, and

  - Additional base map options (e.g., satellite, hybrid).

- The Team liked the draft "splash screen" which appears upon entering the Viewer and provides a disclaimer and overview of the Integrated Source Water Protection Program (ISWPP), Viewer instructions, and affiliations. The COM will update the RCI logo with a white background and NDEP follow up regarding including the NDEP or ISWPP logo.
- The Team agreed to keep VVWD, COM, ISWPPP, and VVWD Water Conservation website links, in addition to:
  - Link to the VVWD calendar of events.
  - Change the names of some of the tabs in the "header" of the Viewer to be more descriptive/eye-catching (TBD).
  - Consider adding to the Action Plan: creation of a link in the VVWD Consumer Confidence Report (CCR) to the Viewer and from the Viewer to the CCR.
- The COM presented the draft Source Water Protection Story Map created by the VVWD and COM. The Team liked the Story Map and discussed the following:
  - Add the CSWP Plan to the Story Map as a link,
  - Include a local Source Water Protection Case Study, and
  - Add/update some of the pictures. Each Team member to send COM and VVWD three local pictures of Source Water Protection taking place within the community.

Review Comments from the Draft CSWP Plan Appendices

RCI reviewed the draft SWPA Maps (Appendix A) with the Team:

- Add Numbers of the wells to the SWPAs on the Maps and Viewer for reference.
- With regard to water system security, the Team is comfortable with the 100-foot radius as shown on the maps.

RCI reviewed the CSWP Plan Appendices, which were made available on OneDrive for the Team to review, as follows:

- Appendix A – Draft SWPA Maps
- Appendix C – Draft Buffer Zone Calculation Summary
- Appendix D – Draft Potential Contaminant Source Inventory
- Appendix E – Draft SWPA Delineations
- Appendix F – Draft Action Plan
- Appendix G – Draft Education Plan

The Team agreed to review and comment on all the documents by the end of February 2023.

Introduce the Main Body of the CSWP Plan

RCI presented the draft CSWP Plan Main Body, and the Team agreed to review the language of the document to ensure that it meets the goals and needs of their community. The Team agreed to send additional pictures to the VVWD who will organize/reorganize current and new photos in the document if necessary. The VVWD will host the final CSWP Plan on their Website under "Our Water," and the COM is eager to include a link to the CSWP Plan on their website as well. Comments from the Team to RCI will be provided before the last week in February.

CSWP Plan Outline and Schedule

The Team discussed the process for future CSWP Plan updates, future community presentations, and a CSWP Plan Local Planning Team meeting.

- The schedule for updates to various other community plans could coincide with updates to the CSWP Plan, including:
    - VVWD Water Master Plan update 2023, with an update every 3 years,
    - COM Hazard Mitigation Plan update Fall 2023,
    - VVWD Well Sustainability Study update 2024, and
    - COM Master Plan update 2023 to 2024, with an update every five years.
- The Team agreed upon an Annual CSWP Plan Local Planning Team Meeting in late January to discuss updates, achievements, and yearly implementation plans. This will coincide with the fiscal year and budget requests for the local partners involved in this planning effort.
- The Team discussed adding links to local events on the VVWD calendar website that promote education and outreach activities related to Source Water Protection.
- COM suggested making a Source Water Protection presentation to the Virgin River Coalition (VRC) at the annual meeting in Fall 2023, following CSWP Plan adoption.

The Team discussed and agreed on a preliminary timeline for presentations to the VVWD Board and the Mesquite City Council for CSWP Plan adoption. This is subject to change as needed.

- Presentation to the VVWD Board April 4th, and all final materials would need to be submitted one week in advance - **March 28th**.
- Presentation to the Mesquite City Council, following VVWD Board adoption, the at the April 28th meeting, and all final materials would need to be submitted two weeks in advance - **April 12th** .

The VVWD Board will not adopt by formal resolution. The Team will pursue the CSWP Plan adoption by resolution from the Mesquite City Council. All entities are comfortable with a copy of the CSWP Plan in pdf format.

Next Steps / To Do List

Next meeting scheduled for: Tuesday, **March 7th, 2023**, 8:30 – 10:30am (PST)

All Team Members –

- Review and comment on the DRAFT CSWP Plan Appendices, target date **February 24th** so that a final draft can be compiled before the March 7th meeting.
- Send three photographs of Source Water Protection in the Community to the VVWD and/or RCI.
- Review the Source Water Protection Viewer and provide comments to COM.

RCI/NDEP -

- Coordinate with COM about authorizing NDEP and/or ISWPP logo on the Viewer splash page.
- Add an annual Source Water Protection Team meeting in late January to the Action Plan.
- Add creating links between the VVWD CCR and the Viewer and into the Action Plan.
- Send a copy of the CSWP Plan Main Body to VVWD for photograph edits, and
- Follow up with the COM and VVWD to discuss the Source Water Protection Viewer and comments on the technical appendices as needed.

VVWD –

- Coordinate with front desk staff to know correct contact information if they receive calls related to Source Water Protection, and
- Send the most up to date water system infrastructure map to RCI.

Community Source Water Protection Plan

Lower Virgin Valley Team Meeting, Feb. 7th, 2023, 8:30 a.m.-10:30 a.m.
VVWD Board Room, Mesquite, NV

Sign In Sheet

NAME	PHONE	EMAIL	AREA OF EXPERTISE/INTEREST
Christopher Berkey	702-540-6107	christopher BC NVRWA.org	Source Water / Geologist
Erin Smith	916-847-1044	erin@rci-nv.com	RCI
Brendon Grant	775 687-9524	bgrant@ndep.nv.gov	NDEP
Ryan Kammerer	(435) 705-9617	rKammerer@mesquitenv.gov	GIS
Dan Catron	702 345-7945	dcatron@mesquitenv.gov	Mesquite
Richard Secrist	702-994-7498	rsecrist@mesquitenv.gov	Land Use / Zoning
JAYSON ANDERSON	702 378-1024	JANDERSON@MESQUITENV.GOV	FIRE
Ethan Mason	775 376-2436	e.mason@ndep.nv.gov	NDEP
Jill Sutherland	775 883-1600	jill@rci-nv.com	RCI
Natalie Anderson	702-241-8195	nanderson@vvh2o.com	VVWD
Kevin Brown	702-346-5731	kbrown@vvh2o.com	VVWD
Aaron Bunker	702-346-5731	abunker@vvh2o.com	VVWD

Agenda

Source Water Protection Program

Lower Virgin River Valley Source Water Protection Planning
Team Meeting 7

Date: March 8, 2023
Time: 8:30 – 10:30 am
Where: Virtual Meeting on Teams

1. **Welcome & Introductions**
2. **Review Comments from the Draft CSWP Plan Appendices**
   We will review Team updates and comments to the Draft CSWP Plan Appendices.
3. **Review Comments from the Draft Main Body of the CSWP Plan**
   We will review Team updates and comments to the Draft CSWP Plan Main Body.
4. **Next Steps**

Link to OneDrive: Lower Virgin River Valley CSWP Plan OneDrive

Meeting Notes

Virgin Valley Source Water Protection Planning – Team Meeting 7

Wednesday, March 8, 2023
10:30am-11:45 am (Pacific)
Virtual Meeting on Teams

Attending

NAME	*CONTACT INFORMATION*		*AFFILIATION*
Aaron Bunker	702-346-5731	abunker@vvh2o.com	Virgin Valley Water District (VVWD)
Steve Hall	702-346-5731	shall@vvh2o.com	Virgin Valley Water District (VVWD)
Natalie Anderson	702-346-5731	nanderson@vvh20.com	Virgin Valley Water District (VVWD)
Kevin Brown	702-533-1892	kbrown@vvh2o.com	Virgin Valley Water District (VVWD)
Travis Anderson	702 346-5237	tanderson@mesquitenv.gov	City of Mesquite – Public Works
Richard Secrist	702-346-2835	rsecrist@mesquitenv.gov	City of Mesquite – Develop. Services
Dan Catron	702-345-7945	dcatron@mesquitenv.gov	City of Mesquite – Develop. Services
Ryan Kammerer	702-345-8080	rkammerer@mesquitenv.gov	City of Mesquite – GIS Specialist
Christopher Berkey	702-540-6107	christopherb@nvrwa.org	Nevada Rural Water Assoc. (NvRWA)
Ethan Mason	775-687-9311	e.mason@ndep.nv.gov	NDEP Integrated Source Water Protection Program (NDEP ISWPP)
Alison Cramer	775-883-1600	alison@rci-nv.com	Resource Concepts, Inc. (RCI)
Erin Smith	775-883-1600	erin@rci-nv.com	Resource Concepts, Inc. (RCI)
Jill Sutherland	775-883-1600	jill@rci-nv.com	Resource Concepts, Inc. (RCI)

Purpose & Overview

The purpose of this meeting was to bring together the local planning team (Team) to discuss the draft Lower Virgin Valley Community Source Water Protection Plan (CSWP Plan). Team Meeting 7 is being held to discuss final review and comments on the CSWP Plan and to review the schedule for presentation to the Virgin Valley Water District (VVWD) Board and Mesquite City Council.

Discussion

Welcome & Introductions

The meeting began with a brief introduction of the CSWP Plan and accomplishments to date.

Review Comments from the Draft Main Body of the CSWP Plan

The Team reviewed the draft CSWP Plan Main Body cover and agreed to change the CSWP Plan name to, *Community Source Water Protection Plan for the Lower Virgin River Valley Clark County, Nevada*, and keep the current cover photo. Additional Team comments included:

- Change one City of Mesquite organization to, City of Mesquite Development Services Department, and
- Add one City of Mesquite organization: City of Mesquite Geographic Information System Services.

The Team would like to have the *Acronyms* section on a separate, stand-alone page after the Table of Contents to match the style of the Technical Appendices.

The VVWD noted that they would like the zeros to be removed from Well 1A and Well 2 throughout the final document.

The draft Executive Summary was provided for review and comment and the Team agreed to have all comments back by March 15, 2023.

The City of Mesquite reviewed a sentence which was confusing in Section 1.5.1. The VVWD agreed to review the sentence and send edited text to RCI by March 15, 2023.

Review Comments from the Draft CSWP Plan Appendices

The Technical Appendices were generally discussed by the Team. Changes requested to the draft appendices presented in Meeting 6 had been made. Removing draft from Appendix B was agreed to by the Team. Draft will remain on the Main Body until approvals from the VVWD Board, Mesquite City Council, and Nevada NDEP are received. The Team concurred the March 15 timeframe for any final comments on the Technical Appendices and Appendix B.

CSWP Plan Presentation Schedules

The Team discussed the submittal processes for CSWP Plan VVWD Board approval and Mesquite City Council adoption. The Team agreed on the following schedule:

- VVWD Board Presentation on April 4, 2023.
  - Final Team comments to RCI by March 15, 2023,
  - Final Draft ready for Board presentation to VVWD by March 23, 2023,
  - VVWD staff will lead presentation and RCI will attend to assist as needed, and
  - Set up a meeting to work on the VVWD Board presentation format and PowerPoint the week of March 13, 2023.

- City of Mesquite, City Council Presentation on April 25, 2023.
  - Final VVWD Board comments to be sent to RCI by April 5, 2023,
  - Team Meeting to discuss any comments from the VVWD Board on April 6, 2023,
  - If needed, revise Draft with VVWD Board comments and submit to City of Mesquite by April 10, 2023, (deadline for agenda materials is April 11), and
  - RCI can provide examples of past Resolutions from other parts of the State for the City staff to consider.

The City of Mesquite reviewed weblink updates to the Source Water Protection Viewer. The Team agreed to make the link short and easy to remember. The Team agreed to change the link to www.cswpp.mesquitenv.gov. The VVWD will add more photos to the Team OneDrive for the Source Water Protection Story Map and possible additions to the CSWP Plan main Body.

Next Steps / To Do List

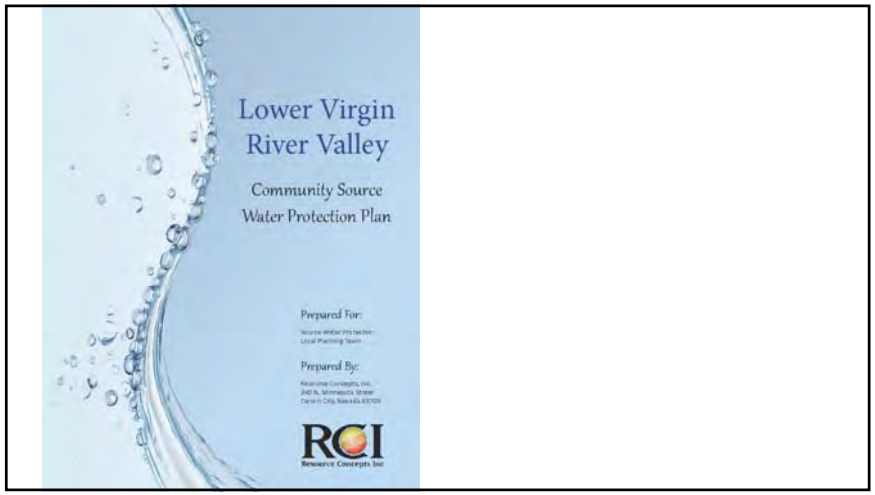
Next meeting scheduled for: Thursday, **April 6th, 2023**, 8:30 – 9:00am (PST)

All Team Members –

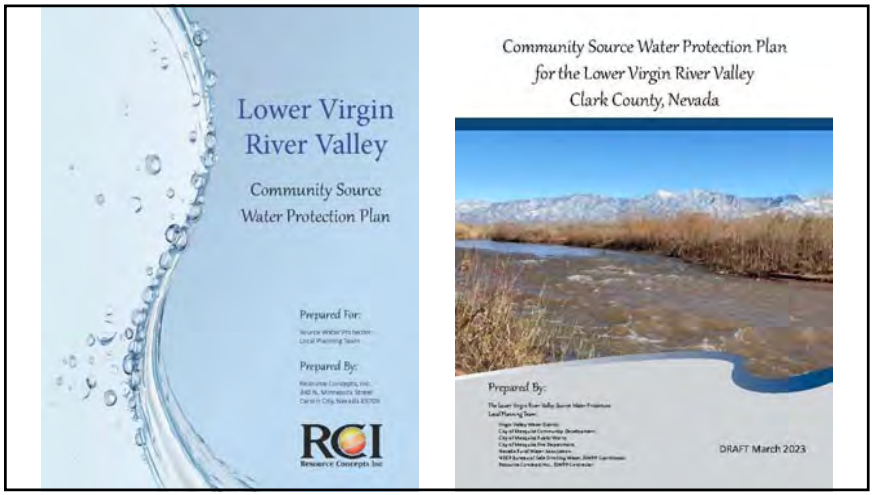
- Review and comment on the DRAFT CSWP Plan main Body and Executive Summary, target date **March 15th** so that a final draft can be compiled for the April 4, 2023, VVWD Board meeting.

RCI/NDEP -

- Coordinate with COM about authorizing NDEP and/or ISWPP logo on the Viewer splash page,
- Follow up with VVWD to discuss the VVWD Board meeting CSWP Plan presentation,
- Remove the zeros from names Well 01A and Well 02 throughout the text, tables and maps,
- Remove the DRAFT from the Team meeting notes and agendas for Appendix B,
- Return final draft of CSWP Plan Main Body and Appendices to the VVWD by March 23, 2023, and
- Share example resolution language for with City of Mesquite.


Lower Virgin
River Valley
Community Source
Water Protection Plan
Prepared For:
Prepared By:
RCI
Resource Concepts Inc

1


Lower Virgin
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Community Source Water Protection Plan
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Clark County, Nevada
Prepared By:
DRAFT March 2023

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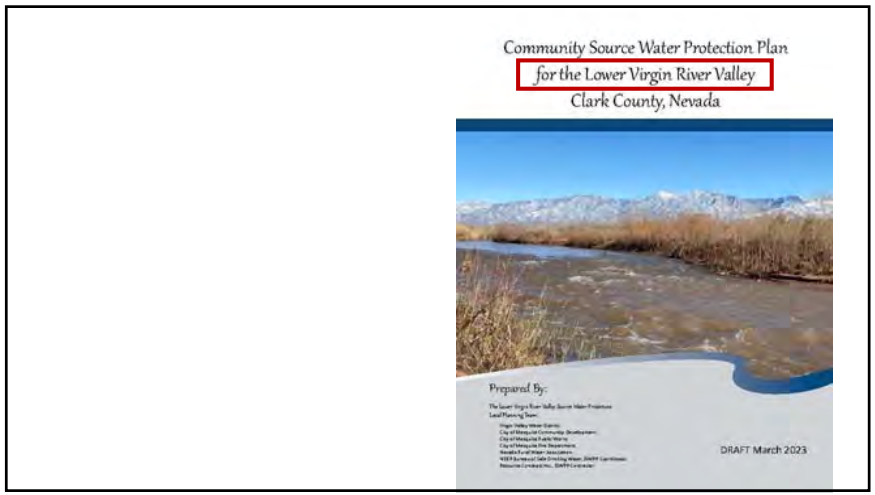
Community Source Water Protection Plan
for the Lower Virgin River Valley
Clark County, Nevada
Prepared By:
DRAFT March 2023

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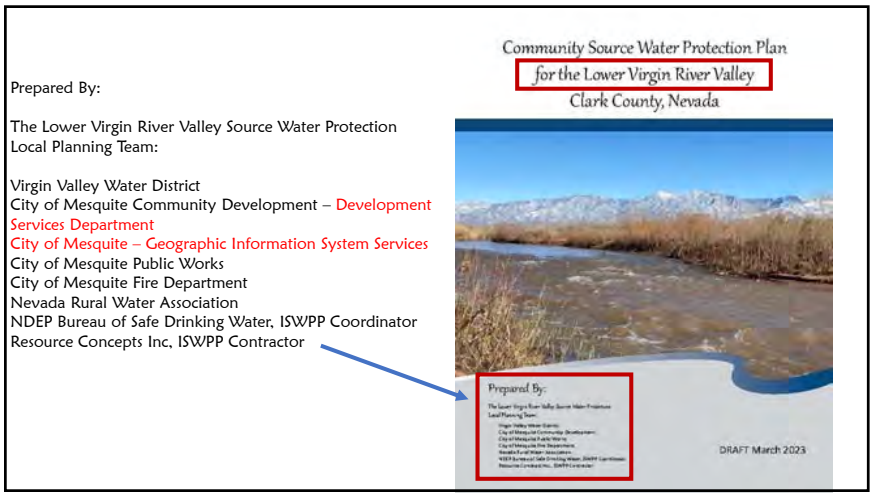
Prepared By:
The Lower Virgin River Valley Source Water Protection
Local Planning Team:
Virgin Valley Water District
City of Mesquite Community Development – Development
Services Department
City of Mesquite – Geographic Information System Services
City of Mesquite Public Works
City of Mesquite Fire Department
Nevada Rural Water Association
NDEP Bureau of Safe Drinking Water, ISWPP Coordinator
Resource Concepts Inc, ISWPP Contractor
Community Source Water Protection Plan
for the Lower Virgin River Valley
Clark County, Nevada
Prepared By:
DRAFT March 2023

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CSWP Plan

Table of Contents

Acronyms

AWWA	American Water Works Association
CSWP Plan	Community Source Water Protection Plan
ISWPP	Integrated Source Water Protection Program
NDEP	Nevada Division Environmental Protection
NDWR	Nevada Division of Water Resources
NvRWA	Nevada Rural Water Association
NvWARN	Nevada Water/Wastewater Agency Response Network
RCI	Resource Concepts, Inc.
SNWA	Southern Nevada Water Authority
SWPA	Source water protection area
VVWD	Virgin Valley Water District
WQMP	Water Quality Management Plan

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CSWP Plan

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Executive Summary
1.0: Introduction
2.0: Existing Plans and Studies
3.0: Plan Development
4.0: Plan Implementation
5.0: Public Participation
6.0: References

Appendices

Appendix A: Source Water Protection Area Maps
Appendix B: Meeting Notes
Appendix C: Buffer Zone Calculation Summary Report
Appendix D: Potential Contaminant Source Inventory
Appendix E: Source Water Protection Area Delineations
Appendix F: Action Plan
Appendix G: Education Plan

Tables

Table 1: Lower Virgin River Valley Local Planning Team
Table 2: Virgin Valley Water District Well Network
Table 3: Regional Plan Goals and Lower Virgin River Valley CSWP Plan Goals
Table 4: County, City-Wide, and Lower Virgin River Valley CSWP Plan Goals and Policies
Table 5: Current Measures to Protect and Conserve Source Water
Table 6: Source Water Protection Area (SWPA) Descriptions
Table 7: Local and Regional Contingency Plans

Figures

Figure 1: Virgin Valley Water District Service Area
Figure 2: Hydrographic Area 222
Figure 3: VVWD System Overview
Figure 4: Arbitrary Fixed Radius
Figure 5: Calculated Fixed Radius
Figure 6: Potential Contaminant Source Activities
Figure 7: Source Water Protection Area Map Overview

Acronyms

AWWA	American Water Works Association
CSWP Plan	Community Source Water Protection Plan
ISWPP	Integrated Source Water Protection Program
NDEP	Nevada Division Environmental Protection
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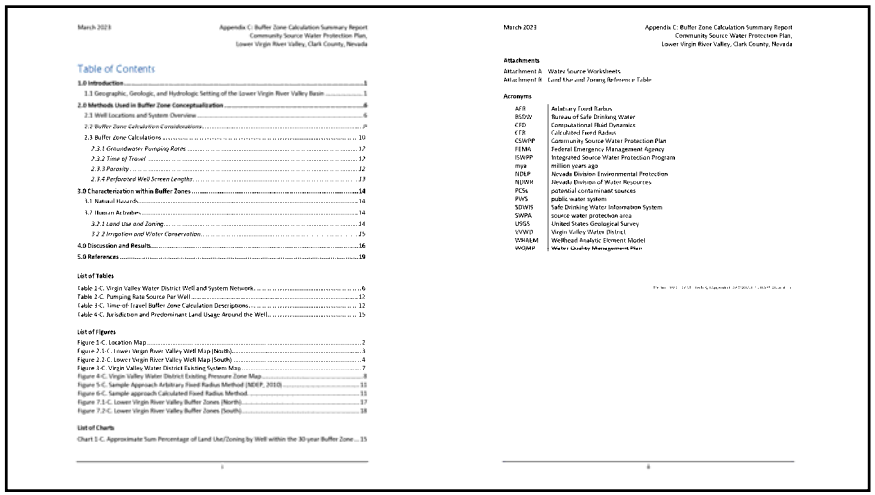

March 2023 — Appendix C: Buffer Zone Calculation Summary Report
Community Source Water Protection Plan,
Lower Virgin River Valley, Clark County, Nevada

Table of Contents

March 2023 — Appendix C: Buffer Zone Calculation Summary Report
Community Source Water Protection Plan,
Lower Virgin River Valley, Clark County, Nevada

Attachments

Attachment A: Water Source Worksheets
Attachment B: Land Use and Zoning Reference Table

Acronyms

AFR	Arbitrary Fixed Radius
BGDV	Bureau of Safe Drinking Water
CFD	Computational Fluid Dynamics
CFR	Calculated Fixed Radius
CSWPP	Community Source Water Protection Plan
FEMA	Federal Emergency Management Agency
ISWPP	Integrated Source Water Protection Program
mya	million years ago
NDEP	Nevada Division Environmental Protection
NDWR	Nevada Division of Water Resources
PCSs	potential contaminant sources
PWS	public water system
SDWIS	Safe Drinking Water Information System
SWPA	source water protection area
USGS	United States Geological Survey
VVWD	Virgin Valley Water District
WHAEM	Wellhead Analytic Element Model
WQMP	Water Quality Management Plan

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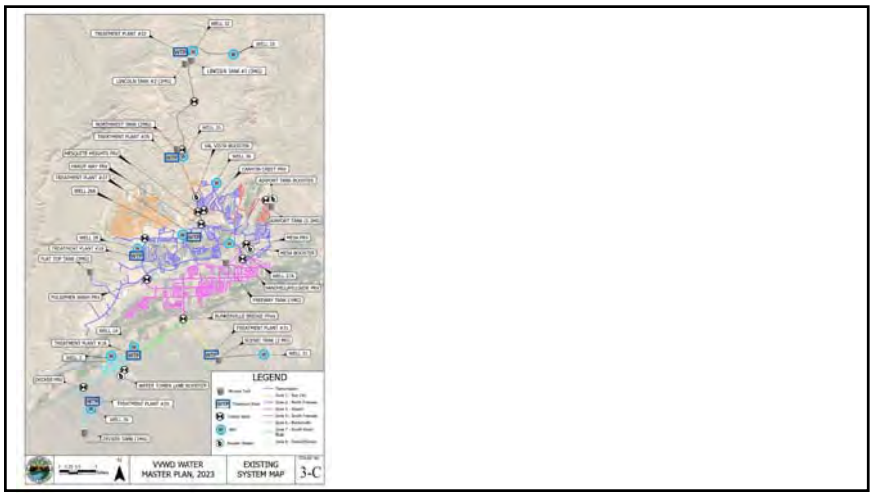

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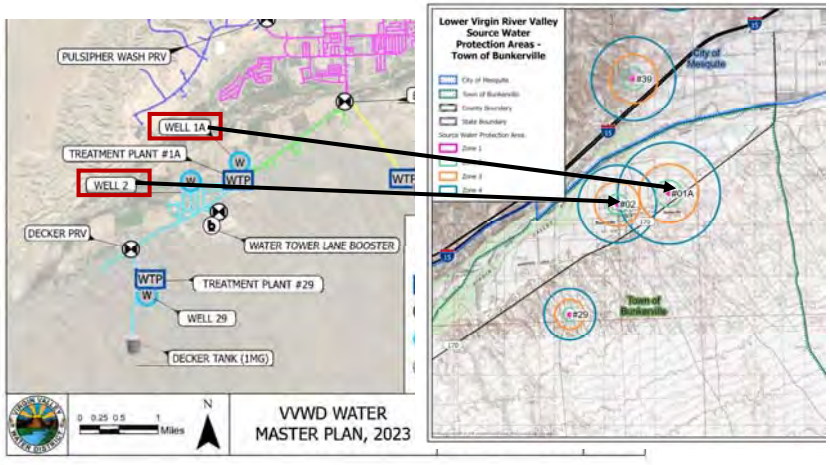

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Executive Summary……

Posted on OneDrive for your Review☺

FINAL TEAM COMMENTS By **March 15, 2023**…?

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Appendices

Appendix A	Source Water Protection Area Maps
Appendix B	Meeting Notes
Appendix C	Buffer Zone Calculation Summary Report
Appendix D	Potential Contaminant Source Inventory
Appendix E	Source Water Protection Area Delineations
Appendix F	Action Plan
Appendix G	Education Plan

RCI Has Posted the Final Drafts on ONEDRIVE for your REVIEW.

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Appendices

Appendix A	Source Water Protection Area Maps
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Appendix B Meeting Notes

WHO REVIEWS THESE NOTES?

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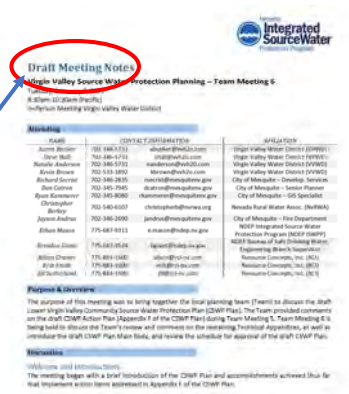
Appendix B Meeting Notes

WHO REVIEWS THESE NOTES?

REMOVE THE DRAFT FROM ALL THE MEETING NOTES?



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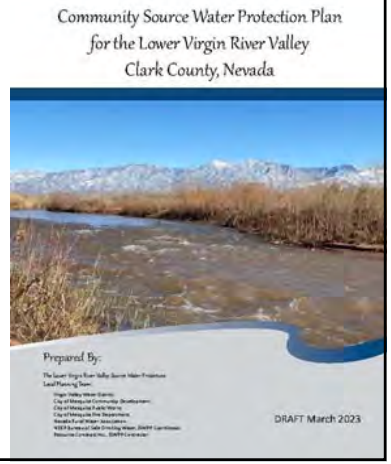
NEXT STEPS…..

- Presentation to VVWD Board for approval on APRIL 4, 2023

DRAFT must be submitted to VVWD Board on **March 28, 2023**

FINAL TEAM COMMENTS By **March 15, 2023**…? – To VVWD (Kevin) on March 23



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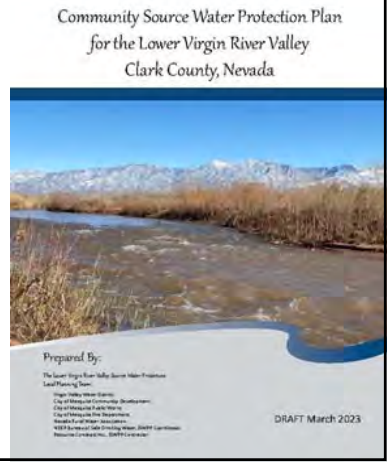
NEXT STEPS…..

- Presentation to Mesquite City Council for adoption on April 25, 2023

DRAFT must be submitted to Mesquite City Council on **April 10, 2023**

FINAL TEAM and VVWD BOARD COMMENTS By **April 5-6, 2023**…?



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VVWD Board Approval

VIRGIN VALLEY WATER DISTRICT
REGULAR BOARD OF DIRECTORS' MEETING
5:00 P.M. on TUESDAY, APRIL 4, 2023

VIRGIN VALLEY WATER DISTRICT OFFICE
500 RIVERSIDE ROAD
MESQUITE, NEVADA 89027

AGENDA

- Call to Order
- Prayer & Pledge
- Public Comment: Public participation (no action will be taken on any item until it is properly agendized). Citizens wishing to speak during public participation are asked to go to the podium, state their name for the record and limit comments to a minimal duration and/or no longer than three (3) minutes.
- Board Comments
- President of Board Comments

Items on the agenda may be taken out of order. A member of the Board may request the combination of two or more agenda items for consideration. A Board member may also request removal of an item from the agenda or delay discussion at any time. The Board may take brief public comments on agenda items as each item is opened for discussion.

CONSENT AGENDA

All items listed under the consent agenda are considered routine and may be acted upon by the Board of Directors with one action and without general discussion or a hearing. Any member of the Board or any citizen may request that an item be taken from the consent agenda, discussed and acted upon separately during this meeting.

1. For Possible Action – Approve Agenda

2. For Possible Action – Approve Minutes from 3/21/2023 Regular Meeting

3. For Possible Action – Approve Bills Paid since last public meeting

**** END OF CONSENT AGENDA ****

4. For Discussion & for Possible Action – Consideration to accept the final draft of the Community Source Water Protection Plan for the Lower Virgin River Valley and approve signing the letter of support to be issued to the City of Mesquite.

5. For Discussion & for Possible Action – Consideration to approve updates and amendments to the District's Tentative Budget for FY2024.

6. For Discussion & for Possible Action – Consideration to proceed with purchase of pump skid equipment for the Airport Tank Booster project from Precision Pumping Systems, in an amount not to exceed $135,000.

7. For Discussion & for Possible Action – Discussion regarding possible changes to the Virgin Valley Water District Logo. Possible actions may include direction to staff to proceed with possible changes to the Virgin Valley Water District Logo, or leaving the logo the same.

8. CFO/Accountant's Report

9. Water System Engineer's Report

10. Water Resource Manager's Report

11. General Manager's Report

12. Public Comment

13. Adjournment

The Virgin Valley Water District offices are generally accessible to persons with disabilities. With a 24-hour advance notice and request, additional efforts may be made to provide special assistance or accommodations for attendance of the Board of Directors meeting. Please call 702-346-5731.

THIS MEETING HAS BEEN PROPERLY NOTICED AND POSTED IN THE FOLLOWING LOCATIONS:

VIRGIN VALLEY WATER DISTRICT
500 Riverside Road
Mesquite, NV 89027

BANK OF NEVADA
11 W. Pioneer Boulevard
Mesquite, NV 89027

AMERICA FIRST CREDIT UNION
570 W. Mesquite Boulevard
Mesquite, NV 89027

MESQUITE U.S. POST OFFICE
510 W. Mesquite Boulevard
Mesquite, NV 89027

BUNKERVILLE U.S. POST OFFICE
170 Main Street
Bunkerville, NV 89007

WEBSITE: vvh2o.com

Backup material for this agenda may be obtained by contacting District Administrator Mary Johnson by calling 702-346-5731; by email at mary@vvh2o.com; or on the District's website under Board Meeting Agendas.

AGENDA POSTED on the _____ day of _____, 2023 at _____ __m.

Posted By: _____ Title: _____

Signature: _____

VIRGIN VALLEY WATER DISTRICT REGULAR BOARD MEETING
VIRGIN VALLEY WATER DISTRICT OFFICE
APRIL 4, 2023

Minutes of a Regular Board Meeting of the Virgin Valley Water District Board held on April 4, 2023, at the Virgin Valley Water District Office at 5:00 p.m. Attending were President Ben Davis, Vice-President Brian Bingham, and Board Members Richard Bowler, Randy Laub and Gary Elgort. Also present were District General Manager Kevin Brown, District Water Resource Manager Aaron Bunker, District Water System Engineer Steve Hall, District Legal Counsel Bo Bingham, District CFO/Accountant Wesley Smith, District Secretary-Treasurer Mary Johnson and other interested parties of agenda items.

- **President Ben Davis called the meeting to order at 5:02 p.m.**
- **Kevin Brown offered a Prayer**
- **Mary Johnson led the pledge**
- **Public Comment** – Natalie Anderson, District Conservation Specialist, commented on the Fix a Leak week and announced the Fix a Leak contest winner; the contest was open to anyone in the valley; the winner was awarded a "throne" for the "Royal Leak Detection Contest" sponsored by Mountainland Supplies.
- Linda Faas thanked Natalie Anderson and the District for encouraging citizens to remove their lawns and stated that she has gone from using 32,000 gallons of water last June to 7,000 gallons of water for January and February of this year after having her lawn removed.
- **Board Comments –** Gary Elgort announced that on April 19, 2023 @ 4:00 p.m. in the Mesquite City Hall, the Nevada Security Site Advisory Board will be meeting to speak about clean up work at the Nevada Security Site (aka, Nevada Test Site) and Gary will be giving a short presentation on his attendance at the Radioactive Waste Management Conference in Phoenix, AZ.
- **President of Board Comments –** Ben stated that he also put in artificial turf in his yard a couple years ago and has seen his water bill come way down.

CONSENT AGENDA:

Richard Bowler moved to approve the agenda and consent agenda as listed below. Gary Elgort seconded the motion and it was unanimously carried. 5-0

1. For Possible Action – Approve **Agenda**

2. For Possible Action – Approve **Minutes from 3/21/23 Regular Meeting**

3. For Possible Action – Approve **Bills Paid since last public meeting $254,699.66**

**** END OF CONSENT AGENDA ****

4. For Discussion & for Possible Action – Consideration to accept the final draft of the Community Source Water Protection Plan for the Lower Virgin River Valley and approve signing the letter of support to be issued to the City of Mesquite.

Aaron Bunker began by stating that the Board directed staff at the November 16, 2021 board meeting to prepare a community source water protection plan in conjunction with Resource Concepts, Inc. (RCI). The Source Water Protection Program is a voluntary program that is locally developed and stakeholder driven. Aaron stated that the stakeholders for the Lower Virgin River Valley Plan includes the District and staff, City of Mesquite and various departments, the State of NV including RCI, NDEP, NvRWA (Nevada Rural Water Association), and the Bureau of Safe Drinking Water.

The final draft Plan, PowerPoint presentation, and a draft letter of support to be sent to the City of Mesquite recommending the Plan be adopted by resolution were included as backup materials.

Richard Bowler suggested that all board members sign the letter.

Gary Elgort stated that after reading the entire Plan, he was impressed by the amount of work that this group put into drafting the Plan.

Natalie Anderson continued with a brief overview of the Community Source Water Protection Plan for the Lower Virgin River Valley through a PowerPoint presentation. Natalie explained what the Plan is; how it evolved; the planning team; what the Plan means for the Lower Virgin River Valley; Plan goals; management strategies; public education and outreach; planning agency coordination; collaboration with local and regional partners; secure locations for future water sources; and links for more information.

Jill Southerland with RCI commented on developing the Plan and her pleasure with working with District and City of Mesquite staff.

Kevin stated that the Plan would be on the City of Mesquite Council agenda for the April 25, 2023 meeting for possible adoption. Kevin also recognized Jill's mom who is a Mesquite resident and also in attendance.

Gary Elgort moved to accept the final draft of the Community Source Water Protection Plan for the Lower Virgin River Valley and approve signing the letter of support to be issued to the City of Mesquite with modification to the letter to have all board members' signatures on it. Ben Davis seconded the motion and it was unanimously carried. 5-0

Ben Davis announced that he had another engagement to attend and would be handing the meeting over to Vice-President Brian Bingham at 5:28 p.m.

5. For Discussion & for Possible Action – Consideration to approve updates and amendments to the District's Tentative Budget for FY2024.

Wes stated that there were a few changes to make before the Tentative Budget was submitted to the State. Wes stated that staff proposed increasing the Maintenance – Meter – 6380-00 category $400,000.00. This will allow the District to completely finish the meter change-out program that has been going on since 2020.

Aaron explained that he would like to add money to the budget for road maintenance for the Districts two ROWs (Right-of-Way) with the BLM that go up to the District's rain gauges. Wes stated that an additional $15,000 would be added to the budget for road maintenance in the coming year.

Richard Bowler moved to approve the Tentative Budget for FY2024 as amended. Randy Laub seconded the motion and it was unanimously carried. 4-0

6. For Discussion & for Possible Action – Consideration to proceed with purchase of pump skid equipment for the Airport Tank Booster project from Precision Pumping Systems in an amount not to exceed $135,000.00

Steve Hall stated that the existing Airport Tank Booster Station is located directly adjacent to the Airport Tank. The booster station includes a control valve that regulates inflow from the higher-pressure zone, Zone 3 (Vista Del Monte, Summerhills, Bella Horizon), into the tank during normal operation. The booster station also includes pumps that provide water from the tank into Zone 3 when the flow needs to be reversed. The equipment in the booster station is considerably inadequate in supplying water to all of Zone 3 and the equipment is outdated. This booster is for emergency use only now, when Treatment Plant 35 begins operating, the booster could be used continuously.

Staff has evaluated the required capacity of the booster station in order to provide adequate flows to serve all of Zone 3 and determined that two 500 gpm pumps and one 250 gpm pump would provide adequate capacity to serve existing maximum day demands in Zone 3 and also demands from assumed growth.

Staff received a quote from Precision Pump Systems to provide the pump skid for the amount of $126,307.00, good through May 13, 2023.

Richard Bowler moved to proceed with purchase of pump skid equipment for the Airport Tank Booster project from Precision Pumping Systems in an amount not to exceed $135,000.00. Gary Elgort seconded the motion and it was unanimously carried. 4-0

7. For Discussion & for Possible Action – Discussion regarding possible changes to the Virgin Valley Water District Logo. Possible actions may include direction to staff to proceed with possible changes to the Virgin Valley Water District Logo, or leaving the logo the same.

Kevin stated that the District logo was created in 1993 when the District was created. Kevin has had people in the community indicate that the District, City of Mesquite and Bunkerville have grown up since the logo was created and that the logo is a bit antiquated. Kevin is bringing this item to the board to discuss if they would like to do anything with the logo.

Discussion ensued with board members commenting. Gary feels that the logo is historical and has connectivity to the past that he doesn't believe it should be thrown away. Rich stated that he wouldn't mind keeping some aspects, but believes that we have grown into a more modern time and would like to see some ideas. Randy and Brian both think that the logo is historical and would like to see it incorporated in a new logo and would like to see some ideas.

Gary Elgort moved to have Natalie create a non-binding contest for a new logo with guidance that the District would like to consider keeping the old logo within a new design. Richard Bowler seconded the motion and it was unanimously carried. 4-0

8. CFO/Accountant's Report

Wes had included a written report. Wes further commented on the "Special Note" at the bottom of his report regarding recent bank failures and concern regarding the safety of funds held at U.S. Banks. Wes stated that he has received information from the District's bank (Bank of Nevada) showing the strength and stability of the bank. Wes also stated that Dan Wright, a Senior Vice-President at Bank of Nevada has confirmed that ALL Public Entity funds held at Bank of Nevada are insured under the Nevada Collateral Pool arrangement.

9. Water System Engineer's Report

Steve had included a written report and further informed the board that the final walk through for the Pioneer/Falcon Ridge waterline replacement project would happen on Monday.

Also, on Monday, the Well 36 Transmission Line project is commencing.

10. Water Resource Manager's Report

Aaron had included a written report. Aaron updated the board on Well 32 stating that Layne-Christensen would be out Monday and work would commence on Tuesday.

Aaron also stated that staff is looking for a new motor for Well 31 since the motor is making a lot of noise.

11. General Manager's Report

Kevin had included a written report and had nothing more to add to his report.

12. Public Comment

There was no public comment at this time.

13. Adjournment

Vice-President Brian Bingham adjourned the meeting at 5:45 p.m.

(NOTE): The minutes of this meeting have been recorded and will remain on file in the District office for a one-year period for public examination.

4. For Discussion & for Possible Action – Consideration to accept the final draft of the Community Source Water Protection Plan for the Lower Virgin River Valley and approve signing the letter of support to be issued to the City of Mesquite.

MEMORANDUM

TO: Board of Directors

FROM: Aaron Bunker and Natalie Anderson

DATE: March 28, 2023

RE: Community Source Water Protection Plan for the Lower Virgin River Valley
April 4, 2023 Board Meeting

****

1) At the November 16, 2021 Board Meeting the Board directed staff to prepare a community source water protection plan in conjunction with Resource Concepts, Inc. (RCI)

2) The Source Water Protection Program is voluntary program that is locally developed and stakeholder driven.

   The stakeholders that supported and developed the Community Source Water Protection Plan for the Lower Virgin River Valley (Plan) includes:

   Virgin Valley Water District
   - General Manager
   - Water Resource Manager
   - District Engineer
   - Conservation Specialist

   City of Mesquite
   - Public Works
   - Development Services
   - Fire Department
   - GIS Specialist

   With assistance from
   - Resource Concepts, Inc.
   - Nevada Division of Environmental Protection
   - Nevada Rural Water Association
   - Bureau of Safe Drinking Water

3) Accompanying this memo is the final draft of the Plan, a brief PowerPoint presentation and a draft letter of support that would be sent to the City of Mesquite recommending the plan be adopted by resolution by the Mesquite City Council.

4) Staff recommendation: Accept the final draft of the Community Source Water Protection Plan for the Lower Virgin River Valley and approve signing the letter of support to be issued to the City of Mesquite.

Community Source Water Protection Plan for the Lower Virgin River Valley

Presentation for Virgin Valley Water District Board

April 4, 2023

What is the Integrated Source Water Protection Program (ISWPP)?

A Voluntary State program which provides funding and assistance to Nevada communities to develop and implement a plan to protect their drinking water supplies from becoming contaminated.

Evolution of Community Source Water Protection Plan

- November 16, 2021: Approval by VVWD Board
- June 14, 2022: Approval by COM
- September 1, 2022: Planning Meetings began and continued until plan was complete and ready for final approval by VVWD Board and City Council April 4, 2023

Local Planning Team

Virgin Valley Water District

- General Manager
- Water Resource Manager
- District Engineer
- Conservation Specialist

City of Mesquite

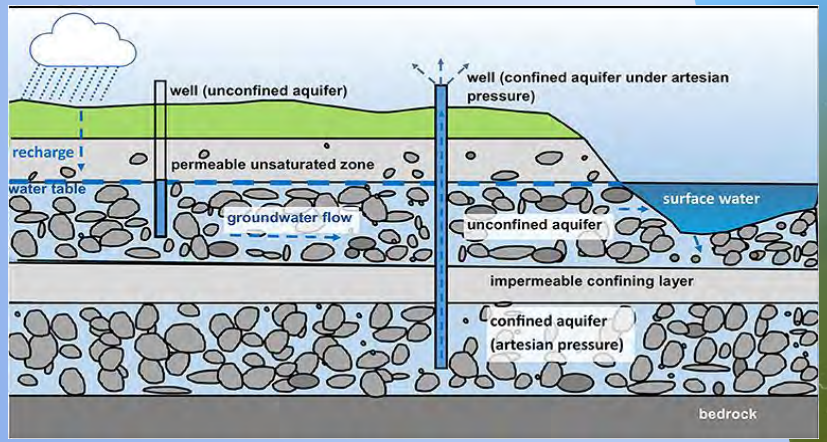
- Public Works
- Development Services
- Fire Department
- GIS Specialist

With assistance from

- Resource Concepts, Inc.
- Nevada Division of Environmental Protection
- Nevada Rural Water
- Bureau of Safe Drinking Water

What does this mean for Lower Virgin River Valley?

- What is Source Water?
- What is our Source Water in the Lower Virgin River Valley?
- How do we protect it?



Community Source Water Protection Plan Goals

1. **Identify** the sources of, and potential risks to drinking water, and consider them in the local planning framework.

2. **Ensure** that clean and safe drinking water is available for future generations.

3. **Integrate** source water protection and conservation into local planning and zoning documents to ensure that the quality of water matches the goals of the community.

4. **Educate** the community about what is being accomplished to achieve source water protection and conservation.

Management Strategies

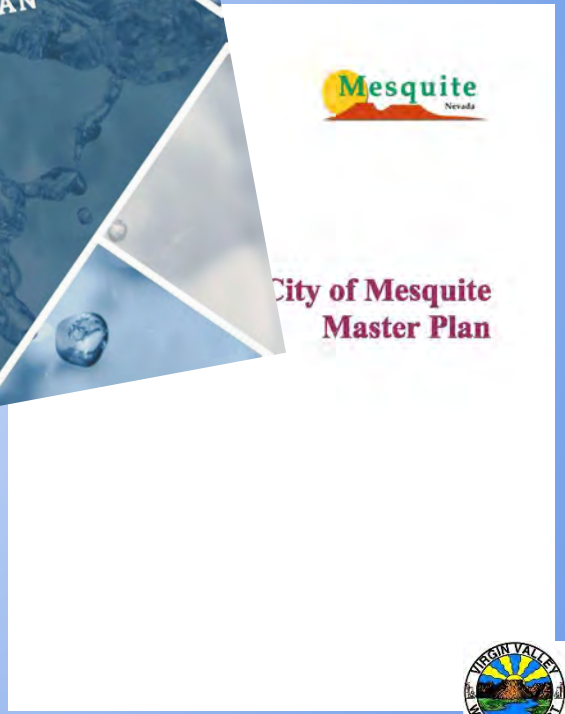
- Public Education and Outreach
- Planning Agency Coordination
- Collaboration with Local and Regional Partners
- Secure Locations for Future Water Sources

Public Education and Outreach

Involve the public in our efforts of Source Water Protection and Conservation

Planning Agency Coordination

Add source water protection and conservation message to VVWD Master Plan, COM Master Plan and VVWD Conservation Plan



Collaboration with Local and Regional Partners

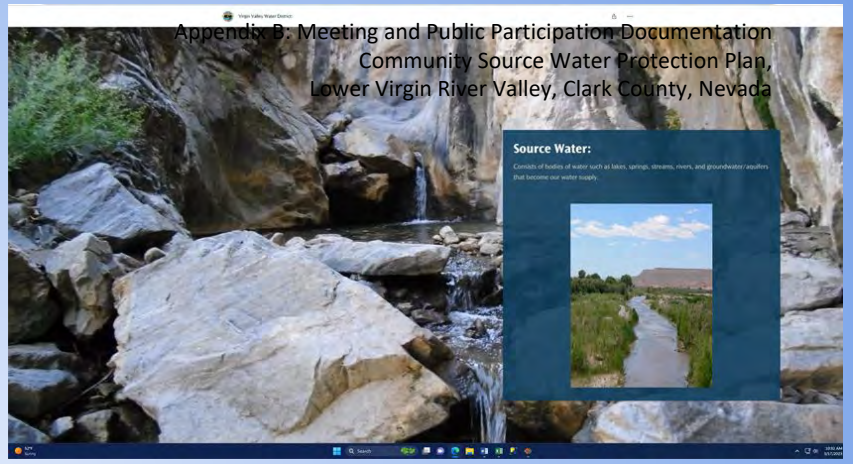
- VVWD
- COM
- Virgin River Coalition
- Nevada Rural Water
- VV Disposal
- BLM

Secure Locations For Future Water Sources

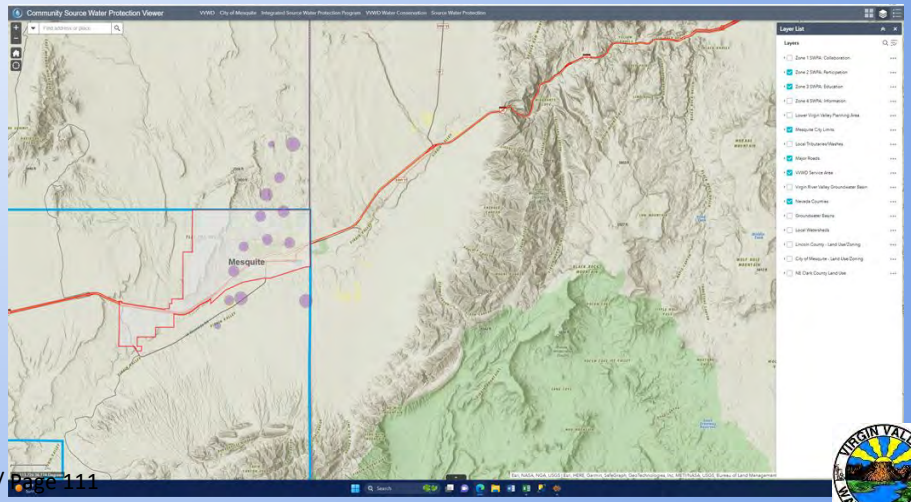
Work in collaboration with our partners to ensure future well sites are protected from contaminants

More Information:

[Lower Virgin River Valley Source Water Protection Story]



[Community Source Water Protection Viewer]



Questions?


WELLHEAD PROTECTION
AREA
PREVENT GROUNDWATER
POLLUTION BEFORE IT STARTS
NO DUMPING

Virgin Valley Water District Board of Directors
500 Riverside Road
Mesquite, Nevada 89027

Date: April 4, 2023

From: Virgin Valley Water District
Board of Directors
500 Riverside Road
Mesquite Nevada, 89027

Re: "Community Source Water Protection Plan for the Lower Virgin River Valley, Clark County, Nevada."

Over the last six months, the local planning team, including staff from the Virgin Valley Water District, the City of Mesquite Development Services Department, the City of Mesquite Geographic Information System Services, the City of Mesquite Public Works, the City of Mesquite Fire Department, the Nevada Rural Water Association, and the Nevada Division of Environmental Protection (NDEP) have collaborated to develop the draft "Community Source Water Protection Plan for the Lower Virgin River Valley, Clark County, Nevada." The Board of Directors for the Virgin Valley Water District recommends the Plan be adopted by resolution R23-018 by the Mesquite City Council and final Plan be endorsed by NDEP. The Plan provides a framework for the long-term protection and conservation of public water supplies in the City of Mesquite, and we support the goals, management strategies, and action projects outlined in the Plan.

Please feel free to contact Kevin Brown, Virgin Valley Water District General Manager, at kbrown@vvh2o.com with any questions regarding this letter of support.

Sincerely,

Ben Davis, President Virgin Valley Water District

Brian Bingham, Vice President Virgin Valley Water District

Richard Bowler, Virgin Valley Water District

Randy Laub, Virgin Valley Water District

Gary Elgort, Virgin Valley Water District

VIRGIN VALLEY WATER DISTRICT

Cc: Ethan Mason, Bureau of Safe Drinking Water

Peter Jankowski, Mesquite City Manager

Kevin Schiller, Clark County Manager

Mesquite City Council Adoption

Notice and Agenda
Master Plan Committee
Training Room 2nd Floor
10 E. Mesquite Blvd.
MONDAY, APRIL 17, 2023 - 4:00 PM

Below is an agenda of all items scheduled to be considered. Unless otherwise stated, items may be taken out of the order presented on the agenda at the discretion of the Chair and Board. Additionally, the Chair and Board may combine two or more agenda items for consideration, and may remove an item from the agenda or delay discussion relating to an item on the agenda at any time. Public comment is limited to three minutes per person.

Roll Call/Determination of Quorum

1. Public Comment

1.1. Public Comment

2. Consent Agenda

2.1. Consideration for approval of the April 17, 2023 Master Plan Committee Agenda.

- Discussion and Possible Action

3. Administrative Items

3.1. Discussion regarding proposed Conservation Element.

-Discussion and Possible Action

3.2. Discussion regarding Source Water Protection Plan.

- Discussion and Possible Action

4. Public Comment

4.1. Public Comment

5. Adjournment

5.1. Adjournment

To obtain any or all supporting materials for this Agenda, please contact the Clerk's Office at 702-346-5295.

Members of the public who are disabled and require special assistance or accommodation at the meeting are requested to notify the City Clerk's Office -City Hall in writing at 10 E. Mesquite Blvd., Mesquite, NV, 89027 or by calling 346-5295 twenty-four hours in advance of the meeting.

THIS NOTICE AND AGENDA HAS BEEN POSTED ON OR BEFORE 9:00 AM ON THE THIRD WORKING DAY BEFORE THE MEETING AT THE FOLLOWING LOCATIONS:

1. *Mesquite City Hall, 10 E. Mesquite Blvd., Mesquite, Nevada*
2. *Mesquite Community & Senior Center, 102 W. Old Mill Road, Mesquite, Nevada*
3. *Mesquite Post Office, 510 W. Mesquite Blvd., Mesquite, Nevada*
4. *Mesquite Library, 121 W. First North, Mesquite, Nevada*

The agenda is also available on the Internet at http://www.mesquitenv.gov and http://nv.gov

Notice and Agenda
Technical Review Meeting
Council Chambers - City Hall
10 E. Mesquite Blvd. - 2nd Floor
TUESDAY, APRIL 18, 2023 - 2:30 PM

Below is an agenda of all items scheduled to be considered. Unless otherwise stated, items may be taken out of the order presented on the agenda at the discretion of the Mayor and Council. Additionally, the Mayor and Council may combine two or more agenda items for consideration, and may remove an item from the agenda or delay discussion relating to an item on the agenda at any time. Public comment is limited to three minutes per person.

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1. Public Comments

During the Public Comment portion of the agenda, comments are to be limited to matters not appearing on the agenda or do not provide for specific public comment under another agenda item. Public Comment will be provided on each agenda under each specific item of business. Any public comment shall be addressed to the Mayor, moderator, or chair of the public body and shall be direct so as to form a viewpoint of an issue. All public comments shall be limited to three (3) minutes, unless specifically extended upon request to the Mayor, moderator, or chair of the public body. Derogatory comments of non-public individuals or another public commenter shall not be permitted. The Mayor, moderator, or chair of the public body may limit the individual's comment period if proper decorum is not observed. Items raised under this portion of the agenda cannot be deliberated or acted upon until the notice provisions of the Nevada Open Meeting Law have been met. If you wish to speak at this time, please step up to the podium, and clearly state your name.

1.1. Public Comment
Cover Page

2. Consent Agenda

Items on the Consent Agenda may not require discussion. These items may be a single motion unless removed at the request of the Mayor, City Council, or City Manager.

2.1. Consideration for approval of the April 25, 2023 Regular City Council Meeting Agenda and the March 14, 2023 City Council Meeting minutes.

- Public Comment
- Discussion and Possible Action
Cover Page

m03-14-23 RCC.docx

2.2. Consideration of approval of:
a) Notification of Budget Transfers
b) Notification of Budget Amendments
c) Notification of Bills Paid
d) Purchase Orders.

- Public Comment
- Discussion and Possible Action
Cover Page

Check Register - City Council Agenda 3.28.23 to 4.06.23.pdf

City Council - Budget Trsfrs & POS 04.25.2023.pdf

2.3. Monthly Financials.

- Public Comment
- Discussion and Possible Action
Cover Page

3. Special Items

3.1. Quarterly presentation from Superintendent RoAnn Triana from CCSD.

- Public Comment
- Discussion and Possible Action
Cover Page

3.2. Presentation of Water Conservation Plan by Virgin Valley Water District.

- Public Comment
- Discussion and Possible Action
Cover Page

VVWD Water Conservation Plan 01_18-23 State Approved.pdf

Virgin Valley Water Conservation Plan.pdf

3.3. Presentation of Source Water Protection Plan.

- Public Comment
- Discussion and Possible Action

Cover Page

4. Resolutions & Proclamations

4.1. Proclamation - Building Safety Month - May 2023

Cover Page

Proclamation Building Safety Month - May 2021.docx

4.2. Consideration of Resolution Number R23-018 to adopt the Community Source Water Protection Plan for the Lower Virgin River Valley, Clark County, Nevada.

- Public Comment
- Discussion and Possible Action

Cover Page

R23-018.docx

CSWPP recommendation letter from board.pdf

Final Draft NDEP Lower Virgin Valley Community Source Water Protection Plan 3.23.23 rdu waps.pdf

CSWPP City of Mesquite.pptx

4.3. Consideration of proposed Resolution (R23-019) supporting AB420.

- Public Comment
- Discussion and Possible Action

Cover Page

5. Department Reports

5.1. Mayor's Comments and Reports

Cover Page

5.2. City Council and Staff Comments or Reports

Cover Page

6. Administrative Items

6.1. Consideration for approval of a Full Liquor On-Sale License for Desert Event Center, located at 780 Hafen Lane Unit B.

- Public Comment
- Discussion and Possible Action

Cover Page

Melissa Silveyra Findings of Suitability.pdf

Desert Event Center liquor application.pdf

6.2. Consideration of Conditional Use Permit Case No CUP-23-003 (Busy Bee Academy) to allow a preschool to operate at 641 Valley View Drive in the Single
Family (SF) Zone.

- Public Hearing
- Discussion and Possible Action

Cover Page

CUP-23-003 Busy Bee Academy Staff Memo.docx

CUP-23-003.pdf

CUP-23-003 Busy Bee Academy VicinityMap.pdf

6.3. Continuance of the discussion regarding the events at the Sports & Events Complex.

- Public Comment
- Discussion and Possible Action

Cover Page

6.4. Consideration for FY 2024 for the Nevada League of Cities and Municipalities Annual Dues Request.

- Public Comment
- Discussion and Possible Action

Cover Page

6.5. Consideration for potential uses for Opioid Settlement Funds.

- Public Comment
- Discussion and Possible Action

Cover Page

List of use of Opioids Settlement Funds.pdf

7. Public Comments

After all council business has concluded, this Public Comment portion of the agenda shall be open to all viewpoint comments, including agendized items. . Any public comment shall be addressed to the Mayor, moderator, or chair of the public body and shall be direct so as to form a viewpoint of an issue. All public comments shall be limited to three (3) minutes, unless specifically extended upon request to the Mayor, moderator, or chair of the public body. Derogatory comments of non-public individuals or another public commenter shall not be permitted. The Mayor, moderator, or chair of the public body may limit the individual's comment period if proper decorum is not observed. Items raised under this portion of the agenda cannot be deliberated or acted upon until the notice provisions of the Nevada Open Meeting Lawhave been met. If you wish to speak at this time, please step up to the podium, and clearly state your name.

7.1. Public Comment
Cover Page

8. Adjournment

8.1. Adjournment
Cover Page

Note: Please be advised that the Standing Rules of the City Council are available for your information and posted in the bulletin board on the first floor of City Hall. The Standing Rules govern the conduct of City Council Meetings. These Standing Rules may be acted upon and utilized by the Mayor and City Council at any City Council Meeting.

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4. *Mesquite Library, 121 W. First North, Mesquite, Nevada*

The agenda is also available on the Internet at http://www.mesquitenv.gov and http://nv.gov

RULES OF PROCEDURE

1. Authority:

1.1 The Mesquite City Charter Article II, Section 2.060(2), Provides that the **City** Council may adopt rules for the government of its members and its meetings; These Rules of Procedure shall be in effect upon their adoption by the Council and until such time as they are amended or new rules are adopted in the manner provided by these Rules of Procedure.

2. General Rules:

2.1. **PUBLIC MEETINGS**: All meetings of the Council shall be open to the public, expect those provided in NRS 241 and 288. The agenda and backup material shall be open to public inspection in the City Clerk's Office.

2.2 **QUORUM:** A majority of the members of the Council shall constitute a quorum and be necessary for the transaction of business. If a quorum is not present, those in attendance will be named and they shall adjourn to a later time.

2.3 **MINUTES:** A written account of all proceedings of the Council shall be kept by the City Clerk and shall be entered into the official records of the Council.

2.4 **RIGHT TO FLOOR:** Any member desiring to speak shall be recognized by the chair, and shall confine his remarks to the item under consideration.

2.5 **CITY MANAGER**: The City Manager or his/her designee shall attend all meetings of the Council. The City Manager may make recommendations to the Council and shall have the right to take part in all discussions of the Council, but shall have no vote.

2.6 **CITY ATTORNEY**: The City Attorney or Deputy City Attorney shall attend all meetings of the Council and shall, upon request, given an opinion, either written or verbal, on questions of the law.

2.7 **CITY CLERK**: The City Clerk or Deputy City Clerk shall attend all meetings of the Council and shall keep the official minutes and perform such other duties as required by the Council.

2.8 **OFFICERS AND STAFF:** Department heads of the City, when there is pertinent business from their departments on the Council agenda, shall attend such Council meetings upon request of the City Manager.

2.9 **RULES OF ORDER:** "Roberts Rules of Order Newly Revised" 11th Edition shall govern the proceedings of the Council in all cases, provided they are not in conflict with these rules.

3. Types of Meetings:

3.1 **REGULAR CITY COUNCIL MEETINGS**: The City Council shall meet in regular session at 5:00 p.m. on the second and fourth Tuesday of each month. The City Council may, as it deems necessary, schedule a regular meeting on a date other than the second and fourth Tuesday of each month, in accordance with Article II, Section 2.040 of the Mesquite City Charter and the provisions of Nevada Revised Statutes ("NRS") chapter 241.

3.2 **TECHNICAL REVIEW MEETINGS**: Pursuant to Article II, Section 2.040(2) of the Mesquite City Charter, the City Council shall hold Technical Review Meeting at 1:30 p.m. on the first and third Tuesday of each month. The purpose of Technical Review Meetings shall be to establish the business to be heard for only the next relevant Regular City Council meeting and other matters properly related thereto.

3.3 **ROLE OF MAYOR**: The Mayor shall preside over both Technical Review Meetings and Regular City Council Meetings. The Mayor may decide in what order to take business from the Agenda. In the Mayor's absence, the Mayor Pro Tem shall fulfill the role of the Mayor. If both the Mayor Pro Tem and the Mayor are absent, the City Council shall choose by majority vote a temporary chair who shall fulfill the administrative duties of presiding over the City Council Meeting. Nothing in this provision shall either abridge or delegate the duties of the Mayor, Mayor Pro Tem or the City Council as provided in Article III of the Mesquite City Charter, except as to the sole issue of fulfilling administrative duties and conducting and directing business during a meeting.

3.4 **PLACE OF MEETINGS**: The City Council herewith designates as its Council Chambers, for the conduct of all regular meetings, the Council Chambers in City Hall located at 10 East Mesquite Boulevard, Mesquite, Nevada, or such other place as the City Council may from time to time determine.

3.5 **SPECIAL MEETINGS**: Special meetings of the City Council include any meeting other than its regular meetings of a quorum of the City Council not exempted from the requirements of NRS Chapter 241. Special meetings of the City Council may be called by the Mayor or a majority of the City Council in compliance with Article II, Section 2.050 of the Mesquite City Charter and the provisions of NRS chapter 241.

3.6 **ADJOURNED MEETINGS**: Any meeting of the City Council may be continued or adjourned from day to day by a call of the Mayor or Councilmember and ratified by a majority vote, and in accordance with an agenda noticed pursuant to NRS chapter 241, but not beyond the next scheduled regular meeting.

3.7 **EXECUTIVE SESSIONS**: Executive sessions, closed meetings or non-public meetings may be held in accordance with the provisions of NRS chapters 241 and 288.220.

4. <u>Duties of Presiding Officer and Meeting Decorum</u>

4.1 **PRESIDING OFFICER:** The Mayor, when present, shall preside as Chairman at all meetings of the City Council. In the absence of the Mayor, the Mayor Pro Tern shall preside; in the absence of the Mayor and Mayor Pro Tern, the quorum of present Councilmembers shall choose a presiding officer. The Presiding Officer of any meeting of the City Council shall have the same right as any other member of the City Council to initiate a motion, question or debate. The Presiding Officer shall preserve order and decorum, and confine Councilmembers in debate to the question under discussion.

4.2 **COUNCIL VOTE**: Unless a roll call vote is requested or necessitated due to a malfunction of the electronic vote system, the vote on any motion, resolution or ordinance shall be cast electronically and displayed for public view.

4.3 **DECORUM OF THE DAIS:** During meetings, all persons present shall assist in preserving order and decorum by limiting conversation and the use of cellular devices that may delay or interrupt the proceedings.

4.4 **POINTS OF ORDER:** Any Councilmember may at any time raise a point of order objection as appropriate by stating the phrase "Point of Order." The Councilmember shall be afforded the opportunity to explain his or her point of order objection to the Mayor. The Mayor shall rule on the point of order. The Mayor may seek advice from the City Clerk in

ruling upon any point of order. If the Mayor's ruling is against the Council member's call for the Point of Order, a vote of the Council may be requested.

5. Order of Business and Agenda

5.1 **AGENDA:** The order of business of each meeting shall be as contained in the agenda in accordance with NRS 241 prepared by the City Clerk and approved by the City Manager. The agenda shall be delivered to members of the Council at least three (3) working days preceding the meeting to which it pertains.

5.2 **SPECIAL INTEREST/PRESENTATION ITEMS**: Unless otherwise approved by the City Manager, and in order to provide for the effective administration of City Council business, a maximum of four (4) items of special interest or presentation shall be scheduled on one agenda. Special Interest/Presentation items must appear on the agenda and it is not appropriate for presentations to be made during the public comment portion of the meeting.

6. Voting

6.1 All voting procedures shall be in accordance with Parliamentary Authority.

6.2 **POINT OF INFORMATION:** This is a request by a Council member, directed to the Presiding Officer or appropriate individual for information relevant to the pending item. A Point of Information takes precedence over a main motion, is not debatable, is not amendable, is not superseded by other motions, and is ruled on for appropriateness by the Presiding Officer.

6.3 **ABSTENTIONS:** A member may abstain from voting for any reason s/he deems appropriate.

6.4 **FAILURE OF AFFIRMATIVE MOTION:** The failure of a motion calling for affirmative action is not the equivalent of the passage of a motion calling for the opposite negative action. The failure of such affirmative motion constitutes no action.

6.5 **FAILURE OF NEGATIVE MOTION**: The failure of a motion calling for a negative action is not the equivalent of the passage of a motion calling for the opposite affirmative action. The failure of such a negative motion constitutes no action.

6.6 **LACK OF PASSAGE OF A MOTION:** In some instances (maps in particular, per NRS) lack of passage of a motion may result in the item being "deemed approved." In other instances no action may result in confusion and complication for the applicant. In all cases the City Council will strive to achieve a decision or action.

7. Citizens' Rights

7.1 **ADDRESSING THE CITY COUNCIL:** Any person desiring to address the Council by oral communication can do such during Public Comments (at the beginning and closing of the meeting), or on a particular item on the agenda.

7.2 **TIME LIMIT:** Each person addressing the Council shall step to the microphone, shall give his/her name in an audible tone of voice for the record and, unless further time is granted by the Presiding Officer, shall limit the time of his/her comments to three (3) minutes.

7.3 **PUBLIC COMMENT CONTENT**: The presiding officer or the majority of City Council may prohibit comment if the content of the comments is a topic that is not relevant to, or within the authority of, the public body, or if the content of the comments is willfully disruptive of the meeting by being irrelevant, repetitious, slanderous, offensive, inflammatory, irrational, or amounting to personal attacks or interfering with the rights of other speakers.

7.4 **DISRUPTIVE CONDUCT:** Any person who willfully disrupts a meeting to the extent that its orderly conduct is made impractical may be removed from the meeting by order of the Presiding Officer or majority of the City Council. A person willfully disrupts a meeting when s/he (1) uses physical violence, threatens the use of physical violence or provokes the use of physical violence, or (2) continues to use loud, boisterous, unruly, or provocative behavior after being asked to stop, which behavior is determined by the Presiding Officer or a majority of the City Council present to be disruptive to the orderly conduct of the

meeting, or (3) fails to comply with any lawful decision or order of the Presiding Officer or of a majority of the City Council relating to the orderly conduct of the meeting.

7.5 **WRITTEN COMMUNICATIONS:**

a. In General: Interested parties or their authorized representatives may address the Council by written communication in regard to any matter concerning the City's business or over which the Council has control at any time by direct mail to Council members, email, or by addressing it to the City Clerk and copies will be distributed to the Council members.

b. At City Council Meetings: Except as provided in subsection c, written communications will not be read at City Council meetings, but will be attached to the item as part of the record, tallied, and reported by the City Clerk as generally in favor of or against the proposition.

c. Exceptions: A written communication to the City Council may be read by City staff at a City Council meeting when (1) the person making the written communication has asked it be read aloud, (2) the person is unavailable to be at the meeting due to emergency or illness, (3) the written communication can be read in an ordinary cadence within three minutes, and (4) the person's name appears on the written communication and will be read into the record.

8. <u>Suspension and Amendment of These Rules</u>

8.1 **SUSPENSION OF THESE RULES**: Any provision of these rules not governed by law may be temporarily suspended by a majority vote of the City Council.

8.2 **AMENDMENT OF THESE RULES:** These rules may be amended, or new rules adopted, by a majority vote of all members of the City Council, provided that the proposed amendments or new rules have been introduced into the records at a prior City Council meeting.

Notice and Agenda
Regular City Council Meeting
City Council Chambers - City Hall
10 E Mesquite Blvd.
TUESDAY, APRIL 25, 2023 - 5:00 PM

Below is an agenda of all items scheduled to be considered. Unless otherwise stated, items may be taken out of the order presented on the agenda at the discretion of the Mayor and Council. Additionally, the Mayor and Council may combine two or more agenda items for consideration, and may remove an item from the agenda or delay discussion relating to an item on the agenda at any time. Public comment is limited to three minutes per person.

Ceremonial Matters

- INVOCATION - Pastor Duke Taber, Mesquite Worship Center
- PLEDGE OF ALLEGIANCE
- PROCLAMATION - Building Safety Month - May 2023

1. Public Comments

During the Public Comment portion of the agenda, comments are to be limited to matters not appearing on the agenda or do not provide for specific public comment under another agenda item. Public Comment will be provided on each agenda under each specific item of business. Any public comment shall be addressed to the Mayor, moderator, or chair of the public body and shall be direct so as to form a viewpoint of an issue. All public comments shall be limited to three (3) minutes, unless specifically extended upon request to the Mayor, moderator, or chair of the public body. Derogatory comments of non-public individuals or another public commenter shall not be permitted. The Mayor, moderator, or chair of the public body may limit the individual's comment period if proper decorum is not observed. Items raised under this portion of the agenda cannot be deliberated or acted upon until the notice provisions of the Nevada Open Meeting Law have been met. If you wish to speak at this time, please step up to the podium, and clearly state your name.

1.1. Public Comment
Cover Page

2. Consent Agenda

Items on the Consent Agenda may not require discussion. These items may be a single motion unless removed at the request of the Mayor, City Council, or City Manager.

2.1. Consideration for approval of the April 25, 2023 Regular City Council Meeting Agenda; the March 14, 2023 City Council Meeting minutes; the March 21, 2023 Technical Review Meeting minutes; the March 28, 2023 City Council Meeting minutes and April 4, 2023 Meeting minutes.

- Public Comment
- Discussion and Possible Action

Cover Page

m03-14-23 RCC.docx

m03-21-23 TRM.docx

m03-28-23 RCC.docx

m04-04-23 TRM.pdf

2.2. Consideration of approval of:
a) Notification of Budget Transfers
b) Notification of Budget Amendments
c) Notification of Bills Paid
d) Purchase Orders.

- Public Comment
- Discussion and Possible Action

Cover Page

Check Register - City Council Agenda 3.28.23 to 4.06.23.pdf

City Council - Budget Trsfrs & POS 04.25.2023.pdf

3. Special Items

3.1. Quarterly presentation from Superintendent RoAnn Triana from CCSD.

- Public Comment
- Discussion and Possible Action

Cover Page

CCSD Quarterly Municipality Report Q1 2023 (2) (1).pdf

3.2. Presentation of Water Conservation Plan by Virgin Valley Water District.

- Public Comment
- Discussion and Possible Action

Cover Page

VVWD Water Conservation Plan 01_18-23 State Approved.pdf

Virgin Valley Water Conservation Plan.pdf

3.3. Presentation of Source Water Protection Plan.

- Public Comment
- Discussion and Possible Action

Cover Page

4. Resolutions

4.1. Consideration of Resolution Number R23-018 to adopt the Community Source Water Protection Plan for the Lower Virgin River Valley, Clark County, Nevada.

- Public Hearing
- Discussion and Possible Action

Cover Page

Res. R23-018.docx

CSWPP recommendation letter from board.pdf

Final Draft NDEP Lower Virgin Valley Community Source Water Protection Plan 3.23.23 rdu_waps.pdf

CSWPP City of Mesquite.pptx

4.2. Consideration of proposed Resolution (R23-019) supporting AB420.

- Public Comment
- Discussion and Possible Action

Cover Page

Mesquite Resolution (R23-019) AB 420 V1[9031].docx

5. Department Reports

5.1. Mayor's Comments and Reports
Cover Page

5.2. City Council and Staff Comments or Reports
Cover Page

6. Administrative Items

6.1. Consideration for approval of a Full Liquor On-Sale License for Desert Event Center, located at 780 Hafen Lane Unit B.

- Public Comment
- Discussion and Possible Action

Cover Page

Melissa Silveyra Findings of Suitability.pdf

Desert Event Center liquor application.pdf

6.2. Consideration of Conditional Use Permit Case No CUP-23-003 (Busy Bee Academy) to allow a preschool to operate at 641 Valley View Drive in the Single
Family (SF) Zone.

- Public Hearing
- Discussion and Possible Action

Cover Page

CUP-23-003 Busy Bee Academy Staff Memo.docx

CUP-23-003.pdf

CUP-23-003 Busy Bee Academy VicinityMap.pdf

6.3. Continuance of the discussion regarding the events at the Sports & Events Complex.

- Public Comment
- Discussion and Possible Action

Cover Page

Agreed Conditions - Expectations #1.pdf

Agreed Conditions - Expectations #2.pdf

6.4. Consideration for FY 2024 for the Nevada League of Cities and Municipalities Annual Dues Request.

- Public Comment
- Discussion and Possible Action

Cover Page

NLC - Annual Dues.pdf

6.5. Consideration for potential uses for Opioid Settlement Funds.

- Public Comment
- Discussion and Possible Action

Cover page

List of use of Opioids Settlement Funds.pdf

6.6. Training and discussion regarding open meeting laws as applied to the City Council.

- Public Comment
- Discussion and Possible Action

Cover Page

7. Public Comments

After all council business has concluded, the final Public Comment portion of the agenda shall be open to all viewpoint comments, including agendized items. Any public comment shall be addressed to the Mayor, moderator, or chair of the public body and shall be direct so as to form a viewpoint of an issue. All public comments shall be limited to three (3) minutes, unless specifically extended upon request to the Mayor, moderator, or chair of the public body. Derogatory comments of non-public individuals or another public commenter shall not be permitted. The Mayor, moderator, or chair of the public body may limit the individual's comment period if proper decorum is not observed. Items raised under this portion of the agenda cannot be deliberated or acted upon until the

notice provisions of the Nevada Open Meeting Lawhave been met. If you wish to speak at this time, please step up to the podium, and clearly state your name.

7.1. Public Comment
Cover Page

8. Adjournment

8.1. Adjournment
Cover Page

Note: Please be advised that the Standing Rules of the City Council are available for your information and posted in the bulletin board on the first floor of City Hall. The Standing Rules govern the conduct of City Council Meetings. These Standing Rules may be acted upon and utilized by the Mayor and City Council at any City Council Meeting.

To obtain any or all supporting materials for this Agenda, please contact the Clerk's Office at 702-346-5295.

Members of the public who are disabled and require special assistance or accommodation at the meeting are requested to notify the City Clerk's Office -City Hall in writing at 10 E. Mesquite Blvd., Mesquite, NV, 89027 or by calling 346-5295 twenty-four hours in advance of the meeting.

THIS NOTICE AND AGENDA HAS BEEN POSTED ON OR BEFORE 9:00 AM ON THE THIRD WORKING DAY BEFORE THE MEETING AT THE FOLLOWING LOCATIONS:

1. *Mesquite City Hall, 10 E. Mesquite Blvd., Mesquite, Nevada*
2. *Mesquite Community & Senior Center, 102 W. Old Mill Road, Mesquite, Nevada*
3. *Mesquite Post Office, 510 W. Mesquite Blvd., Mesquite, Nevada*
4. *Mesquite Library, 121 W. First North, Mesquite, Nevada*

The agenda is also available on the Internet at http://www.mesquitenv.gov and http://nv.gov

RULES OF PROCEDURE

1. Authority:

1.1 The Mesquite City Charter Article II, Section 2.060(2), Provides that the **City** Council may adopt rules for the government of its members and its meetings; These Rules of Procedure shall be in effect upon their adoption by the Council and until such time as they are amended or new rules are adopted in the manner provided by these Rules of Procedure.

2. General Rules:

2.1. **PUBLIC MEETINGS**: All meetings of the Council shall be open to the public, expect those provided in NRS 241 and 288. The agenda and backup material shall be open to public inspection in the City Clerk's Office.

2.2 **QUORUM:** A majority of the members of the Council shall constitute a quorum and be necessary for the transaction of business. If a quorum is not present, those in attendance will be named and they shall adjourn to a later time.

2.3 **MINUTES:** A written account of all proceedings of the Council shall be kept by the City Clerk and shall be entered into the official records of the Council.

2.4 **RIGHT TO FLOOR:** Any member desiring to speak shall be recognized by the chair, and shall confine his remarks to the item under consideration.

2.5 **CITY MANAGER**: The City Manager or his/her designee shall attend all meetings of the Council. The City Manager may make recommendations to the Council and shall have the right to take part in all discussions of the Council, but shall have no vote.

2.6 **CITY ATTORNEY**: The City Attorney or Deputy City Attorney shall attend all meetings of the Council and shall, upon request, given an opinion, either written or verbal, on questions of the law.

2.7 **CITY CLERK**: The City Clerk or Deputy City Clerk shall attend all meetings of the Council and shall keep the official minutes and perform such other duties as required by the Council.

2.8 **OFFICERS AND STAFF:** Department heads of the City, when there is pertinent business from their departments on the Council agenda, shall attend such Council meetings upon request of the City Manager.

2.9 **RULES OF ORDER:** "Roberts Rules of Order Newly Revised" 11th Edition shall govern the proceedings of the Council in all cases, provided they are not in conflict with these rules.

3. <u>Types of Meetings:</u>

3.1 **REGULAR CITY COUNCIL MEETINGS**: The City Council shall meet in regular session at 5:00 p.m. on the second and fourth Tuesday of each month. The City Council may, as it deems necessary, schedule a regular meeting on a date other than the second and fourth Tuesday of each month, in accordance with Article II, Section 2.040 of the Mesquite City Charter and the provisions of Nevada Revised Statutes ("NRS") chapter 241.

3.2 **TECHNICAL REVIEW MEETINGS**: Pursuant to Article II, Section 2.040(2) of the Mesquite City Charter, the City Council shall hold Technical Review Meeting at 1:30 p.m. on the first and third Tuesday of each month. The purpose of Technical Review Meetings shall be to establish the business to be heard for only the next relevant Regular City Council meeting and other matters properly related thereto.

3.3 **ROLE OF MAYOR**: The Mayor shall preside over both Technical Review Meetings and Regular City Council Meetings. The Mayor may decide in what order to take business from the Agenda. In the Mayor's absence, the Mayor Pro Tem shall fulfill the role of the Mayor. If both the Mayor Pro Tem and the Mayor are absent, the City Council shall choose by majority vote a temporary chair who shall fulfill the administrative duties of presiding over the City Council Meeting. Nothing in this provision shall either abridge or delegate the duties of the Mayor, Mayor Pro Tem or the City Council as provided in Article III of the Mesquite City Charter, except as to the sole issue of fulfilling administrative duties and conducting and directing business during a meeting.

3.4 **PLACE OF MEETINGS**: The City Council herewith designates as its Council Chambers, for the conduct of all regular meetings, the Council Chambers in City Hall located at 10 East Mesquite Boulevard, Mesquite, Nevada, or such other place as the City Council may from time to time determine.

3.5 **SPECIAL MEETINGS**: Special meetings of the City Council include any meeting other than its regular meetings of a quorum of the City Council not exempted from the requirements of NRS Chapter 241. Special meetings of the City Council may be called by the Mayor or a majority of the City Council in compliance with Article II, Section 2.050 of the Mesquite City Charter and the provisions of NRS chapter 241.

3.6 **ADJOURNED MEETINGS**: Any meeting of the City Council may be continued or adjourned from day to day by a call of the Mayor or Councilmember and ratified by a majority vote, and in accordance with an agenda noticed pursuant to NRS chapter 241, but not beyond the next scheduled regular meeting.

3.7 **EXECUTIVE SESSIONS**: Executive sessions, closed meetings or non-public meetings may be held in accordance with the provisions of NRS chapters 241 and 288.220.

4. Duties of Presiding Officer and Meeting Decorum

4.1 **PRESIDING OFFICER:** The Mayor, when present, shall preside as Chairman at all meetings of the City Council. In the absence of the Mayor, the Mayor Pro Tern shall preside; in the absence of the Mayor and Mayor Pro Tern, the quorum of present Councilmembers shall choose a presiding officer. The Presiding Officer of any meeting of the City Council shall have the same right as any other member of the City Council to initiate a motion, question or debate. The Presiding Officer shall preserve order and decorum, and confine Councilmembers in debate to the question under discussion.

4.2 **COUNCIL VOTE**: Unless a roll call vote is requested or necessitated due to a malfunction of the electronic vote system, the vote on any motion, resolution or ordinance shall be cast electronically and displayed for public view.

4.3 **DECORUM OF THE DAIS:** During meetings, all persons present shall assist in preserving order and decorum by limiting conversation and the use of cellular devices that may delay or interrupt the proceedings.

4.4 **POINTS OF ORDER:** Any Councilmember may at any time raise a point of order objection as appropriate by stating the phrase "Point of Order." The Councilmember shall be afforded the opportunity to explain his or her point of order objection to the Mayor. The Mayor shall rule on the point of order. The Mayor may seek advice from the City Clerk in ruling upon any point of order. If the Mayor's ruling is against the Council member's call for the Point of Order, a vote of the Council may be requested.

5. Order of Business and Agenda

5.1 **AGENDA:** The order of business of each meeting shall be as contained in the agenda in accordance with NRS 241 prepared by the City Clerk and approved by the City Manager. The agenda shall be delivered to members of the Council at least three (3) working days preceding the meeting to which it pertains.

5.2 **SPECIAL INTEREST/PRESENTATION ITEMS**: Unless otherwise approved by the City Manager, and in order to provide for the effective administration of City Council business, a maximum of four (4) items of special interest or presentation shall be scheduled on one agenda. Special Interest/Presentation items must appear on the agenda and it is not appropriate for presentations to be made during the public comment portion of the meeting.

6. Voting

6.1 All voting procedures shall be in accordance with Parliamentary Authority.

6.2 **POINT OF INFORMATION:** This is a request by a Council member, directed to the Presiding Officer or appropriate individual for information relevant to the pending item. A Point of Information takes precedence over a main motion, is not debatable, is not amendable, is not superseded by other motions, and is ruled on for appropriateness by the Presiding Officer.

6.3 **ABSTENTIONS:** A member may abstain from voting for any reason s/he deems appropriate.

6.4 **FAILURE OF AFFIRMATIVE MOTION:** The failure of a motion calling for affirmative action is not the equivalent of the passage of a motion calling for the opposite negative action. The failure of such affirmative motion constitutes no action.

6.5 **FAILURE OF NEGATIVE MOTION**: The failure of a motion calling for a negative action is not the equivalent of the passage of a motion calling for the opposite affirmative action. The failure of such a negative motion constitutes no action.

6.6 **LACK OF PASSAGE OF A MOTION:** In some instances (maps in particular, per NRS) lack of passage of a motion may result in the item being "deemed approved." In other instances no action may result in confusion and complication for the applicant. In all cases the City Council will strive to achieve a decision or action.

7. Citizens' Rights

7.1 **ADDRESSING THE CITY COUNCIL:** Any person desiring to address the Council by oral communication can do such during Public Comments (at the beginning and closing of the meeting), or on a particular item on the agenda.

7.2 **TIME LIMIT:** Each person addressing the Council shall step to the microphone, shall give his/her name in an audible tone of voice for the record and, unless further time is granted by the Presiding Officer, shall limit the time of his/her comments to three (3) minutes.

7.3 **PUBLIC COMMENT CONTENT***:* The presiding officer or the majority of City Council may prohibit comment if the content of the comments is a topic that is not relevant to, or within the authority of, the public body, or if the content of the comments is willfully disruptive of the meeting by being irrelevant, repetitious, slanderous, offensive, inflammatory, irrational, or amounting to personal attacks or interfering with the rights of other speakers.

7.4 **DISRUPTIVE CONDUCT:** Any person who willfully disrupts a meeting to the extent that its orderly conduct is made impractical may be removed from the meeting by order of the Presiding Officer or majority of the City Council. A person willfully disrupts a meeting when s/he (1) uses physical violence, threatens the use of physical violence or provokes the use of physical violence, or (2) continues to use loud, boisterous, unruly, or provocative behavior after being asked to stop, which behavior is determined by the Presiding Officer or a majority of the City Council present to be disruptive to the orderly conduct of the meeting, or (3) fails to comply with any lawful decision or order of the Presiding Officer or of a majority of the City Council relating to the orderly conduct of the meeting.

7.5 **WRITTEN COMMUNICATIONS:**

a. In General: Interested parties or their authorized representatives may address the Council by written communication in regard to any matter concerning the City's business or over which the Council has control at any time by direct mail to Council members, email, or by addressing it to the City Clerk and copies will be distributed to the Council members.

b. At City Council Meetings: Except as provided in subsection c, written communications will not be read at City Council meetings, but will be attached to the item as part of the record, tallied, and reported by the City Clerk as generally in favor of or against the proposition.

c. Exceptions: A written communication to the City Council may be read by City staff at a City Council meeting when (1) the person making the written communication has asked it be read aloud, (2) the person is unavailable to be at the meeting due to emergency or illness, (3) the written communication can be read in an ordinary cadence within three minutes, and (4) the person's name appears on the written communication and will be read into the record.

8. Suspension and Amendment of These Rules

8.1 **SUSPENSION OF THESE RULES**: Any provision of these rules not governed by law may be temporarily suspended by a majority vote of the City Council.

8.2 **AMENDMENT OF THESE RULES:** These rules may be amended, or new rules adopted, by a majority vote of all members of the City Council, provided that the proposed amendments or new rules have been introduced into the records at a prior City Council meeting.

AGENDA ITEM
City Council Meeting
Meeting Date: April 25, 2023
Submitted by: Richard Secrist
Submitting Department: Development Services

Resolutions & Proclamations

Consideration of Resolution Number R23-018 to adopt the Community Source Water Protection Plan for the Lower Virgin River Valley, Clark County, Nevada.

- Public Comment
- Discussion and Possible Action

PETITIONER: Virgin Valley Water District **DEPARTMENT:** Development Services

---

RECOMMENDATION:

Approve Resolution R23-018, and authorize the Mayor to sign the Resolution for adoption.

Background:

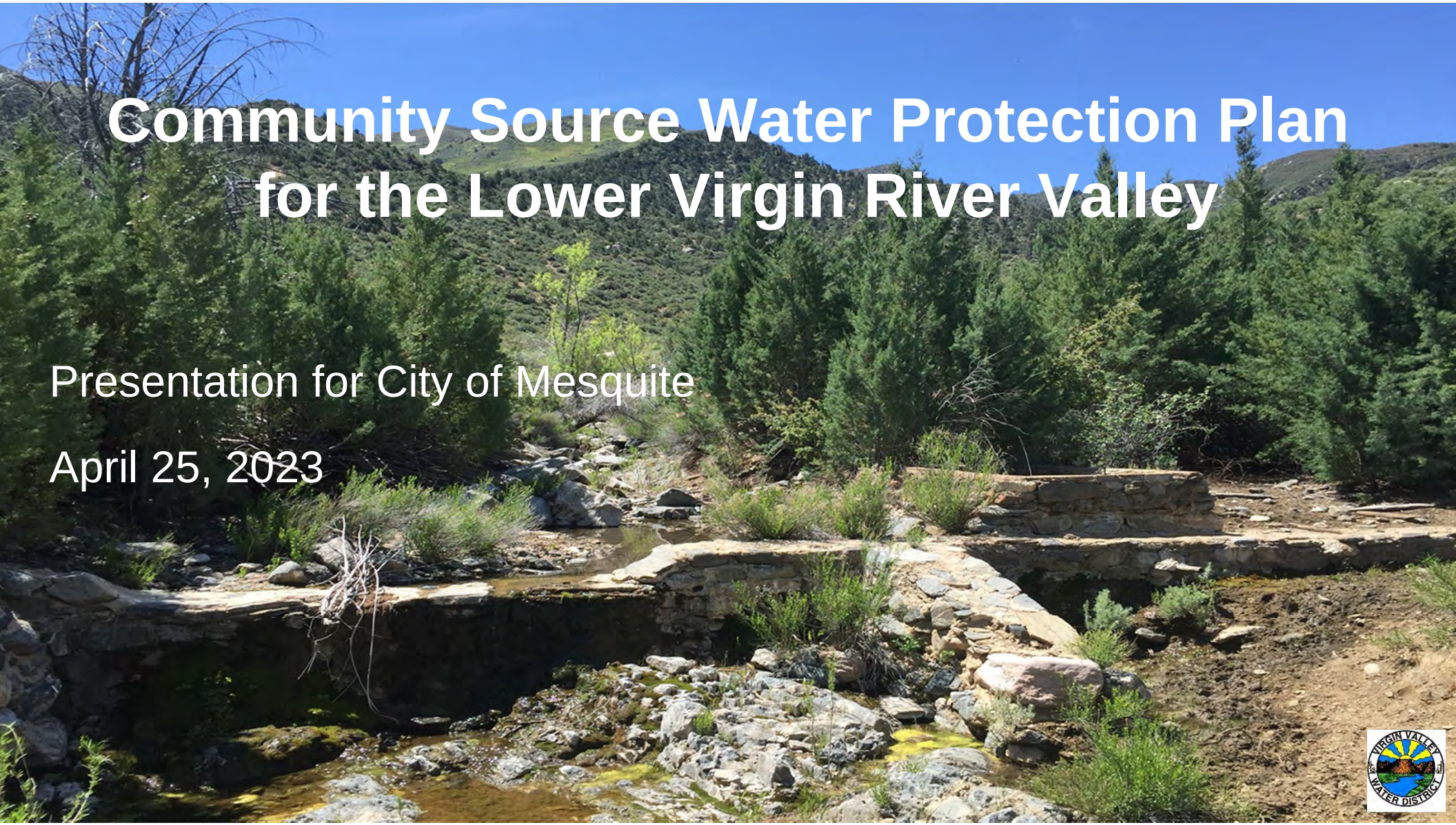
On June 15, 2022, the City of Mesquite approved participation in the State of Nevada's Integrated Source Water Protection Program (ISWPP), a voluntary program to prevent the pollution of community drinking water sources.

The "Community Source Water Protection Plan for the Lower Virgin River Valley, Clark County, Nevada" (CSWP Plan) was prepared over a period of six months through research and work by the local planning team, composed of representatives from the Virgin Valley Water District, the City of Mesquite Development Services Department, the City of Mesquite Geographic Information System Services, the City of Mesquite Public Works, the City of Mesquite Fire Department, the Nevada Rural Water Association, and the Nevada Department of Environmental Protection (NDEP).

The CSWP Plan provides a framework for the long-term protection and conservation of public water supplies in the City of Mesquite. And adoption of the CSWP Plan by the City of Mesquite is a prerequisite for State endorsement and grants to implement action projects recommended in the CSWP Plan;

Fiscal Impact: None

Budgeted Item: No



Community Source Water Protection Plan for the Lower Virgin River Valley

Presentation for City of Mesquite

April 25, 2023

What is the Integrated Source Water Protection Program (ISWPP)?

A Voluntary State program which provides funding and assistance to Nevada communities to develop and implement a plan to protect their drinking water supplies from becoming contaminated.

Evolution of Community Source Water Protection Plan

- November 16, 2021: Approval by Virgin Valley Water District Board
- June 14, 2022: Approval by City of Mesquite
- September 1, 2022: Planning Meetings began and continued until plan was complete and ready for final approval by VVWD Board on April 4, 2023 and City Council on April 25, 2023

Local Planning Team

Virgin Valley Water District

- General Manager
- Water Resource Manager
- District Engineer
- Conservation Specialist

City of Mesquite

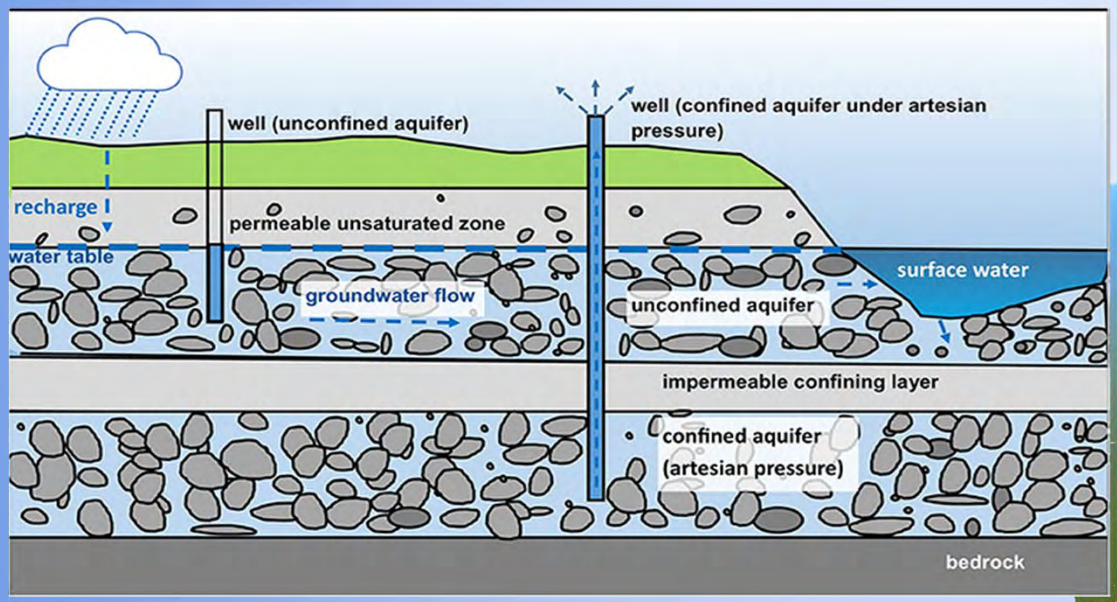
- Public Works
- Development Services
- Fire Department
- GIS Specialist

With assistance from

- Resource Concepts, Inc.
- Nevada Division of Environmental Protection
- Nevada Rural Water
- Bureau of Safe Drinking Water

What does this mean for Lower Virgin River Valley?

- What is Source Water?
- What is our Source Water in the Lower Virgin River Valley?
- How do we protect it?



Community Source Water Protection Plan Goals:

1. **Identify** the sources of, and potential risks to drinking water, and consider them in the local planning framework.

2. **Ensure** that clean and safe drinking water is available for future generations.

3. **Integrate** source water protection and conservation into local planning and zoning documents to ensure that the quality of water matches the goals of the community.

4. **Educate** the community about what is being accomplished to achieve source water protection and conservation.

Management Strategies

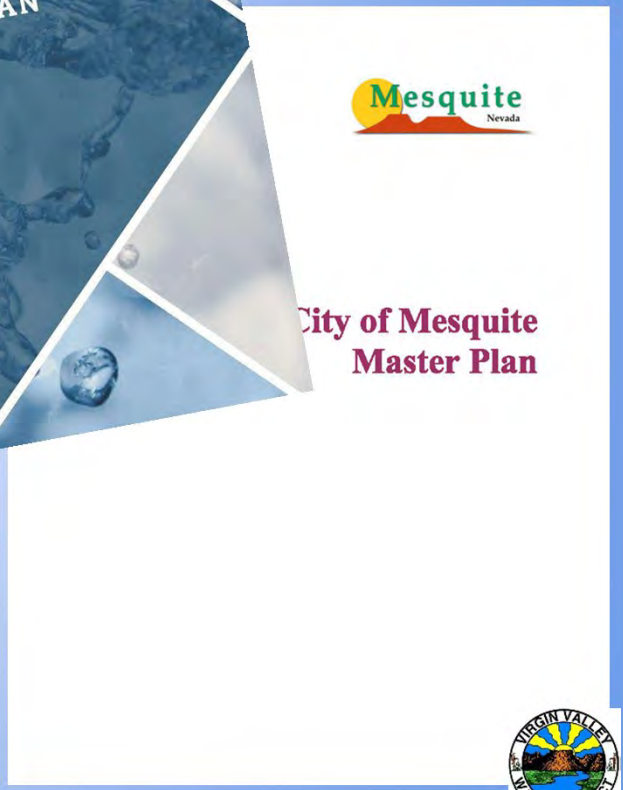
- Public Education and Outreach
- Planning Agency Coordination
- Collaboration with Local and Regional Partners
- Secure Locations for Future Water Sources

Public Education and Outreach

Involve the public in our efforts of Source Water Protection and Conservation

Planning Agency Coordination

Add source water protection and conservation message to VVWD Master Plan, COM Master Plan and VVWD Conservation Plan



Collaboration with Local and Regional Partners

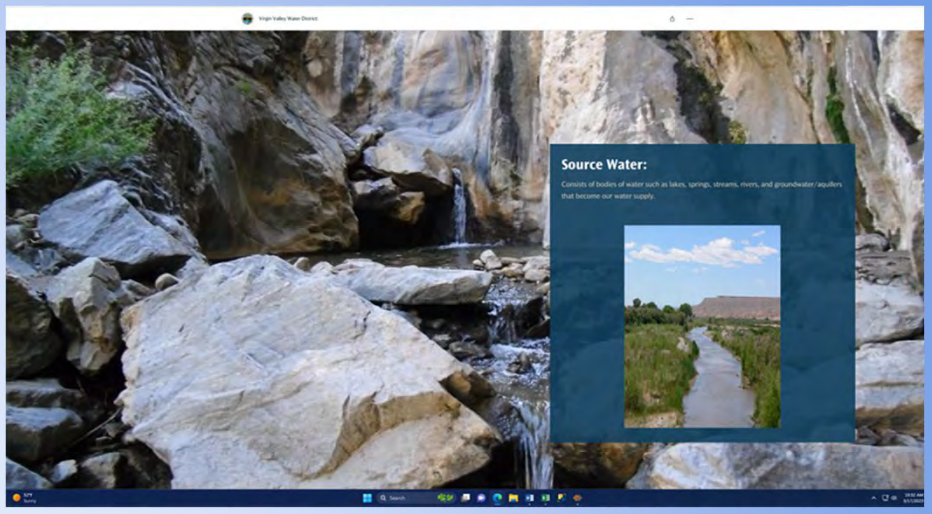
- VVWD
- COM
- Virgin River Coalition
- Nevada Rural Water
- VV Disposal
- BLM

Secure Locations For Future Water Sources

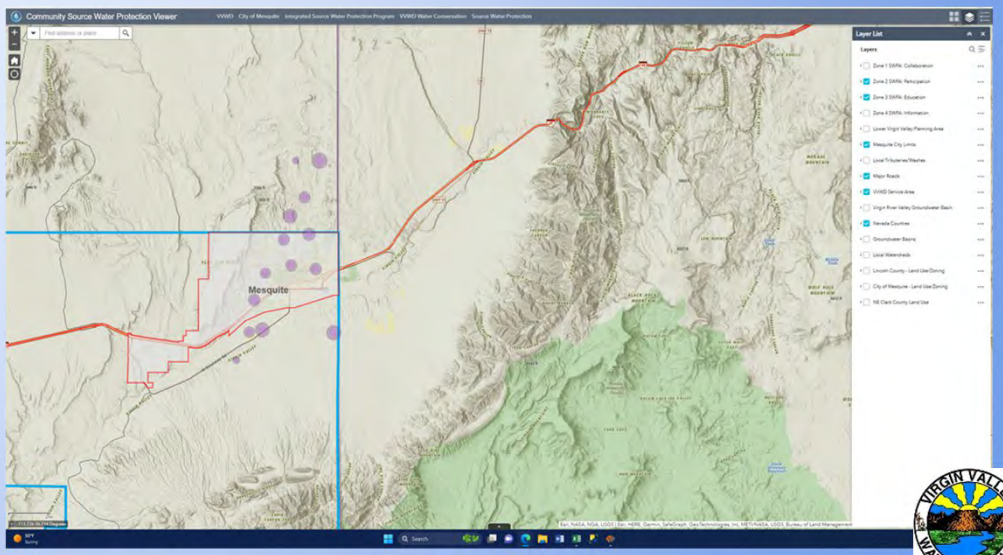
Work in collaboration with our partners to ensure future well sites are protected from contaminants

More Information:

[Lower Virgin River Valley Source Water Protection Story]



[Community Source Water Protection Viewer]




Questions?
WELLHEAD PROTECTION AREA
PREVENT GROUNDWATER POLLUTION BEFORE IT STARTS
NO DUMPING

Attachments:

- Res. R23-018.docx
- CSWPP recommendation letter from board.pdf
- Final Draft NDEP Lower Virgin Valley Community Source Water Protection Plan 3.23.23 rdu_waps.pdf
- CSWPP City of Mesquite.pptx

Mesquite
Nevada

RESOLUTION
R23-018

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MESQUITE ADOPTING THE COMMUNITY SOURCE WATER PROTECTION PLAN FOR THE LOWER VIRGIN RIVER VALLEY, CLARK COUNTY, NEVADA.

WHEREAS, on June 15, 2022, the City of Mesquite approved participation in the State of Nevada's Integrated Source Water Protection Program (ISWPP), a voluntary program to prevent the pollution of community drinking water sources; and

WHEREAS, the "Community Source Water Protection Plan for the Lower Virgin River Valley, Clark County, Nevada" (CSWP Plan) was prepared over a period of six months through research and work by the local planning team, composed of representatives from the Virgin Valley Water District, the City of Mesquite Development Services Department, the City of Mesquite Geographic Information System Services, the City of Mesquite Public Works, the City of Mesquite Fire Department, the Nevada Rural Water Association, and the Nevada Department of Environmental Protection (NDEP); and

WHEREAS, the CSWP Plan provides a framework for the long-term protection and conservation of public water supplies in the City of Mesquite; and

WHEREAS, adoption of the CSWP Plan by the City of Mesquite is a prerequisite for State endorsement and grants to implement action projects recommended in the CSWP Plan; and

WHEREAS, the City Council of the City of Mesquite hereby finds that it is in the best interest of the City to adopt the CSWP Plan to help guide activities to protect and conserve the City's drinking water sources.

NOW, THEREFORE, IT IS HEREBY RESOLVED by the Mayor and City Council of the City of Mesquite that The "Community Source Water Protection Plan for the Lower Virgin River Valley, Clark County, Nevada" adopted as an official plan of the City of Mesquite. The respective officials identified in the CSWP Plan are directed to pursue implementation of the recommended action projects in the CSWP Plan. Future revisions and CSWP Plan maintenance required under the ISWPP are hereby adopted as part of this resolution.

PASSED, ADOPTED AND APPROVED by the City Council of the City of Mesquite, Nevada, on the 25th of April, 2023.

THE CITY OF MESQUITE:
By:

Allan S. Litman, Mayor

Resolution R23-018
Page 1

Attest:
By:

Tracy E. Beck, City Clerk

Approved as to form:
By:

Bryan Pack, City Attorney

NDEP Endorsement

NEVADA DIVISION OF
ENVIRONMENTAL
PROTECTION

STATE OF NEVADA
Department of Conservation & Natural Resources
Joe Lombardo, *Governor*
James A. Settelmeyer, *Director*
Jennifer L. Carr, *Administrator*

May 15, 2023

City of Mesquite; Mayor and City Council
The Honorable Litman Allan, Mayor
10 E Mesquite Blvd,
Mesquite, NV 89027

Virgin Valley Water District Board
Ben Davis, President
500 Riverside Rd,
Mesquite, NV 89027

RE: NDEP Endorsement of the "Community Source Water Protection Plan for the Lower Virgin River Valley Clark County, Nevada"

Dear Mayor, Litman and Mr. Davis,

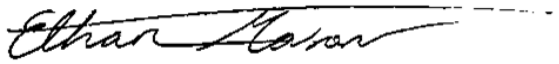
The Nevada Division of Environmental Protection (NDEP) is pleased to endorse and approve the "Community Source Water Protection Plan for the Lower Virgin River Valley Clark County, Nevada" Plan adopted by the Virgin Valley Water District Board on April 4, 2023, and adopted by resolution by the City of Mesquite on April 26, 2023. This new Plan was created through the collaboration between the Virgin Valley Water District (VVWD) staff, City of Mesquite officials and additional stakeholders over the past seventeen months.

The Plan meets established criteria for the State of Nevada's Integrated Source Water Protection Program (ISWPP) and endorsement of a Community Source Water Protection Plan. The local planning team took considerable time to develop and adopt a Plan that meets their community's source water priorities. The approval of this Plan offers participants the opportunity to request technical and financial assistance through NDEP's ISWPP.

NDEP applauds the community's work in protecting drinking water sources and would like to recognize all the team participants and partnering organizations (copied) who gave their time to ensure the plans success. Each participant brought a unique perspective to the planning effort and was dedicated to the plan development process. These talented team members were instrumental in the development of a realistic and community specific planning approach. It was our sincere pleasure to work with each of them and NDEP looks forward to continued collaboration to implement the Plan.

For further assistance, please email the Bureau of Safe Drinking Water, Source Water Protection Program, ndepsourcewater@ndep.nv.gov, or call us at 775-687- 9521.

Sincerely,



Ethan Mason
NDEP ISWPP Coordinator

CC:

Virgin Valley Water District Board
City of Mesquite Mayor & City Council
City of Mesquite Development Services Department
City of Mesquite Geographic Information System Services
City of Mesquite Public Works
City of Mesquite Fire Department
Clark County Manager
Nevada Rural Water Association, USDA Source Water Protection Specialist
NDEP Bureau of Safe Drinking Water, ISWPP Coordinator,
NDEP Bureau of Safe Drinking Water, BSDW Engineering Branch Supervisor,
NDEP Bureau of Safe Drinking Water, BSDW Bureau Chief,
Resource Concepts Inc., RCI ISWPP Contractor
District EPA Region 9 SWP Coordinator

Appendix C

Buffer Zone Calculation Summary Report

Table of Contents

List of Tables

List of Figures

List of Charts

Attachments

Attachment A Water Source Worksheets
Attachment B Land Use and Zoning Reference Table

Acronyms

AFR	Arbitrary Fixed Radius
BSDW	Bureau of Safe Drinking Water
CFR	Calculated Fixed Radius
CSWP Plan	Community Source Water Protection Plan
FEMA	Federal Emergency Management Agency
HA	Hydrographic Area
HUC12	Hydrologic Unit Code 12
ISWPP	Integrated Source Water Protection Program
mya	million years ago
NDEP	Nevada Division of Environmental Protection
NDWR	Nevada Division of Water Resources
PCS	potential contaminant source
PWS	public water system
SDWIS	Safe Drinking Water Information System
SWPA	source water protection area
Team	Local Planning Team
USGS	United States Geological Survey
VVWD	Virgin Valley Water District
WHAEM	Wellhead Analytic Element Model
WQMP	Water Quality Management Plan

[file doc: 2023-05-24 Fnl Tech Rpt Appendix C 20-158.B5-C ac-jm L5-20.docx)

1.0 Introduction

The following report presents the conceptual approach for delineating well buffer zones relative to the public water system (PWS) in the Lower Virgin River Valley. The Virgin Valley Water District (VVWD) is the only PWS in Planning Area 3, as outlined in the Clark County 208 Area-Wide Water Quality Management Plan (WQMP). The Nevada Division of Water Resources (NDWR) has divided Nevada into Hydrographic Areas (HAs) for the administration of water rights. The Lower Virgin River Valley and all of the public groundwater supply wells managed by the VVWD are located in HA 222. The VVWD serves the City of Mesquite and the town of Bunkerville (Bunkerville). The VVWD service area, outlined on Figure 1-C, encompasses the majority of Planning Area 3 (WQMP, 2009). All water sources managed by the VVWD are groundwater sources (Figures 2.1-C and 2.2-C), and there are no plans to utilize surface water in the near future.

This technical report has been prepared for the Local Planning Team (Team) and the Bureau of Safe Drinking Water (BSDW) to review and comment, in accordance with the Nevada Integrated Source Water Protection Program (ISWPP) guidelines for developing a state-endorsable Community Source Water Protection Plan (CSWP Plan).

This documentation of the conceptual approach includes:

- Comprehensive review of the water supply area and well parameters used to calculate buffer zones around each well,
- Description of the methods used to calculate the buffer zones, including a discussion of basic assumptions, and
- Buffer zone results for the water sources in the PWS managed by the VVWD.

Detailed water source worksheets are presented in Attachment A. Each water source worksheet contains a summary of the data collected and results of the buffer zone calculations.

1.1 Geographic, Geologic, and Hydrologic Setting of the Lower Virgin River Valley Basin

The Lower Virgin River Valley Basin is primarily located in southeast Lincoln County and northeast Clark County, Nevada. The Basin also extends into Mohave County, Arizona, and Washington County, Utah. Several communities in Arizona use groundwater in the Valley for municipal supplies. The VVWD manages the only Nevada PWS in the Valley utilizing groundwater for its potable water supply.

The Lower Virgin River Valley Basin is a large structural depression which formed during the Miocene, approximately 24 million years ago (mya). The Lower Virgin River Valley Basin is thought to be one of the deepest in the entire Basin and Range Province, with an estimated depth to carbonate basement rock of five miles. Today, the Lower Virgin River Valley Basin is approximately 1,178 square miles and is surrounded by the East Mormon Mountains to the west, Tule Spring Hills to the northwest, and the Beaver Dam Mountains to the east-northeast. The Virgin Mountains sharply truncate the Lower Virgin River Valley Basin from the south.

Figure 1-C. Location Map

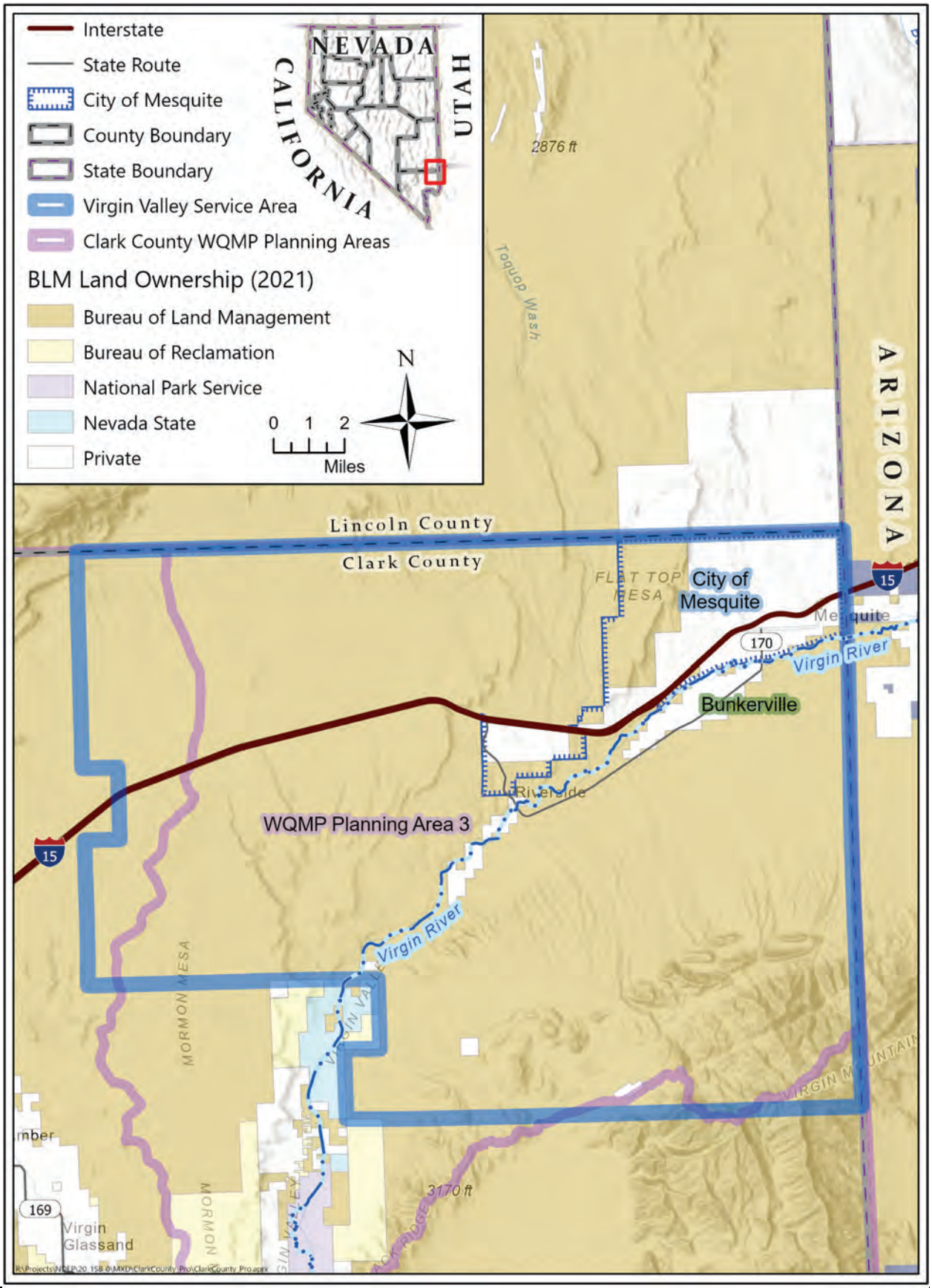


Figure 2.1-C. Lower Virgin River Valley Well Map (North)

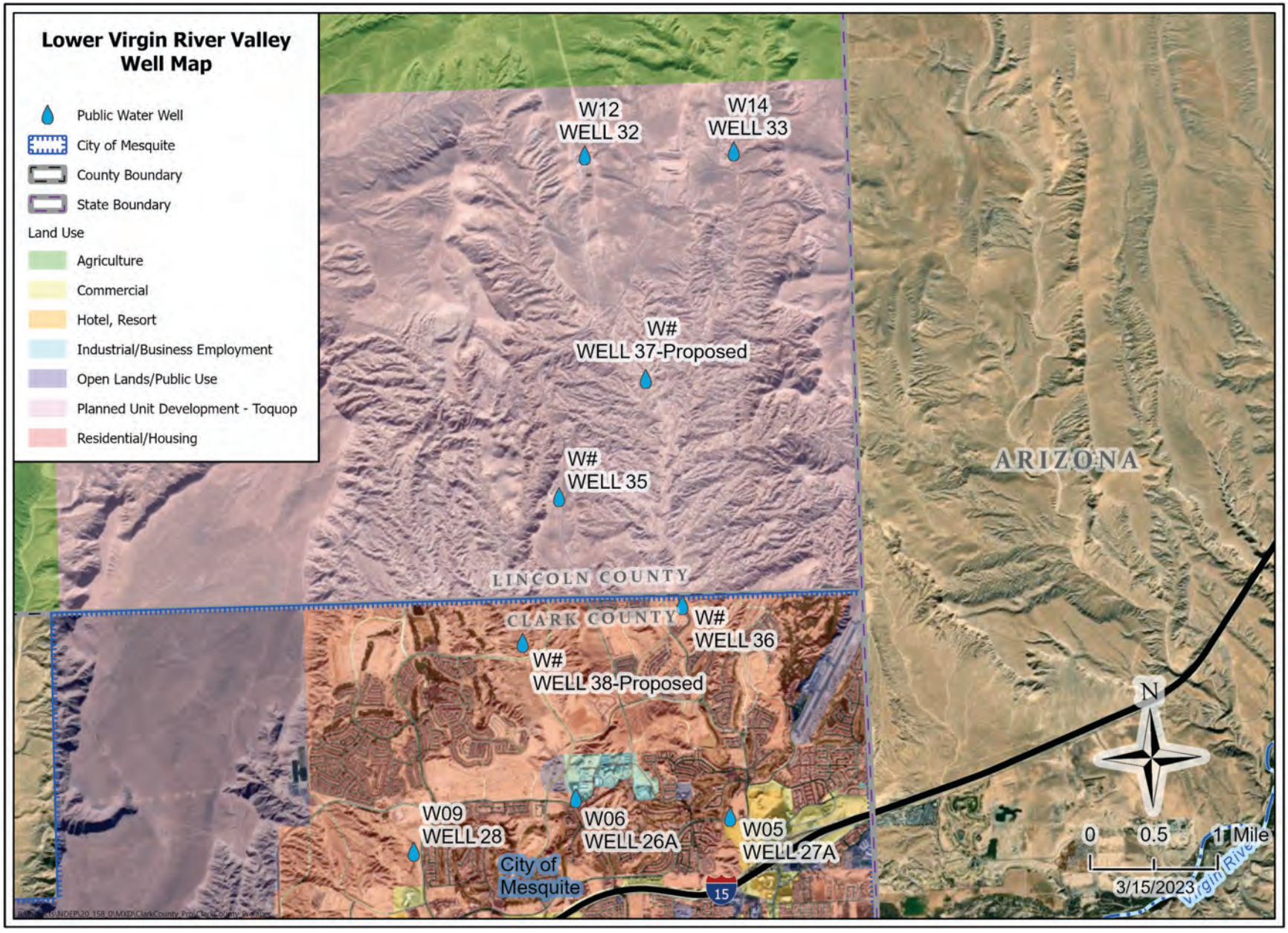
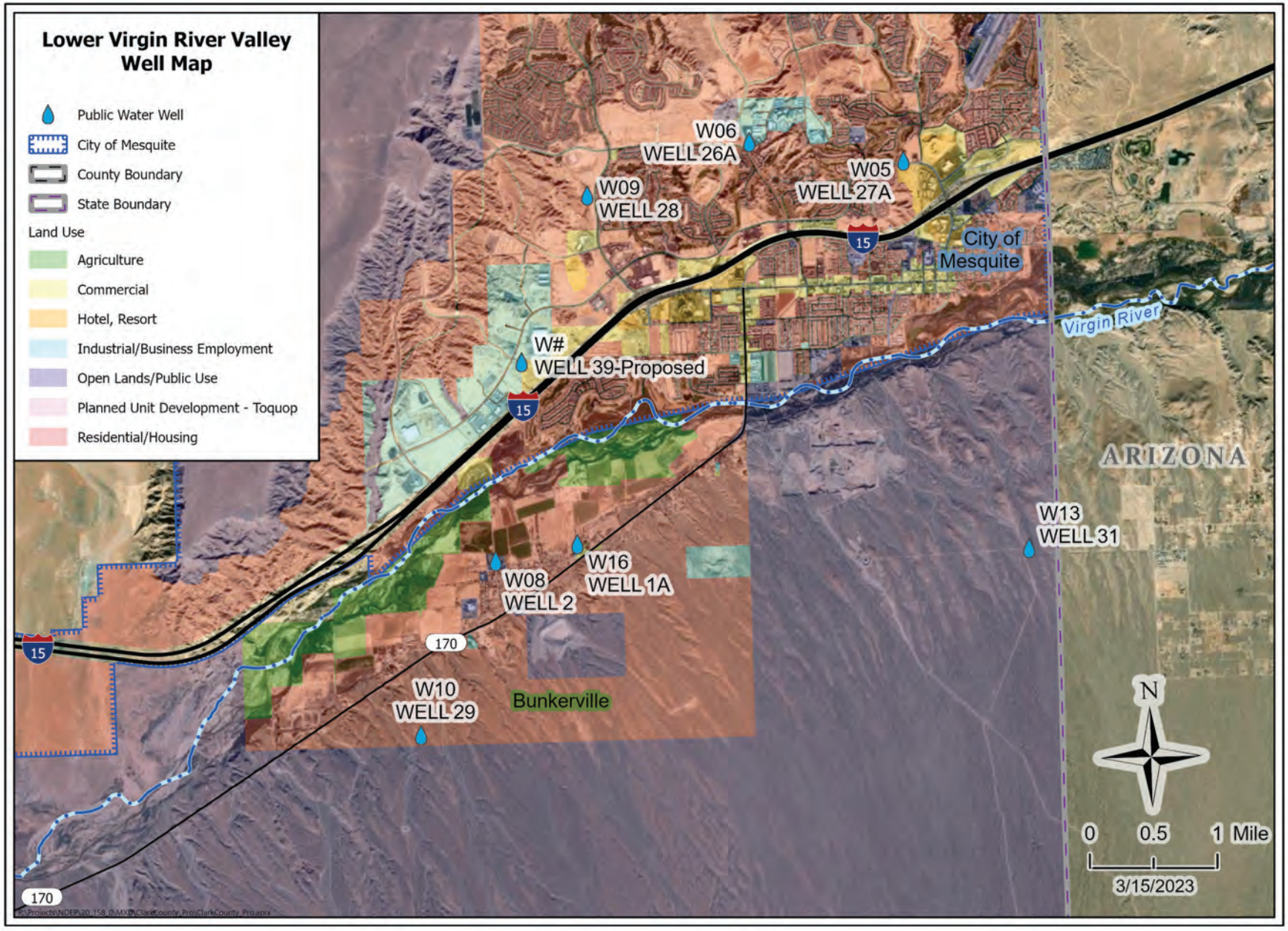


Figure 2.2-C. Lower Virgin River Valley Well Map (South)



Prior to the Miocene, the present-day Mesquite area was structurally similar to the Colorado Plateau. Extensional stress, subsidence, and normal faulting during the Miocene developed the basins and ranges in Nevada and relative uplift of the marginal Colorado Plateau. From 24 to 13 mya, slow basin subsidence and accumulation of the Horse Springs and Muddy Creek Formations occurred. Subsequently, from 13 to 10 mya, normal faulting divided the Lower Virgin River Valley Basin from the Lower Moapa Valley Basin to the southwest. As tectonic activity decreased, deposition of the Muddy Creek Formation into the Lower Virgin River Valley Basin lasted approximately six million years (11.5 to 5.5 mya). Steep dips and angular unconformities indicate that the area around present-day Mesquite experienced continued subsidence and normal faulting throughout the deposition of the Muddy Creek Formation. Quaternary fault scarps indicate that deformation is still occurring, and deposition is estimated to be 0.5 to 1 mile thick in some places.

Muddy Lake was formed approximately 5.5 mya, as a result of inflow from the Colorado and Virgin Rivers into the Lower Virgin River Valley Basin. A subsequent breach of the Lower Virgin River Valley Basin caused drainage into the Colorado River Basin, and eventually the Pacific Ocean. A lowering of base level followed the breach, inducing at least four cycles of incision and aggradation by the Virgin River, and surface regrading between the river and the Virgin Mountains. Modern day landforms are a result of the subsequent rapid erosion of soft sediments.

Today, the Valley has a drainage area of approximately 1,723 square miles, from the Virgin River Gorge to the confluence of the Virgin River and Lake Mead. The Virgin River is the main surface-water feature, with one other perennial stream, the Beaver Dam Wash. There are several aquifers in the Mesquite Basin, with the main being the Muddy Creek Formation. The deepest aquifer underlies the entire basin and is comprised of saturated Paleozoic carbonate rocks. These carbonate rocks are overlain with the 0.5 to 1 mile thick Muddy Creek Formation. Upwelling from the carbonate-aquifer system through faults and fracture zones is the main source of groundwater recharge to the Muddy Creek Formation aquifer. The VVWD is the largest and only Nevada PWS in the Valley to draw all of its potable groundwater from the Muddy Creek Formation, with well depths ranging from 1,000 to over 2,000 feet.

2.0 Methods Used in Buffer Zone Conceptualization

2.1 Well Locations and System Overview

The VVWD manages the effective service area in the City of Mesquite and Bunkerville, located in Clark County, Nevada (Figure 1-C). The VVWD delivers drinking water to an estimated 25,000 people, and provides services to golf courses, casinos, and commercial, industrial, and institutional facilities.

The VVWD manages a system which includes nine active wells, two newly constructed inactive wells, and three proposed future well locations, as depicted on Figure 2.1-C and Figure 2.2-C. The system consists of eight pressure zones, six arsenic treatment plants, with one additional plant in design, and eight water storage tanks. An existing system map and an existing pressure zone map are included as Figure 3-C and Figure 4-C, respectively. Table 1-C outlines the VVWD well and system network.

Table 1-C. Virgin Valley Water District Well and System Network

Well Name	Jurisdiction	Status	Pressure Zone	Storage Tanks	Arsenic Treatment Plant
Well 1A	Bunkerville	Active	5, 6, 7, 8	Scenic and Decker	No. 1A
Well 2	Bunkerville	Active	5, 6, 7, 8	Scenic and Decker	NA
Well 26A	Mesquite	Active	2	Airport and Flat Top	No. 27
Well 27A	Mesquite	Active	2	Airport and Flat Top	No. 27
Well 28	Mesquite	Active	2	Airport and Flat Top	No. 28
Well 29	Bunkerville	Active	5, 6, 7, 8	Decker	No. 29
Well 31	Bunkerville	Active	5, 6, 7, 8	Scenic	No. 31
Well 32	Lincoln County	Active	1, 3, 5	Lincoln 1 and 2	No. 32
Well 33	Lincoln County	Active	1, 3, 5	Lincoln 1 and 2	No. 32
Well 35	Lincoln County	New-Inactive	1	Northwest	Future No. 35
Well 36	Mesquite	New-Inactive	1	Northwest	Future No. 35
Well 37	Lincoln County	Future	NA	NA	NA
Well 38	Mesquite	Future	NA	NA	NA
Well 39	Mesquite	Future	NA	NA	NA

NA= Not Applicable

Concentrations of gypsum and evaporite minerals in the Lower Virgin River Valley Basin effect the quality of the groundwater. The groundwater extracted from the Muddy Creek Formation in the Lower Virgin River Valley Basin contains naturally occurring arsenic at levels ranging from 5 to 86 micrograms per liter. Compliance with federal drinking water standards requires arsenic levels to be at or below 10 micrograms per liter. All District wells, except for Well 2 in Bunkerville, require Arsenic Treatment Plants (Figure 3-C, Table 1-C).

The VVWD wells are outfitted to be pumped continuously without significant drawdown. Typically, three to five, out of nine active wells, are always in operation from October through April. During the months of May through September, seven to eight of the wells are online. Well 1A and Well 2 are the only two wells which interact with each other (i.e., when Well 2 is operating, the water level in Well 1A is reduced). One of either Well 26A or Well 27A typically runs 24 hours a day, while the other seven active wells in the system will run for 4 to 12 hours and shut down for 12 hours or longer depending on the time of year.

Figure 3-C. Virgin Valley Water District Existing System Map

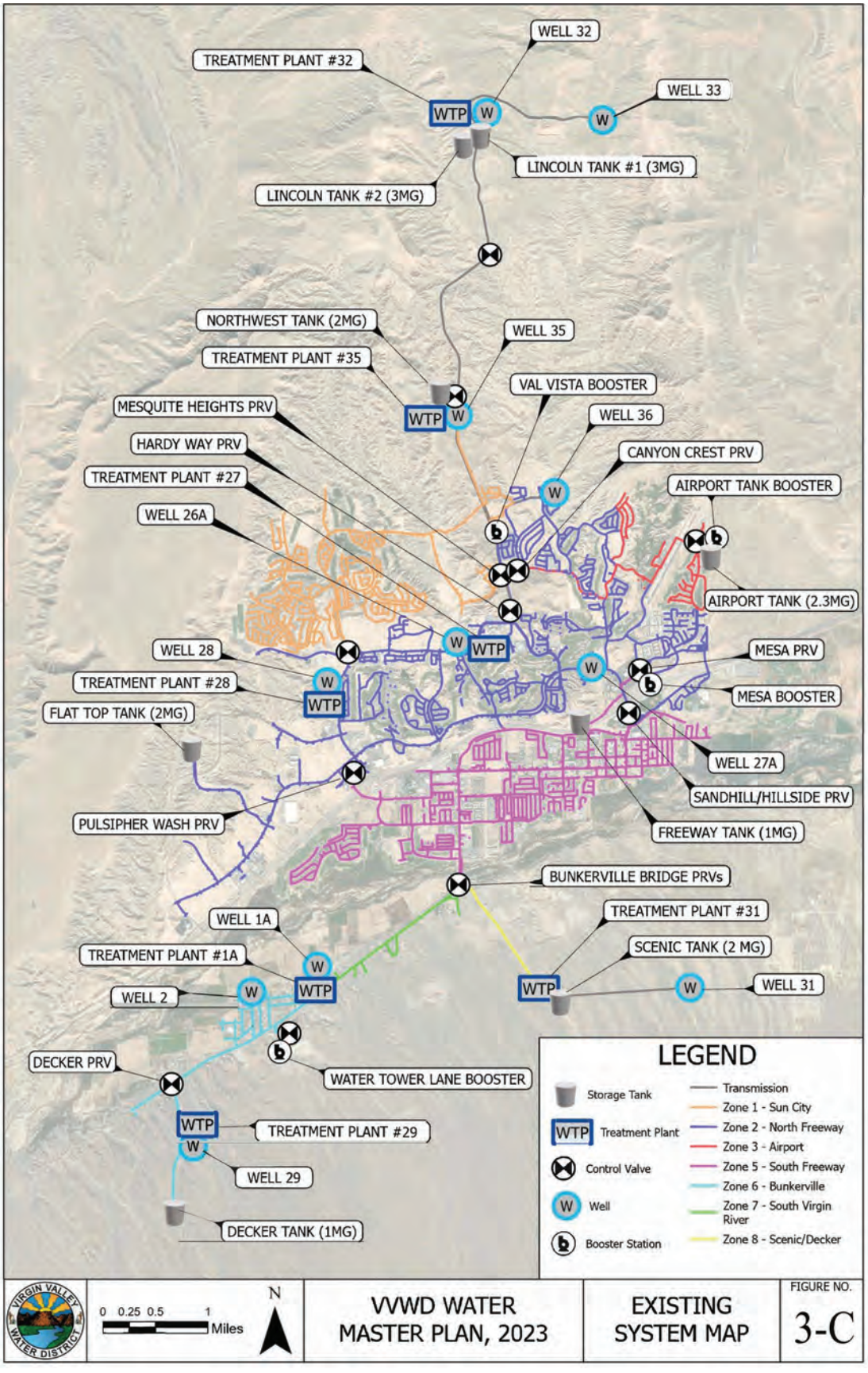
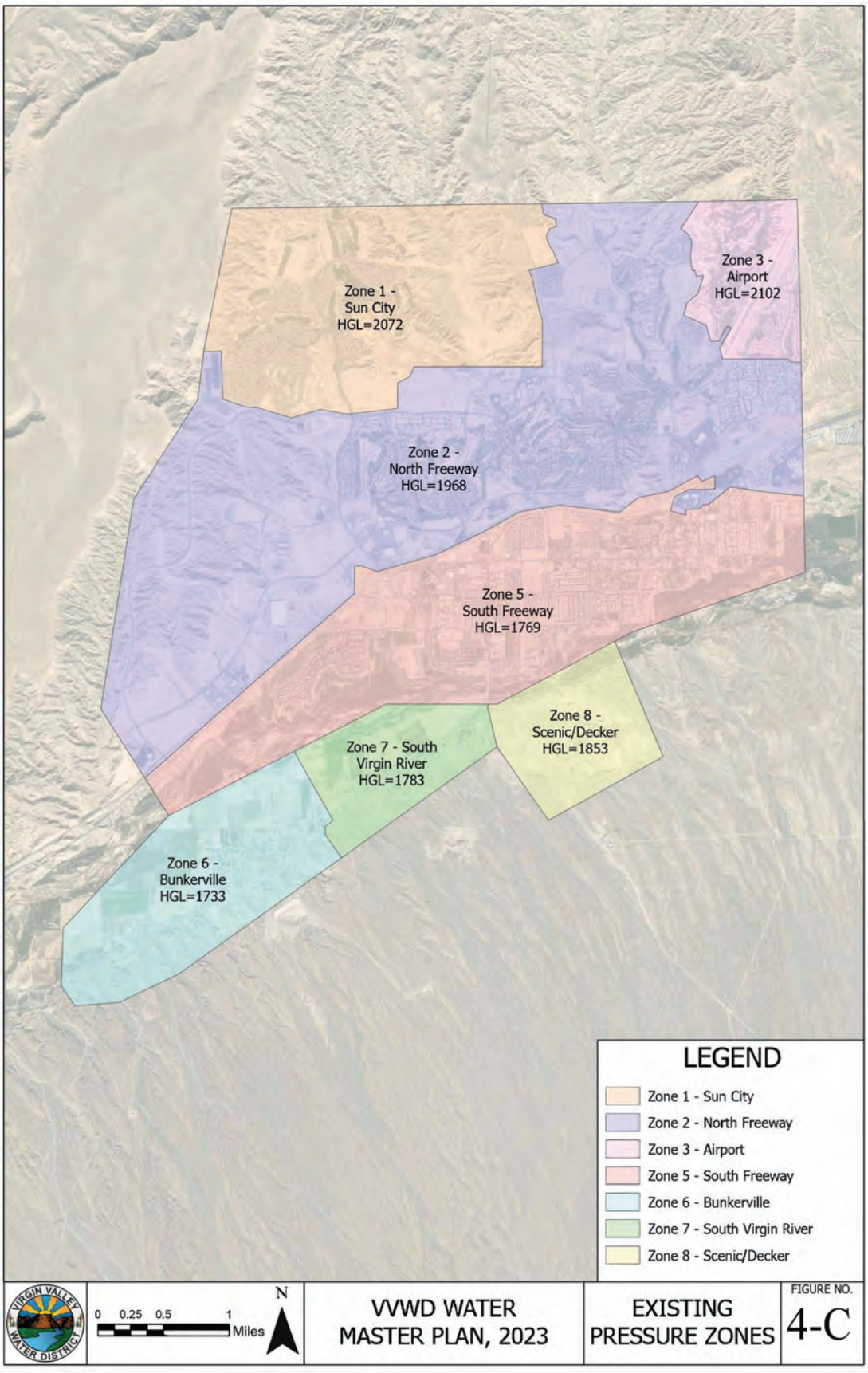


Figure 4-C. Virgin Valley Water District Existing Pressure Zone Map



Well data considered for the conceptual buffer zone calculations are organized by well on the water source worksheets in Attachment A, and were obtained from multiple sources including:

- Databases maintained by the VVWD,
- Well logs obtained from the VVWD and the Nevada Division of Water Resources (NDWR) database for active public supply wells,
- VVWD 2018 Sustainability Report, 2020 Water Master Plan, and 2022 Trigger Source Monitoring Plan, and
- Safe Drinking Water Information System (SDWIS).

Additional data on the water source worksheets include the HA number and the Hydrologic Unit Code 12 (HUC12). The HUC12 watershed boundaries are determined by the United States Geological Survey (USGS) using science-based hydrologic principles without the consideration of administrative boundaries, special projects, or a particular program or agency (USGS, 2017). These data were sourced from the NDWR and the USGS, respectively.

2.2 Buffer Zone Calculation Considerations

A buffer zone represents an area of potential groundwater recharge around a well. Buffer zones are a useful tool for delineating and visualizing areas around a well which should be safeguarded from surface and subsurface sources of man-made pollution to protect drinking water quality. Buffer zones can be determined using hydrologic characteristics and can employ either simple or complex analytical and numerical models.

Complex numerical and analytical models describe groundwater flow to pumped wells and involve groundwater flow equations that are not always useful for every aquifer (USGS, 1994). Complex models require several assumptions to generate the equations and are not always representative of the groundwater flow system. For instance, the transmissivity, or the ability of the Muddy Creek Formation to transmit groundwater throughout its entire saturated thickness, can vary significantly based on location (Warner, 2003). This can pose a problem for numerical models that may require a fixed hydraulic conductivity and aquifer thickness, which are proportional to the varying transmissivity. The Muddy Creek Formation is separated by continuous confining units which contain discontinuous clay interbeds (Warner, 2003), making a homogenous numerical simulation invalid. All models have error, and time-intensive numerical simulations are often based on the same assumptions relative to simpler analytical models, making them prone to the same invalidations (USGS, 1994).

Within the next three years, the VVWD will complete an integrated Perennial Yield Groundwater Model to determine the maximum amount of groundwater that can be used annually over the long-term without depletion. Phase 1 of the study consisted of gathering existing data, and Phase 2 will consist of adding new monitoring data to the study. Once the study is complete, it will include a detailed groundwater flow model, which will be updated every five years. Subsequently, an intensive numerical model may be appropriate for buffer zone delineations.

The United States Environmental Protection Agency's Wellhead Analytic Element Model (WhAEM) is a groundwater flow model designed to facilitate buffer zone and source water protection area delineations. The WhAEM (EPA, 2018) calculates buffer zones based on radius methods, well in uniform flow solutions, and geohydrologic modeling methods. The WhAEM was considered for this CSWP Plan. However, the VVWD determined that the model might not be representative of their current modeling efforts, making it counterproductive. The VVWD wells are over 1,000 feet deep (Attachment A), and the WhAEM uniform flow solutions would not reflect the complexity of the Muddy Creek Formation aquifer characteristics. In

addition, the WhAEM does not consider the fate and transport of contaminants in the unsaturated zone between the ground surface and the local aquifer. All of the potential contaminant sources (PCSs) in the VVWD service area occur from human activities at the ground surface. However, contaminants moving downward from the ground surface could also encounter impermeable layers causing them to travel horizontally toward a well location. As a result, the Team emphasized that their priority will be to manage PCSs in the vicinity of the public water system wells to accomplish local source water protection.

Simple analytical calculations can provide buffer zones which are more representative of the needs of the community that the VVWD serves. They can make it easier to identify the sources of and potential risks to drinking water for consideration in the local planning framework, as outlined in Goal 1 of this CSWP Plan. The equations can be solved quickly, and the methods can be easily interpreted. This can help facilitate the integration of source water protection into local planning and zoning documents, as outlined in Goal 3 of this CSWP Plan. The Team determined that a calculated fixed radius with a specified time of travel would be the most effective way to conceptualize the buffer zones and integrate source water protection into the local planning framework.

The time-of-travel buffer zones were based on specific requests from the Team with regard for the future needs of the community, while also incorporating the Nevada ISWPP guidelines for buffer zone calculations. Two methods were used to establish buffer zones around each wellhead. The Arbitrary Fixed Radius (AFR) method and the Calculated Fixed Radius (CFR) method are both approved methods within the ISWPP (NDEP, 2010) for determining buffer zones. These conceptual approaches do not "simulate" the complex reality of heterogeneous geologic formations and dynamic groundwater flows. They do, however, provide for a conservative buffer zone delineation which can be updated once the integrated perennial yield study and groundwater model are complete. The data and results of the buffer zone calculations and related information are included on the Water Source Worksheets in Attachment A and described in the following paragraphs.

2.3 Buffer Zone Calculations

The initial buffer zone was represented using the AFR method. The AFR method uses the distance criterion to define a circle around a well (Figure 5-C) and was selected based on the VVWD's desire to establish control/ownership within close proximity of a well. The AFR method implies a fixed setback from a public water supply source which allows for initial protection from a PCS. The subsequent buffer zones were calculated using the CFR method, which uses a volumetric flow equation and the specified time of travel thresholds to calculate the radius of a circle (Figure 6-C). The calculated radius represents the groundwater contributing to a well over time. The CFR method considers pumping data, aquifer/well characteristics, and time-of-travel. The following equation was employed:

$$r = \sqrt{\frac{Qt}{\pi n b}}$$

Fixed Radius Method USEPA, 1987

Where:
r = calculated fixed radius (buffer zone in feet) for the specified time of travel
Q = pumping rate of the well (cubic feet per day)
t = travel time interval (days)
π = pi 3.1416
n = aquifer porosity (expressed as fraction by volume)
b = length of well screen (feet)

Figure 5-C. Sample Approach Arbitrary Fixed Radius Method (NDEP, 2010)

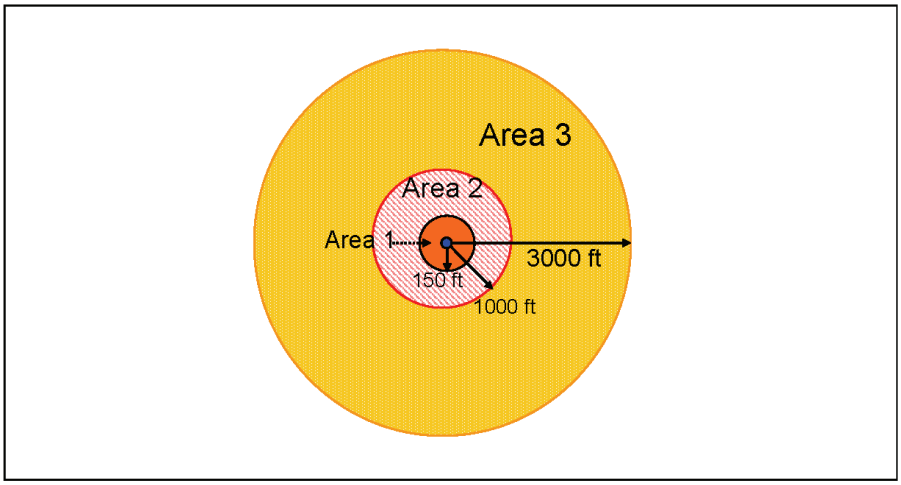
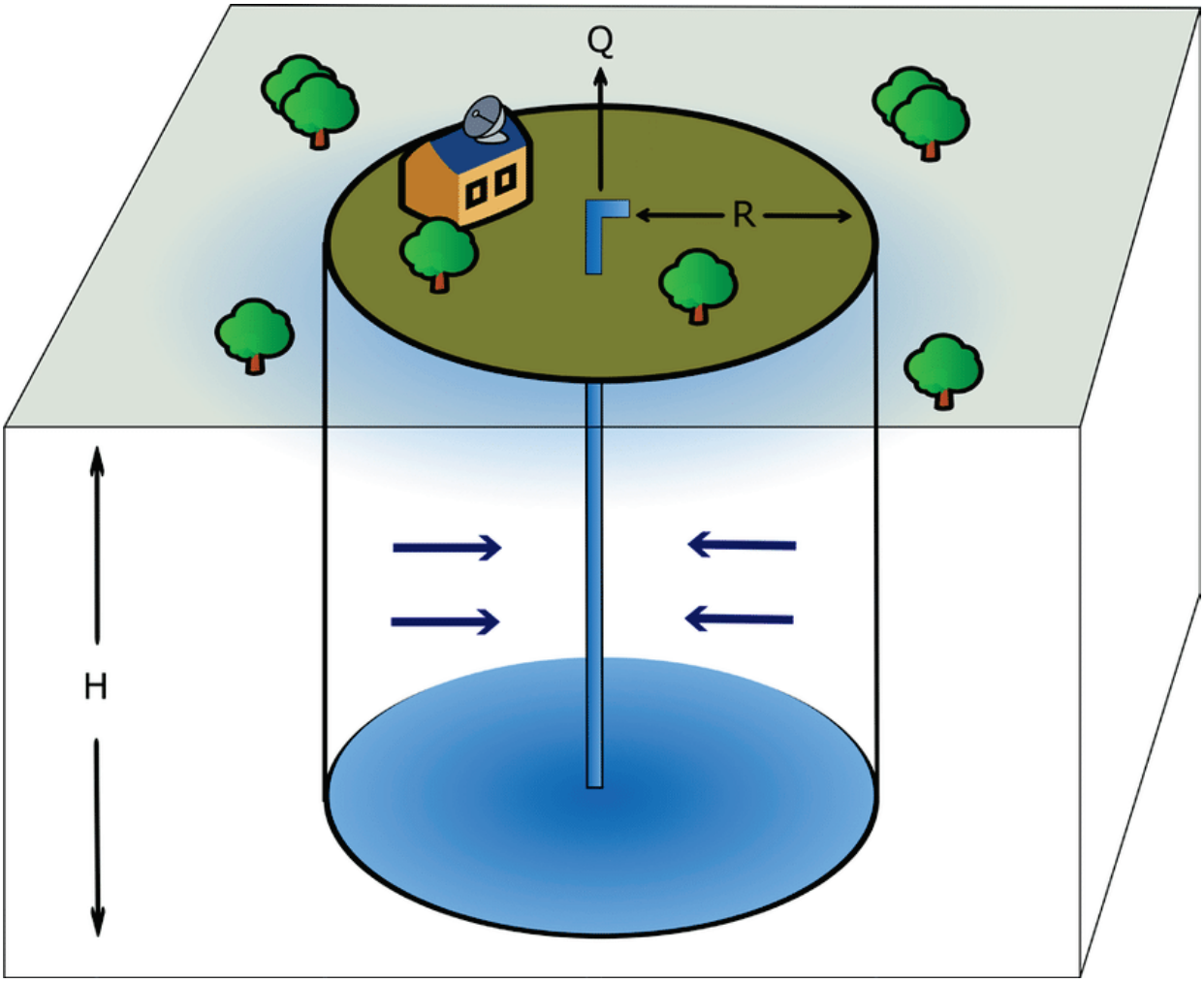


Figure 6-C. Sample approach Calculated Fixed Radius Method.

H = length of the well screen



2.3.1 Groundwater Pumping Rates

Groundwater can be obtained by drilling or digging a well deep enough to penetrate an aquifer. The well will fill with water, which is then brought to the surface using a pump. A groundwater pumping rate is the volumetric unit over time, the rate, at which water is drawn out of the well. Pumping rate data used in the CFR calculations for each well, including the newly constructed inactive and future wells, were provided by the VVWD. The technical source for each rate is outlined in Table 2-C. The pumping rates were reviewed by the VVWD and used to calculate the conservative buffer radius around each well.

Table 2-C. Pumping Rate Source Per Well

Source	Well Name
August 2018 maximum pumping rate from the 2020 Water Master Plan	2, 26A, 28, 29, 31, 32, and 33
Sustainable yield from the 2018 Well Sustainability Study	1A and 27A
Estimated maximum pumping rate provided by the VVWD	35, 36, 37, 38, and 39

2.3.2 Time of Travel

The fixed radius and time of travel buffer zones were based on the Team's consideration for the future needs of the community and the Nevada ISWPP guidelines. The key criteria and descriptions for the time of travel buffer zone calculations are explained in Table 3-C.

Table 3-C. Time-of-Travel Buffer Zone Calculation Descriptions

Buffer Zone	Descriptions
100-ft AFR	Establishing a boundary around all property within a 100-ft radius of each wellhead is important to the VVWD and consistent with the 100-ft radius well buffer outlined in the Clark County 208 Area-Wide Water Quality Management Plan (Las Vegas Valley Groundwater Management Program).
250-Day and 2-Year CFR	The location of high hazard PCSs within the 250-Day and 2-Year CFR are a concern for the VVWD. These buffer zones will support management of PCSs in close proximity to water sources. The 2-Year buffer zone satisfies NDEP criteria for an endorsable CSWP Plan.
5- and 10-Year CFR	Identifying the sources of and potential risks to drinking water within these time-of-travel buffer zones will give the community time to consider them in the local planning framework and integrate source water protection into local planning and zoning documents. The 5-and 10-Year buffer zones satisfy NDEP criteria for an endorsable CSWP Plan.
30-Year CFR	Reflects broader community goals and risks over the long term to the deep aquifer.

2.3.3 Porosity

The porosity of an aquifer is the percentage of empty space which exists within a given porous media. In the CFR calculation, porosity is represented by a dimensionless decimal value, where multiplication by 100 gives a percentage value. Well screens in the VVWD are generally set in clayey sandy gravel, silty sandy clay, and clayey sand. Minimum porosity for these three soil types ranges from 0.17 to 0.21, with an average of 0.21. A porosity of 0.2 was used in the CFR calculations for this report to obtain the most

conservative buffer zones. A porosity of 0.2 was also reviewed and confirmed by the VVWD as reasonably representative for their existing and proposed wells.

2.3.4 Perforated Well Screen Lengths

A perforated well screen is a length of casing inside a well which is structured to protect the borehole while allowing water to flow through. The “length of well screen’’ parameter used in the CFR calculation was determined by the sum of the perforated well screen intervals in each well (active and inactive), as derived from available well logs. This approach obtains the most conservative (largest) radius for each time threshold around each water source. The “length of well screen” for future Wells 37 through 39 were estimated by the VVWD using best professional judgement.

3.0 Characterization within Buffer Zones

Source water protection programs can help manage the degradation of groundwater quality from human activities, as well as from natural hazards such as wildfires and floods. Characterization within the buffer zones of the potential occurrence of human activities and natural hazards were important to the Team for framing water quality concerns, and then developing local source water protection strategies. Buffer zone characterizations provided detailed and relevant data to facilitate source water protection area (SWPA) delineation discussions, which will ultimately help to protect drinking water sources so that the VVWD can serve its community for generations to come.

3.1 Natural Hazards

Flooding is a risk to PWSs because it can occur with little warning, exert impulsive loads on objects in the flood paths, block drainage ways, and damage infrastructure. Flooding that inundates private domestic or public water system wells also has potential to contaminate those water sources. Wildland fire is a risk to PWSs because it can destabilize the watershed, increase erosion that delivers sediment to drainages, and also destroy infrastructure. Wellheads and spring developments are particularly susceptible to fire damage.

Mapping to characterize well buffer zones for risk of these potential hazards was obtained from the following sources:

- Federal Emergency Management Agency (FEMA) map service, and
- Nevada Division of Forestry Natural Resources and Fire Information Portal.

Information about these hazards was evaluated for each VVWD well location, included on the Water Source Worksheets (Attachment A), and discussed in the Potential Contaminant Source Inventory (Appendix D of this CSWP Plan). Currently, the buffer zones for VVWD wells are not characterized as having a high risk of wildland fire and all wells are located outside the “100-year” floodplain indicated by FEMA mapping.

3.2 Human Activities

3.2.1 Land Use and Zoning

Land use and zoning controls are used to influence the location and type of real estate development within a community. Land use, or the way that people adapt the land to suit their needs, is typically a long-range planning tool used shape the development of a community. Zoning is typically a regulatory designation by local government used to established requirements for various use types, on a parcel-by-parcel basis within a community. Land use and zoning designations provide an indicator of existing and future locations where potential contaminant sources are more likely to be present. For example, transportation and storage use is more likely to occur for:

- Hazardous chemicals in Industrial areas,
- Pesticides and fertilizers in agricultural areas, and
- Hydrocarbon fuels at gas stations in commercial areas.

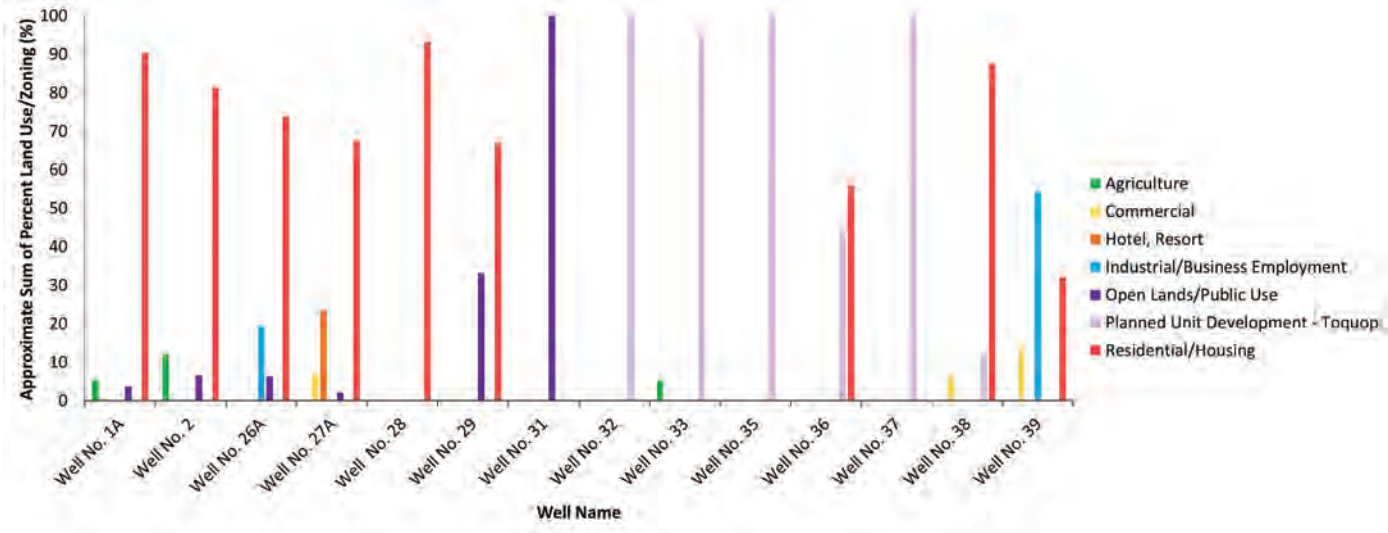
Land use and zoning designations from the City of Mesquite and Clark County were grouped for mapping and well buffer zone characterization purposes. A reference table of the grouped designations for “land

usage" used in this CSWP Plan are included as Attachment B. The local jurisdiction and predominant land usages around each water source within the 30-Year buffer zones are listed in Table 4-C and the approximate sum percentage of land usage is presented on Chart 1-C. The grouped land usage is depicted on Figures 2.1-C and 2.2-C.

Table 4-C. Jurisdiction and Predominant Land Usage Around the Well

Well Name	Jurisdiction	Land Usage 30-Year CFR
Well 1A	Bunkerville	Residential/Housing
Well 2	Bunkerville	Residential/Housing
Well 26A	City of Mesquite	Residential/Housing
Well 27A	City of Mesquite	Residential/Housing
Well 28	City of Mesquite	Residential/Housing
Well 29	Bunkerville	Residential/Housing
Well 31	Bunkerville	Open Lands/Public Use
Well 32	Lincoln County	Planned Unit Development - Toquop
Well 33	Lincoln County	Planned Unit Development - Toquop
Well 35	Lincoln County	Planned Unit Development - Toquop
Well 36	City of Mesquite	Residential/Housing
Well 37	Lincoln County	Planned Unit Development - Toquop
Well 38	City of Mesquite	Residential/Housing
Well 39	City of Mesquite	Industrial/Business Employment

Chart 1-C. Approximate Sum Percentage of Land Use/Zoning by Well within the 30-year Buffer Zone



3.2.2 Irrigation and Water Conservation

Both residential and agricultural irrigated areas are considered as potential contaminant sources because fertilizers and pesticides can be conveyed to groundwater and surface water. This is particularly true where irrigation and chemical applications are managed to maximize aesthetics for landscaping, often resulting in over application of both water and chemicals in southern Nevada's desert climate. In the Colorado River Basin, where water shortage is an urgent and on-going concern, the local Team has identified management strategies that achieve both source water protection and conservation goals.

4.0 Discussion and Results

The AFR and CFR method results were presented to the Team for review and comment to ensure that the results were reasonable and justifiable given the assumptions and available data. Results of the AFR, and CFR method calculations are presented on Figure 7-C.

Although these methods may not accurately represent complex groundwater systems, the results are useful for understanding local water resources and identifying measures to protect them from potential contamination. The results facilitated Team discussions around PCS risks to source water, SWPA delineations, and CSWP Plan management strategies and actions.

- Final results and evaluation of PCSs within buffer zones are discussed in Appendix D,
- SWPA delineation methods and results based are outlined in Appendix E, and
- The Action Plan for implementing source water protection is presented in Appendix F of this CSWP Plan.

Figure 7.1-C. Lower Virgin River Valley Buffer Zones (North)

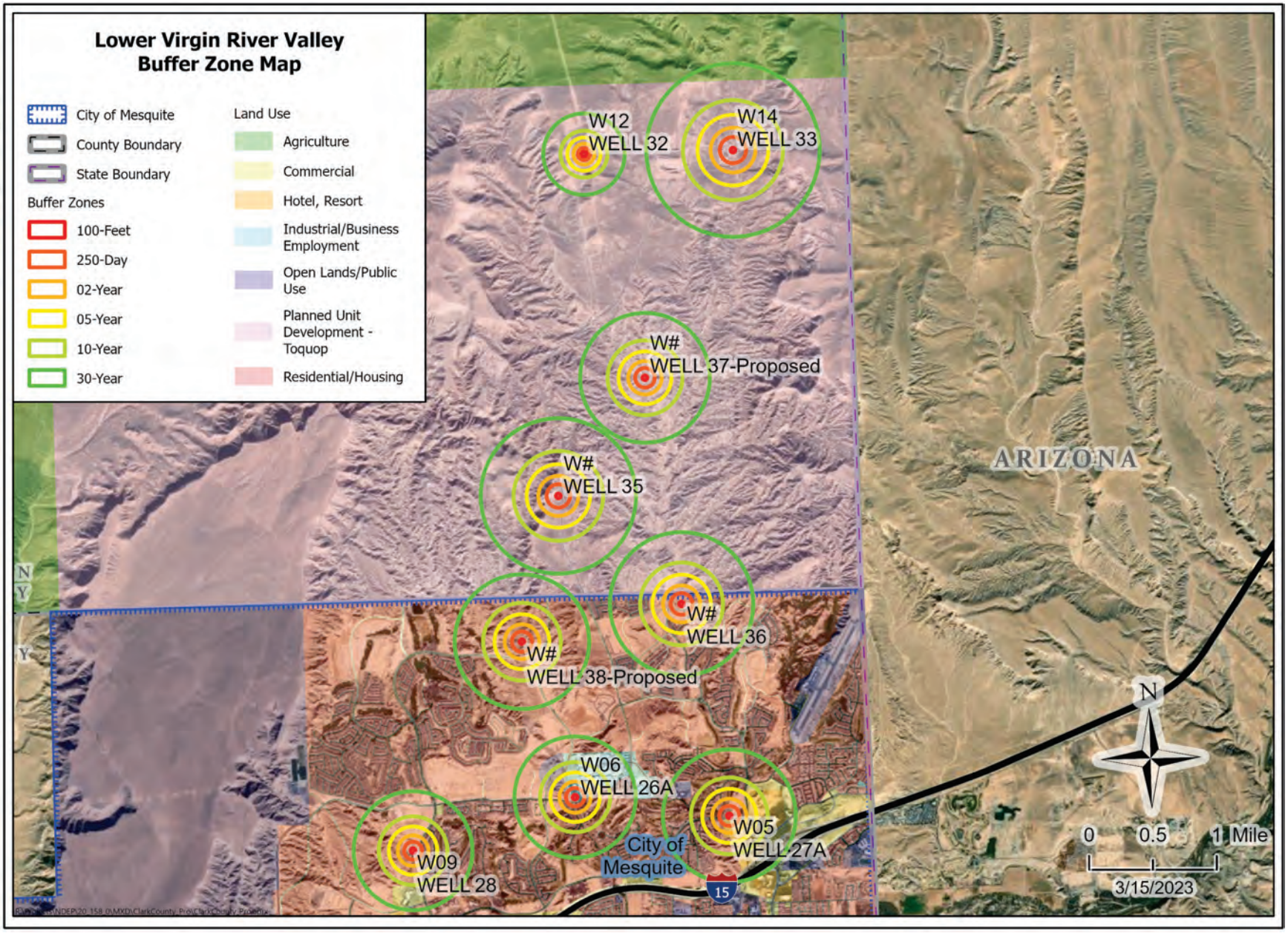
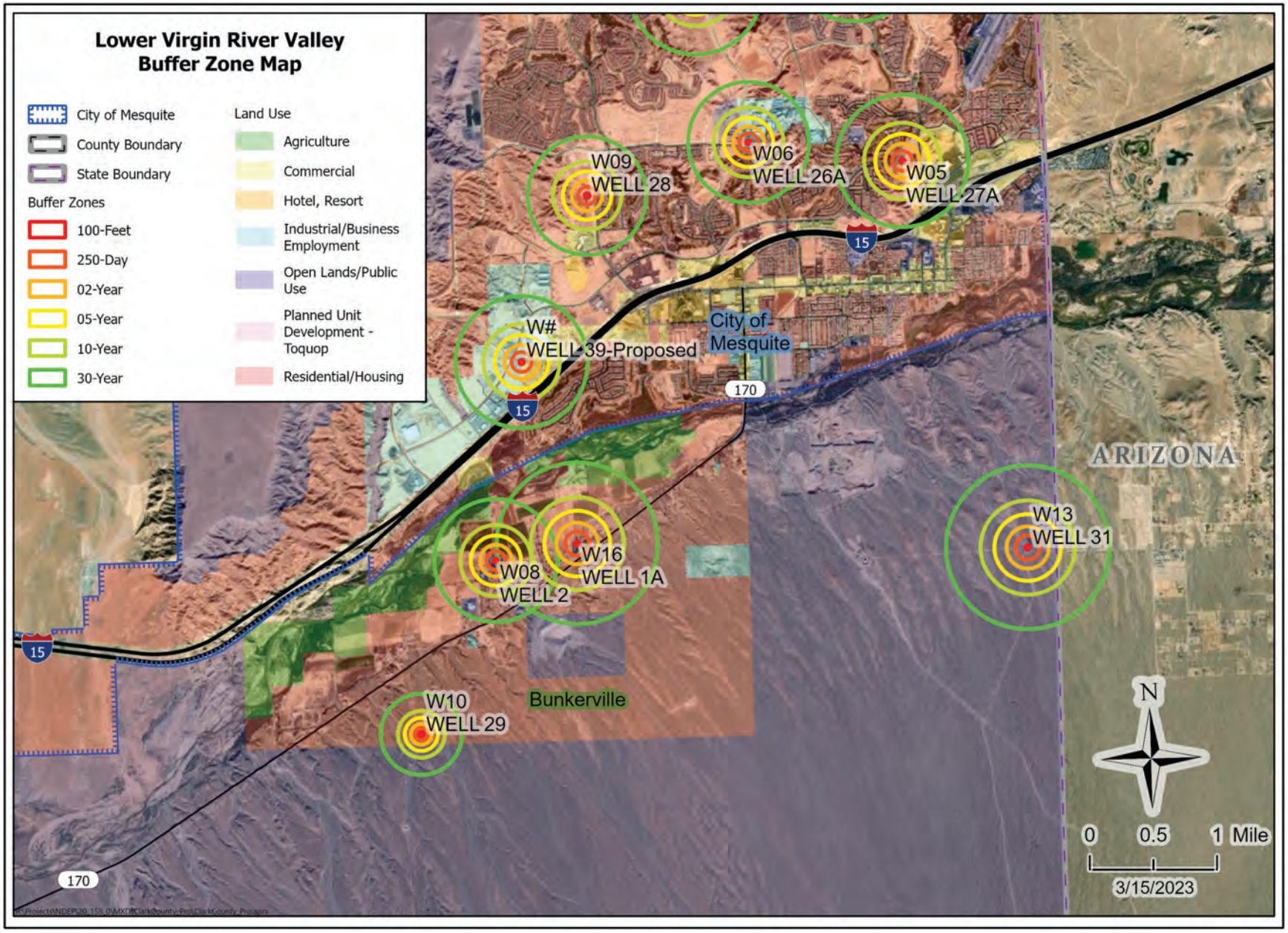


Figure 7.2-C. Lower Virgin River Valley Buffer Zones (South)



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Attachment A

Water Source Worksheets

Water Source Worksheet

Data	Well 1A	Source of Data
State Identifier	W16	SDWIS
Local Well Name	Well 01A	VVWD
Jurisdiction	Bunkerville, NV	VVWD
Active (I, A, F, M)	A	VVWD
FEMA Flood Zone	100 Year Flood Zone AE	FEMA FIRM
Fire Risk	Low to Moderate	https://nevadaresourcesandwildfireinfo.com/Map/Public/#whats-your-risk
APN	00225610001	City of Mesquite
Hydrographic Area Number	222	Nevada Division of Water Resources
HUC12 Number	150100100610	https://water.usgs.gov/wsc/a_api/wbd/subwatershed15/150100100610.html
Well Log Number	123866	Well Log
Drill Date	10/22/2015	Well Log
Well Depth (Feet)	855	Well Log
Diameter (Inches)	12	VVWD
Perforated Screen Total (Feet)	285	Well Log
Screened Depth (Feet below land surface)	300	Well Log
Flow Rate (gpm) - Pumping Rate	950	VVWD
Specific Capacity (gpm/ft), SC	5.43	VVWD
Aquifer Type	Semi Confined	VVWD
Porosity	0.2	Well Log
100 ft Radius	100	Fixed
TOT 250-day (ft)	505.28	Calculated Fixed Radius
TOT 2-year (ft)	863.43	Calculated Fixed Radius
TOT 5-year (ft)	1,365.20	Calculated Fixed Radius
TOT 10-year (ft)	1,930.68	Calculated Fixed Radius
TOT 30-year (ft)	3,344.04	Calculated Fixed Radius
Predominant Land Usage Around the Well in the TOT 30-Year	Residential/Housing	City of Mesquite and Clark County

Comments:

Water is treated for arsenic at Arsenic Treatment Plant 1A. Treated water is sent into the 10-inch transmission line which runs between the Scenic and Decker Tanks, and provides water to Pressure Zones 5, 6, 7, and 8.

SDWIS = Safe Drinking Water Information System; VVWD = Virgin Valley Water District; FEMA = Federal Emergency Management Agency; I = Inactive; A = Active; F = Future; M = Monitoring; APN = Assessor's Parel Number; HUC12 = Hydrologic Unit Code 12; gpm = gallon per minute; ft = foot; TOT = Time of Travel

Water Source Worksheet

Data	Well 2	Source of Data
State Identifier	W08	SDWIS
Local Well Name	Well 02	VVWD
Jurisdiction	Bunkerville, NV	VVWD
Active (I, A, F, M)	A	VVWD
FEMA Flood Zone	100 Year Flood Zone AE	FEMA FIRM
Fire Risk	Very Very Low	https://nevadaresourcesandwildfireinfo.com/Map/Public/#whats-your-risk
APN	00225310098	City of Mesquite
Hydrographic Area Number	222	Nevada Division of Water Resources
HUC12 Number	150100100610	https://water.usgs.gov/wsc/a_api/wbd/subwatershed15/150100100610.html
Well Log Number	120439	Well Log
Drill Date	6/24/2014	Well Log
Well Depth (Feet)	645	Well Log
Diameter (Inches)	12	VVWD
Perforated Screen Total (Feet)	180	Well Log
Screened Depth (Feet below land surface)	410	Well Log
Flow Rate (gpm) - Pumping Rate	350	VVWD
Specific Capacity (gpm/ft), SC	1.1	VVWD
Aquifer Type	Semi Confined	VVWD
Porosity	0.2	Well Log
100 ft Radius	100	Fixed
TOT 250-day (ft)	385.92	Calculated Fixed Radius
TOT 2-year (ft)	659.45	Calculated Fixed Radius
TOT 5-year (ft)	1,042.69	Calculated Fixed Radius
TOT 10-year (ft)	1,474.58	Calculated Fixed Radius
TOT 30-year (ft)	2,554.05	Calculated Fixed Radius
Predominant Land Usage Around the Well in the TOT 30-Year	Residential/Housing	City of Mesquite and Clark County

Comments:

Water is sent into the 10-inch transmission line which runs between the Scenic and Decker Tanks, and provides water to Pressure Zones 5, 6, 7, and 8. Water from Well No. 2 does not require arsenic removal.

SDWIS = Safe Drinking Water Information System; VVWD = Virgin Valley Water District; FEMA = Federal Emergency Management Agency; I = Inactive; A = Active; F = Future; M = Monitoring; APN = Assessor's Parel Number; HUC12 = Hydrologic Unit Code 12; gpm = gallon per minute; ft = foot; TOT = Time of Travel

Water Source Worksheet

Data	Well 26A	Source of Data
State Identifier	W06	SDWIS
Local Well Name	Well 26A	VVWD
Jurisdiction	Mesquite, NV	VVWD
Active (I, A, F, M)	A	VVWD
FEMA Flood Zone	Area of Undetermined Flood Hazard	FEMA FIRM
Fire Risk	Moderate to High	https://nevadaresourcesandwildfireinfo.com/Map/Public/#whats-your-risk
APN	00108201033	City of Mesquite
Hydrographic Area Number	222	Nevada Division of Water Resources
HUC12 Number	150100100609	https://water.usgs.gov/wsc/a_api/wbd/subwatershed15/150100100609.html
Well Log Number	134476	Well Log
Drill Date	3/2/2020	Well Log
Well Depth (Feet)	1,070	Well Log
Diameter (Inches)	20	Well Log
Perforated Screen Total (Feet)	640	Well Log
Screened Depth (Feet below land surface)	400	Well Log
Flow Rate (gpm) - Pumping Rate	1,200	VVWD
Specific Capacity (gpm/ft), SC	4.4	VVWD
Aquifer Type	Semi Confined	VVWD
Porosity	0.2	Well Log
100 ft Radius	100	Fixed
TOT 250-day (ft)	378.96	Calculated Fixed Radius
TOT 2-year (ft)	647.57	Calculated Fixed Radius
TOT 5-year (ft)	1,023.90	Calculated Fixed Radius
TOT 10-year (ft)	1,448.01	Calculated Fixed Radius
TOT 30-year (ft)	2,508.03	Calculated Fixed Radius
Predominant Land Usage Around the Well in the TOT 30-Year	Residential/Housing	City of Mesquite and Clark County

Comments:

Water is treated for arsenic at Arsenic Removal Plant No. 27. The treated water is pumped directly into the system, and provides water to Pressure Zone 2.

SDWIS = Safe Drinking Water Information System; VVWD = Virgin Valley Water District; FEMA = Federal Emergency Management Agency; I = Inactive; A = Active; F = Future; M = Monitoring; APN = Assessor's Parel Number; HUC12 = Hydrologic Unit Code 12; gpm = gallon per minute; ft = foot; TOT = Time of Travel; NA = Not Available

Water Source Worksheet

Data	Well 27A	Source of Data
State Identifier	W05	SDWIS
Local Well Name	Well 27A	VVWD
Jurisdiction	Mesquite, NV	VVWD
Active (I, A, F, M)	A	VVWD
FEMA Flood Zone	Area of Undetermined Flood Hazard	FEMA FIRM
Fire Risk	Moderate to High	https://nevadaresourcesandwildfireinfo.com/Map/Public/#whats-your-risk
APN	00109201017	City of Mesquite
Hydrographic Area Number	222	Nevada Division of Water Resources
HUC12 Number	150100100607	https://water.usgs.gov/wsc/a_api/wbd/subwatershed15/150100100607.html
Well Log Number	127675	Well Log
Drill Date	4/6/2017	Well Log
Well Depth (Feet)	1,460	Well Log
Diameter (Inches)	20	Well Log
Perforated Screen Total (Feet)	800	Well Log
Screened Depth (Feet below land surface)	570	Well Log
Flow Rate (gpm) - Pumping Rate	1,800	VVWD
Specific Capacity (gpm/ft), SC	6.8	VVWD
Aquifer Type	Semi Confined	VVWD
Porosity	0.2	Well Log
100 ft Radius	100	Fixed
TOT 250-day (ft)	415.13	Calculated Fixed Radius
TOT 2-year (ft)	709.38	Calculated Fixed Radius
TOT 5-year (ft)	1,121.62	Calculated Fixed Radius
TOT 10-year (ft)	1,586.22	Calculated Fixed Radius
TOT 30-year (ft)	2,747.41	Calculated Fixed Radius
Predominant Land Usage Around the Well in the TOT 30-Year	Residential/Housing	City of Mesquite and Clark County

Comments:

Water is treated for arsenic at Arsenic Removal Plant No. 27. The treated water is pumped directly into the system, and provides water to Pressure Zone 2.

SDWIS = Safe Drinking Water Information System; VVWD = Virgin Valley Water District; FEMA = Federal Emergency Management Agency; I = Inactive; A = Active; F = Future; M = Monitoring; APN = Assessor's Parel Number; HUC12 = Hydrologic Unit Code 12; gpm = gallon per minute; ft = foot; TOT = Time of Travel; NA = Not Available

Water Source Worksheet

Data	Well 28	Source of Data
State Identifier	W09	SDWIS
Local Well Name	Well 28	VVWD
Jurisdiction	Mesquite, NV	VVWD
Active (I, A, F, M)	A	VVWD
FEMA Flood Zone	Area of Undetermined Flood Hazard	FEMA FIRM
Fire Risk	Moderate to High	https://nevadaresourcesandwildfireinfo.com/Map/Public/#whats-your-risk
APN	00212701005	City of Mesquite
Hydrographic Area Number	222	Nevada Division of Water Resources
HUC12 Number	150100100609	https://water.usgs.gov/wsc/a_api/wbd/subwatershed15/150100100609.html
Well Log Number	60155	Well Log
Drill Date	2/10/1996	Well Log
Well Depth (Feet)	1,170	VVWD
Diameter (Inches)	20	VVWD
Perforated Screen Total (Feet)	500	Well Log
Screened Depth (Feet below land surface)	510	Well Log
Flow Rate (gpm) - Pumping Rate	900	VVWD
Specific Capacity (gpm/ft), SC	2.4	VVWD
Aquifer Type	Semi Confined	VVWD
Porosity	0.2	Well Log
100 ft Radius	100	Fixed
TOT 250-day (ft)	371.31	Calculated Fixed Radius
TOT 2-year (ft)	634.49	Calculated Fixed Radius
TOT 5-year (ft)	1,003.21	Calculated Fixed Radius
TOT 10-year (ft)	1,418.75	Calculated Fixed Radius
TOT 30-year (ft)	2,457.36	Calculated Fixed Radius
Predominant Land Usage Around the Well in the TOT 30-Year	Residential/Housing	City of Mesquite and Clark County

Comments:

Water is treated for arsenic at Treatment Plant No. 28. Treated water is pumped direcly into the distribution system and indirectly into the Airport/Flat Top Tanks, and provides water Pressure Zone 2.

SDWIS = Safe Drinking Water Information System; VVWD = Virgin Valley Water District; FEMA = Federal Emergency Management Agency; I = Inactive; A = Active; F = Future; M = Monitoring; APN = Assessor's Parel Number; HUC12 = Hydrologic Unit Code 12; gpm = gallon per minute; ft = foot; TOT = Time of Travel

Water Source Worksheet

Data	Well 29	Source of Data
State Identifier	W10	SDWIS
Local Well Name	Well 29	VVWD
Jurisdiction	Bunkerville, NV	VVWD
Active (I, A, F, M)	A	VVWD
FEMA Flood Zone	No	FEMA FIRM
Fire Risk	Very Low	https://nevadaresourcesandwildfireinfo.com/Map/Public/#whats-your-risk
APN	00235401001	City of Mesquite
Hydrographic Area Number	222	Nevada Division of Water Resources
HUC12 Number	150100100610	https://water.usgs.gov/wsc/a_api/wbd/subwatershed15/150100100610.html
Well Log Number	76639	Well Log
Drill Date	12/2/1997	Well Log
Well Depth (Feet)	1,260	VVWD
Diameter (Inches)	20	VVWD
Perforated Screen Total (Feet)	590	Well Log
Screened Depth (Feet below land surface)	540	Well Log
Flow Rate (gpm) - Pumping Rate	500	VVWD
Specific Capacity (gpm/ft), SC	1.5	VVWD
Aquifer Type	Semi Confined	VVWD
Porosity	0.2	Well Log
100 ft Radius	100	Fixed
TOT 250-day (ft)	254.77	Calculated Fixed Radius
TOT 2-year (ft)	435.36	Calculated Fixed Radius
TOT 5-year (ft)	688.36	Calculated Fixed Radius
TOT 10-year (ft)	973.49	Calculated Fixed Radius
TOT 30-year (ft)	1,686.13	Calculated Fixed Radius
Predominant Land Usage Around the Well in the TOT 30-Year	Residential/Housing	City of Mesquite and Clark County

Comments:

Water is treated for arsenic at Arseinc Treatment PLant No. 29. Treated water is pumped into the Decker Tank, and provides water to Pressure Zones 5, 6, 7, and 8.

SDWIS = Safe Drinking Water Information System; VVWD = Virgin Valley Water District; FEMA = Federal Emergency Management Agency; I = Inactive; A = Active; F = Future; M = Monitoring; APN = Assessor's Parel Number; HUC12 = Hydrologic Unit Code 12; gpm = gallon per minute; ft = foot; TOT = Time of Travel; NA = Not Available

Water Source Worksheet

Data	Well 31	Source of Data
State Identifier	W13	SDWIS
Local Well Name	Well 31	VVWD
Jurisdiction	Bunkerville	VVWD
Active (I, A, F, M)	A	VVWD
FEMA Flood Zone	No	FEMA FIRM
Fire Risk	Low	https://nevadaresourcesandwildfireinfo.com/Map/Public/#whats-your-risk
APN	00127000001	City of Mesquite
Hydrographic Area Number	222	Nevada Division of Water Resources
HUC12 Number	150100100608	https://water.usgs.gov/wsc/a_api/wbd/subwatershed15/150100100608.html
Well Log Number	87070	Well Log
Drill Date	5/21/2002	Well Log
Well Depth (Feet)	1,600	Well Log
Diameter (Inches)	20	VVWD
Perforated Screen Total (Feet)	760	Well Log
Screened Depth (Feet below land surface)	600	Well Log
Flow Rate (gpm) - Pumping Rate	2,600	VVWD
Specific Capacity (gpm/ft), SC	10.9	VVWD
Aquifer Type	Semi Confined	VVWD
Porosity	0.2	Well Log
100 ft Radius	100	Fixed
TOT 250-day (ft)	511.89	Calculated Fixed Radius
TOT 2-year (ft)	874.71	Calculated Fixed Radius
TOT 5-year (ft)	1,383.04	Calculated Fixed Radius
TOT 10-year (ft)	1,955.92	Calculated Fixed Radius
TOT 30-year (ft)	3,387.75	Calculated Fixed Radius
Predominant Land Usage Around the Well in the TOT 30-Year	Opens Lands/Pubic Use	City of Mesquite and Clark County

Comments:

Water is treated for arsenic at Arsenic Treatment Plant No. 31. Treated water is pumped into the Scenic Tank and provides water to Pressure Zones 5, 6, 7, and 8.

SDWIS = Safe Drinking Water Information System; VVWD = Virgin Valley Water District; FEMA = Federal Emergency Management Agency; I = Inactive; A = Active; F = Future; M = Monitoring; APN = Assessor's Parel Number; HUC12 = Hydrologic Unit Code 12; gpm = gallon per minute; ft = foot; TOT = Time of Travel; NA = Not Available

Water Source Worksheet

Data	Well 32	Source of Data
State Identifier	W12	SDWIS
Local Well Name	Well 32	VVWD
Jurisdiction	Lincoln County, NV	VVWD
Active (I, A, F, M)	A	VVWD
FEMA Flood Zone	No	FEMA FIRM
Fire Risk	Very Low	https://nevadaresourcesandwildfireinfo.com/Map/Public/#whats-your-risk
APN	NA	http://water.nv.gov/welllogquery.aspx
Hydrographic Area Number	222	Nevada Division of Water Resources
HUC12 Number	150100100607	https://water.usgs.gov/wsc/a_api/wbd/subwatershed15/150100100607.html
Well Log Number	86039	Well Log
Drill Date	11/19/2001	Well Log
Well Depth (Feet)	2,040	Well Log
Diameter (Inches)	20	VVWD
Perforated Screen Total (Feet)	711	Well Log
Screened Depth (Feet below land surface)	1,140	Well Log
Flow Rate (gpm) - Pumping Rate	600	VVWD
Specific Capacity (gpm/ft), SC	1.6	VVWD
Aquifer Type	Semi Confined	VVWD
Porosity	0.2	Well Log
100 ft Radius	100	Fixed
TOT 250-day (ft)	254.24	Calculated Fixed Radius
TOT 2-year (ft)	434.44	Calculated Fixed Radius
TOT 5-year (ft)	686.91	Calculated Fixed Radius
TOT 10-year (ft)	971.43	Calculated Fixed Radius
TOT 30-year (ft)	1,682.57	Calculated Fixed Radius
Predominant Land Usage Around the Well in the TOT 30-Year	Planned Unit Development - Toquop	Lincoln County

Comments:

Water is treated for arseinc at Arsenic Treatment Plant No. 32. Treated water is pumped into the two Lincoln Tanks, and provides water to Pressure Zones 1, 3, and 4.

SDWIS = Safe Drinking Water Information System; VVWD = Virgin Valley Water District; FEMA = Federal Emergency Management Agency; I = Inactive; A = Active; F = Future; M = Monitoring; APN = Assessor's Parel Number;
HUC12 = Hydrologic Unit Code 12; gpm = gallon per minute; ft = foot; TOT = Time of Travel; NA = Not Available

Water Source Worksheet

Data	Well 33	Source of Data
State Identifier	W14	SDWIS
Local Well Name	Well 33	VVWD
Jurisdiction	Lincoln County, NV	VVWD
Active (I, A, F, M)	A	VVWD
FEMA Flood Zone	No	FEMA FIRM
Fire Risk	Very Low	https://nevadaresourcesandwildfireinfo.com/Map/Public/#whats-your-risk
APN	NA	http://water.nv.gov/welllogquery.aspx
Hydrographic Area Number	222	Nevada Division of Water Resources
HUC12 Number	150100100607	https://water.usgs.gov/wsc/a_api/wbd/subwatershed15/150100100607.html
Well Log Number	86904	Well Log
Drill Date	3/13/2002	Well Log
Well Depth (Feet)	1,398	Well Log
Diameter (Inches)	20	VVWD
Perforated Screen Total (Feet)	600	Well Log
Screened Depth (Feet below land surface)	718	Well Log
Flow Rate (gpm) - Pumping Rate	2,300	VVWD
Specific Capacity (gpm/ft), SC	11.2	VVWD
Aquifer Type	Semi Confined	VVWD
Porosity	0.2	Well Log
100 ft Radius	100	Fixed
TOT 250-day (ft)	541.85	Calculated Fixed Radius
TOT 2-year (ft)	925.92	Calculated Fixed Radius
TOT 5-year (ft)	1,464.01	Calculated Fixed Radius
TOT 10-year (ft)	2,070.42	Calculated Fixed Radius
TOT 30-year (ft)	3,586.08	Calculated Fixed Radius
Predominant Land Usage Around the Well in the TOT 30-Year	Planned Unit Development - Toquop	Lincoln County

Comments:

Water is treated for arseinc at Arsenic Treatment Plant No. 32. Treated water is pumped into the two Lincoln Tanks, and provides water to Pressure Zones 1, 3, and 4.

SDWIS = Safe Drinking Water Information System; VVWD = Virgin Valley Water District; FEMA = Federal Emergency Management Agency; I = Inactive; A = Active; F = Future; M = Monitoring; APN = Assessor's Parel Number;
HUC12 = Hydrologic Unit Code 12; gpm = gallon per minute; ft = foot; TOT = Time of Travel; NA = Not Available

Water Source Worksheet

Data	Well 35	Source of Data
State Identifier	NA	NA
Local Well Name	Well 35	VVWD
Jurisdiction	Lincoln County, NV	VVWD
Active (I, A, F, M)	I	VVWD
FEMA Flood Zone	Area of Undetdermined Flood Hazard	FEMA FIRM
Fire Risk	Very Low	https://nevadaresourcesandwildfireinfo.com/Map/Public/#whats-your-risk
APN	08-261-17	http://water.nv.gov/welllogquery.aspx
Hydrographic Area Number	222	Nevada Division of Water Resources
HUC12 Number	150100100607	https://water.usgs.gov/wsc/a_api/wbd/subwatershed15/150100100607.html
Well Log Number	137345	Well Log
Drill Date	7/8/2021	Well Log
Well Depth (Feet)	1,490	Well Log
Diameter (Inches)	20	VVWD
Perforated Screen Total (Feet)	650	Well Log
Screened Depth (Feet below land surface)	790	Well Log
Flow Rate (gpm) - Pumping Rate	2,000	VVWD
Specific Capacity (gpm/ft), SC	12.5	VVWD
Aquifer Type	Semi Confined	VVWD
Porosity	0.2	Well Log
100 ft Radius	100	Fixed
TOT 250-day (ft)	485.46	Calculated Fixed Radius
TOT 2-year (ft)	829.55	Calculated Fixed Radius
TOT 5-year (ft)	1,311.64	Calculated Fixed Radius
TOT 10-year (ft)	1,854.94	Calculated Fixed Radius
TOT 30-year (ft)	3,212.85	Calculated Fixed Radius
Predominant Land Usage Around the Well in the TOT 30-Year	Planned Unit Development - Toquop	Lincoln County

Comments:

Water is treated for arseinc at Arsenic Treatment Plant No. 32. Treated water is pumped into the two Lincoln Tanks, and provides water to Pressure Zones 1, 3, and 4.

SDWIS = Safe Drinking Water Information System; VVWD = Virgin Valley Water District; FEMA = Federal Emergency Management Agency; I = Inactive; A = Active; F = Future; M = Monitoring; APN = Assessor's Parel Number; HUC12 = Hydrologic Unit Code 12; gpm = gallon per minute; ft = foot; TOT = Time of Travel; NA = Not Available

Water Source Worksheet

Data	Well 36	Source of Data
State Identifier	NA	NA
Local Well Name	Well 36	VVWD
Jurisdiction	Mesquite, NV	VVWD
Active (I, A, F, M)	I	VVWD
FEMA Flood Zone	Area of Undetdermined Flood Hazard	FEMA FIRM
Fire Risk	Very Low	https://nevadaresourcesandwildfireinfo.com/Map/Public/#whats-your-risk
APN	00105501017	City of Mesquite
Hydrographic Area Number	222	Nevada Division of Water Resources
HUC12 Number	150100100607	https://water.usgs.gov/wsc/a_api/wbd/subwatershed15/150100100607.html
Well Log Number	138064	Well Log
Drill Date	11/15/2021	Well Log
Well Depth (Feet)	1,500	Well Log
Diameter (Inches)	20	VVWD
Perforated Screen Total (Feet)	915	Well Log
Screened Depth (Feet below land surface)	560	Well Log
Flow Rate (gpm) - Pumping Rate	2,400	VVWD
Specific Capacity (gpm/ft), SC	15	VVWD
Aquifer Type	Semi Confined	VVWD
Porosity	0.2	Well Log
100 ft Radius	100	Fixed
TOT 250-day (ft)	448.22	Calculated Fixed Radius
TOT 2-year (ft)	765.92	Calculated Fixed Radius
TOT 5-year (ft)	1,211.02	Calculated Fixed Radius
TOT 10-year (ft)	1,712.64	Calculated Fixed Radius
TOT 30-year (ft)	2,966.38	Calculated Fixed Radius
Predominant Land Usage Around the Well in the TOT 30-Year	Residential/Housing	City of Mesquite and Clark County

Comments:

Currently inactive and will come online once an arsenic treatment plant is complete. Water will be treated for arsenic at Arsenic Treatment Plant No. 35 and provide water to Pressure Zone 1.

SDWIS = Safe Drinking Water Information System; VVWD = Virgin Valley Water District; FEMA = Federal Emergency Management Agency; I = Inactive; A = Active; F = Future; M = Monitoring; APN = Assessor's Parel Number; HUC12 = Hydrologic Unit Code 12; gpm = gallon per minute; ft = foot; TOT = Time of Travel; NA = Not Available

Water Source Worksheet

Data	Well 37	Source of Data
State Identifier	NA	NA
Local Well Name	Well 37	VVWD
Jurisdiction	Lincoln County, NV	VVWD
Active (I, A, F, M)	F	VVWD
FEMA Flood Zone	Area of Undetdermined Flood Hazard	FEMA FIRM
Fire Risk	Very Very Low	https://nevadaresourcesandwildfireinfo.com/Map/Public/#whats-your-risk
APN	NA	NA
Hydrographic Area Number	222	Nevada Division of Water Resources
HUC12 Number	150100100607	https://water.usgs.gov/wsc/a_api/wbd/subwatershed15/150100100607.html
Well Log Number	NA	NA
Drill Date	NA	NA
Well Depth (Feet)	1,450	VVWD
Diameter (Inches)	NA	NA
Perforated Screen Total (Feet)	700	VVWD
Screened Depth (Feet below land surface)	750	VVWD
Flow Rate (gpm) - Pumping Rate	1,500	VVWD
Specific Capacity (gpm/ft), SC	NA	NA
Aquifer Type	Semi Confined	VVWD
Porosity	0.2	Assumed to be similar to surrounding wells
100 ft Radius	100	Fixed
TOT 250-day (ft)	405.13	Calculated Fixed Radius
TOT 2-year (ft)	692.28	Calculated Fixed Radius
TOT 5-year (ft)	1,094.59	Calculated Fixed Radius
TOT 10-year (ft)	1,547.99	Calculated Fixed Radius
TOT 30-year (ft)	2,681.19	Calculated Fixed Radius
Predominant Land Usage Around the Well in the TOT 30-Year	Planned Unit Development - Toquop	Lincoln County

Comments:

Proposed Future Well.

VVWD = Virgin Valley Water District; FEMA = Federal Emergency Management Agency; I = Inactive; A = Active;
F = Future; M = Monitoring; APN = Assessor's Parel Number; HUC12 = Hydrologic Unit Code 12; gpm = gallon per minute;
ft = foot; TOT = Time of Travel; NA = Not Available

Water Source Worksheet

Data	Well 38	Source of Data
State Identifier	NA	NA
Local Well Name	Well 38	VVWD
Jurisdiction	Mesquite, NV	VVWD
Active (I, A, F, M)	F	VVWD
FEMA Flood Zone	Area of Undetdermined Flood Hazard	FEMA FIRM
Fire Risk	Very Very Low	https://nevadaresourcesandwildfireinfo.com/Map/Public/#whats-your-risk
APN	00106510001	City of Mesquite
Hydrographic Area Number	222	Nevada Division of Water Resources
HUC12 Number	150100100609	https://water.usgs.gov/wsc/a_api/wbd/subwatershed15/150100100609.html
Well Log Number	NA	NA
Drill Date	NA	NA
Well Depth (Feet)	1,200	VVWD
Diameter (Inches)	NA	NA
Perforated Screen Total (Feet)	650	VVWD
Screened Depth (Feet below land surface)	500	VVWD
Flow Rate (gpm) - Pumping Rate	1,500	VVWD
Specific Capacity (gpm/ft), SC	NA	NA
Aquifer Type	Semi Confined	VVWD
Porosity	0.2	Assumed to be similar to surrounding wells
100 ft Radius	100	Fixed
TOT 250-day (ft)	420.42	Calculated Fixed Radius
TOT 2-year (ft)	718.41	Calculated Fixed Radius
TOT 5-year (ft)	1,135.91	Calculated Fixed Radius
TOT 10-year (ft)	1,606.42	Calculated Fixed Radius
TOT 30-year (ft)	2,782.41	Calculated Fixed Radius
Predominant Land Usage Around the Well in the TOT 30-Year	Residential/Housing	City of Mesquite and Clark County

Comments:

Proposed Future Well.

VVWD = Virgin Valley Water District; FEMA = Federal Emergency Management Agency; I = Inactive; A = Active;
F = Future; M = Monitoring; APN = Assessor's Parel Number; HUC12 = Hydrologic Unit Code 12; gpm = gallon per minute;
ft = foot; TOT = Time of Travel; NA = Not Available

Water Source Worksheet

Data	Well 39	Source of Data
State Identifier	NA	NA
Local Well Name	Well 39	VVWD
Jurisdiction	Mesquite, NV	VVWD
Active (I, A, F, M)	F	VVWD
FEMA Flood Zone	Area of Undetdermined Flood Hazard	FEMA FIRM
Fire Risk	Moderate to High	https://nevadaresourcesandwildfireinfo.com/Map/Public/#whats-your-risk
APN	00224101002	City of Mesquite
Hydrographic Area Number	222	Nevada Division of Water Resources
HUC12 Number	150100100610	https://water.usgs.gov/wsc/a_api/wbd/subwatershed15/150100100610.html
Well Log Number	NA	NA
Drill Date	NA	NA
Well Depth (Feet)	1,200	VVWD
Diameter (Inches)	NA	NA
Perforated Screen Total (Feet)	670	VVWD
Screened Depth (Feet below land surface)	530	VVWD
Flow Rate (gpm) - Pumping Rate	1,500	VVWD
Specific Capacity (gpm/ft), SC	NA	NA
Aquifer Type	Semi Confined	VVWD
Porosity	0.2	Assumed to be similar to surrounding wells
100 ft Radius	100	Fixed
TOT 250-day (ft)	414.10	Calculated Fixed Radius
TOT 2-year (ft)	707.61	Calculated Fixed Radius
TOT 5-year (ft)	1,118.83	Calculated Fixed Radius
TOT 10-year (ft)	1,582.27	Calculated Fixed Radius
TOT 30-year (ft)	2,740.56	Calculated Fixed Radius
Predominant Land Usage Around the Well in the TOT 30-Year	Industrial/Business Employment	City of Mesquite and Clark County

Comments:

Proposed Future Well.

VVWD = Virgin Valley Water District; FEMA = Federal Emergency Management Agency; I = Inactive; A = Active;
F = Future; M = Monitoring; APN = Assessor's Parel Number; HUC12 = Hydrologic Unit Code 12; gpm = gallon per minute;
ft = foot; TOT = Time of Travel; NA = Not Available

Attachment B

Land Use and Zoning Reference Table

Mesquite Land Use Designations: Type1= Code, Type2=Formal Name, Type3=map symbology

City of Mesquite Data:		
Type 1	**Type 2**	**Type 3**
Various	Residential	Residential/Housing
CR-1	Commercial and Retail	Commercial
CR-2	Commercial and Retail	Commercial
CR-3	Commercial and Retail	Commercial
CR-H	Commercial and Retail	Commercial
HT	Hotel and Tourist	Hotel, Resort
IR-1	Industrial-Research	Industrial/Business Employment
IR-2	Industrial-Research	Industrial/Business Employment
MH	Manufactured Housing	Residential/Housing
PB	Professional/Business Office	Industrial/Business Employment
PF	Public Facilities	Open Lands/Public Use
PROS	Parks, Recreation and Open Space	Open Lands/Public Use
RV	RV/Motor Home	Residential/Housing

Clark County Data:		
Type 1	**Type 2**	**Type 3**
AG	Agriculture	Agriculture
BE	Business Employment	Industrial/Business Employment
CM	Corridor Mixed-Use	Commercial
EN	Edge Neighborhood	Residential/Housing
MN	Mid-Intensity Suburban Neighborhood	Residential/Housing
OL	Open Lands	Open Lands/Public Use
ON	Outlying Neighborhood	Residential/Housing
PU	Public Use	Open Lands/Public Use
RN	Ranch Estate Neighborhood	Residential/Housing

Lincoln County Data:		
Type 1	**Type 2**	**Type 3**
A5	Agricultural - 40 Acres	Agricultural
PUD_TOQ	Planned Unit Development - Toquop	Planned Unit Development - Toquop

Appendix D

Potential Contaminant Source Inventory

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Attachments

File doc: 2023-05-24 fnl Rpt Tech Rpt Appendix D 20-158.B5-C NDEP ac-jm L5-20.docx

Acronyms

APN	Assessor Parcel Number
BMRR	Bureau of Mining Regulation and Reclamation
BSDW	Bureau of Safe Drinking Water
BWPC	Bureau of Water Pollution Control
CSWP Plan	Community Source Water Protection Plan
DMV	Department of Motor Vehicles
DW Maps	Drinking Water Mapping Application
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FRS	Facility Registry Service
GIS	Geographic Information System
ISDS	individual sewage disposal system
ISWPP	Integrated Source Water Protection Program
NDEP	Nevada Division of Environmental Protection
NPDES	National Pollutant Discharge Elimination System
NvRWA	Nevada Rural Water Association
PCS	potential contaminant source
PFAS	per-and polyfluoroalkyl substances
PWS	public water system
RCRA	Resource Conservation and Recovery Act
SWAP	Source Water Assessment Program
SWPA	source water protection area
Team	Local Planning Team
UCMR	Unregulated Contaminant Monitoring Rule
UIC	underground injection control
UST	Underground storage tank
VVWD	Virgin Valley Water District

1.0 Introduction

The Virgin Valley Water District (VVWD) is the only Nevada public water system in the Lower Virgin River Valley, and it relies on groundwater from the Muddy Creek Formation for its drinking water supply. The VVWD delivers drinking water to the City of Mesquite and the town of Bunkerville (Bunkerville) in unincorporated Clark County. Human activities can result in the pollution of drinking water sources, and are typically derived from urban, industrial, and agricultural activities. Potential contaminant sources (PCSs) are current and prospective contaminants of concern which could possibly migrate into groundwater. A PCS inventory characterizes the local activities and potential hazards which could affect the quality of the public drinking water supply. The Local Planning Team (Team) conducted an inventory of the PCSs throughout the City of Mesquite, Bunkerville, and southeast Lincoln County, near the VVWD's well locations. The local inventory was derived from existing on-line databases and windshield surveys, as well as meetings with water system operators and staff from the City of Mesquite.

The PCS inventory for this Community Source Water Protection Plan (CSWP Plan) compiles potential sources of contaminants which could pose a risk to groundwater quality in the vicinity of the VVWD's wells. The inventory provides a basis for developing and implementing locally driven management strategies to help protect public drinking water sources. The inventory was designed to be easily updated as part of this CSWP Plan. Appendix D explains the methods for developing, formatting, and evaluating the PCS inventory, including:

- Classes and sources of potential contaminants (Table 1-D),
- Method of data collection,
- A description of the steps taken to develop the PCS inventory that satisfy the goals outlined by the Team as well as State criteria for an endorsable plan,
- Documentation of the data gathering process to facilitate future updates by the Team and to satisfy Goal 1 of this CSWP Plan: Identify the sources of and potential risks to drinking water and consider them in the local planning framework,
- Summary and presentation of the PCS inventory by well and buffer zone, and
- Team evaluation of the inventory with respect to the goals outlined in this CSWP Plan.

2.0 Potential Sources and Types of Contaminants

Potential sources of contamination are current and prospective human activities which could possibly release and facilitate the migration of contaminants to ground or surface water used to supply drinking water to the public. Understanding the PCS types and locations within the communities the VVWD serves was important to the Team to identify the sources of and potential risks near their existing and proposed wells.

2.1 PCS "Classes"

The PCS types presented in the Nevada Division of Environmental Protection (NDEP) Integrated Source Water Protection (ISWPP) Guidance (NDEP, 2010) with "*Suggested Risk Ranking for PCS in Nevada"* are listed in Table 1-D, numbered 1 through 56. Risk rankings often depend on various factors, including proximity to wells or waterways and local assessment of relevance by the Team. The Team reviewed and did not propose any changes to the risk rankings shown in Table 1-D, such as High, Moderate, and Low, for sources of potential contaminants. The Team chose to add four PCS "Classes" to Table 1-D, to better align these PCS types with "uses" identified in local planning and regulatory frameworks. The four additional "Classes" included:

- Not Applicable (0) – Includes PCSs identified by the City of Mesquite considered very low risk, such as churches, police stations, and City of Mesquite government offices,
- Hospitality (57) – Includes hotels and casinos, businesses with large landscaped parcels, and event centers with large parking lots,
- Industrial Stormwater Permits (58) – Includes facilities with National Pollutant Discharge Elimination System (NPDES) permits which do not otherwise have a Class, such as drugstore and grocery chains, and
- Hazardous Material (59) – Includes Resource Conservation and Recovery Act (RCRA) Sites which do not fall within another Class, such as drugstore and grocery chains.

2.2 Other Potential Hazards Considered

2.2.1 Natural Floods and Wildfires

Natural floods and wildfire hazards are a risk to public water systems (PWSs) because they can occur with little warning, can exert impulsive loads on objects in their paths, and can block drainage ways and damage infrastructure. Two wells, Well 1A and Well 2, managed by the VVWD are located near the Federal Emergency Management Association (FEMA) 100-year flood zone. In 1989, a 500-year flood reached the City of Mesquite, upstream of the two Bunkerville wells, and did not present a threat. Therefore, the Team determined that there is no sufficient reason to believe a 100-year flood would present a risk to Well 1A or Well 2.

The risk of wildfire showed that several wells were in locations deemed as "moderate" risk. The Team felt that the response to wildfire is efficiently addressed in emergency response plans and did not need to be included in this CSWP Plan. Natural flood and wildfire hazard information for each well were obtained from the FEMA map service and the Nevada Division of Forestry Natural Resources and Fire Information Portal, respectively. Natural flood and wildfire hazard information for each well are depicted on the water source worksheets in Appendix C of this CSWP Plan, Attachment A.

Table 1-D. Suggested Risk Rankings for Potential Contaminant Sources in the Lower Virgin River Valley

CLASS	#	SOURCE	CATEGORY					RISK RANKING
			A	B	C	D	E	
Not Applicable	0	Not Applicable						Very Low
Agricultural	1	Animal burial areas			X	X		High
	2	Animal feedlots		X	X	X		Mod to High
	3	Chemical application (e.g., pesticides, fungicides, & fertilizers)		X	X			High
	4	Chemical mixing & storage areas (Including rural airports)	X	X	X			High
	5	Irrigated fields & Irrigation ditches		X	X			Moderate to High
		Irrigation ditches			X			High
	6	Manure spreading & pits	X		X			Moderate
	7	Unsealed irrigation wells	X		X			High
Industrial	8	Chemical manufactures, warehousing/distribution activities	X	X	X			High
	9	Electroplaters & fabricators			X			High
	10	Electrical products & manufacturing			X			High
	11	Machine & metalworking shops	X					High
	12	Manufacturing sites	X	X	X			High
	13	Petroleum products production, storage, & distribution centers	X					High
Commercial	14	Dry cleaning establishments	X					High
	15	Furniture & wood stripper & refinishers	X					High
	16	Jewelry & metal plating			X			High
	17	Laundromats						Low
	18	Paint shops	X					High
	19	Photography establishments & printers			X			High
Automotive	20	Auto repair shops	X					High
	21	Car washes	X		X	X		Moderate
	22	Gas stations	X					High
	23	Road deicing operations: storage & application			X			Moderate
	24	Road maintenance depots	X		X			High
Residential	25	Household hazardous products	X	X	X			Moderate
	26	Private wells	X	X		X		Moderate
	27	Septic systems, cesspools		X	X	X		Mod to High
Medical/ Educational	28	Educational institutions (labs, lawns, & chemical storage)		X	X			Moderate
	29	Medical institutions (medical, dental, vet offices)				X		Low
	30	Research Laboratories	X	X		X		High

CLASS	#	SOURCE	CATEGORY					RISK RANKING
			A	B	C	D	E	
Storage	31	Above ground storage tanks	X					High
	32	Underground storage tanks	X					High
	33	Public storage	X					Low
	34	Radioactive materials storage					X	High
Municipal	35	Dumps and landfills (historical/active)	X	X	X	X	X	High
	36	Municipal incinerators		X	X	X		Moderate
	37	Recycling & reduction facilities			X			High
	38	Scrap & junkyards	X		X			High
	39	Wastewater reclamation facilities		X	X	X		High
	40	Sewer lift stations		X	X	X		High
Miscellaneous	41	Airports	X					High
	42	Asphalt plants	X					High
	43	Boat yards	X					High
	44	Cemeteries				X		Moderate
	45	Construction areas	X			X		Moderate
	46	Dry wells	X					High
	47	Fuel storage systems	X					High
	48	Golf courses, parks & nurseries (chemical application)		X	X			High
	49	Mining (surface & underground)	X		X			High
	50	Pipelines (oil, gas, coal slurry)	X					High
	51	Railroad tracks, yards & maintenance	X	X	X	X		High
	52	Surface water impoundments, streams, ditches				X		High
	53	Storm water drains & retention basins	X	X	X	X		High
	54	Unplugged abandoned well	X	X		X		High
	55	Well – operating	X	X	X	X		Low to High
	56	Other	X	X	X	X	X	Low to High
Hospitality	57	Hotels and Casinos, Landscaping, Parking, Events		X	X			Low
Industrial Stormwater Permits	58	National Pollutant Discharge Elimination System (NPDES) Industrial Stormwater Permits	X	X	X	X	X	High
Hazardous Materials	59	Hazardous Material Generator	X	X	X	X	X	High

Contaminant Categories: A = Volatile Organic Compounds, B = Synthetic Organic Chemical, C = Inorganic Compound, D = Microbiological, E = Radionuclides

2.2.2 Per- and Polyfluoroalkyl Substances

Per- and polyfluoroalkyl substances (PFAS) are widely used, long lasting fluorinated compounds which break down slowly over time. PFAS are typically found in water, air, fish, and soil, and are being detected in drinking water supplies around the nation. NDEP developed a working group to support the development of the PFAS Action Plan for the State of Nevada. Currently, PFAS has not been found to be a concern for source water in the Lower Virgin River Valley. The VVWD has participated in the third Unregulated Contaminant Monitoring Rule (UCMR), which required groundwater monitoring for 30 contaminants, and will participate in the upcoming fifth UCMR. As changes in PFAS regulations promulgated by either the Environmental Protection Agency (EPA) or the State emerge, the VVWD will continue to stay within regulatory compliance, as they do with all other federal and state drinking water regulations. The EPA's "PFAS Analytic Tools" provides information about PFAS across the country to help the public, researchers, and other stakeholders better understand potential PFAS sources in their communities. The publicly available on-line tool shows where testing has been conducted and includes data for PFAS detection levels.

2.2.3 Zoning and Land Use

Zoning and land use have a significant influence on the development of real estate within a community, which can have an impact on source water if PCSs are developed within Buffer Zones. Buffer Zones are detailed in Appendix C of this CSWP Plan. Land use describes the way that people adapt the land to suit their needs, and is associated with planning, control, and rights of property. Zoning is the allocation of land in a municipality and represents how local governments regulate the land. Presenting the PCS inventory with land use was beneficial for the Team to visualize where future PCSs might be developed in relation to the Buffer Zones surrounding their drinking water sources. The process facilitated management strategy development and Source Water Protection Area (SWPA) delineation considerations, which aim to integrate source water protection into local planning and zoning documents to ensure that drinking water quality matches the goals of the community.

2.2.4 Irrigation and Water Conservation

Both residential and agricultural irrigated areas were considered as PCSs because fertilizers and pesticides can be conveyed to groundwater and surface water. This is particularly true where irrigation and chemical applications are managed to maximize aesthetics for landscaping, often resulting in over application of both water and chemicals in southern Nevada's desert climate. In the Colorado River Basin, where water shortage is an urgent and on-going concern, the local Team has identified both residential and agricultural irrigated areas as PCSs. The intention is to build upon management strategies which achieve both source water protection and conservation goals.

2.3 Controlled versus Uncontrolled PCSs

Per the ISWPP guidance for an endorsable CSWP Plan, the PCS inventory should identify PCSs as "controlled" or "uncontrolled". Risk rankings associated with PCS inventories are generally based upon criteria presented in Table 1-D. The risk rankings can be modified if desired, by developing criteria to identify a PCS as "controlled" or "uncontrolled". For the purposes of this CSWP Plan, PCSs were designated as "controlled" if regulated under a State or Federal environmental permit/program (for example, an NPDES Industrial Stormwater Permit). The PCSs considered as "controlled" are in found in Attachment A accompanied by the Facility Registry Service (FRS) or State of Nevada regulatory reference. All other PCSs were considered as "uncontrolled" and listed in Attachment B. The Team did not choose to modify the risk ranking for PCSs (Table 1-D) based on these designation criteria at the time of CSWP Plan development. Electronic links were added to the inventory to help find detailed information about the "controlled" PCSs.

3.0 Inventory Development and Potential Contaminant Source Evaluation

The PCS inventory development and evaluation involved iterative steps which included data collection and review, map presentations and discussions, field review, and Geographic Information System (GIS) map and data preparation for future updates. The Team developed the PCS inventory between August 2022 and December 2022, utilizing electronic databases, existing documents, interviews with Team members, and field surveys. The PCS inventory evaluation was conducted during Team meetings to identify the sources of and potential risks to drinking water so they may be considered in the local planning framework.

Data gathered to develop the PCS inventory was assembled and formatted using a variety of methods, including GIS data, kml and kmz files, and spreadsheets. The Team reviewed the PCS inventory, presented as points, via web mapping applications, online viewers managed by RCI, and PowerPoint presentations. Details are outlined in the following paragraphs, and a summary of all PCS resources utilized for the development of this CSWP Plan are provided in Table 2-D.

3.1 Existing Documents

The Bureau of Safe Drinking Water (BSDW) implements the Source Water Assessment Program (SWAP) for all public water systems in the State of Nevada. SWAP reports for public water systems include water system descriptions, vulnerability assessments, and risk rankings for regulated categories of contaminants in drinking water. The available documentation was reviewed for the PWS in the Lower Virgin River Valley planning area to provide a reference for previously surveyed sources of potential contaminants under the BSDW SWAP protocols.

3.2 Electronic Databases

Electronic database technology has seen rapid growth in the last two decades, as various types of information can be stored, organized, and processed in a way which makes it easy to access, download, and store data. The electronic databases used for this PCS inventory included both public and private GIS software and website databases. A GIS system is a network which creates, manages, analyzes, and maps data, integrating location data with descriptive information. The majority of databases used to compile the PCS inventory and evaluate SWPA characteristics for the Lower Virgin River Valley, are publicly available. However, some sources were only available by request due to proprietary information or water system security concerns. Many databases are updated regularly by the agencies who compile the data, while others provide a static snapshot in time. Data sources for the PCS inventory development and evaluation are outlined below and summarized in Table 2-D.

Table 2-D. Summary of PCS Digital Data Sources

Data Source	Data Description	Availability	Data Maintenance	Creation	Data Type
ESRI World Imagery Service	This map service presents satellite imagery for the world and high-resolution imagery for the United States and other areas around the world (variable dates).	http://www.arcgis.com/home/item.html?id=10df2279f9684e4a9f6a7f08febac2a9	Ongoing	Multiple	Geospatial Files
U.S. Environmental Protection Agency	"Facility", "Tank", and "Owner" databases with information on registered underground storage tanks.	https://www.epa.gov/sourcewaterprotection/drinking-water-mapping-application-protect-source-waters-dwmaps#What	Ongoing	Federal	Geospatial and Spreadsheet Files
U.S. Environmental Protection Agency	Corrective Actions/Leaking Underground Storage Tank Summary.	https://www.epa.gov/sourcewaterprotection/drinking-water-mapping-application-protect-source-waters-dwmaps#What	Ongoing	Federal	Geospatial and Spreadsheet Files
U.S. Environmental Protection Agency	National Map of Underground Storage Tanks and Leaking Underground Storage Tank data.	https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=c220c67462e14763a8e0c4df75550278	Ongoing	Federal	Geospatial and Spreadsheet Files
Nevada Bureau of Safe Drinking Water	Nevada Drinking Water Information System (NDWIS) public water system sources and characteristics.	Upon Request to the Bureau of Safe Drinking Water.	Ongoing	State	Spreadsheet Files
Nevada Division Environmental Protection	NDEP eMap, GeoData Service for spatial data download of regulated facilities: Mining, Waste Management, Water Quality, Water Pollution Control, and Corrective Actions.	https://ndep.nv.gov/land/land-gis-map-resources/gis-downloads	Ongoing	State	Geospatial Files
Nevada Department of Motor Vehicles	Business License Verification databases for: Body Shops, Dealers, Garages, Off-Hwy Dealers, Wreckers, and Manufacturers.	https://dmvapp.nv.gov/DMV/OBL/Business_Reports/Pages/BusinessLicenses.aspx	Ongoing	State	Spreadsheet Files

Data Source	Data Description	Availability	Data Maintenance	Creation	Data Type
U.S. Environmental Protection Agency	Geospatial Data Access Project, downloadable files of sites subject to environmental regulation: Superfund National Priorities List; EPA and State TSD facilities; Toxic Release Inventory System; Integrated Compliance Information System (ICIS) and Permit Compliance System; NPDES; RCRAInfo: Large Quantity Generators; Risk Management Plan; SSTS - Section Seven Tracking System (Pesticides); ACRES - Brownfields Properties.	https://www.epa.gov/sourcewaterprotection/drinking-water-mapping-application-protect-source-waters-dwmaps#What	Ongoing	Federal	Geospatial Files
U.S. Environmental Protection Agency	Interactive webpage providing mapping, charting, filtering functions, and downloadable data for PFAS testing and detection level data across the U.S.	https://echo.epa.gov/trends/pfas-tools	Ongoing	Federal	Spreadsheet Files
U.S. Federal Emergency Management System	Flood hazard mapping for Nevada, Map Service Center Flood Map Store, 32-NFHL_20110929.	Upon Request	Ongoing	Federal	Geospatial Files
Nevada Division of Forestry	Fire Hazard mapping for Nevada.	https://nevadaresourcesandwildfireinfo.com/Map/Public/#map-themes	Ongoing	State	Geospatial Files PDF Reports
The City of Mesquite	PCSs, Parcel Data, stormwater structures, sanitary sewer lines and manholes, storm drain structures, wastewater, and irrigation data.	Upon Request	Ongoing	City	Geospatial Files

3.2.1 Drinking Water Mapping Application

The United States EPA maintains the Drinking Water Mapping Application (EPA, 2016) to provide the state, municipalities, water utility operators, watershed protection groups, and source water collaboratives with mapping tools to update their source water assessments and protection plans. The initial steps for PCS inventory began by conducting a desktop search using the Drinking Water Mapping Application (DW Maps) website. The EPA *Potential Contaminant Source* layers are comprised of several layers from the FRS and Underground Storage Tank (UST) Databases. The Team reviewed the FRS and UST data and included the following in their inventory.

- Active Industrial Stormwater NPDES; active or past construction stormwater permits were discussed with the Team and were not included because the turnover rate is high and construction disturbance is temporary,
- Resource Conservation and Recovery Act (RCRA) active and inactive sites which have the potential to become active in the future or have residual concerns,
- All Toxic Release Inventory sites, and
- UST inventory sites, including active facilities, facilities with historical releases, and facilities with no further action releases due to a concern for residual contaminants.

Data from DW Maps included in this report was cross-referenced with the EPA RCRAInfo Search, EPA EnviroMapper, and EPA UST Finder databases. Any additional references were added to the "controlled" PCS inventory presented in Attachment A.

3.2.2 State of Nevada Databases

The NDEP maintains publicly available GIS web maps for a variety of programs, such as Recycling, Sustainable Materials Management, and Bureau of Mining Regulation and Reclamation (BMRR), among others. The NDEP eMap was utilized to identify any facilities with groundwater discharge or underground injection control (UIC) permits issued by the Nevada Bureau of Water Pollution Control (BWPC). The desktop survey revealed three groundwater discharge permits.

The three permits belong to the VVWD and are associated with discharge at Arsenic Treatment Plants 29, 31, and 32. The VVWD confirmed that they use a coagulation filtration system to remove arsenic from the groundwater. Ferric chlorides, an iron-based coagulant, adsorb the arsenic, in which the solids are filtered out. The coagulation/filtration process resultant solids are discharged to a concrete evaporation basin. The resultant sludge is disposed of in the landfill, following a leachate test in which the sludge does not exceed RCRA toxicity characteristic limits. Taking this process into account, these three groundwater discharge permits were not included in the PCS inventory.

The State of Nevada Department of Motor Vehicles (DMV) maintains a database of business license verifications throughout the state. The DMV database was utilized to identify licensed facilities that fall within the Automotive Class on the *NDEP Suggested Risk Ranking for PCS in Nevada* (Table 1-D). The Team reviewed the data and included the following PCSs in their uncontrolled inventory:

- Auto body shops and garages,
- Salvage yards and wreckers,
- Vehicle manufacturers and dealers, and
- Emission stations.

3.2.3 Data Layers from the City of Mesquite

The City of Mesquite maintains an extensive electronic database, some of which are available to the public through online viewers. The City of Mesquite provided GIS files containing current parcel data and PCSs of concern including:

- Storm drains and spillways,
- Sanitary sewer facilities,
- Irrigation ditches and storage basins,
- Parcels served by individual sewage disposal systems (ISDSs) and private wells, and
- Previously mapped private and public PCSs of concern identified by the City of Mesquite.

Based on a low associated risk determined by the Team, sanitary sewer and storm drainage infrastructure were generally excluded from the inventory. Reclaimed water storage, irrigation water storage, and storm water detention features were typically included in the PCS inventory. Major irrigation ditches and storage basins were also included in the PCS inventory. Use of fertilizers and agricultural chemicals, particularly with flood irrigation methods, are potential non-point sources of contaminants.

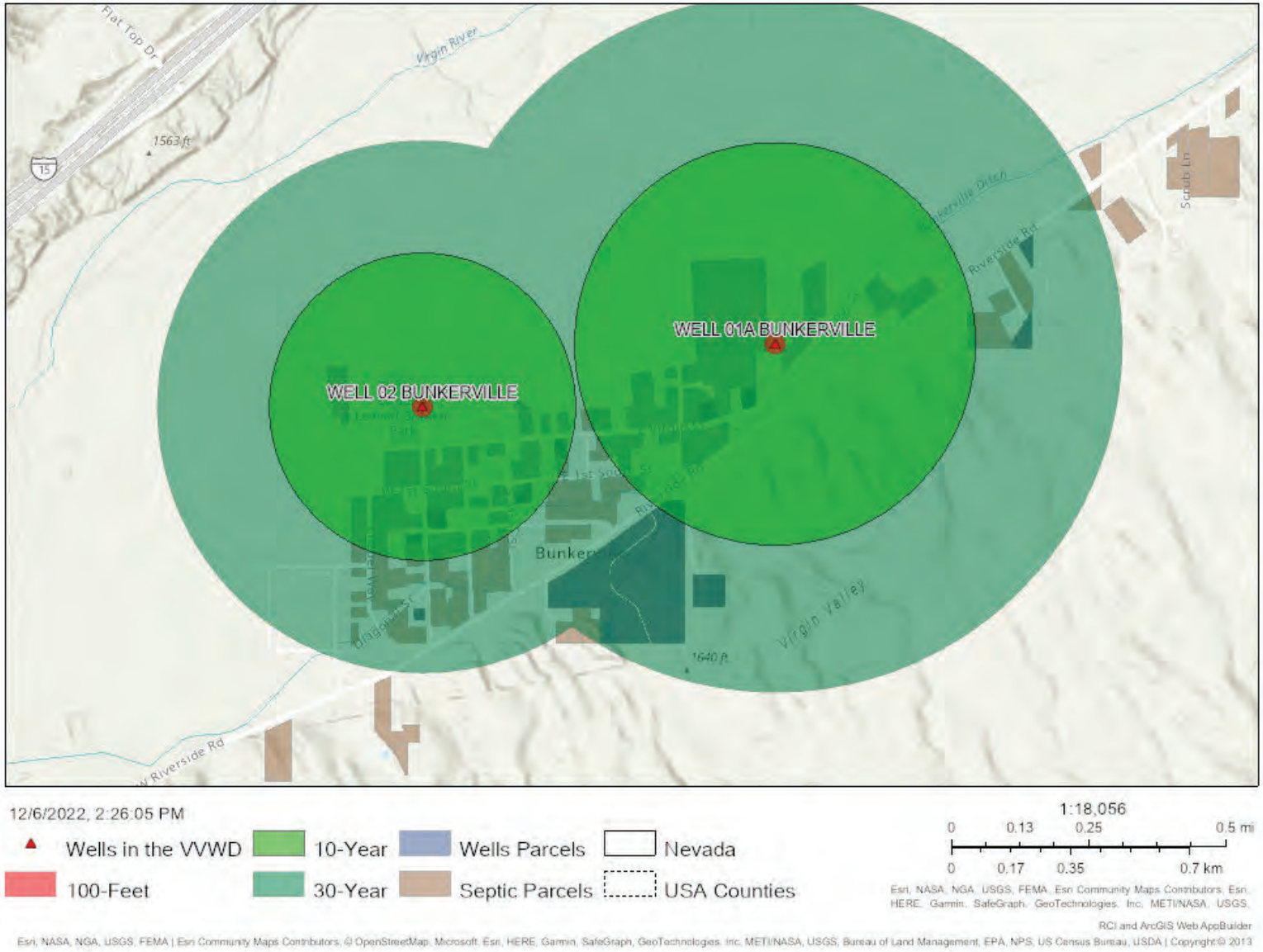
ISDSs can be a potential source of nitrate contamination in groundwater, and unused or "orphaned" wells can provide a direct route to groundwater and can allow pollutants to contaminate other wells that draw water from the same aquifer. The City of Mesquite is a relatively new community with almost all residential, commercial, and industrial facilities served by municipal water and sanitary sewer. The only parcels served by ISDSs are found in the small residential and agricultural community near Bunkerville (unincorporated Clark County) as shown on Figure 1-D. Bunkerville is predominantly served by municipal water provided through the VVWD, though a handful of parcels may also have privately owned wells.

3.2.4 Web-Based Services

Web services such as Google Earth provided detailed information about geographical regions, such as public and private businesses, roadways, parks and recreational centers, and surface water features. These services provided an additional PCS desktop search based on the NDEP *Suggested Risk Rankings for PCS in Nevada* worksheet (Table 1-D). The Team reviewed the web-based data and included the following uncontrolled PCSs in their inventory:

- Agricultural, industrial, and commercial facilities,
- Automotive and storage facilities,
- Residential, medical, and educational facilities,
- Municipal waste, and
- Miscellaneous facilities or activities which store or handle hazardous materials, nutrients, or salts, that can act as a conduit for contaminants to reach groundwater, or facilities and activities which can distribute PCSs to the environment.

Figure 1-D. Parcels Served by ISDSs and Private Wells, Bunkerville SWPAs



3.3 Team Discussions

Team discussions around PCSs in the community are an important part of inventory development and evaluation. Potential groundwater contamination sources vary community-by-community, and the Team provided crucial insight about the risk to their drinking water sources and provided input for the following PCSs.

- The highway was included in the PCS inventory, but Bureau of Corrections transportation related releases were not included. The City of Mesquite Fire Department has adequate response plans in place and future communication with the VVWD about spill/release locations is detailed in Appendix F of this CSWP Plan.
- PFAS has not been identified in the community, but the City of Mesquite Fire Department and VVWD agreed to include training locations in the PCS inventory to consider potential past and future use of fire-fighting foam in training.
- The Wastewater Treatment Plant does not discharge to the Virgin River. All treated wastewater (existing and future recycled water) is and will be accommodated by golf course irrigation. Golf Courses and irrigation storage basins are included in the PCS inventory (see Section 3.2.3 and 3.2.4).
- Sanitary sewer and stormwater drainage systems posed no specific concerns and very low risk for source water protection. Most of the community's infrastructure has been recently constructed and is in good condition.
- Except for the small community of Bunkerville (see section 3.2.3) the area is served by municipal water and sanitary sewer systems. As such, the limited number of ISDSs and privately owned wells are a low priority for source water protection.

3.4 Field Verification

The field verification, or windshield survey, for this CSWP Plan included an on-site survey of the desktop survey and Team discussion inventory throughout the City of Mesquite and the Bunkerville. During this time, a field investigation was conducted to visually identify any PCS not captured in the desktop survey or Team discussions. The field verification/investigation was conducted by a Team member from the Nevada Rural Water Association (NvRWA) on October 6-7 and October 12, 2022. The NvRWA Team member was provided kml, kmz, and spreadsheet files of the preliminary PCS inventory, current and future well locations, and buffer zone calculations. The following recommendations were documented in the spreadsheet and included:

- Remove businesses which have home addresses rather than facilities, including mobile mechanics and cleaners,
- Remove Test Prep Centers, which include web-based tests and web-based courses and certificates,
- Consider where parcels that have PCS facilities intersect the buffer zones,
- Remove PCSs which are not pertinent, such as administrative offices and cardboard-only recycling facilities,
- Add additional PCS businesses noted in the field, and

- Provide the entire PCS inventory to the Team, including PCS which fall outside of the Buffer Zones, so the Team may edit the list following the completion of the Perennial Yield Study.

The NvRWA recommendations were discussed with the Team during meetings, and the Team concurred and implemented most of the suggestions.

The City of Mesquite parcel database was used to identify PCS facilities by parcel, and GIS points were relocated in the buffer zones to represent the extent of the parcel. For example, two PCSs were identified in the desktop survey in the 30-Year Buffer Zone for Well 27A. However, the parcel associated with the two points extended into the 250-Day Buffer Zone. Taking the associated parcel into account, the two points were moved from the 30-Year to the 250-Day Buffer Zone. This example is presented in Figure 2-D. This process was repeated for several PCSs and multiple well locations to facilitate Buffer Zone analysis.

Figure 2-D. Example of associated parcel number consideration for PCSs near Well 27A.

Notes: The area near Well 27A provides an example of how PCSs "points" were located when associated with parcels falling in multiple buffer zones. Two points were moved from the 30-Year Buffer Zone to the 250-Day Buffer Zone based on parcel and Buffer Zone intersection. Purple represents the 30-Year Buffer Zone, orange represents the 250-Day Buffer Zone, the parcel is outlined in teal, and the red points represent the adjusted PCS "point" locations.

4.0 Potential Contaminant Source Analysis within Buffer Zones

Careful evaluation and analysis of the PCS distribution within the various water source Buffer Zones drives how SWPAs are delineated. A well-by-well analysis of the PCS inventory within the Buffer Zones was presented to the Team to facilitate management strategy and SWPA delineation discussions.

GIS tools were used to help characterize the type and frequency of PCSs near each water source. Examples of the analysis include:

- Counting the number of PCSs occurring by well and buffer zone. Figure 3-D shows an example of the Total Count of PCS within the 30-Year Buffer Zone.
- An assessment of the number of PCSs occurring in various "land usage" types is shown in Figure 4-D. This helped inform the Team about the occurrence of PCSs relative to land usage, as well as the significance of land use/zoning for future PCS locations in the community. "Land usage" is a designation discussed in Appendix C of this CSWP Plan and was developed from Clark County and City of Mesquite parcel data for this planning process (Appendix C Figures 7.1-C and 7.2-C, and Appendix C Attachment B - Land Use and Zoning Reference Table).

Figure 3-D. Potential Contaminant Source Analysis within the 30-Year Buffer Zone.

Count of PCS	
Well Name	Total
Well 1A	7
Well 2	5
Well 26A	13
Well 27A	14
Well 28	13
Well 29	
Well 31	
Well 32	
Well 33	1
Well 35	
Well 36	
Well 37	
Well 38	
Well 39	8
Grand Total	**61**

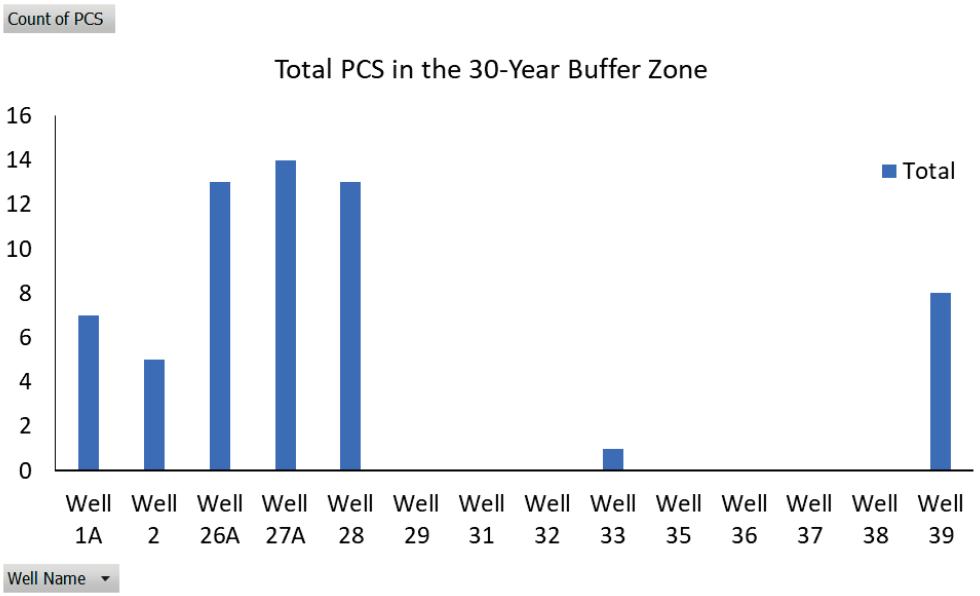
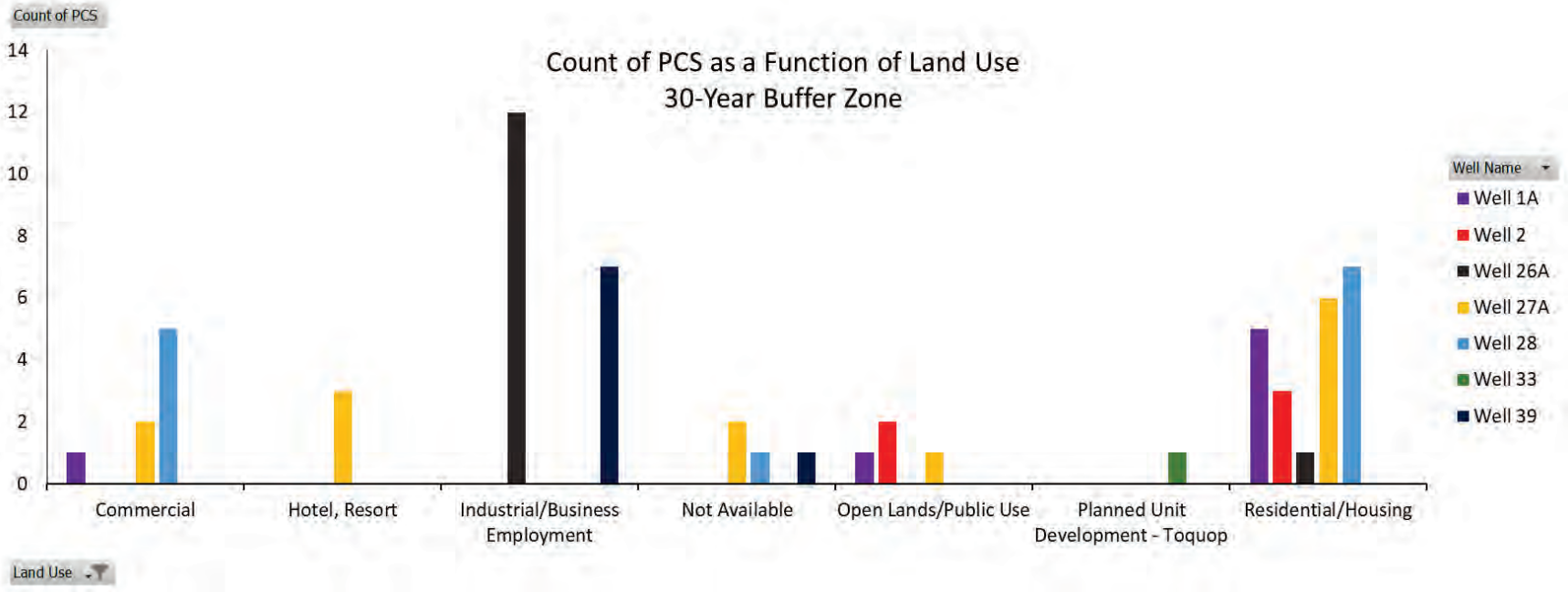


Figure 4-D. Land Use and Potential Contaminant Source Analysis within the Buffer Zone.

Count of PCS	Well Name						
Land Use	Well 1A	Well 2	Well 26A	Well 27A	Well 28	Well 33	Well 39
Commercial	1			2	5		
Hotel, Resort				3			
Industrial/Business Employment			12				7
Not Available				2	1		1
Open Lands/Public Use	1	2		1			
Planned Unit Development - Toquop						1	
Residential/Housing	5	3	1	6	7		
Grand Total	7	5	13	14	13	1	8



5.0 Potential Contaminant Source Inventory Deliverables and Conclusions

The PCS inventory for this CSWP Plan considered desktop and windshield surveys, Team discussions, and risk rankings categories designated by the ISWPP guidance (2010). The PCS inventory was compiled electronically (kml, kmz, compatible GIS files), as well as EXCEL and WORD tables for the Team to review and discuss. Electronic files are intended to be used and updated regularly by the local stakeholders. The final static inventory from 2022 is included in this technical report as the following tables:

- Attachment A – "Controlled" PCSs (permitted/regulated by State or Federal environmental regulations) with links to more detailed information for registered facilities. Facilities can also be searched by the Permit or FRS identifications included in the inventory for more details. "Controlled" examples include hazardous waste generators and Industrial Stormwater Discharge permit holders.
- Attachment B – "Uncontrolled" PCS facilities and activities identified by the Team as PCSs consistent with available guidance and local knowledge, but not falling under existing State or Federal environmental regulations. "Uncontrolled" examples include parks and medical offices.

In order to help fulfill Goal 3 of this CSWP Plan, to integrate source water protection into local planning and zoning documents to ensure that the quality of drinking water matches the goals of the community, the uncontrolled PCS inventory in Attachment B also includes the assessor parcel number (APN). The Team agreed that relating the APN to the PCS will assist city planners in potentially considering source water protection in the local planning framework, which can help to ensure that clean and safe drinking water is available for generations to come.

The inventory development, evaluation, and analysis guided Team discussions and decisions regarding how to establish SWPAs and educate the community about what is being done to protect source water. The inventory analysis in Figure 3-D shows that only seven out of fourteen wells have PCSs within the 30-Year buffer zone. Figure 4-D indicates that the majority of the PCSs occur on Industrial/Business Employment and Commercial land use areas. Careful evaluation and analysis of the PCS inventory ultimately drives how SWPAs are delineated and how management strategies are developed to protect that source water. The SWPA delineation methods and results are presented in Appendix E, and management strategies and the Action Plan are presented in Appendix F of this CSWP Plan.

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Attachment A

Potential Contaminant Source Inventory in the Lower Virgin River Valley (Controlled)

Lower Virgin River Valley Controlled Potential Contaminant Source Inventory			
Registry-Facility ID; Permit Name-ID	**LUST-Permit ID**	**Name**	**Information Link**
110070563027		Mesquite Municipal Airport	https://ofmpub.epa.gov/frs_public2/fii_query_detail.disp_program_facility?p_registry_id=110070563027
110059856847		Sunroc - Bunkerville	https://ofmpub.epa.gov/frs_public2/fii_query_detail.disp_program_facility?p_registry_id=110059856847
110039881232		Mesquite City of - WWTP Expansion	https://ofmpub.epa.gov/frs_public2/fii_query_detail.disp_program_facility?p_registry_id=110039881232
110059837066		Mesquite Landfill	https://ofmpub.epa.gov/frs_public2/fii_query_detail.disp_program_facility?p_registry_id=110059837066
110027824978		Primex Plastics Corp	https://ofmpub.epa.gov/frs_public2/fii_query_detail.disp_program_facility?p_registry_id=110027824978
110004305939		Rite Aid No 6296	https://ofmpub.epa.gov/frs_public2/fii_query_detail.disp_program_facility?p_registry_id=110004305939
110070680456		City of Mesquite Landfill	https://ofmpub.epa.gov/frs_public2/fii_query_detail.disp_program_facility?p_registry_id=110070680456
110064377856		Dollar General Store #14258	https://ofmpub.epa.gov/frs_public2/fii_query_detail.disp_program_facility?p_registry_id=110064377856
110043858554		Mesquite Auto Body & Paint	https://ofmpub.epa.gov/frs_public2/fii_query_detail.disp_program_facility?p_registry_id=110043858554
110055932273		Mesa View Regional Hospital	https://ofmpub.epa.gov/frs_public2/fii_query_detail.disp_program_facility?p_registry_id=110055932273
110038861657		Pro Image Body and Paint	https://ofmpub.epa.gov/frs_public2/fii_query_detail.disp_program_facility?p_registry_id=110038861657
110070912356		Sally Beauty Supply #3686	https://ofmpub.epa.gov/frs_public2/fii_query_detail.disp_program_facility?p_registry_id=110070912356
110063678809		Family Dollar #5818	https://ofmpub.epa.gov/frs_public2/fii_query_detail.disp_program_facility?p_registry_id=110063678809
110023119873		Walmart Supercenter #3847	https://ofmpub.epa.gov/frs_public2/fii_query_detail.disp_program_facility?p_registry_id=110023119873
110004306867		LEES DRY CLEANER	https://ofmpub.epa.gov/frs_public2/fii_query_detail.disp_program_facility?p_registry_id=110004306867
110004303986		Smiths Food and Drug One Hour Photo	https://ofmpub.epa.gov/frs_public2/fii_query_detail.disp_program_facility?p_registry_id=110004303986
110006442885		Diamond Dry Cleaning	https://ofmpub.epa.gov/frs_public2/fii_query_detail.disp_program_facility?p_registry_id=110006442885
110004303566		Peppermill Casinos Inc	https://ofmpub.epa.gov/frs_public2/fii_query_detail.disp_program_facility?p_registry_id=110004303566
NV8-000213		Glendal Arco AM PM	https://geopub.epa.gov/DWWidgetApp/
NV8-000987		Green Valley Grocery #41	https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=c220c67462e14763a8e0c4df75550278
NV8-000132		C Mart Chevron	https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=c220c67462e14763a8e0c4df75550278
NV8-001385		Terrible Herbst #176	https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=c220c67462e14763a8e0c4df75550278
NV8-002111		Maverik Country Store #342	https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=c220c67462e14763a8e0c4df75550278
NV8-002192		Terible Herbst Station #329	https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=c220c67462e14763a8e0c4df75550278
NV8-002268		Mesquite Mart	https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=c220c67462e14763a8e0c4df75550278
NV8-001300		Green Valley Grocery #24	https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=c220c67462e14763a8e0c4df75550278
NV8-001787		Mesquite ARCO AM PM	https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=c220c67462e14763a8e0c4df75550278
NV8-001786		Smith's Express #342	https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=c220c67462e14763a8e0c4df75550278

Lower Virgin River Valley Controlled Potential Contaminant Source Inventory			
Registry-Facility ID; Permit Name-ID	**LUST-Permit ID**	**Name**	**Information Link**
NV8-001908		Virgin Valley High School	https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=c220c67462e14763a8e0c4df75550278
NV8-001803		Virgin Valley Food Mart (Unocal)	https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=c220c67462e14763a8e0c4df75550278
NV8-001806		Mesquite Municipal Airport	https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=c220c67462e14763a8e0c4df75550278
NV8-000478	NV2401	Former Peppermill Truck Stop	https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=c220c67462e14763a8e0c4df75550278
NV8-001510	NV2455	Mesquite Truck Stop	https://geopub.epa.gov/DWWidgetApp/
NV8-000499	NV1421	Wiser Construction	https://geopub.epa.gov/DWWidgetApp/
NV8-000975	NV1870	One Stop Hardware/Pioneer Market	https://geopub.epa.gov/DWWidgetApp/
NV8-001085	NV1966	Glendale Service Facility	https://geopub.epa.gov/DWWidgetApp/
NV8-001085	NV1967	Glendale Service Facility	https://geopub.epa.gov/DWWidgetApp/
NV8-001373	NV2069	Arrowhead Service	https://geopub.epa.gov/DWWidgetApp/
NV8-001373	NV2070	Arrowhead Service	https://geopub.epa.gov/DWWidgetApp/
NV8-001385	NV2080	Terrible Herbst #176	https://geopub.epa.gov/DWWidgetApp/
NV8-001510	NV2146	Mesquite Truck Stop	https://geopub.epa.gov/DWWidgetApp/
NV8-000197	NV1163	FAA - Mormon Mesa V.O.R.	https://geopub.epa.gov/DWWidgetApp/
NV8-001550	NV2155	Lee's Texaco	https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=c220c67462e14763a8e0c4df75550278
NV8-001550	NV2156	Lee's Texaco	https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=c220c67462e14763a8e0c4df75550278
NV8-001968	NV2254	Mesquite City Hall	https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=c220c67462e14763a8e0c4df75550278
NV8-001300	NV2025	Mesquite Shell	https://geopub.epa.gov/DWWidgetApp/
NV8-000236	NV1197	Andrus Transportation Services	https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=c220c67462e14763a8e0c4df75550278
NV8-000838	NV1769	Virgin Valley High School	https://geopub.epa.gov/DWWidgetApp/
NV8-000838	NV1768	Virgin Valley High School	https://geopub.epa.gov/DWWidgetApp/
GNEVOSDS09L0105		CCSD Joseph Bowler Elementary School	https://webgis.ndep.nv.gov/Html5Viewer/index.html?viewer=eMap.eMap_HTML
NS0096016	6482	Oasis Golf Club	https://webgis.ndep.nv.gov/Html5Viewer/index.html?viewer=eMap.eMap_HTML
NS2000512	6534	Falcon Ridge Investments	https://webgis.ndep.nv.gov/Html5Viewer/index.html?viewer=eMap.eMap_HTML
NS2000510	6332	Par 3, LLC Conestoga Golf Club	https://webgis.ndep.nv.gov/Html5Viewer/index.html?viewer=eMap.eMap_HTML
		Historical Mesquite Landfill	NDEP Internal

Notes:
NPDES: National Pollutant Discharge Elimination System
RCRA: Resource Conservation Recovery Act
ID: Identification
LUST: Leaking Underground Storage Tank

Attachment B

Potential Contaminant Source Inventory in the Lower Virgin River Valley (Uncontrolled)

Lower Virgin River Valley Potential Contaminant Source Inventory				
Name	**Source**	**#**	**Risk Ranking**	**APN**
Act Auto Care & Collision Center	Auto Repair Shop	20	High	00224212010
Bunkerville Cemetery	Cemetery	44	Moderate	00225710007
Lincare	Chemical Manufacture Warehouse Distribution	8	High	00223610005
Matsun Nutrition, Inc.	Chemical Manufacture Warehouse Distribution	8	High	00223610006
Mequite Ford Lincoln & RV	Dealer	20	High	00213710002
Mesquite Business Center	Dealer	20	High	00224212006
Domestic Well #43686	Domestic Well	26	Moderate	00225501007
Domestic Well #62851	Domestic Well	26	Moderate	00225501016
Domestic Well #28256	Domestic Well	26	Moderate	00234701003
Domestic Well #43687	Domestic Well	26	Moderate	03500001003
Domestic Well #62847	Domestic Well	26	Moderate	00213501008
Flying J	Gas Station	22	High	00223411003
Shell on Falcon Ridge Pkwy and W Pioneer Blvd	Gas Station	22	High	00213601006
Sinclair	Gas Station	22	High	00118310003
Bunker Farms IR Well #60108	Irrigation Well	7	High	00235401001
Private Label Liquids	Manufacturing	12	High	00223610006
Liquid Health Inc	Manufacturing	12	High	00223610006
Load Technology	Manufacturing	12	High	00224212016
Mesa View Medical Group	Medical Institution	29	Low	00213501011
P3 Medical Group Mesquite	Medical Institution	29	Low	00213510003
Cosmopolitan Dental	Medical Institution	29	Low	00213501011
Dr. Theresa Woolridge-Ofori, DDS	Medical Institution	29	Low	00213501011
Falcon Ridge Dental Care	Medical Institution	29	Low	00213510007
Valley Pediatric Dental and Orthodontics	Medical Institution	29	Low	00118114016
DRH	Medical Institution	29	Low	00213212003
Start Nursery Rock Center	Nursery	48	High	00224212005
Heaton & Lyton Well #1156	Well-Other	55	Low to High	00204000001
Constructino Well #62852	Well-Other	55	Low to High	00232000007
Biasi Dairy Well #35323	Well-Other	55	Low to High	03500001003
Hafen Dairy Well #62859	Well-Other	55	Low to High	00118302012
Thomas Leavitt Memorial Park	Park	48	High	00226710009
StoreMore! Self Storage	Public Storage	33	Low	00213710001
Pioneer Storage	Public Storage	33	Low	00224212015

Lower Virgin River Valley Potential Contaminant Source Inventory				
Name	**Source**	**#**	**Risk Ranking**	**APN**
Innovative Wood Design, LLC	Wood Making	15	High	00224212007
Mesa View Regional Hospital	Medical Institution	29	High	00213501010
Solstice	RV Park	48	High	00213601007
CasaBlanca Golf Course	Golf Course	48	High	00224601021
Mesquite Medical Center	Medical Institution	29	Low	00213501010
Fire Station #3	Other	56	Low to High	00213310003
Desert Falls Sports Resort	Park	48	High	00214811001
Mesquite Regional Park Trails	Park	48	High	00214101001
Prince of Peace Lutheran Church	NA	0	Low	00118114014
Calvary Chapel Mesquite	NA	0	Low	00223610005
SEC Long Drive/Soccer Complex	Park	48	High	00211000002
Joseph Bowler Elementary	Educational Institution	28	Moderate	00226801006
Iglesia Christana Bet-El	NA	0	Low	00118114016
Sunroc - Bunkerville	Construction	45	High	00235299002
Mesa View Regional Hospital	Medical Institution	29	High	00213599003
Pro Image Body and Paint	Paint Shop	18	High	00223610007
Sunroc - Bunkerville	Construction	45	High	00235299002
Terible Herbst Station #329	Storage	32	High	00118299003
Mesquite Mart	Storage	32	High	00118299003
Former Peppermill Truck Stop	Storage	32	High	00118399015
Mesquite Municial Airport	Airport	41	High	00103101004
Precision Aggregate Products	Asphalt/Concrete	42	High	00120301001
Big O Tires	Auto Repair Shop	20	High	00116602031
Pimienta Mobile Auto Repair	Auto Repair Shop	20	High	00118810024
Belltuning	Auto Repair Shop	20	High	00117301046
RMOR	Auto Repair Shop	20	High	00117301046
On The Spot Mobile RV Repair	Auto Repair Shop	20	High	00118712041
A-1 Auto Repair	Auto Repair Shop	20	High	00117603038
LV Auto & Tire Service	Auto Repair Shop	20	High	00116301012
John's Diesel & Auto Repair	Auto Repair Shop	20	High	00116201035
Mesquite Ford	Auto Repair Shop	20	High	00116202030
Mesquite Auto Service	Auto Repair Shop	20	High	00120101002
The Shop	Auto Repair Shop	20	High	00108111012
Walmart Auto Care Center	Auto Repair Shop	20	High	00118210018

Lower Virgin River Valley Potential Contaminant Source Inventory				
Name	**Source**	**#**	**Risk Ranking**	**APN**
Ackerson Auto Glass Co.	Auto Repair Shop	20	High	00118210018
Falcon Ridge Car Wash	Car Wash	21	Moderate	00118117003
Tagg-N-Go Car Wash	Car Wash	21	Moderate	00118210008
MJ's Car Wash and Detailing	Car Wash	21	Moderate	00117201008
Mesquite Mobile Car Wash	Car Wash	21	Moderate	00117301012
Deluxe Mobile Car Wash	Car Wash	21	Moderate	00117815059
Bulldog Car Wash	Car Wash	21	Moderate	00116601008
Morcon Industrial Nevada	Chemical Storage	4	High	00108110022
SouthWest Plumbing Supply	Chemical Storage	4	High	00108111013
Clark County Printing & Mailing	Printing	19	High	00116301006
City Shoppes Embroidery	Printing	19	High	00116311018
Virgin Valley Food Mart	Dealer	20	High	00109701014
Ready Golf Cars	Dealer	20	High	00118114025
Ace Hardware	Dealer	20	High	00116301017
Mequite Auto	Dealer	20	High	00116301001
Abbott Wash	Dewatering Well	55	Low to High	00120201006
Dewater Well Hafen Trailhead	Dewatering Well	55	Low to High	00117813046
Domestic Well #9090	Domestic Well	26	Moderate	00116701027
Domestic Well #378	Domestic Well	26	Moderate	00116701027
Domestic Well #1440	Domestic Well	26	Moderate	00116511025
Domestic Well #29791	Domestic Well	26	Moderate	00129000001
Iron Mountain Cleaners	Dry Cleaner	14	High	00118114024
ARTI Academics - Exclusive Test Prep Center	Education	28	Moderate	00118114023
College of Southern Nevada Mesquite Center	Education	28	Moderate	00116202036
Sunshine Academy	Education	28	Moderate	00116601029
Smith's Fuel Center	Gas Station	22	High	00116510006
Chevron on Falcon Ridge Pkwy	Gas Station	22	High	00118210025
Shell on N Sandhill Blvd and E Old Mill Rd	Gas Station	22	High	00116602001
Shell on W Mesquite Blvd and Pulsipher Ln	Gas Station	22	High	00118701004
Chevron on W Mesquite Blvd and Riverside Rd	Gas Station	22	High	00118702003
Conoco	Gas Station	22	High	00117301001
76	Gas Station	22	High	00109701014
Coyote Willows Golf Course-Member of the SNGA	Golf Course	48	High	00119501022
Golf Mesquite Nevada	Golf Course	48	High	00109216009
Falcon Ridge Golf Course	Golf Course	48	High	00107711007
B&B Drilling IR Well #62858	Irrigation Well	7	High	00117116001

Lower Virgin River Valley Potential Contaminant Source Inventory				
Name	**Source**	**#**	**Risk Ranking**	**APN**
Hardy IR Well #62855	Irrigation Well	7	High	00116199002
Geminis Jewelry LLC	Jewelry Making	16	High	00120101001
L&M Welding	Welding	11	High	00116201035
North View Laundromat	Laundromat	17	Low	00116301006
Primex Plastics Corporation	Manufacturing	12	High	00108601002
Iwynner Packaging	Manufacturing	12	High	00110216007
DJV Merchandise, Inc.	Manufacturing	12	High	00116514001
Canyonlands Healthcare-Mesquite	Medical Institution	29	Low	00116602033
Virgin Valley Dental	Medical Institution	29	Low	00117116002
Dr. Gregory D. Dumitru, DDS	Medical Institution	29	Low	00117116002
Dr. Merchant	Medical Institution	29	Low	00116203021
Mesquite Dental	Medical Institution	29	Low	00116203020
Blazzard, DDS	Medical Institution	29	Low	00109216002
Virgin Valley Veterinary Hospital	Medical Institution	29	Low	00108110023
Mesquite Veterinarian Clinic	Medical Institution	29	Low	00118802005
Envirochem Mill Site	Mill	8	High	00109601003
Aggandize Mining Co. Mill	Mill	8	High	00122000001
White Park R.D. Mill	Mill	8	High	00121000002
Mesquite Farmstead Well #35324	Well-Other	55	Low to High	00128000001
Tri-State Metals Well #25852	Well-Other	55	Low to High	00121000002
Unknown Use Well #62857	Well-Other	55	Low to High	00116511025
F&S Dairy Well #25469	Well-Other	55	Low to High	00109799005
Royal Sanitary Services	Other	56	Low to High	00118801008
Master Craftsmen Body & Paint	Paint and Body Shop	18	High	00108110023
Matinez Customs	Paint and Body Shop	18	High	00120101002
Pulsipher Park	Park	48	High	00116302005
Marilyn Redd Park	Park	48	High	00109501004
Jensen Trailside Park	Park	48	High	00117401003
Library Park	Park	48	High	00116202041
Town Spuare Park	Park	48	High	00116202031
Woodbury Park	Park	48	High	00117603049
Hafen Lane Park	Park	48	High	00117815060
All Secure Storage	Public Storage	33	Low	00116401010
Gold Butte Self Storage	Public Storage	33	Low	00120101005
Extra Space Storage on Mayan Cir	Public Storage	33	Low	00108110047
Extra Space Storage on Riverside Rd	Public Storage	33	Low	00117301005
Mesquite Self Storage	Public Storage	33	Low	00108110040
Hardy Way Storage	Public Storage	33	Low	00108110008

Lower Virgin River Valley Potential Contaminant Source Inventory				
Name	**Source**	**#**	**Risk Ranking**	**APN**
Virgin Valley Disposal Recycle Bins in grocery store parking lot	Recycling	37	High	00116510007
City of Mesquite WWTP	Wastewater Treatment	39	High	00120201001
Falcon Ridge Golf Course	Golf Course	48	High	00118101029
Wolf Creek Golf Club	Golf Course	48	High	00104701035
Oasis Golf Club	Golf Course	48	High	00109201024
The Canyons Golf Course	Golf Course	48	High	00104401012
Eureka Hotel and Casino	Hotel and Casino	57	High	00109601003
Virgin River Hotel and Casino	Hotel and Casino	57	High	00109301002
Virgin River Convention Center	Convention Center	57	High	00116501012
Oasis Hotel and Casino	Hotel and Casino	57	High	00118602008
CasaBlanca Resort and Casino	Hotel and Casino	57	High	00118701002
City Recreation Center and Ballfields	Park	48	High	00116102005
Virgin Valley Heritage Museum	NA	0	Low	00116203010
Fine Arts Center	NA	0	Low	00116203013
Department of Motor Vehicles	NA	0	Low	00117511006
Mesquite City Hall	NA	0	Low	00116301034
Mesquite Community and Senior Center	Park	48	High	00116202032
Courthouse & Jail Facility	NA	0	Low	00109810001
Hunter Sports Park	Park	48	High	00116701026
Fire Station #1	Fire Station	56	Low to High	00116301034
Fire Station #2	Fire Station	56	Low to High	00103101004
The Deuce	NA	0	Low	00116202034
Palmer Golf Course	Golf Course	48	High	00109201024
Conestoga Golf Course	Golf Course	48	High	00201510003
Animal Shelter	Other	56	Low to High	00108201014
Chamber of Commerce	NA	0	Low	00109301001
Mesquite City Cemetery (Hillside Dr Location)	Cemetery	44	Moderate	00109801002
Pioneer Park Ballfield Complex	Park	48	High	00109801002
Old Mill Ballfields	Park	48	High	00116102004
Virgin Valley Water District	NA	0	Low	00120101004
United States Post Office	NA	0	Low	00117701040
Overton Power District #5	Electrical Products & Manufacturing	10	Low to High	00108601004
Reliance Connects Phone Company	NA	0	Low	00116203009

Lower Virgin River Valley Potential Contaminant Source Inventory				
Name	**Source**	**#**	**Risk Ranking**	**APN**
TDS Communications	NA	0	Low	00116602034
Mesquite Campus	Educational Institution	28	Moderate	00116202034
River Valley Bible Church	NA	0	Low	00116701012
Living Waters Fellowship	NA	0	Low	00116514002
Grace Alliance Church	NA	0	Low	00118802005
La Virgen De Guadalupe Catholic Church	NA	0	Low	00105701005
Church of Jesus Christ of Latter-day Saints	NA	0	Low	00116201041
Church of Jesus Christ of Latter-day Saints	NA	0	Low	00116201040
Church of Jesus Christ of Latter-day Saints Seminary	NA	0	Low	00110301004
First Baptist Church	NA	0	Low	00108110036
Christian Community Church	NA	0	Low	00116601011
Mesquite United Methodist Church	NA	0	Low	00108801002
Mesquite Lutheran Church	NA	0	Low	00108801004
Mesquite Christian Center - Christian Fellowship Ministries	NA	0	Low	00116301011
C.A. Hughes Middle School	Educational Institution	28	Moderate	00120501002
Virgin Valley Elementary School	Educational Institution	29	Moderate	00117603048
Clark County Library	NA	0	Low	00116203039
Tennis Court Complex	Park	48	High	00117801003
Valley Presbyterian Church	NA	0	Low	00106313060
Valley Presbyterian Church	NA	0	Low	00118114017
Police Department	NA	0	Low	00108110054
Mesquite Christian Center	NA	0	Low	00116603013
Mesquite City Cemetery (Hardy Way Location)	Cemetery	44	Moderate	00212701006
Leslie's Pool Supplies	Chemical Distribution	8	High	00116510010
Pro Paint-Glass	Paint Shop	18	High	00120101001
Mesquite Municipal Airport	Airport	41	High	00104899001
Mesquite City of - WWTP Expansion	Industrial Stormwater	58	High	00120299007
Primex Plastics Inc	Manufacturing Sites	12	High	00108699001

Lower Virgin River Valley Potential Contaminant Source Inventory				
Name	**Source**	**#**	**Risk Ranking**	**APN**
Rite Aid No. 6296	Hazardous Material Generator	59	High	00116599003
City of Mesquite Landfill	Landfill	35	High	00105399001
Dollar General Store #14258	Hazardous Material Generator	59	High	00116399001
Mesquite Auto Body & Paint	Paint Shop	18	High	00120199001
Sally Beauty Supply #3686	Hazardous Material Generator	59	High	00118199002
Family Dollar #5818	Hazardous Material Generator	59	High	00118799021
Walmart Supercenter #3847	Hazardous Material Generator	59	High	00118199002
Lees Dry Cleaner	Dry Cleaning Establishment	14	High	00120199004
Smiths Food and Drug One Hour Photo	Hazardous Material Generator	59	High	00116599009
Diamond Dry Cleaning	Dry Cleaning Establishment	14	High	00120199004
Peppermill Casinos Inc	Hotel and Casino	57	Low to High	00118399022
Green Valley Grocery #41	Storage	32	High	00118799026
C Mart Chevron	Storage	32	High	00117399001
Terrible Herbst #176	Storage	32	High	00118799005
Maverik Country Store #342	Storage	32	High	00116799050
Green Valley Grocery #24	Storage	32	High	00116699007
Mesquite ARCO AM PM	Storage	32	High	00116599008
Smith's Express #342	Storage	32	High	00116599003
Virgin Valley High School	Storage	32	High	00110399003
Virgin Valley Food Mart (Unocal)	Storage	32	High	00109799003
Mesquite Municipal Airport	Storage	32	High	00104899001
Mesquite Truck Stop	Storage	32	High	00117799016

Lower Virgin River Valley Potential Contaminant Source Inventory				
Name	**Source**	**#**	**Risk Ranking**	**APN**
Terrible Herbst #176	Storage	32	High	00118799005
Mesquite Truck Stop	Storage	32	High	00117799016
FAA - Mormon Mesa V.O.R.	Storage	32	High	00116399002
Lee's Texaco	Storage	32	High	00116301034
Lee's Texaco	Storage	32	High	00116301034
Mesquite City Hall	Storage	32	High	00116399004
Mesquite Shell	Storage	32	High	00116699007
Andrus Transportation Services	Storage	32	High	00116701027
Virgin Valley High School	Storage	32	High	00110399003
Virgin Valley High School	Storage	32	High	00110399003
Mesquite Ditch	Surface Water Ditch	52	High	NA
Pulsipher Wash Detention Basin	Stormwater Retention Basin	53	High	00212701003
Proposed Well 39 Interstate 15	Other	56	Low to High	NA
Well 27A Interstate 15	Other	56	Low to High	NA
Bunkerville Septic 02	Septic	27	Mod to High	NA
Bunkerville Septic 01A	Septic	27	Mod to High	NA
Irrigated Fields 01A	Irrigation Field	5	High	NA
Irrigation Ditch 01A	Irrigation Ditch	5	High	NA
Irrigated Fields 02	Irrigation Field	5	High	NA
Irrigation Ditch 02	Irrigation Ditch	5	High	NA

Notes:

"Source", "#" , and "Risk Ranking" corresponds to Table 1-D, Suggested Risk Rankings for Potential Contaminant Sources .

NA = Not Applicable

Appendix E

Source Water Protection Area Delineations

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Acronyms

AFR	Arbitrary Fixed Radius
BLM	Bureau of Land Management
CFR	Calculated Fixed Radius
CSWP Plan	Community Source Water Protection Plan
ISDS	individual sewage disposal system
ISWPP	Integrated Source Water Protection Program
NDEP	Nevada Division of Environmental Protection
PCS	potential contaminant source
PUD	Planned Unit Development
PWS	public water system
SWPA	source water protection area
Team	Local Planning Team
VVWD	Virgin Valley Water District

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1.0 Introduction

1.1 What is a Source Water Protection Area?

Source water is used to define drinking water in its natural environment (surface or ground water) before it is withdrawn, treated, and distributed to the public by a regulated water system. Managing human activities to reduce the possibility for contaminants to enter these source waters is source water protection. A Source Water Protection Area (SWPA) represents an area where the community has established a precautionary boundary on the land surrounding a drinking water source where water quality is potentially vulnerable to contamination, and local strategies can be developed to implement source water protection.

1.2 Lower Virgin River Valley

The Virgin Valley Water District (VVWD) is the only regulated public water system (PWS) located in Planning Area 3, as outlined in the Wellhead Protection section of the Clark County 208 Area-Wide Water Quality Management Plan (2009). The VVWD serves the City of Mesquite, and the town of Bunkerville (Bunkerville) in unincorporated Clark County. A detailed description of the VVWD water system is provided in Appendix C of the Lower Virgin River Valley Community Source Water Protection (CSWP) Plan.

1.3 CSWP Plan Development Process

The Local Planning Team (Team) started developing the CSWP Plan by determining the purpose and goals for source water protection in the Lower Virgin River Valley area. Then, with the assistance of the Nevada Integrated Source Water Protection Program (ISWPP), they compiled and mapped data to help identify community-based strategies for protecting the quality of their drinking water sources. The process involved:

- Characterizing the VVWD water sources (well location and construction, surrounding land usage, and natural hazards) as described in Appendix C of this CSWP Plan,
- Mapping a range of buffer zones for each well from 100 feet to a calculated 30-year time-of travel (Appendix C), and
- Preparing an inventory of Potential Contaminant Sources (PCSs) to illustrate the location and type of PCSs relative to each well location as presented in Appendix D of this CSWP Plan.

Using this information, the Team was able to consider where precautionary SWPA boundaries should be established in the community. The SWPAs presented and described in the following sections were chosen by the Team to:

- Align with the established CSWP Plan purpose and goals,
- Support the local Source Water Protection management strategies and Action Plan (Appendices F and G of this CSWP Plan),
- Incorporate the PCS inventory evaluation and analysis (Appendix D of this CSWP Plan), and
- Consider community change and growth to complement the local planning framework.

Water conservation is becoming an integral part of life for communities within Clark County. The City of Mesquite and the VVWD are currently working together to promote and implement water conservation measures. The Team recognized that source water protection and water conservation planning and messaging can work hand-in-hand to ensure the community can enjoy their water resources for generations to come. The Team developed this CSWP Plan to incorporate water conservation into source water protection because *all the water in the world won't be enough if it's contaminated, and if the community wastes its water, there could be nothing left to protect* (Anderson, 2023).

2.0 Source Water Protection Area Delineations

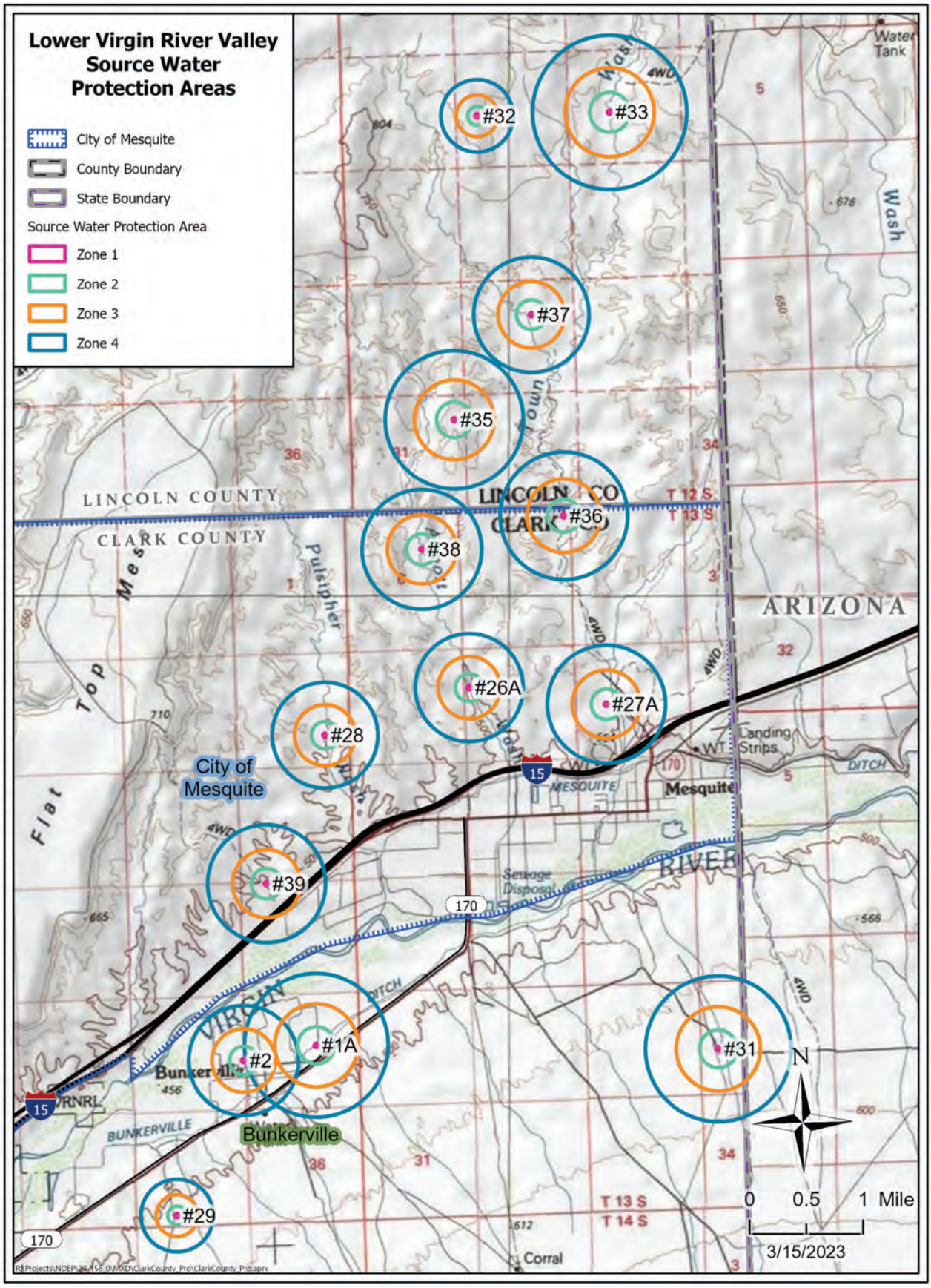
SWPAs are a strategic safeguard that aim to protect sources of drinking water which are necessary for the economic, environmental, social, and public health of a community. Preventing contamination of a groundwater source is a better approach than relying on costly groundwater remediation and treatment technologies to clean up contaminated public water supplies. After a well-by-well review of PCS types and locations, land usage, and buffer zones (Appendices C and D of this CSWP Plan), the Team discussed using different types of SWPAs to establish meaningful management area boundaries for protecting their future drinking water quality.

The Team chose to delineate five types of SWPAs based on the Arbitrary Fixed Radius (AFR) and Calculated Fixed Radius (CFR) methods detailed in Appendix C of this CSWP Plan. They also established a placeholder for results of the VVWDs planned hydrogeologic model in which groundwater recharge areas will be identified. The SWPAs and the motivation behind the delineations are described in Table 1-E. The SWPA delineations are presented on Figure 1-E in this report and in Appendix A of this CSWP Plan.

Table 1-E. Source Water Protection Areas and the Motivation behind the Delineations

SWPA Name	Objective
Zone 1	100-foot AFR: Within a 100-ft radius, the VVWD is concerned about the risk posed by activities adjacent to their wells. Zone 1 is a reasonably confined area to closely monitor existing and proposed activities to ensure that contaminants are suitably managed to prevent releases to the environment and protect water sources. This is consistent with the 100-ft radius management area outlined in the Clark County 208 Area-Wide Water Quality Management Plan (2009) for the Las Vegas Valley Groundwater Management Program. Given the harmful and costly consequences of potential contaminants occurring adjacent to their wells, the VVWD would like to consider control or ownership of lands within a 100-foot radius around their wells.
Zone 2	2-Year CFR: Within the calculated 2-year time-of travel to a PWS well, uses identified as PCSs, particularly those with a "high" risk ranking (See Appendix D of this CSWP Plan), are a high priority for local source water protection management. Establishing Zone 2 will support management of PCSs and education of property owners about source water protection in close proximity to water sources.
Zone 3, Zone 4	10-, 30-Year CFR: Activities occurring in Zone 3 and Zone 4, the calculated 10-year and 30-year time-of-travel, respectively, represent the broader occurrence of PCSs within the community. Depth of the local water aquifer and complexity of contaminant transport warrants reducing long-term risks to water quality from release on the ground surface. These SWPAs will give the community references to identify, and more comprehensively, manage PCSs within the local planning framework. Public education about source water protection and conservation will encourage community involvement within Zones 3 and 4 to ensure that clean and safe drinking water is available for future generations.
Zone 5	Zone 5: A placeholder in this CSWP Plan to be consistent with the Water Master Plan and VVWD's on-going water planning phases. The VVWD has started the development of a comprehensive groundwater model to identify aquifer properties and recharge areas for their water supply source. They anticipate this study will be completed in the next three years and results can be incorporated in the next update of the CSWP Plan.

Figure 1-E. Source Water Protection Areas for the Lower Virgin River Valley



3.0 Source Water Protection Area Characteristics

SWPA characteristics can be summarized in numerous ways. Characteristics may be based on land use, geography/topography, jurisdiction, or activities which may be considered PCSs. The Team prioritized land usage and PCSs within the different SWPAs to build the management strategies and develop the Action Plan (Appendix F of this CSWP Plan). In the Colorado River Basin, where water shortage is an urgent and on-going concern, the Team has included both source water protection and conservation in their goals and management strategies within SWPAs to protect drinking water sources for generations to come. The following sections summarize SWPA characteristics by jurisdiction.

3.1 Overview

The PCS inventory (Appendix D of this CSWP Plan) provided valuable information to the Team regarding the locations of individual facilities which might be, or could become, contaminant sources. Additionally, land use and zoning indicate different "use types" that may be correlated to PCSs, and where they are more likely to be located in the community (for example, areas zoned "industrial"). These details supported the Team as they designed strategies and actions (Appendix F and Appendix G of this CSWP Plan) to help fulfill the goals of this CSWP Plan. The Lower Virgin River Valley CSWP Plan goals are:

> Goal 1: *Identify the sources of and potential risks to drinking water and consider them in the local planning framework.*
>
> Goal 2: *Ensure that clean and safe drinking water is available for future generations.*
>
> Goal 3: *Integrate source water protection and conservation into local planning and zoning documents to ensure that the quality of drinking water matches the goals of the community.*
>
> Goal 4: *Educate the community about what is being accomplished to achieve source water protection and conservation.*

An overview map of PCSs within the SWPAs is included as Figure 2-E. The map shows the 14 wells managed by the VVWD. Seven out of the fourteen wells are located on undeveloped lands and have no PCSs identified within their SWPAs. For these water sources, the Zone 1 through Zone 4 SWPAs provide a structure for local partners to engage in future discussions and recognize the value of source water protection as the community continues to develop.

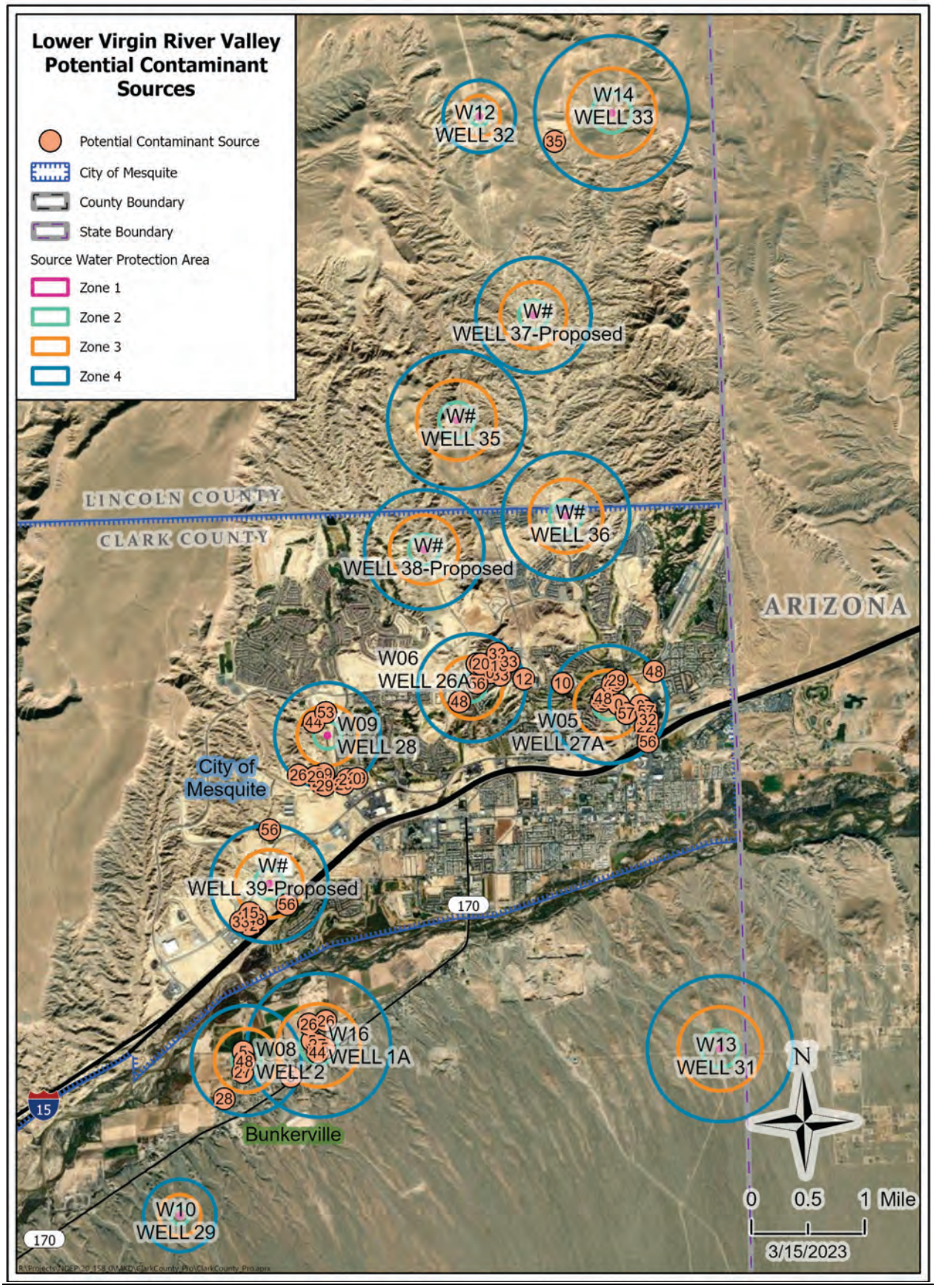
The seven wells managed by the VVWD that have existing PCSs within SWPAs occur in three different jurisdictions, as described in Table 2-E. These water sources are generally discussed by jurisdiction because the planning framework and applicability of various source water protection strategies will vary by jurisdiction.

Table 2-E. Location of Water Source in Different Jurisdictions

Jurisdiction	# Water Sources With NO PCSs in 30-Yr Buffer (Zone 4 SWPA)	# Water Sources With PCSs in 30-Yr Buffer (Zone 4 SWPA)	Total # of Water Sources by Jurisdiction
City of Mesquite	2	4	6
Bunkerville (Unincorp. Clark County)	2	2	4
Lincoln County	3	1	4

The PCS locations relative to the SWPAs for each individual water source are shown on Figure 2-E. Figure 2-E also shows the PCS "Class", a number representing the type of PCS as designated by the *Nevada Division of Environmental Protection (NDEP) Suggested Risk Ranking for PCS in Nevada* (Attachment A). Risk rankings often depend on various factors, such as proximity to source water and the derivatives of potential pollutants produced on site.

Figure 2-E. Potential Contaminant Sources within Source Water Protection Areas



3.2 Land Usage and PCSs within Source Water Protection Areas - City of Mesquite

The VVWD manages four active wells and two proposed future wells in the City of Mesquite. Three active wells and one proposed future well currently contain PCSs within SWPAs, and there are currently no PCSs in Zone 1 for any of the VVWD's wells in the City of Mesquite. Land Use, PCS Class, and Risk Ranking by well and SWPA, as a function of PCS Count, are presented on Chart 1-E and Chart 2-E. For the ease of presentation and analysis, designated land uses and zoning for the City of Mesquite and Clark County were grouped. A table of the grouped land uses for the purpose of this CSWP Plan are included as Attachment B.

Both Well 36 and proposed Well 38 are located in the City of Mesquite, and have SWPAs which extend into Lincoln County to the north. The predominant land usage for both locations is Residential/Housing. Although these wells do not currently have PCSs within the SWPAs, the boundaries motivate planning agency coordination and collaboration with local and regional partners. Creating positive and open communication channels between the City of Mesquite and Lincoln County can facilitate the exchange of data related to SWPAs and future development within the boundaries.

The predominant land usage for Well 26A and Well 27A, where PCSs were identified within the City of Mesquite, are:

- Industrial/Business Employment for Well 26A, and
- Residential/Housing and Open Lands/Public Use for 27A.

The majority of PCSs located near Well 26A occur in Zone 3 and Zone 4 and have risk rankings which range from high to very low. The bulk of PCSs located near Well 27A occur in Zone 4 and have risk rankings which range from high to very low (Chart 1-E) . The PCSs are generally located to the northeast of Well 26A, and to the southeast of Well 27A (Figure 3-E). The SWPAs for these wells can help establish a precautionary boundary to safeguard water quality at the water source, and facilitate education, monitoring, and land use planning to provide more comprehensive management of drinking water sources.

Chart 1-E. Source Water Protection Area Characteristics for the City of Mesquite – East

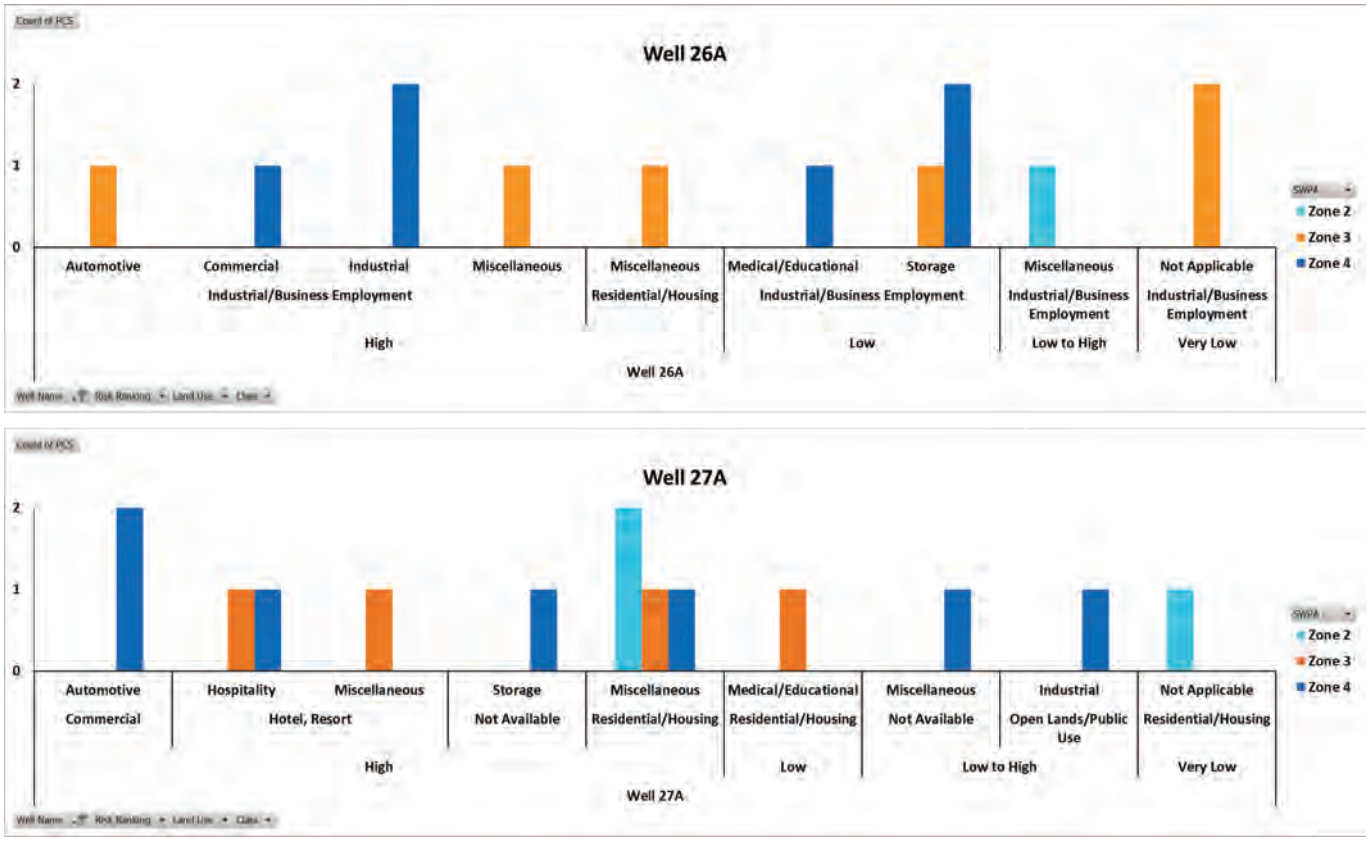
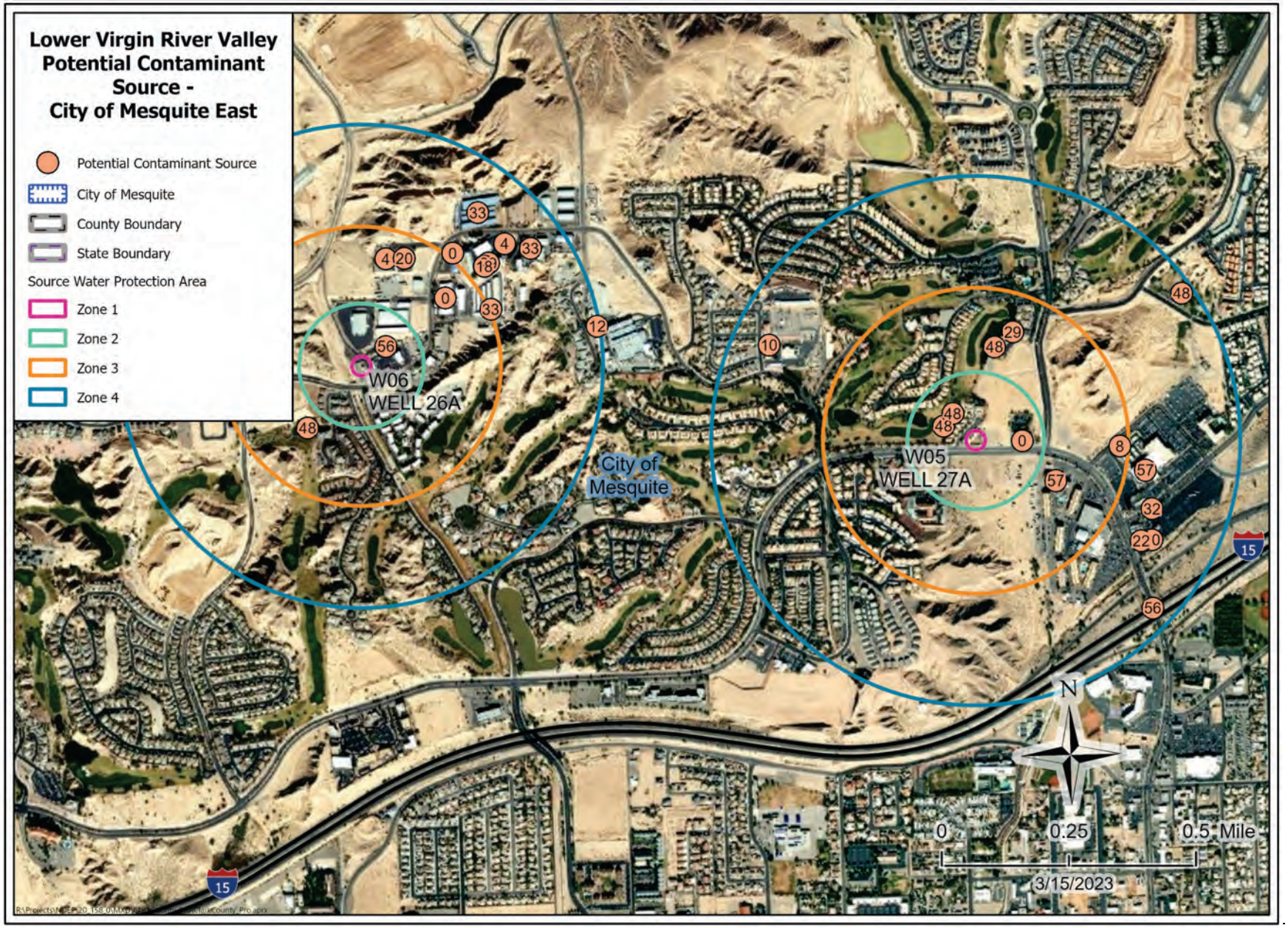


Figure 3-E. Potential Contaminant Source Map in the City of Mesquite – East



The predominant land usage for Well 28 and proposed Well 39 where existing PCSs were identified, are:

- Residential/Housing for Well 28, and
- Industrial/Business Employment for proposed Well 39.

The bulk of PCSs located near Well 28 and proposed Well 39 occur in Zone 4, with risks ranging from high to very low (Chart 2-E). The PCSs are generally located to the north and south of Well 28, and to the southwest of proposed Well 39 (Figure 4-E). Since the majority of PCSs for these wells occur in Zone 4, SWPAs for these wells can help foster public education about what is being accomplished to achieve source water protection and encourage community involvement to ensure that clean and safe drinking water is available for future generations.

Chart 2-E. Source Water Protection Area Characteristics for the City of Mesquite – West

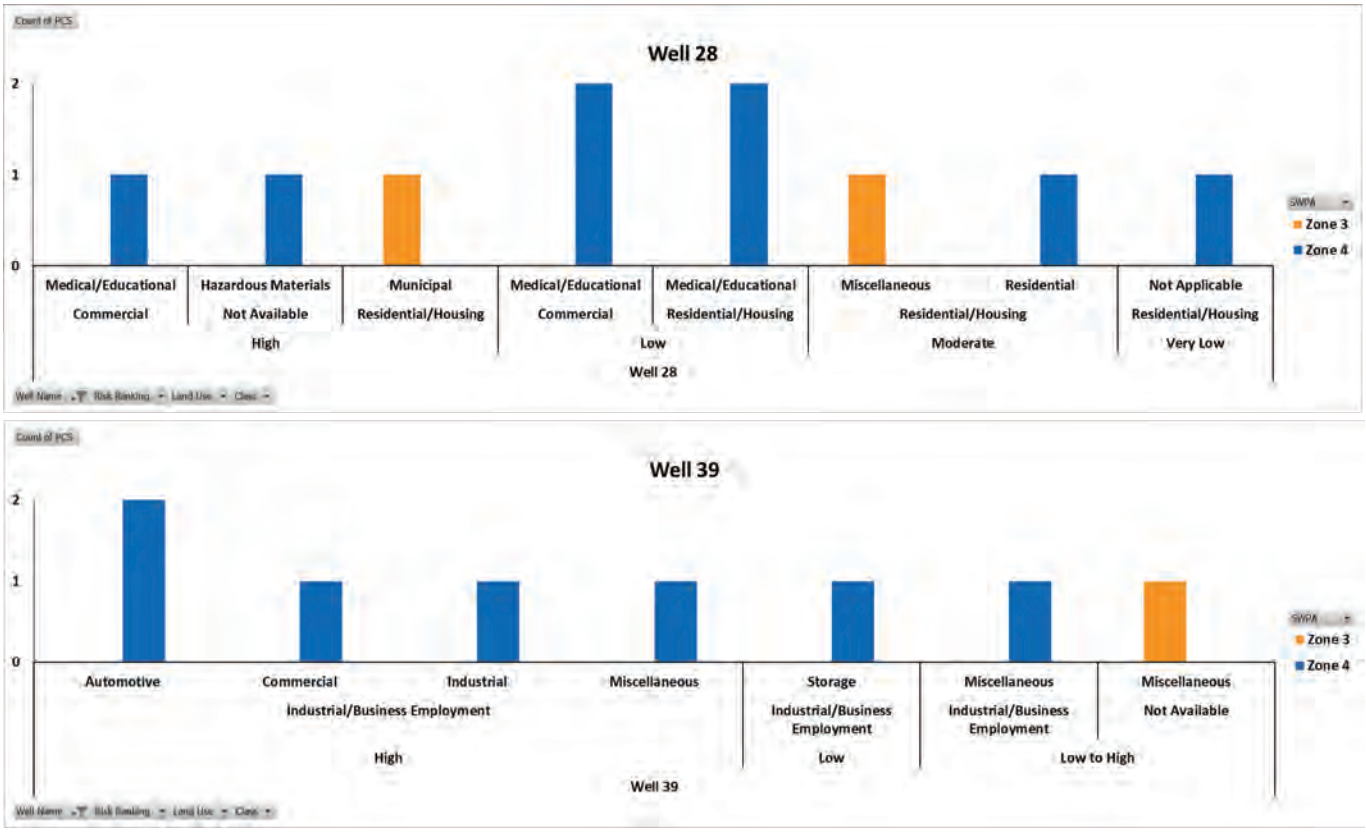
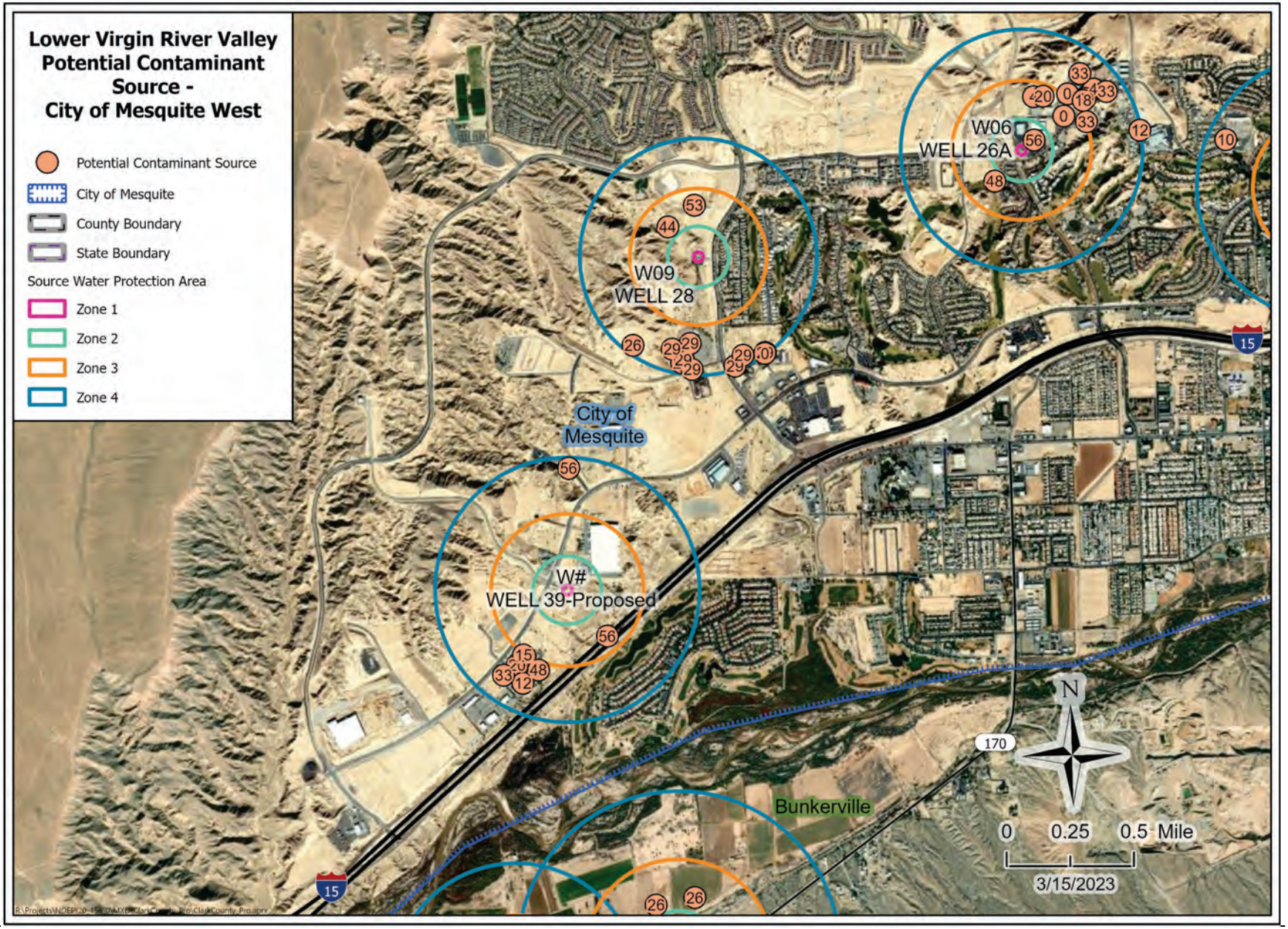


Figure 4-E. Potential Contaminant Source Map in the City of Mesquite – West.



3.3 Land Usage and PCSs within Source Water Protection Areas – Bunkerville

The VVWD manages four active wells in Bunkerville and provides drinking water to this community in unincorporated Clark County. Two of the wells in the Bunkerville area contain existing PCSs within SWPAs. Land Use, PCS Class, and Risk Ranking by well and SWPA, as a function of PCS Count, are presented on Chart 3-E.

Both Well 29 and Well 31 are located in Bunkerville, and Well 31 has SWPAs which extend east into Arizona. The predominant land usage in SWPAs for Well 29 and Well 31 are Residential/Housing and Open Lands/Public Use, respectively. Although these wells do not currently have PCSs within the SWPAs, the boundaries motivate planning agency coordination and collaboration with local and regional partners. Creating positive and open communication channels with Clark County and the Bureau of Land Management (BLM) can expand the conversation related to SWPAs and future development within those boundaries.

The predominant land usage for Well 1A and Well 2 in Bunkerville are:

- Residential/Housing for Well 1A, and
- Residential/Housing and Open Lands/Public Use for Well 2.

PCSs located within Zone 1 through Zone 4 of SWPAs for Well 1A and Well 2 include parcels served by individual sewage disposal systems (ISDSs) and irrigated fields. All parcels in the Bunkerville area are served by ISDSs and almost all are supplied with drinking water by the VVWD (Figure 1-D, Appendix D of this CSWP Plan). For mapping and analysis purposes, the presence of ISDSs and irrigated agriculture were represented by single points in the SWPAs nearest to each of the wells (Well 1A and Well 2). These types of PCSs have potential to introduce nutrients and other contaminants into the shallow groundwater. However, both wells are screened in a deep aquifer, separated by confining layers from the shallow aquifer, and protected by sanitary seals greater than 100 feet. To date, the wells have not shown elevated or increasing nutrient levels, which might reflect contamination from surface activities.

The majority of PCSs located near Well 1A occur in Zone 2 and Zone 3 and have risk rankings which range from high to moderate. One ISDS was identified in Zone 1 for Well 1A, with a risk ranking of moderate to high. The bulk of PCSs located near Well 2 occur in Zone 2 and Zone 4, with one high risk PCS located in Zone 1 (Chart 3-E) . The PCSs are dispersed throughout the SWPAs (Figure 4-E). The SWPAs for these wells can help establish a precautionary boundary to safeguard water quality at the water source, and facilitate public education and outreach targeted toward community education related to safe septic practices and proper household hazardous waste disposal. In addition, the SWPAs can facilitate regional source water protection planning strategies with Clark County and communication related to future development in and around the SWPA boundaries.

Chart 3-E. Source Water Protection Area Characteristics for Bunkerville

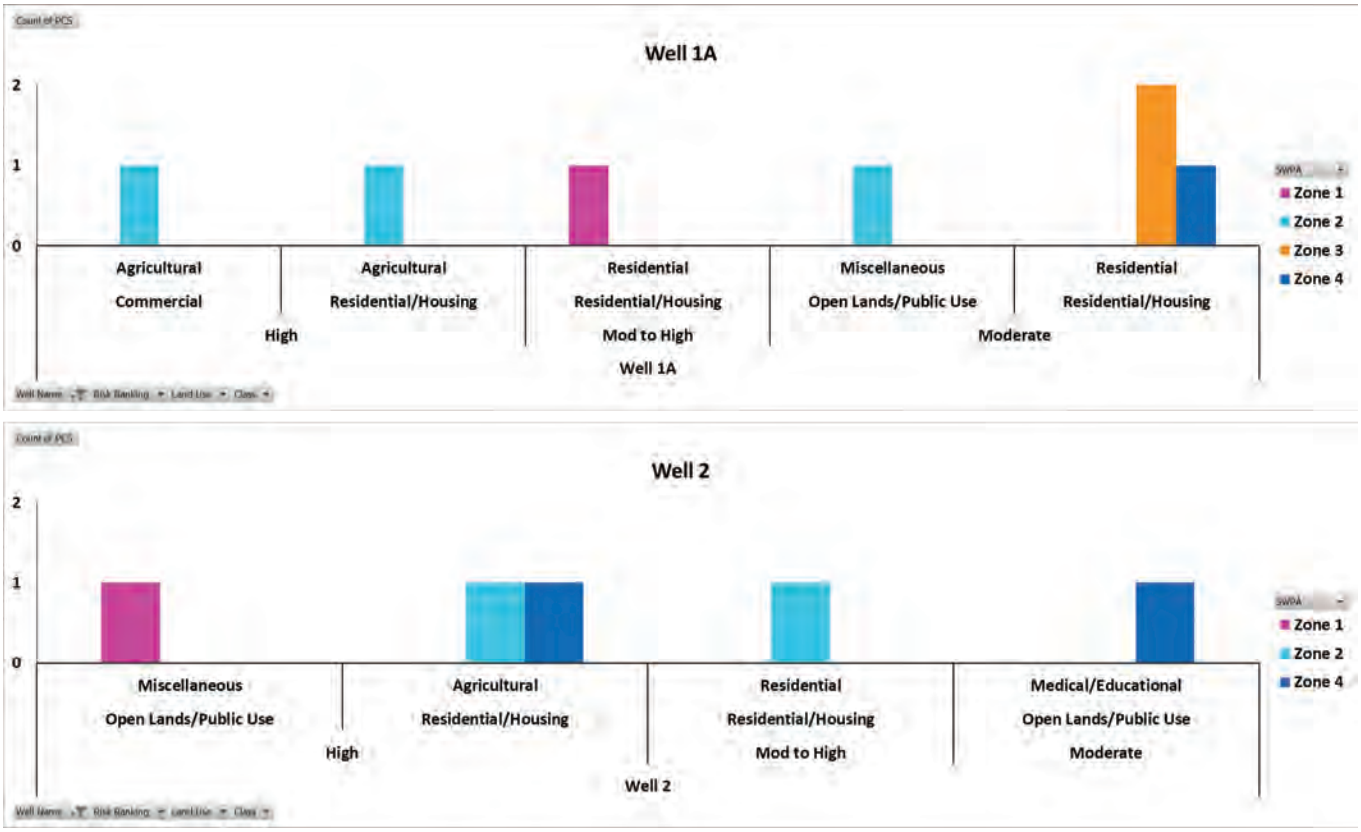
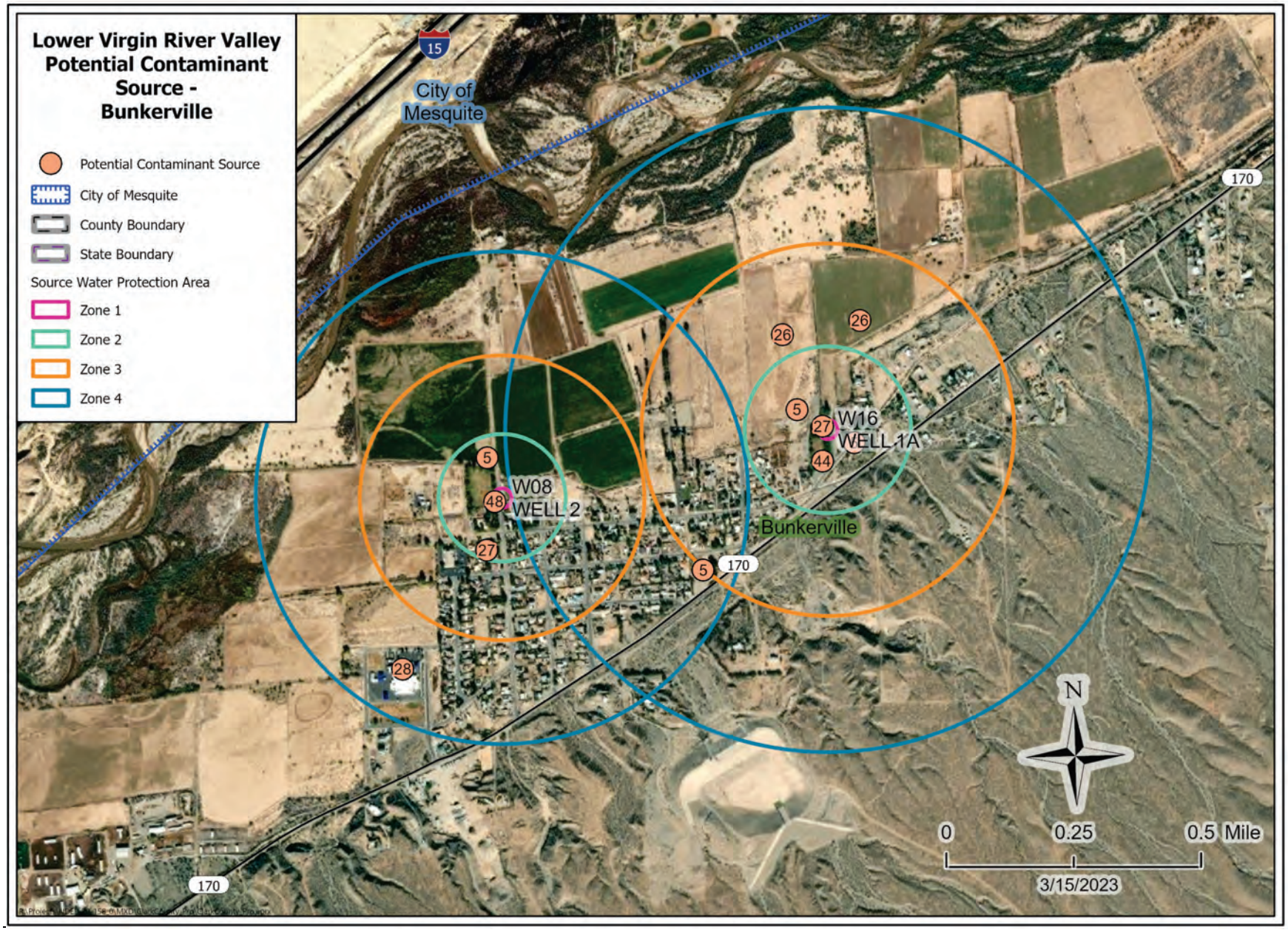


Figure 5-E. Potential Contaminant Source Map in Bunkerville

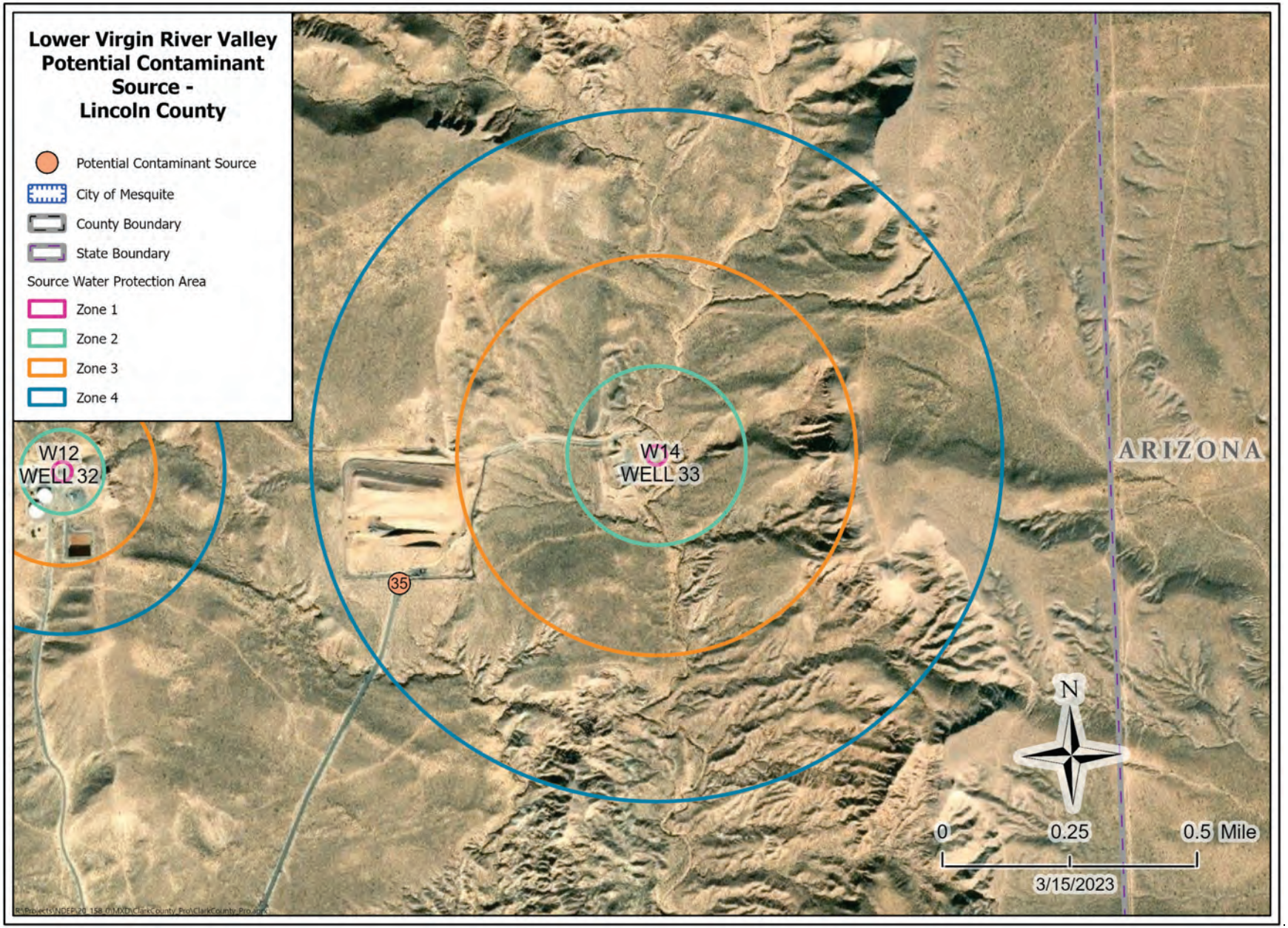


3.4 Land Usage and PCSs within Source Water Protection Areas – Lincoln County

The VVWD manages three active wells and one proposed well located in Lincoln County. All the wells managed by the VVWD are on undeveloped land, zoned as "Planned Unit Development (PUD) – Toquop" by Lincoln County. There is only one existing PCS in the area, which is located in Zone 4 to the southwest of Well 33. This PCS is a regulated landfill, has a municipal PCS Class, and a high risk ranking. The PCS within the SWPAs for Well 33 is presented on Figure 6-E.

The SWPAs in Lincoln County were established as precautionary boundaries to safeguard water quality at the source. Currently, there is no development within the PUD designation, but establishing SWPAs in this area can facilitate coordination of regional source water protection planning strategies with Lincoln County during future development of the area. Additionally, the SWPA boundaries can expand communication with the landfill operators regarding notifications of any releases/spills or future changes to disposal practices.

Figure 6-E. Potential Contaminant Sources within Source Water Protection Areas – Lincoln County



4.0 Management Strategies within Source Water Protection Areas

Source water protection management strategies consider the results of the PCS and land usage analyses, in combination with anticipated community growth within SWPAs, to achieve the goals of this CSWP Plan. The management strategies developed by the Team were designed to be simple and easy to implement, and to reduce the potential of source water contamination within the Lower Virgin River Valley SWPAs. Through Team discussions and meetings, the Team developed four management strategies for this CSWP Plan, including:

1. Public Education and Outreach (Appendix G of this CSWP Plan),
2. Planning Agency Coordination,
3. Collaboration with Local and Regional Partners, and
4. Secure Locations for Current and Future Water Sources.

Management strategies support the goals outlined by the Team, and the Action Plan describes how CSWP Plan goals and strategies will be implemented. The Team worked to create practical projects within the Action Plan which are reasonable to implement. Examples of the management strategies and action projects which were developed in consideration of the SWPAs are outlined in Table 2-E and Table 3-E. Thoughtful considerations were made by the Team based on SWPAs, PCSs, land use and zoning, planning, regional collaboration based on well location, public education and outreach, and hazard mitigation. The Action Plan and the Education Plan are detailed in Appendix F and Appendix G of this CSWP Plan, respectively.

Table 2-E. Management Strategy and Action Plan Development in SWPAs

SWPA - Zone 1	Management Strategies
100-foot AFR: Within a 100-ft radius, the VVWD is concerned about the risk posed by activities adjacent to their wells. Zone 1 is a reasonably confined area to closely monitor existing and proposed activities to ensure that contaminants are suitably managed to prevent releases to the environment and protect water sources. This is consistent with the 100-ft radius management area outlined in the Clark County 208 Area-Wide Water Quality Management Plan (2009) for the Las Vegas Valley Groundwater Management Program. Where feasible, such as in areas that are currently undeveloped, the VVWD would like to consider control or ownership of lands within Zone 1.	**Planning Agency Coordination:** *Example:* Support source water protection communication between the VVWD and local agencies in Clark County regarding prospective development outside the City of Mesquite boundary. **Collaboration with Local and Regional Partners:** *Example:* Continue to endorse regional plans which protect source water and promote water quality and resource management. For example, support updates to the Clark County 208 Area-Wide Water Quality Management Plan. **Secure Locations for future water sources:** *Example:* Continue to work with landowners on a purchase or land swap near future Well 39.

SWPA - Zone 2	Management Strategies
2-Year CFR: Within the calculated 2-year time-of travel to a PWS well, uses identified as PCSs, particularly those with a "high" risk ranking (See Appendix D of this CSWP Plan) are a high priority for local source water protection management. Establishing Zone 2 will support management of PCSs and education of property owners about source water protection close proximity to water sources.	**Public Education and Outreach:** *Example*: Consider working with property owners to promote proper septic tank maintenance as it relates to source water protection. **Planning Agency Coordination:** *Example:* Assist the City of Mesquite in the development review process to consider source water protection. **Collaboration with Local and Regional Partners:** *Example*: Expand communication with the Mesquite Fire Department and the VVWD regarding notifications and procedures for incidents of spill/release of petroleum and hazardous chemicals in SWPAs.

Table 3-E. Management Strategy and Action Plan Development in SWPAs – Zone 3, Zone 4, and Zone 5

SWPA - Zone 3, Zone 4	Management Strategies
10-, 30-Year CFR: Activities occurring in Zone 3 and Zone 4, the calculated 10-year and 30-year time-of-travel respectively, represent the broader occurrence of PCS within the community. Depth of the local water aquifer and complexity of contaminant transport warrants reducing long-term risks to water quality from release on the ground surface. These SWPAs will give the community references to identify and more comprehensively manage PCSs within the local planning framework. Public education about source water protection and conservation will encourage community involvement within Zones 3 and 4 to ensure that clean and safe drinking water is available for future generations.	**Public Education and Outreach:** *Example:* Expand source water protection education into the application process for development review within the City of Mesquite. Examples include providing developers a SWPA map, or information on how to contact the VVWD if there are plans to develop within a SWPA. **Planning Agency Coordination:** *Example:* Consider preparation of a Conservation Element for the City of Mesquite Master Plan that incorporates source water protection and water conservation goals and policies. **Collaboration with Local and Regional Partners:** *Example:* Consider presenting source water protection achievements to the Virgin River Coalition (VRC) and coordinate on incorporating a source water protection message into the bi-annual meetings. **Secure Locations for Future Water Sources:** *Example:* Consider land use and zoning when reviewing proposed future well locations.

SWPA - Zone 3, Zone 4	Management Strategies
Zone 5	**Management Strategies**
A placeholder in this CSWP Plan to be consistent with the Water Master Plan and VVWDs on-going phases water planning. The VVWD has started the development of a comprehensive groundwater model to identify aquifer properties and recharge areas for their water supply source. They anticipate this study will be completed in the next 3-years and results can be incorporated in next update of the CSWP Plan.	**Planning Agency Coordination:** *Example:* Coordinate review and update of this CSWP Plan in with updates of the VVWD Water Master Plan (typically every 5 years) and Well Sustainability Study, or more frequently as needed to include new information (water sources location, hydrogeologic information, etc.). **Collaboration with Local and Regional Partners:** *Example:* Consider protection of drinking water sources in the stormwater planning guidance and updates.

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Attachment A

Suggested Rick Rankings for Potential Contaminant Sources in the Lower Virgin River Valley

Attachment A

Suggested Risk Rankings for Potential Contaminant Sources in the Lower Virgin River Valley

CLASS	#	SOURCE	CATEGORY					RISK RANKING
			A	B	C	D	E	
Not Applicable	0	Not Applicable						Very Low
Agricultural	1	Animal burial areas			X	X		High
	2	Animal feedlots		X	X	X		Mod to High
	3	Chemical application (e.g., pesticides, fungicides, & fertilizers)		X	X			High
	4	Chemical mixing & storage areas (Including rural airports)	X	X	X			High
	5	Irrigated fields & Irrigation ditches		X	X			Moderate to High
		Irrigation ditches			X			High
	6	Manure spreading & pits	X		X			Moderate
	7	Unsealed irrigation wells	X		X			High
Industrial	8	Chemical manufactures, warehousing/distribution activities	X	X	X			High
	9	Electroplaters & fabricators			X			High
	10	Electrical products & manufacturing			X			High
	11	Machine & metalworking shops	X					High
	12	Manufacturing sites	X	X	X			High
	13	Petroleum products production, storage, & distribution centers	X					High
Commercial	14	Dry cleaning establishments	X					High
	15	Furniture & wood stripper & refinishers	X					High
	16	Jewelry & metal plating			X			High
	17	Laundromats						Low
	18	Paint shops	X					High
	19	Photography establishments & printers			X			High
Automotive	20	Auto repair shops	X					High
	21	Car washes	X		X	X		Moderate
	22	Gas stations	X					High
	23	Road deicing operations: storage & application			X			Moderate
	24	Road maintenance depots	X		X			High
Residential	25	Household hazardous products	X	X	X			Moderate
	26	Private wells	X	X		X		Moderate
	27	Septic systems, cesspools		X	X	X		Mod to High

CLASS	#	SOURCE	CATEGORY					RISK RANKING
			A	B	C	D	E	
Medical/ Educational	28	Educational institutions (labs, lawns, & chemical storage)		X	X			Moderate
	29	Medical institutions (medical, dental, vet offices)				X		Low
	30	Research Laboratories	X	X		X		High
Storage	31	Above ground storage tanks	X					High
	32	Underground storage tanks	X					High
	33	Public storage	X					Low
	34	Radioactive materials storage					X	High
Municipal	35	Dumps and landfills (historical/active)	X	X	X	X	X	High
	36	Municipal incinerators		X	X	X		Moderate
	37	Recycling & reduction facilities			X			High
	38	Scrap & junkyards	X		X			High
	39	Wastewater reclamation facilities		X	X	X		High
	40	Sewer lift stations		X	X	X		High
Miscellaneous	41	Airports	X					High
	42	Asphalt plants	X					High
	43	Boat yards	X					High
	44	Cemeteries				X		Moderate
	45	Construction areas	X			X		Moderate
	46	Dry wells	X					High
	47	Fuel storage systems	X					High
	48	Golf courses, parks & nurseries (chemical application)		X	X			High
	49	Mining (surface & underground)	X		X			High
	50	Pipelines (oil, gas, coal slurry)	X					High
	51	Railroad tracks, yards & maintenance	X	X	X	X		High
	52	Surface water impoundments, streams, ditches				X		High
	53	Storm water drains & retention basins	X	X	X	X		High
	54	Unplugged abandoned well	X	X		X		High
	55	Well – operating	X	X	X	X		Low to High
	56	Other	X	X	X	X	X	Low to High
Hospitality	57	Hotels and Casinos, Landscaping, Parking, Events		X	X			Low
Industrial Stormwater Permits	58	National Pollutant Discharge Elimination System (NPDES) Industrial Stormwater Permits	X	X	X	X	X	High
Hazardous Materials	59	Hazardous Material Generator	X	X	X	X	X	High

Contaminant Categories: A = Volatile Organic Compounds, B = Synthetic Organic Chemical, C = Inorganic Compound, D = Microbiological, E = Radionuclides

Attachment B

Land Use and Zoning Reference Table

Mesquite Land Use Designations: Type1= Code, Type2=Formal Name, Type3=map symbology		

City of Mesquite Data:		
Type 1	Type 2	Type 3
Various	Residential	Residential/Housing
CR-1	Commercial and Retail	Commercial
CR-2	Commercial and Retail	Commercial
CR-3	Commercial and Retail	Commercial
CR-H	Commercial and Retail	Commercial
HT	Hotel and Tourist	Hotel, Resort
IR-1	Industrial-Research	Industrial/Business Employment
IR-2	Industrial-Research	Industrial/Business Employment
MH	Manufactured Housing	Residential/Housing
PB	Professional/Business Office	Industrial/Business Employment
PF	Public Facilities	Open Lands/Public Use
PROS	Parks, Recreation and Open Space	Open Lands/Public Use
RV	RV/Motor Home	Residential/Housing

Clark County Data:		
Type 1	Type 2	Type 3
AG	Agriculture	Agriculture
BE	Business Employment	Industrial/Business Employment
CM	Corridor Mixed-Use	Commercial
EN	Edge Neighborhood	Residential/Housing
MN	Mid-Intensity Suburban Neighborhood	Residential/Housing
OL	Open Lands	Open Lands/Public Use
ON	Outlying Neighborhood	Residential/Housing
PU	Public Use	Open Lands/Public Use
RN	Ranch Estate Neighborhood	Residential/Housing

Lincoln County Data:		
Type 1	Type 2	Type 3
A5	Agricultural - 40 Acres	Agricultural
PUD_TOQ	Planned Unit Development - Toquop	Planned Unit Development - Toquop

Appendix F

Action Plan

Acronyms

BLM	Bureau of Land Management
BMPs	best management practices
COM	City of Mesquite
CSWP Plan	Community Source Water Protection Plan
ESRI	Environmental Systems Research Institute
FEMA	Federal Emergency Management Agency
ISWPP	Integrated Source Water Protection Program
IT	Information Technology
LID	low impact development
NDEP	Nevada Division of Environmental Protection
NvRWA	Nevada Rural Water Association
PCSs	potential contaminant sources
PUD	Public Utilities District
PWS	public water system
STEM	Science, Technology, Engineering and Math
SWPAs	source water protection areas
Team	Local Planning Team
USGS	United States Geological Survey
VVWD	Virgin Valley Water District

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The Action Plan was developed by the Local Planning Team (Team) to achieve the goals of the Lower Virgin River Valley Community Source Water Protection (CSWP) Plan. The management strategies (Section 3.4 of this CSWP Plan) were designed by the Team to support the CSWP Plan Goals, and the action projects represent how the goals and management strategies will be implemented. The Team worked to create manageable action projects with real world applications which are easy and reasonable to implement. The individual action projects are organized by management strategy and are not listed in the order of priority. Instead, the action projects are grouped by strategy type, such as Public Education and Outreach.

The Action Plan evolved throughout the development of the Lower Virgin River Valley CSWP Plan during Team meetings. Each action project includes an action description, priority and cost, project lead, type of assistance needed, and expected implementation year. Implementation is dependent upon resource availability and the actions will be implemented by the Team as funding and time allows. Potential funding sources can be used to assist the Team in Action Plan implementation. The Team benefits from building relationships and leveraging resources with various entities. A list of potential funding sources is outlined below.

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 and Innovation Act >Pollution Prevention Grant Program >Water Infrastructure Improvements for the Nation >FITS
United States Department of Agriculture (USDA)	>Emergency Community Water Assistance Grants
Federal Emergency Management Agency (FEMA)	>Flood Mitigation Assistance
State of Nevada	>AB 198 Grants >Integrated Source Water Protection Program (ISWPP) Implementation 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(h) Nonpoint Source Grant Program
United States Geological Survey (USGS)	>CFDA 15.980 National Groundwater Monitoring Network >CFDA 15.981 Water Use and Data Research

	Community Source Water Protection - Action Plan					
	Management Strategy	**Action Description**	**Priority and Cost**	**Project Lead**	**Type of Assistance Needed**	**Expected Implementation Year**
1.1	*Public Education and Outreach*	Promote source water protection on the Virgin Valley Water District (VVWD) website. For example, provide a link to the CSWP Plan or a public online viewer.	High Staff Time	VVWD	Technical Assistance	2023
1.2	*Public Education and Outreach*	Promote source water protection on the VVWD Facebook page.	High Staff Time	VVWD	Technical Assistance	2023
1.3	*Public Education and Outreach*	Promote source water protection on the City of Mesquite (COM) website. For example, create a public online viewer which includes source water protection areas (SWPAs). The COM has license to create and house a public Community Source Water Protection Viewer.	High Staff Time	City of Mesquite	Information Technology (IT) Department Services	2023
1.4	*Public Education and Outreach*	Expand source water protection education into the application process for development review within the COM. Examples include providing developers a SWPA map, or information on how to contact the VVWD if there are plans to develop within a SWPA.	High Staff Time	COM	IT Department Services	2023
1.5	*Public Education and Outreach*	Consider promoting and participating in established events which support source water protection. For example, American Water Works Association National Source Water Protection Week.	Medium to High Staff Time $3000	VVWD	Technical Assistance	2023
1.6	*Public Education and Outreach*	Promote source water protection and obtain resources to purchase watershed and groundwater models. For example, the Awesome Aquifer and Enviroscape Models.	High $1,700	VVWD	Technical Assistance for Materials	2023
1.7	*Public Education and Outreach*	Help promote source water protection through the VVWD's water conservation outreach program. For example, present the Enviroscape Model at community or school events.	High $1,000	VVWD	Technical Assistance for Materials	2023 and Forward

	Community Source Water Protection - Action Plan					
	Management Strategy	**Action Description**	**Priority and Cost**	**Project Lead**	**Type of Assistance Needed**	**Expected Implementation Year**
1.8	*Public Education and Outreach*	Invite source water protection partners to present a drinking water message at local schools or events. For example, the ISWPP Contractor or Nevada Rural Water Association (NvRWA).	Medium Staff Time	VVWD	Technical Assistance and NvRWA Assistance	2023 and Forward
1.9	*Public Education and Outreach*	Participate in Science, Technology, Engineering, and Math (STEM) theme nights at local schools promoting age-appropriate information on protecting local water sources.	Medium Staff Time	VVWD	Technical Assistance for Materials	2023-2024 School Year
1.10	*Public Education and Outreach*	Consider site visits to the VVWD and/or Public Works for school age children and parents to promote source water and water quality education within the community.	Medium Up to $10,000 for Videography	VVWD	Technical Assistance for Materials	2024
1.11	*Public Education and Outreach*	Expand outreach to teachers about educational opportunities which include a drinking water message. For example, Project Wet.	Medium $1,000	VVWD	Technical Assistance for Materials	2023 and Forward
1.12	*Public Education and Outreach*	Coordinate with the NvRWA and other local public water systems (PWSs) regarding training and resources for source water protection education.	High Staff Time	VVWD	Technical Assistance for Materials and NvRWA Assistance	2023 and Forward
1.13	*Public Education and Outreach*	Consider working with property owners to promote proper septic tank maintenance as it relates to source water protection.	High $500	VVWD	Technical Assistance for Materials and NvRWA Assistance	2023 and Forward
1.14	*Public Education and Outreach*	Expand information and support public education and outreach about proper disposal of chemicals, pharmaceuticals, and household hazardous materials.	High $500	VVWD	Technical Assistance for Materials	2023 and Forward
1.15	*Public Education and Outreach*	Expand public education and outreach regarding proper fertilizer and pesticide management.	Medium $500	VVWD	Technical Assistance for Materials	2023 and Forward

	Community Source Water Protection - Action Plan					
	Management Strategy	**Action Description**	**Priority and Cost**	**Project Lead**	**Type of Assistance Needed**	**Expected Implementation Year**
1.16	*Public Education and Outreach*	Broaden community public education and outreach by producing source water protection and conservation pamphlets and outreach materials in both English and Spanish.	Medium to High $1,000	VVWD	Technical Assistance for Materials	2023 – 2024 and Forward
1.17	*Public Education and Outreach*	Advertise what the community is doing for source water protection at the golf courses using flyers and banners.	Low Staff Time $500	VVWD	Technical Assistance for Materials	2023 – 2024 and Forward
1.18	*Public Education and Outreach*	Reach out to community and non-profit organizations about what is being done to protect and conserve their source water. For example, the Rotary Club, Elks Club, and Homeowners Associations.	Medium Staff Time	VVWD	Technical Assistance for Materials	2023 and Forward
1.19	*Public Education and Outreach*	Consider incorporating a source water protection booth at community events such as Mesquite Day, Mesquite Night Out, Bunkerville Water Fight, and July 3rd and 4th celebrations.	Medium to High Staff Time $1000	VVWD	Technical Assistance for Materials	2023 and Forward
1.20	*Public Education and Outreach*	Reach out to Casinos and retirement communities to establish a partnership and promote source water protection by distributing flyers and participating in community events.	Medium to High $500	VVWD	Technical Assistance for Materials	2023 and Forward
1.21	*Public Education and Outreach*	Consider developing a program which recognizes and highlights the water conservation achievements of local businesses to promote water conservation throughout the community. For example, promote achievements and tag businesses on social media, and reward businesses with a banner to hang in their window.	Medium to High Staff Time $100	VVWD	Fire Department	2023 and Forward
2.1	*Planning Agency Coordination*	Present source water protection planning accomplishments to local partners. For example, the Bunkerville Town Council and/or Lincoln County.	Medium Staff Time	VVWD	Staff Time	2023-2024
2.2	*Planning Agency Coordination*	Support source water protection communication between the VVWD and local agencies in Clark County regarding prospective development outside the COM boundary.	High Staff Time	VVWD	Technical Assistance for Materials Needed	2023 and Forward

	Community Source Water Protection - Action Plan					
	Management Strategy	**Action Description**	**Priority and Cost**	**Project Lead**	**Type of Assistance Needed**	**Expected Implementation Year**
2.3	*Planning Agency Coordination*	Ensure that source water protection planning is incorporated in updates to the VVWD Water Master Plan and Well Sustainability Study.	High Staff Time	VVWD	Technical Assistance for Materials Needed	2025
2.4	*Planning Agency Coordination*	Coordinate a review and update of the CSWP Plan with updates to the VVWD Water Master Plan (typically every 3-5 years) and Well Sustainability Study, or more frequently as needed to include new information (water source locations, hydrogeologic information, etc.).	High Staff Time	ISWPP Coordinator and VVWD	Technical Assistance for Materials Needed	2025
2.5	*Planning Agency Coordination*	Include a SWPA placeholder for recharge areas if appropriate and consistent with the Water Master Plan, the Well Sustainability Study, and future hydrogeologic studies.	Medium	ISWPP Coordinator and VVWD	Technical Assistance and COM Geographic Information System (GIS) Services	2023 - 2025
2.6	*Planning Agency Coordination*	Consider incorporating source water protection into the Public Services and Facilities Section of the City of Mesquite Master Plan.	High Staff Time	COM	IT Department Services	2023-2024
2.7	*Planning Agency Coordination*	Consider preparation of a Conservation Element for the City of Mesquite Master Plan that incorporates source water protection and water conservation goals and policies.	High Staff Time	COM	VVWD	Earliest practicable opportunity
2.8	*Planning Agency Coordination*	Consider revising development code and standards to improve protection and conservation of source water, for example: • Low impact development (LID) standards, • Stormwater best management practices (BMPs), • Geotechnical study elements for SWPAs, and • Landscaping BMPs or standards.	High Staff Time	COM	VVWD	Earliest practicable opportunity
2.9	*Planning Agency Coordination*	Continue to detail a crosswalk between the potential contaminant sources (PCSs) identified in the ISWPP guidance and “use types” identified in local codes and ordinances.	High Staff Time	COM	VVWD and Technical Assistance	Earliest practicable opportunity

	Community Source Water Protection - Action Plan					
	Management Strategy	**Action Description**	**Priority and Cost**	**Project Lead**	**Type of Assistance Needed**	**Expected Implementation Year**
2.10	*Planning Agency Coordination*	Assist the COM in the development review process to consider source water protection.	High Staff Time	COM	IT Department Services	2023
2.11	*Planning Agency Coordination*	Continue to build communication between the VVWD and the COM when land use and zoning changes occur in SWPAs. For example, facilitate opportunities for the VVWD to comment on new development, re-development, and non-compliance issues in SWPAs.	High Staff Time	COM and VVWD	Staff Time For Review and Comment and Technical Assistance	2023 and Forward
2.12	*Planning Agency Coordination*	Facilitate the exchange and maintenance of map layer updates between the VVWD and the COM. For example, a shared Environmental Systems Research Institute) (ESRI) viewer could include the most current SWPAs, well locations, and PCSs.	High Staff Time	COM	GIS	2023
2.13	*Planning Agency Coordination*	Consider source water protection during future coordination between the VVWD, the COM, and Lincoln County regarding future developments. For example, the Toquop Public Utilities District (PUD) area.	Medium Staff Time	COM	GIS	2023-2024 and Forward
2.14	*Planning Agency Coordination*	Continue to implement the CSWP Plan, and consider an annual Local Planning Team meeting in late January to review planned education and outreach events and discuss CSWP Plan updates.	High Staff Time	COM and VVWD	Staff Time and Technical Assistance	2024 and Forward
3.1	*Collaboration with Local and Regional Partners*	Continue to endorse regional plans which protect source water and promote water quality and resource management. For example, support updates to the Clark County 208 Area-Wide Water Quality Management Plan.	Medium Staff Time	VVWD and COM	Shared Information	As needed
3.2	*Collaboration with Local and Regional Partners*	Expand communication with the Mesquite Fire Department to include past and future training locations as they relate to well location and SWPAs.	Medium Staff Time	COM	GIS and Shared Information	2023

	Community Source Water Protection - Action Plan					
	Management Strategy	**Action Description**	**Priority and Cost**	**Project Lead**	**Type of Assistance Needed**	**Expected Implementation Year**
3.3	*Collaboration with Local and Regional Partners*	Expand communication with the Mesquite Fire Department and the VVWD regarding notifications and procedures for incidents of spill/release of petroleum and hazardous chemicals in SWPAs.	High Staff Time	COM	Incident Notification	As Needed
3.4	*Collaboration with Local and Regional Partners*	Follow-up with Nevada Division of Environmental Protection (NDEP) to clarify when the VVWD will be notified of spill/release response and notifications of petroleum and hazardous chemicals. For example, call down risks and Bureau of Corrective Action spill reports.	High Staff Time	VVWD	Shared Reports, Future Communication, and Technical Assistance	2023 and As Needed
3.5	*Collaboration with Local and Regional Partners*	Consider presenting source water protection achievements to the Virgin Valley Disposal and discuss future communication with the VVWD to include notifications of any release/spills or changes to disposal practices.	Medium Staff Time	VVWD	Technical Assistance and Future Communication	2023 and As Needed
3.6	*Collaboration with Local and Regional Partners*	Consider protection of drinking water sources in the stormwater planning guidance and updates.	Medium Staff Time	COM	Public Works Plans and GIS	As Needed
3.7	*Collaboration with Local and Regional Partners*	Consider source water protection in planning for wastewater reclamation, reuse, and disposal guidance and updates.	Medium Staff Time	COM	Public Works Plans	As Needed
3.8	*Collaboration with Local and Regional Partners*	Continue to discuss wastewater reuse opportunities with the COM.	Medium Staff Time	VVWD	Public Works, Shared Information, and Technical Assistance	As Needed
3.9	*Collaboration with Local and Regional Partners*	Support source water protection communication between the VVWD and the Bureau of Land Management (BLM) regarding future management activities on existing BLM land. For example, the SWPA in Arizona, near well No. 31.	High Staff Time	VVWD	BLM Management Plans, Access to Staff, and Technical Assistance	2023

	Community Source Water Protection - Action Plan					
	Management Strategy	**Action Description**	**Priority and Cost**	**Project Lead**	**Type of Assistance Needed**	**Expected Implementation Year**
3.10	*Collaboration with Local and Regional Partners*	Consider presenting source water protection achievements to the Virgin River Coalition and coordinate on incorporating source water protection and conservation messages into the bi-annual meetings.	Medium Staff Time	VVWD	Notice of Meetings and Agendas and Technical Assistance	2023-2024
4.1	*Secure Locations for future water sources.*	Persist in working with landowners in Falcon Ridge to secure enough land for future Well No. 38 and the Arsenic Treatment Plant.	High Staff Time	VVWD	Budgeted Land Costs and Technical Assistance	As Needed
4.2	*Secure Locations for future water sources.*	Continue to work with landowners on a purchase or land swap near future Well No. 39.	High Staff Time	VVWD	Budgeted Land Costs and Technical Assistance	As Needed
4.3	*Secure Locations for future water sources.*	Consider land use and zoning when reviewing proposed future well locations.	High Staff Time	VVWD	Shared GIS and Zoning and Land Use Information	As Needed

Appendix G

Education Plan

Table of Contents

List of Tables

Attachments

Acronyms

AWWA	American Water Works Association
BSDW	Bureau of Safe Drinking Water
Conservation Plan	2023 Water Conservation Plan
CSWP Plan	Community Source Water Protection Plan
GIS	Geographic Information System
ISWPP	Integrated Source Water Protection Program
NDEP	Nevada Division of Environmental Protection
NvRWA	Nevada Rural Water Association
PWS	public water system
PWSSP	Public Water System Supervision Program
QR	Quick Response
SWPA	source water protection area
TBD	To be determined
Team	Local Planning Team
VVWD	Virgin Valley Water District

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1.0 Introduction

Source water protection and conservation education and outreach can increase public awareness and support about state, regional, and community efforts taking place to protect and conserve drinking water. Increasing the public's understanding can help residents make more informed choices about what they can do to protect and conserve their water sources.

In addition to the development of this Community Source Water Protection (CSWP) Plan, the Virgin Valley Water District (VVWD) has also developed a 2023 Water Conservation Plan (Conservation Plan). The Conservation Plan provides direction and decision-making guidelines to ensure water assets in the Lower Virgin River Valley are utilized effectively and efficiently. Water conservation in Southern Nevada is an urgent need given the effects of drought in the Colorado River Basin, yet not everyone is aware of the Nevada Integrated Source Water Protection Program (ISWPP). Combining conservation and source water protection messages provides a unique opportunity to simultaneously educate the community about source water protection. Uniting the messages can help residents participate in the effort to protect and conserve their drinking water.

The Nevada ISWPP is a voluntary, non-regulatory program which is initiated and implemented at the local level. During the development of this CSWP Plan, the Local Planning Team (Team) understood that CSWP Plan success depends on the willingness of the community to participate in source water protection and conservation, as outlined in Goal 4.

Goal 4: *Educate the community about what is being accomplished to achieve source water protection and conservation.*

Public education and is not only an explicit goal of this CSWP Plan, but also an independent management strategy. A variety of future education and outreach activities are proposed in the Action Plan (Appendix F of this CSWP Plan) to achieve Goal 4. Not only did the Team recognize that education will need to continue after CSWP Plan development, but they also understood the benefit of promoting source water protection during CSWP Plan development. Education and outreach activities completed during plan development are described in Section 5.0 of this CSWP Plan. The following sections outline various educational tools and tactics that can be used to combine source water protection and conservation messages in the Lower Virgin River Valley.

2.0 Education Plan Goals

As with the CSWP Plan purpose and goals described in Sections 1.0 and 1.2 of this CSWP Plan, respectively, the Team developed goals for this Education Plan, presented in Table 1-G. These measurable Education Plan goals can help guide the development and implementation of public education and outreach so that members of the community are aware and educated about what is being accomplished to achieve source water protection and conservation in the Lower Virgin River Valley.

Table 1-G. Education Plan Purpose and Goals

Education Plan Purpose: ***Educate the community about their drinking water sources and how they can protect and conserve them.***	
Community Goals for Source Water Protection Education	
Goal 1: ***Educate multiple facets of the community about source water.***	**Goal 2:** ***Participate in two community/school events per year.***
Goal 3: ***Continue to reach out and identify community partners.***	**Goal 4:** ***Utilize innovative technical resources to promote source water protection and conservation.***
Goal 5: ***Incorporate a source water protection message into conservation activities.***	

3.0 Education Plan Key Audiences

Public Education and Outreach is the overarching strategy for any community plan. The success of this CSWP Plan depends on the willingness of the community to participate in source water protection and conservation. In order for a community to participate, they need to be educated about their water sources and presented with actions they can take in their daily lives to protect and conserve their drinking water.

A key audience refers to a specific group of people defined by a combination of demographic, behavioral, geographic, and firmographic segmentation. Through Team discussions and meetings, specific community groups of special interest were developed to fulfill Goal 1 of this Education Plan: Educate multiple facets of the community about source water. The Education Plan *Key Audiences* and the motivation behind these community groups are outlined in Table 2-G.

Table 2-G. Education Plan Key Audiences and Motivations

Key Audiences	Motivation
Residents 55+	❖ Approximately 42% of the population in the City of Mesquite is over 65 (2020 Census). ❖ Tend to participate in and attend community events where source water protection and conservation messages will be presented. ❖ Large groups congregate at the Mesquite Senior Center and assisted-living facilities, making group outreach achievable.
Students (All grade levels)	❖ Source water protection and conservation science and education blends well with current curriculums. ❖ Hands-on training in the classroom facilitates source water protection and conservation discussions and education at home. ❖ Students will eventually inherit their community water sources; education promotes awareness around source water protection and conservation to help ensure drinking water is available for generations to come.
Homeowners Associations • Sun City Mesquite • Colonial Property Management • Terra West • Future HOAs	❖ Sun City Mesquite is a 55+ community which supports water conservation and the preservation of environmental assets; combining source water protection and conservation messages could facilitate community preservation of drinking water sources. ❖ Colonial Property Management and Terra West manage common interest real estate developments throughout the region; Source water protection and conservation education can raise awareness of efforts described throughout this CSWP Plan, with the ability to reach a wide range of community residents.
General Population • City of Mesquite • Unincorporated Clark County	❖ Source water protection and conservation education at community events can inform the community about what is being accomplished to protect their drinking water sources. ❖ Developing flyers and social media posts in English and Spanish will ensure that all community members can receive the messages. ❖ Facilitates collaboration with local and regional partners to work together to protect and conserve water resources. ❖ Gives the public easier access to Team staff and builds trust and confidence which can lead to public acceptance and support for source water protection and conservation ideas and requests.

4.0 Educational Tools for Presentations

Education tools can provide a fun learning experience and can promote the learners' engagement and increase participation and communication. During the development of this Education Plan, four education tools were developed to facilitate public education and awareness around source water protection. These tools are available through the Team and are described in Table 3-G.

Table 3-G. Education Plan Tools and Descriptions

Educational Tools	Description
The City of Mesquite Community Source Water Protection Viewer https://cswpp.mesquitenv.gov/ *Geographic Information System (GIS) online viewer which allows the user to zoom in and out to view areas with variable detail and see where SWPAs are located in their community.*	❖ Ability to capture public attention and foster source water protection engagement. ❖ Website displaying SWPAs in the Lower Virgin River Valley. ❖ Displays pertinent GIS layers, such as local watersheds, land use, groundwater basins, and regional planning areas, among others. ❖ Allows the user to search an address to see if a business or residence is located within a SWPA. ❖ Provides a link to the 2023 Lower Virgin River Valley CSWP Plan. ❖ Access via the City of Mesquite website. ❖ Works to fulfill Goal 4 of this Education Plan.
Groundwater and Watershed Model (Attachment A): *Groundwater Model demonstrates how contaminants can infiltrate into the ground and eventually contaminate a drinking water well. Watershed Model is a hands-on activity showing how contaminants from industrial and residential activities can be washed into drainages.*	❖ Powerful tools to engage an audience and help them understand how source water can become contaminated. ❖ Groundwater Model provides lessons in groundwater terminology, physical makeup of an aquifer, role of groundwater in the hydrologic cycle, and groundwater contamination. ❖ Watershed Model provides lessons in how stormwater runoff carries pollutants through the watershed and facilitates discussions about the best management practices to prevent this type of pollution. ❖ Assists in achieving Goals 1 through 5 of this Education Plan.
Virtual Tours with Quick Response (QR) Code: *Virtual Tours of the VVWD water system with a QR code available outside of facilities or near well locations where community members can view SWPAs.*	❖ Facilitates community education about the Public Water System (PWS) managed by the VVWD. ❖ Community members can learn about the ways in which the VVWD protects their water sources. ❖ Community members can use a QR code to tour and learn about a specific facility or SWPA. ❖ Works to fulfill Goal 4 of this Education Plan.
PowerPoint Presentation (Attachment B): *PowerPoint presentation for large groups uses visual aids to explain the source water protection messages described in Section 5.0 of this Education Plan.*	❖ Allows presenters to explain source water protection using easily digestible visuals. ❖ Allows viewers to interpret, expound, and engage with the information being presented. ❖ Can reach a large audience at once. ❖ Assists in achieving Goals 1 through 5 of this Education Plan.

5.0 Source Water Protection Messages

When presenter(s) engage the crowd, it can help the audience better understand the material, and they are more likely to retain information and pay attention. One of the ways to get an effective and meaningful message across is to kick-start open communication. The following messages were developed by the Team to bring source water protection and conservation messages into their community's own experience. The source water protection and conservation messages described below are specific to the communities which are served by the VVWD. However, they were designed so they may be slightly altered to participate in, and add to, the regional effort to protect and conserve source water in Southern Nevada.

Have you ever wondered where the water in your tap comes from?
100% of drinking water in the City of Mesquite and Bunkerville comes from groundwater. Groundwater is underneath the Earth's surface, and your groundwater is stored in a large underground aquifer that we can't see. The mountains which surround your community feed the aquifer as rain and snowmelt percolates into the soil and down into the aquifer. The VVWD, your community public water system, pumps the water out of the aquifer, cleans it, and sends it right to your tap.

Why is it important to protect drinking water at the source?
Groundwater sources can be polluted by various human activities. Your groundwater aquifer is thousands of feet deep, and once your aquifer becomes polluted, it is extremely costly and difficult to remove those contaminants. You have the power to support the VVWD and the City of Mesquite as they integrate strategic safeguards, such as source water protection and conservation ordinances, to avoid and/or control contamination threats and incidents which may pollute your drinking water.

What is your public water system doing to provide clean drinking water?
The VVWD, your public water system, maintains comprehensive analyses of your drinking water supplies, and gives you the most up-to-date information regarding your water news on their website. The groundwater in your community contains naturally occurring arsenic. The VVWD has installed arsenic treatment plant systems at many of its well sites to bring you fresh drinking water that is 100% safe for consumption. Additionally, the VVWD tests your drinking water for over 130 contaminants. The VVWD makes sure your water is 100% safe to drink, right from the tap!

What can you do to protect your drinking water?
Protecting your drinking water from contamination or overuse is a huge challenge, but nothing we can't overcome if we band together as a community. Protecting your drinking water sources starts right here, with awareness and education. We can take everything we've learned today home with us, educate our friends and families, and change our behaviors to limit our effects on groundwater. All the water in the world won't be enough if it's contaminated, and if we waste it, there will be nothing left to protect.

How does water conservation support source water protection?

Excess watering of the land surface can cause leaching of fertilizers or other potential contaminates into your groundwater. The City of Mesquite is currently looking into city code and ordinance changes to limit landscape turf in the hope it will motivate your community to conserve groundwater resources. These changes can help you protect your source water by reducing the use of fertilizers and potentially hazardous runoff which could possibly contaminate the groundwater that you rely on for drinking water.

6.0 Lower Virgin River Valley CSWP Plan Information

This Lower Virgin River Valley CSWP Plan references resources and ideas which may be useful for source water protection public education and outreach activities. Presenters may want to become familiar with the various information throughout this CSWP Plan, including:

- Definition of Terms (see Attachment C),
- Names and affiliations of the individuals who helped prepare the CSWP Plan (see Table 1 of this CSWP Plan),
- The existing regional and local plans which support source water protection and conservation (see Section 2.0 of this CSWP Plan),
- The management strategies developed to protect drinking water sources in the Lower Virgin River Valley (see Section 3.4 of this CSWP Plan),
- The VVWD Contingency Plans describing what the community would do should water sources become contaminated or run out due to overuse (see Section 3.5 of this CSWP Plan),
- Source Water Protection Area Maps of the Lower Virgin River Valley (viewed on the City of Mesquite Online Viewer and available in Appendix A of this CSWP Plan),
- Inventory of activities and conditions which may adversely affect drinking water quality (see Appendix D of this CSWP Plan),
- Maps of the areas around the drinking water sources which may be susceptible to contamination (see Appendix E of this CSWP Plan), and
- The Action Plan which outlines a schedule for implementation of the Education Plan (see Appendix F of this CSWP Plan).

7.0 Additional Education and Outreach Tools

The Team will work together with their community to implement this CSWP Plan and carry it into the future. In the Lower Virgin River Valley, CSWP Plan implementation also includes regional collaboration, in which the Team has invaluable educational resources at their fingertips. As CSWP Plan Ambassadors, the Team should take every opportunity to convey the essence and objectives of this CSWP Plan. Various tactics which can help increase knowledge about, and/or promote source water protection and conservation in the Lower Virgin River Valley, are presented in Table 4-G and outlined in the VVWD Conservation Plan.

Table 4-G. Additional Education Plan tools and tactics.

Additional Educational Tools	Description
Nevada Rural Water Association (NvRWA)	The NvRWA is a *nonprofit organization providing water and wastewater technical assistance, and watershed protection coordination programs statewide*. A NvRWA field specialist is one of the Lower Virgin River Valley Team members who assisted in the development of this CSWP Plan. He has participated in education and outreach activities conducted during CSWP Plan development and intends to continue participation in the future. NvRWA has been, and will continue to be, a partner and asset during local and regional source water protection and conservation outreach and education efforts.
Advisory Boards and Local Leader Education and Engagement	Educate board members, town councils, and other local government leaders about the importance of source water protection and conservation. Promote the goals and accomplishments of this CSWP Plan and the VVWD 2023 Water Conservation Plan. Invite Team members to talk about their source water protection achievements at home and encourage figureheads in the community to participate and lead by example.
Informational Meetings/Presentations	Informational meetings/presentations about source water protection and conservation to HOAs, schools, businesses, and the general population can facilitate positive changes in the way people think about their drinking water sources (short-term impacts), which can lead to positive *behavioral* changes that protect drinking water sources (long-term impacts).
Educational Flyers (Attachment D)	Educational flyers such as proper disposal of household hazardous waste and pharmaceuticals, and safe septic practices, promote source water protection and give the community an opportunity to participate in protecting drinking water quality. Conservation awareness materials, such as suggested watering schedules and conservation tips, available on the VVWD's website and in the District office, increase customer awareness of conservation needs and practices.

Additional Educational Tools	Description
Participate in American Water Works Association (AWWA) Source Water Protection Week, Fix a Leak Week, and Imagine A Day Without Water (Examples provided in Attachment E).	Supporting national water events and holding contests, such as "Imagine A Day Without Water", to engage the community can facilitate community collaboration and expand how the community thinks about drinking water to cultivate short- and long-term impacts.
Website links (Attachment F)	Website links are an important tool for promoting this CSWP Plan, and for creating mutually beneficial relationships with local and regional organizations who support source water protection and conservation. For example, the VVWD can post a link to the CSWP Plan and the CSWP viewer, which will be hosted on the City of Mesquite website. The VVWD and City of Mesquite may want to provide links to regional plans which help build momentum and assist in building regional collaboration to protect and conserve drinking water for generations to come.
Social Media Promotion	Social media posts give the VVWD an opportunity to share their source water protection and conservation accomplishments. The VVWD can also invite the community to share their ideas and personal achievements, creating an environment where the community comes together to protect their drinking water.
Source Water Protection and Conservation Booth at Community Events	A sponsored booth at community events, such as Mesquite Days and the Bunkerville July 4th Events, can promote source water protection and conservation education and expand communication between water system operators and their community. The watershed and groundwater models can provide an interactive element related to best management practices and conservation tips and tricks. Information flyers can also be offered and/or distributed.
Site Signage	Businesses who use low impact development or best management practices to reduce their impact on source water can post signs to indicate their dedication to the community's most valuable resource, drinking water.
Testimonials	Encourage Team members, residents, and businesses who have changed their practices to share how they reduced their impact on source water, why they care about source water, and what the results mean for source water protection and conservation. Can be in many forms, such as posters, social media posts, pamphlets at events, and in presentations.

8.0 Measuring Education and Outreach Success

Measuring education and outreach success includes an evaluation procedure to determine the effect of influence a program has on the target audience. It's important to measure changes in the ways people think as this often influences their behaviors. The widespread adoption of responsible behaviors related to source water protection and conservation can lead to water quality improvements. Effective evaluation can also help the Team determine what changes may need to be implemented to improve the outreach program. The evaluation type should be selected based on the chosen tactic(s) and available resource(s). Both quantitative and qualitative measurements should be considered, examples include:

Quantitative measurements – measure the amount of information distributed, such as:

- The quantity of presentations delivered and people in attendance,
- The quantity of distributed materials, and
- The quantity of inquiries (e.g., phone calls, emails, social media posts, contest participation, testimonials, booth visits, etc.)

Qualitative measurements – measure the quality of information being presented, such as:

- Presentation, email, and website surveys,
- Pay attention to audience participation and engagement,
- Short quiz at the end of school presentations,
- Ask questions about presentation content at the beginning and the end to see if attitudes or knowledge of material has changed, and
- Ask participants what they can do to protect their source water at the end of presentations to measure potential community participation.

9.0 Educational Tips

The education outreach tools and tactics outlined in this CSWP Plan were created so that each presenter can personalize them to their audience's needs. In some cases, additional communication pieces may be necessary. Tips to consider when creating a new communication piece include:

- Simple is best.
- Allow whitespace – do not fill every space.
- Be consistent in the look and message of every communication piece.
- Limit the communication piece to no more than three messages.

Finally, always include a call to action such as:

- "To learn more, log onto our website: https://vvh2o.com/."
- "To register for a presentation, contact Natalie Anderson at the VVWD."
- "Take expired pharmaceuticals to one of the following disposal locations…"

Without the resources to execute a great idea, it will not be effective. For instance, brochures that simply sit on the counter at the community library will not reach the target audience for whom they are intended. A few questions should be considered when targeting an audience and choosing an education tactic, including:

- What is the best way to reach my audience?
- What is my budget?
- How much time do I have?
- How will I follow up to see if it was effective? And when?

Additional public education and outreach activities, including priority and cost, lead presenter, and expected implementation year, can be found in the Action Plan, Appendix F of this CSWP Plan.

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Attachment A

School Presentation Content Example

Attachment A
School Presentation Content Example

School presentations should last roughly 45 minutes. Introduce yourself and engage the students by asking a few questions:

Have you ever wondered where the water in your tap comes from?
Depending on the answers, the discussion can evolve. A discussion regarding the hydrologic cycle, groundwater aquifers, and how water is pumped from the aquifer to the tap is appropriate for the Lower Virgin River Valley.

Why is it important to protect drinking water at the source?
Protecting drinking water at the source may be difficult to understand for grade school or intermediate school students. The presenter may have to facilitate the discussion with statements, such as:

- We rely on groundwater – it's the water we drink and the water that grows our food!
- Man-made products, such as gasoline, oil, and road salt can move through the soil and end up in our groundwater.

Demonstration of the Watershed Model

Invite the students to come close to see the watershed model and ask if they know:

- ✓ *What is a watershed?* Discuss what is displayed on the watershed model, such as the area of land and the different water bodies.
- ✓ *What is a contaminant?* Discuss various forms such as oil and grease, factory chemicals, lawn fertilizer, etc. Hand the "contaminants" to the students and let them sprinkle it around. Engage them and ask them what kind of contaminants are on the farm, on the lawns, on the road, etc.
- ✓ *How much rainfall does the community receive each year?* Discuss rainfall in the Lower Virgin River Valley, and then rain on the watershed using a spray bottle. This is also a good place to discuss overwatering. Demonstrate what happens if someone has a leaky sprinkler, and what happens to fertilizers on landscape turf. Discuss the water flowing down the hills and the streets, and then discuss infiltration. Discuss replacements for landscape turf, which in turn conserves the drinking water. Pull the plug once the water settles in the "lake" and move to the groundwater model.
- ✓ Discuss the importance of individual actions to protect and conserve drinking water sources.

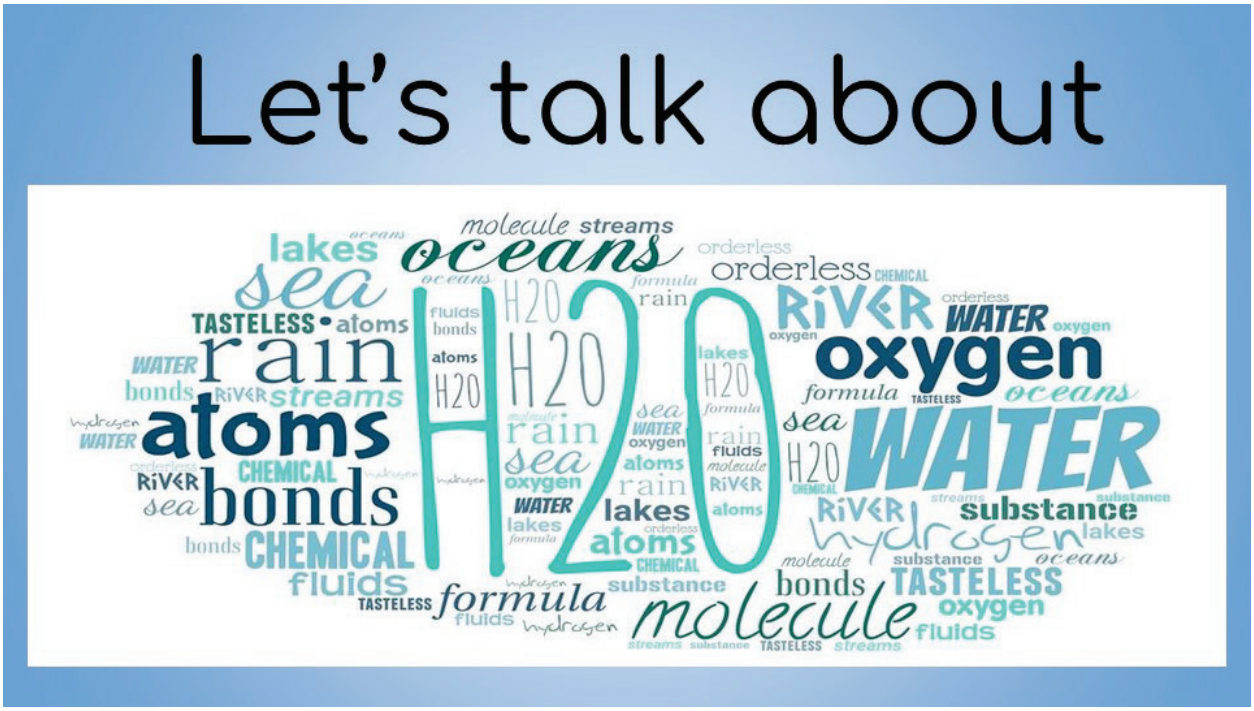
Demonstration of the Groundwater Model

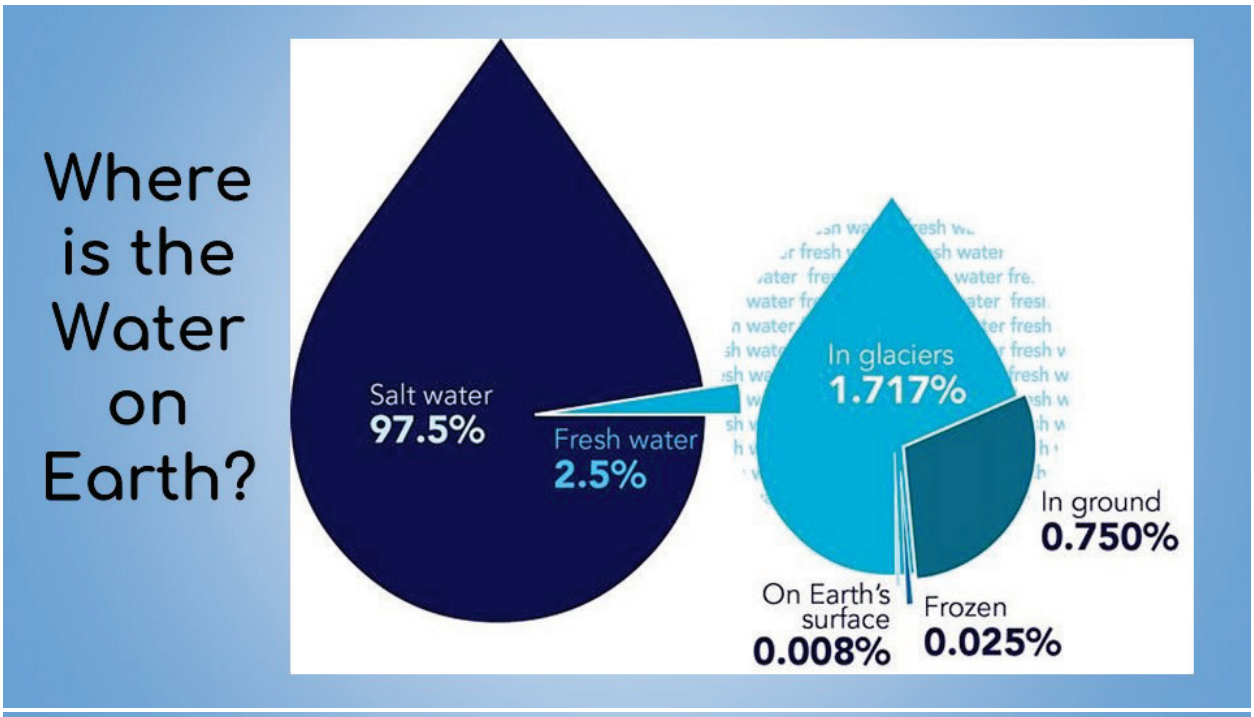
- ✓ Put the green and the red coloring into the lake and pond and pump different wells.
- ✓ Discuss aquifers, contaminants, pumping, water movement, etc.
- ✓ Talk about infiltration and how the pollution in the watershed model can end up in the groundwater.
- ✓ Revisit the question: ***Why is it important to protect drinking water at the source?***
- ✓ Invite the students to brainstorm about what they can do to protect their water sources.

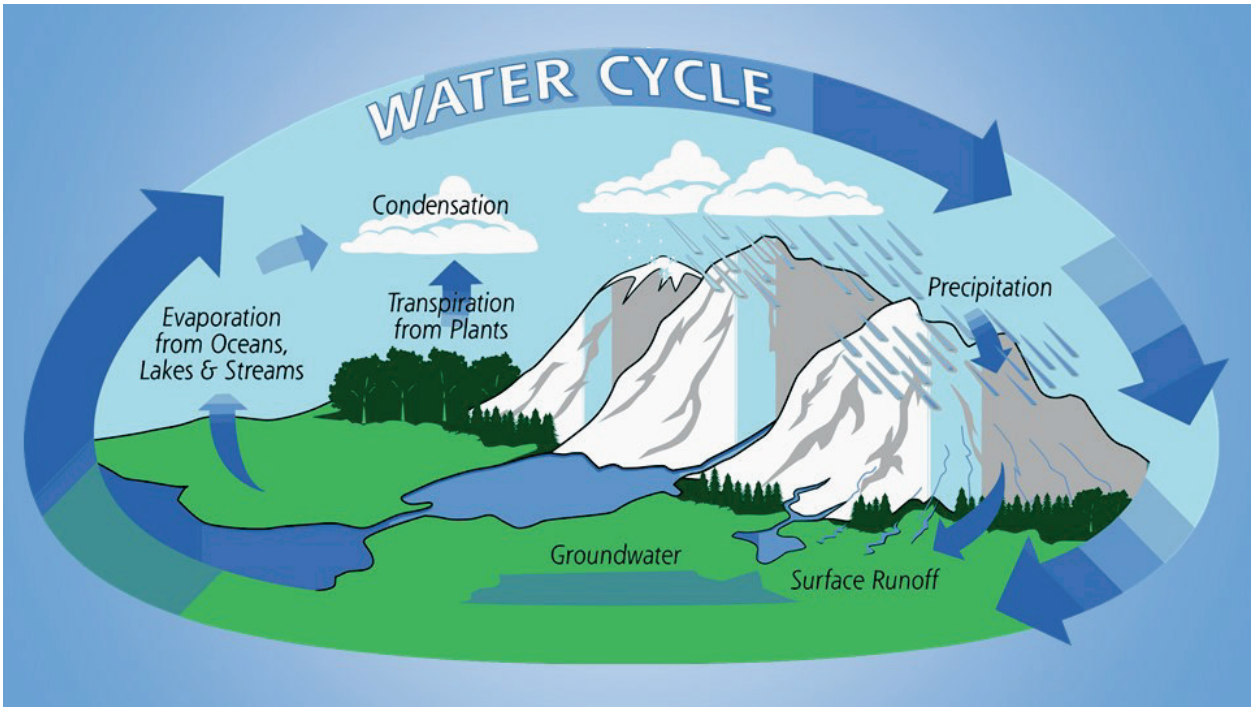
Attachment B

Source Water Protection and Conservation
PowerPoint Example

Attachment B
Source Water Protection and Conservation PowerPoint Example

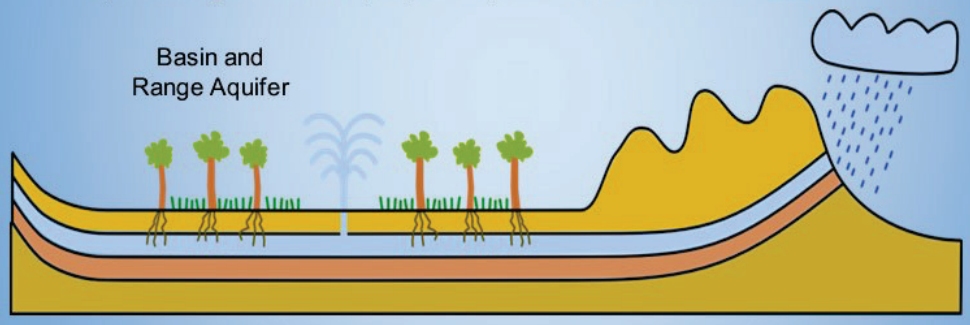



Where is the Water on Earth?
Salt water
97.5%
Fresh water
2.5%
In glaciers
1.717%
In ground
0.750%
On Earth's surface
0.008%
Frozen
0.025%

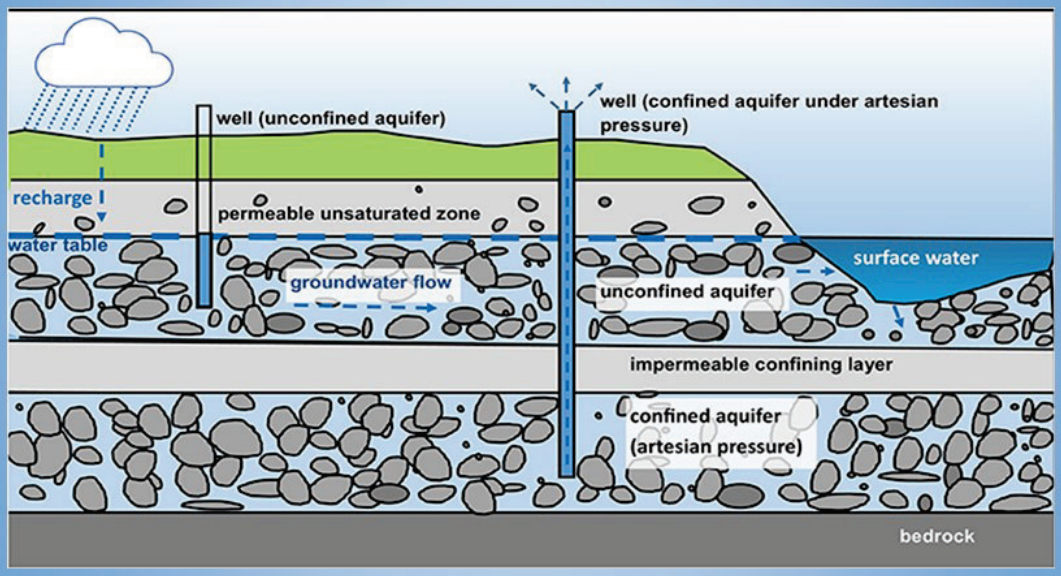

WATER CYCLE
Condensation
Evaporation from Oceans, Lakes & Streams
Transpiration from Plants
Precipitation
Groundwater
Surface Runoff

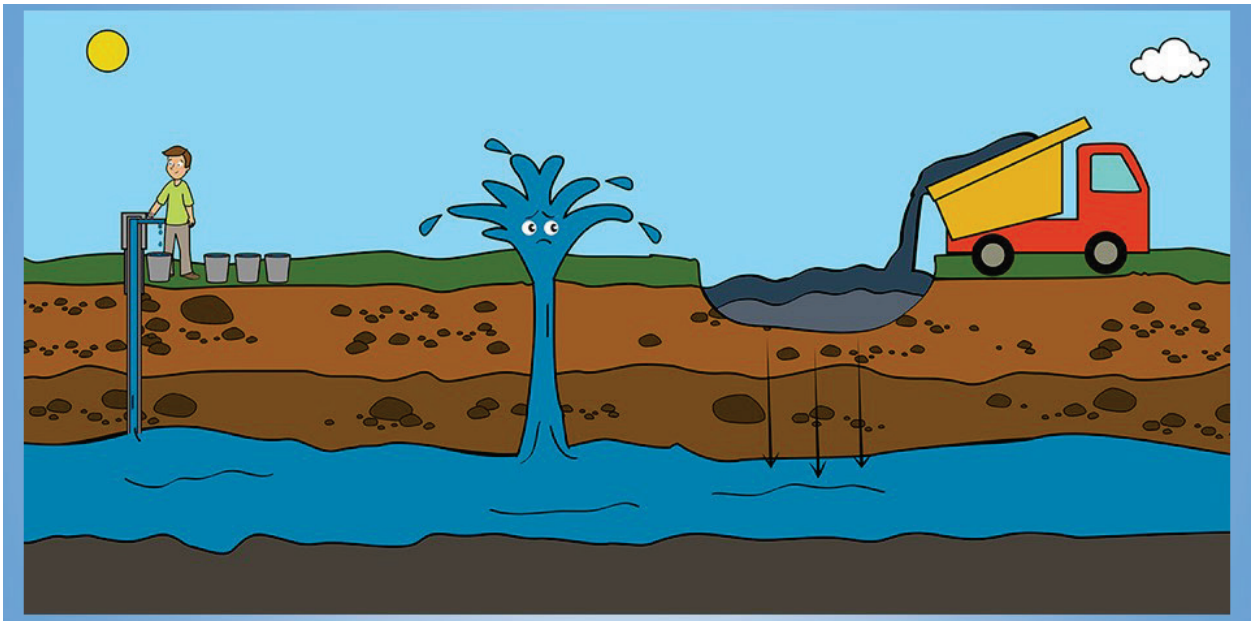
Where does Virgin Valley Water District get its water?

Our water supply currently comes from the hydrologic basin (Aquifer) known as Basin 222



What is an Aquifer?





How can water get contaminated if it is deep underground?

Where should we protect?

How Many Gallons of Water does it take to make...

Car	40,000 gal
Pair of shoes	2110 gallons
Pair of jeans	2600 gallons
Cotton t-shirt	713 gallons
Gallon of paint	13 gallons
Smartphone	3400 gallons
Disposable diaper	9 gallons
Sheet of paper	3 gallons
Individual bottle of water	1.85 gallons

How much water do you think you use every day?

The average person in the Virgin Valley uses 120 gallons per day. This includes, water we drink, water used to clean, and water used outside for watering plants and grass. That is 43,800 gallons in a year!

What's your favorite thing about water?


How do we make sure we have enough safe water?
Protect and Conserve!


What is Conservation?
con·ser·va·tion
[känsərˈvāSH(ə)n]
NOUN
1. prevention of wasteful use of a resource:
"they launched a week-long campaign to promote energy conservation"
synonyms:
careful management · good housekeeping · economy · thrift · thriftiness · frugality · saving · budgeting · sparingness
○ preservation, protection, or restoration of the natural environment and of wildlife:
"nature conservation"
synonyms:
preservation · protection · safeguarding · safe keeping · keeping · [more]
○ preservation and repair of archaeological, historical, and cultural sites and artifacts:
"the artworks in the collection need indexing and conservation"
synonyms:
maintenance · repair(s) · service · servicing · care · aftercare · preservation · running


Why should we protect?


Why Should We Conserve?
Finite Resource

Why do we need to protect AND conserve?

If we don't protect...there will be nothing to conserve... if we don't conserve there will be nothing to protect

4 easy ways you can help conserve:


4 easy ways you can help protect:
FERTILIZERS!
"UNION BRANDS" OF FERTILIZER
"THE FERTILIZER WITHOUT A FAULT"
UNION
FERTILIZERS
THE KIND THAT DRILLS
FOR ALL CROPS
UNION GUANO COMPANY
WINSTON-SALEM, N. C.
SHARPSAFE
BIOHAZARD
molecule streams
lakes
oceans
orderless
sea
TASTELESS
atoms
rain
WATER
bonds
RiVER
streams
hydrogen
CHEMICAL
fluids
formula
substance
oxygen
H2O
Protect it! Conserve it! Enjoy it!

Attachment C

Terms Defined

Attachment C
Terms Defined

Aquifer: a naturally occurring, underground area of water-soaked sand or gravel.

Watershed: the area of land that drains to a common water body like a stream, river, or lake.

Source water: consists of bodies of water such as lakes, springs, streams, rivers, and ground water/aquifers that become our water supply.

Ground water: water found beneath the earth's surface. The water is pumped to the surface for drinking water.

Surface water: consists of springs, streams, and rivers that become our drinking water.

Hydrologic Cycle: the sum of all processes in which water circulates from the land and ocean surface to the atmosphere and back in the form of precipitation.

Water Conservation: includes all policies, strategies, and activities which support careful use and preservation of the water supply.

Contamination: introduction of an undesirable chemical or biological substance not normally present in source water.

Best Management Practices: barriers, methods, measures, or practices designed to prevent or reduce water pollution.

Integrated Source Water Protection Program (ISWPP): ISWPP is a comprehensive, voluntary approach designed to help communities develop and implement a plan that protects their drinking water supplies. ISWPP is a program created and monitored through BSDW.

Nevada Division of Environmental Protection (NDEP): NDEP will protect the State's natural resources through an effective, efficient program of permitting, enforcement of regulations, monitoring the environment, pollution prevention and remediation based on state and federal laws. NDEP encourages, motivates, and supports communities' local source water protection activities; manages, shares, and integrates source water protection information; develops federal, state, and local source water protection partnerships; and integrates and implements source water protection at the state level.

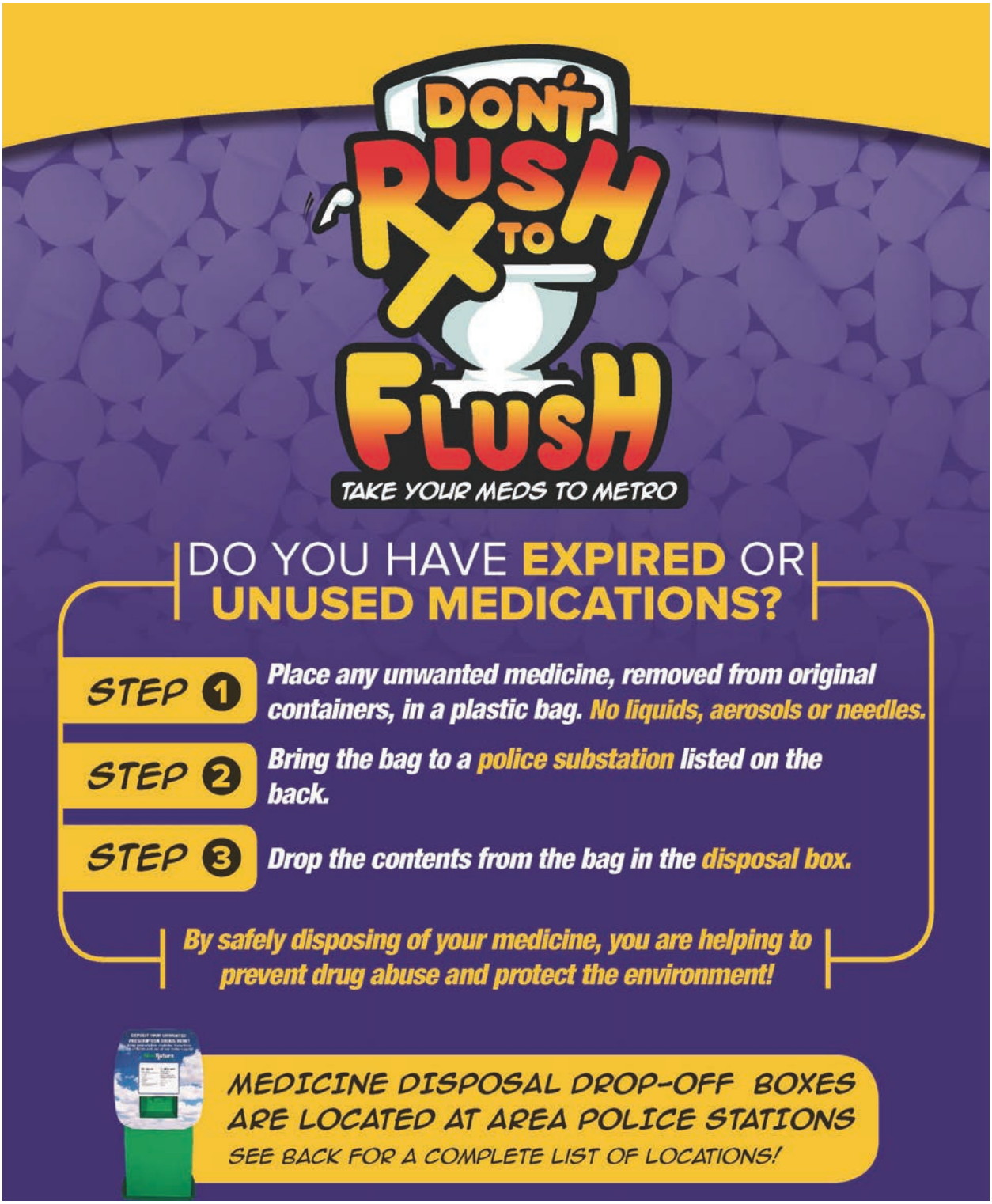
Bureau of Safe Drinking Water (BSDW): the mission of BSDW is *to protect public health and the environment by providing oversight, guidance, and support, while fostering collaboration with safe drinking water partners*. This is accomplished by providing regulatory oversight for the Public Water System Supervision Program (PWSSP) in Nevada, reviews compliance data from approximately 600 public water systems (PWSs) based on State and Federal regulations, and conducts Source Water Assessments and Vulnerability Assessment Reports for Nevada PWSs. Through the NDEP, the Source Water Protection Program is administered through the BSDW to help communities protect their drinking water.

American Water Works Association (AWWA): the AWWA is an international nonprofit and the largest organization of water supply professionals in the world dedicated to *providing total water solutions assuring the effective management of water.* Members include public water and wastewater systems, environmental advocates, scientists, academics, and others who have a genuine interest in protecting our most vital resource, water.

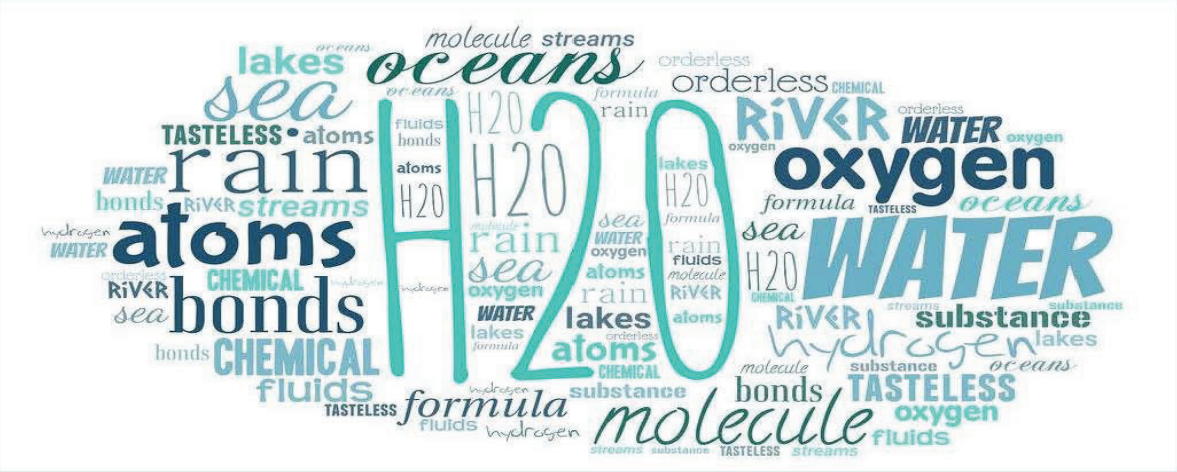
Attachment D

Educational Flyers

Attachment D
Educational Flyers




DON'T RUSH Rx TO FLUSH
TAKE YOUR MEDS TO METRO
MEDICINE DISPOSAL DROP-OFF LOCATIONS
LAS VEGAS
LVMPD Headquarters
400 S. Martin Luther King, Bldg. C
Las Vegas, NV 89106
Hours of Operation: 8:00am-5:00pm
Monday-Friday
LVMPD Bolden Area Command
1851 Stella Lake Street
Las Vegas, NV 89106
Hours of Operation: 9:00am-5:00pm
Monday-Friday
LVMPD Convention Center Area Command
750 Sierra Vista
Las Vegas, NV 89169
Hours of Operation: 9:00am-5:00pm
Monday-Friday
LVMPD Downtown Area Command
621 North 9th Street
Las Vegas, NV 89101
Hours of Operation: 9:00-5:00pm
Monday-Friday
LVMPD Enterprise Area Command
6975 West Windmill
Las Vegas, NV 89113
Hours of Operation: 9:00-5:00pm
Monday-Friday
LVMPD Northeast Area Command
3750 Cecile
Las Vegas, NV 89115
Hours of Operation: 9:00am-5:00pm
Monday-Friday
LVMPD Northwest Area Command
9850 W. Cheyenne
Las Vegas, NV 89129
Hours of Operation: 9:00am-5:00pm
Monday-Friday
LVMPD South Central Area Command
4860 Las Vegas Boulevard South
Las Vegas, NV 89119
Hours of Operation: 8:00am-5:00pm
Monday-Friday
LVMPD Southeast Area Command
3675 East Harmon Avenue
Las Vegas, NV 89121
Hours of Operation: 8:00am-5:00pm
Monday-Friday
LVMPD Spring Valley Area Command
8445 Eldora Avenue
Las Vegas, NV 89117
Hours of Operation: 8:00 am-5:00pm
Monday-Friday
NORTH LAS VEGAS
North Las Vegas Police Headquarters
1301 E. Lake Mead
North Las Vegas, NV 89030
Hours of Operation: 8:00am-5:45pm
North Las Vegas Police Northeast Area Command
3755 W. Washburn
North Las Vegas, NV 89031
Hours of Operation: 8:00am-5:00pm
Monday-Thursday Only
BOULDER CITY
Boulder City Police Department
1005 Arizona Street
Boulder City, NV 89005
Hours of Operation: 24 hours
7 days a week
MESQUITE
Mesquite Police Department
695 Mayan Circle
Mesquite, NV 89027
Hours of Operation: 7:00am-5:00pm
(Friday 3:00pm)
Monday-Friday
Mesquite Municipal Court
500 Hillside Drive
Mesquite, NV 89027
Hours of Operation: 7:00am-5:00pm
Monday-Friday
LAUGHLIN
LVMPD Laughlin Substation
101 Laughlin Civic Way
Laughlin, NV 89029
Hours of Operation: 8:00am-4:30pm
Monday-Friday
LVMPD Overton Substation
320 N. Moapa Valley Blvd.
Overton, NV 89040
Hours of Operation: 7:00am-4:00pm
Monday-Thursday Only
DON'T RUSH Rx TO FLUSH
for more information, visit www.paininthedrain.com



Every living organism on Earth needs water. It keeps the humans, animals and plants alive. We need to make sure we have enough clean, safe water for now and the future, for drinking, agriculture and recreation! Water is necessary, fun and delicious! But it is up to us to ensure it stays clean, safe and plentiful enough for our needs!

All the water in the world won't be enough if it's contaminated and if we waste our water, there could be nothing to protect…

Please join the Virgin Valley Water District, The City of Mesquite and the Town of Bunkerville as we work together to protect and conserve our most precious resource!

Source Water Protection Week September 24-30, 2023

Protect it…Conserve it…Enjoy it!

FLUSHABLE? THINK TWICE

DISPOSE OF THESE ITEMS IN THE TRASH, NOT THE TOILET!

Many household cleaning products labeled as "flushable" should not be flushed down the toilet. The only things you should flush down the toilet are the

THREE P'S: PEE, POO and **TOILET PAPER!**

Disposable Wipes

Cleaning Wipes

Personal Wipes

FLUSH IT OR CAN IT?

NOT SURE whether something belongs in the drain or toilet? visit PAININTHEDRAIN.COM please call us at (702) 668-8065 or email us at publicinfo@cleanwaterteam.com

Thank you for being a partner in clean water!

PAININTHEDRAIN.COM

Attachment E

Source Water Protection and
Conservation Event Examples

Attachment E
Source Water Protection and Conservation Event Examples

Mesquite
Nevada

PROCLAMATION
Imagine a Day with Water - 2020

WHEREAS, recognizing the fifth annual national "Imagine a Day Without Water" campaign to be held October 20, 2022 which is an organized effort to highlight the critical importance of clean water in our lives, and the investment in infrastructure that is necessary to utilize and protect this valuable resource; and

WHEREAS, the residents of the City of Mesquite utilize on average 120 gallons of water per person per day, and the infrastructure that brings water to and from homes and businesses is essential to the quality of life and economic vitality of the community; and

WHEREAS, the Mesquite community currently receives its water from Groundwater Basin 222 via 9 wells, through 6 arsenic treatment facilities, 8 storage tanks, and more than 165 miles of water lines; and transports wastewater through approximately 150 miles of wastewater lines, 2 lift stations and treats by aerobic digesters, clarifiers, headworks, belt press dewatering system, ultra-violet disinfection and sludge disposal; and

WHEREAS, the Mesquite community also has access to the Virgin River water and mountain springs, and recognizes that protecting them, protects our future; and

WHEREAS, water emergencies across the country, ranging from contaminated water, to drought, and flooding show the severe impact of what can happen to public health and the well-being of a community without access to clean drinking water and safe wastewater removal and treatment. Utilities nationwide are grappling with aging infrastructure and lack reliable revenue and funding to maintain and upgrade their systems; and

WHEREAS, managing water responsibly is critical to public and environmental health and investing in drinking water and wastewater systems ensures a bright and prosperous future for generations to come; and

WHEREAS, innovations in water conservation and water reuse drives job growth, economic development, and establishes a 21st Century paradigm of water management. A national day without water would cause $43.5 billion dollars in economic damage as one fifth if the U.S. economy would grind to a halt without a reliable clean source of water; and

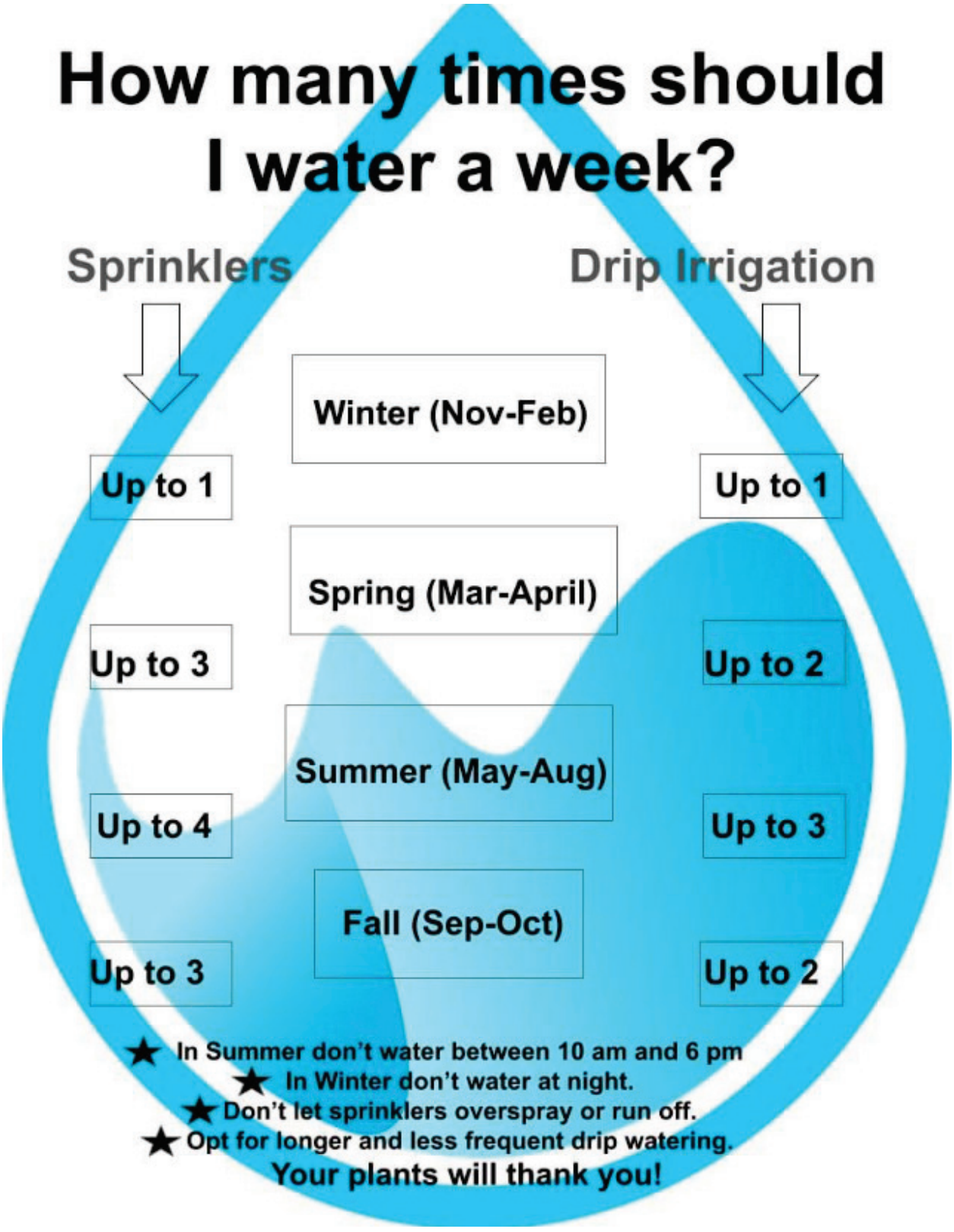
WHEREAS, as each community's access to clean water is different, the solution to strengthening the drinking water and wastewater systems must be community driven. Reinvestment in the infrastructure must be a local and national priority; and

WHEREAS the City of Mesquite recognizes that water is essential to the quality of life of its citizens and visitors, and economic competitiveness for its businesses, the City of Mesquite acknowledges the importance of educating the public about the value of water; and

NOW THEREFORE, I Allan S. Litman, Mayor of the City of Mesquite and the City Council do hereby proclaim October 20, 2022 as:

Imagine a Day Without Water

Allan S. Litman, Mayor


How many times should I water a week?
Sprinklers
Drip Irrigation
Winter (Nov-Feb)
Up to 1
Up to 1
Spring (Mar-April)
Up to 3
Up to 2
Summer (May-Aug)
Up to 4
Up to 3
Fall (Sep-Oct)
Up to 3
Up to 2
★ In Summer don't water between 10 am and 6 pm
★ In Winter don't water at night.
★ Don't let sprinklers overspray or run off.
★ Opt for longer and less frequent drip watering.
Your plants will thank you!

Attachment F

Online Resources

Attachment F
Online Resources

For more information on your drinking water, local, and regional websites which support source water protection and conservation education, and the State of Nevada Integrated Source Water Protection Program, go to:

- Clark County Water Reclamation District: https://www.cleanwaterteam.com/public-outreach/pain-in-the-drain
- National Groundwater Association Groundwater Fundamentals: https://www.ngwa.org/what-is-groundwater/About-groundwater
- Nevada Integrated Source Water Protection Program: https://www.cleanwaterteam.com/public-outreach/pain-in-the-drain
- United States Environmental Protection Agency Drinking Water and Groundwater Kids Stuff: https://www3.epa.gov/safewater/kids/index.html
- United States Geological Survey Water Science School: https://www.usgs.gov/special-topics/water-science-school
- Virgin Valley Water District Website: https://vvh2o.com/our-water/
- Virgin Valley Water District Water Conservation Plan: https://vvh2o.com/our-water/water-conservation/