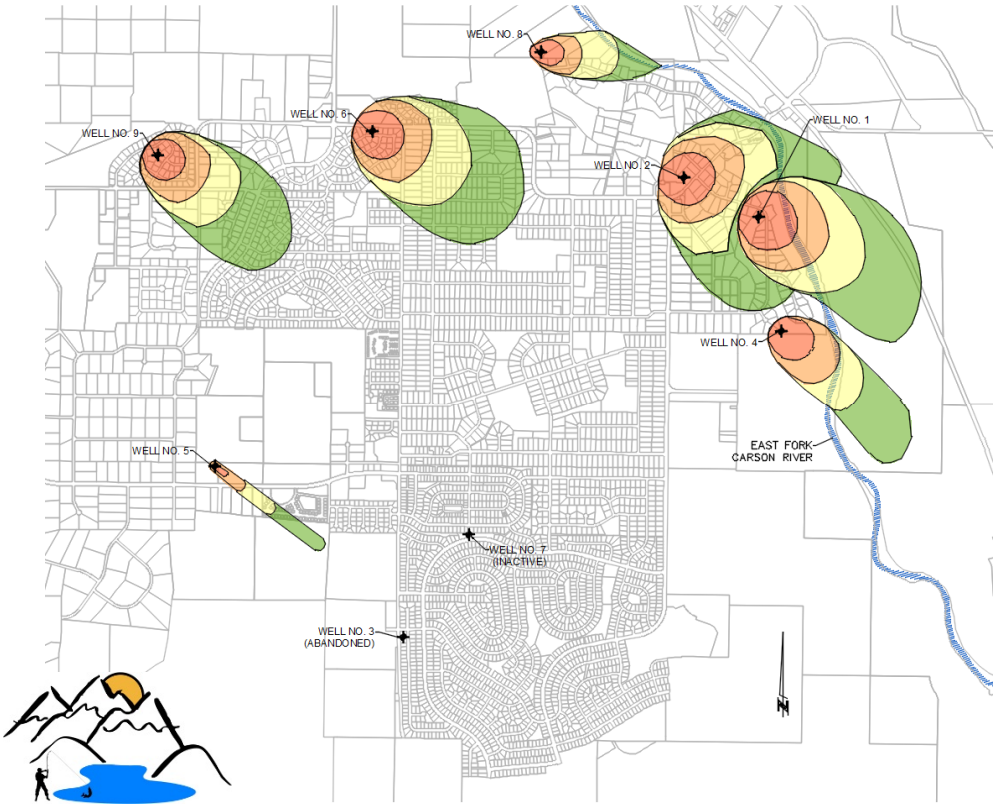
Gardnerville Ranchos
General Improvement District
2017 Wellhead Protection Program

Final
November 2017



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1.0 INTRODUCTION

1.1 Purpose

The purpose of this Wellhead Protection Program (WHPP) is to enable the Gardnerville Ranchos General Improvement District (GRGID or District) to assess potential threats to their drinking water supply sources and to develop a plan to protect those supply sources. The WHPP is intended to be an active tool that the District can use in making planning decisions and for community awareness of groundwater resources. The 2017 GRGID WHPP serves as an update to the previous WHPP prepared in 1997 [1].

1.2 Overview

The GRGID WHPP was prepared considering the following elements recommended in the guidance document for the Nevada Integrated Source Water Protection Program (ISWPP) [2]:

- Formation of a local planning team;
- Inventory of all water supply sources and delineation of protection areas;
- Inventory of potential contaminant sources within each protection area;
- Development of contaminant source management strategies and action plans; and
- Management and sharing of data.

1.3 Location and Description

GRIGD is located in Douglas County, Nevada within the Carson Valley (see Figure 1). The Gardnerville Ranchos area was historically used for agricultural/ranching purposes but over time has also developed into urban and rural areas. GRGID is primarily a residential community with existing land uses including single-family residential, multi-family residential, commercial, industrial, community/public facilities, schools, and parks. The GRGID service boundary is located in the central portion of Township 12N, Range 20E, M.D.B.&.M.

GRGID is responsible for the operation and maintenance of its water system, sewer system, streets, storm drain system, and streetlights, as well as maintenance of open spaces, parks, and recreational areas. GRGID owns and operates the community water system under Permit No. NV0000066 and serves approximately 4,300 water connections and a population of approximately 11,312 (2010 U.S. Census [3]). The GRGID water system relies exclusively on groundwater and has a total of seven active production wells.

GRGID is governed by a five-member Board of Trustees that are elected by the registered voters who reside within the District boundaries. The GRGID District Manager is responsible for carrying out the policies set forth by the Board of Trustees.

2.0 PROGRAM TEAM

A successful WHPP requires a diverse planning team and the involvement of the community, local jurisdictions, and other stakeholders. GRGID's WHPP will be reviewed by the GRGID staff members and Board of Trustees with opportunity for community input at public meetings.

A WHPP was prepared by Douglas County in 2012 [4] with funding and technical assistance from the Nevada Division of Environmental Protection (NDEP). The Douglas County WHPP includes

analysis and planning for 26 public water systems within the County. Information on the GRGID water supply sources was obtained from the 1997 WHPP [1]. NDEP will be providing assistance for plan updates every 10-12 years and it is recommended that GRGID participate in the next County-wide WHPP update to take advantage of the available planning resources and coordinated approach with other water systems in the area.

3.0 PLAN DEVELOPMENT

3.1 Water Source Information

Background information on the GRGID water supply sources is presented in the sections to follow.

3.1.1 Current Groundwater Supply Sources

A summary of information on the GRGID groundwater wells including current pumping capacities is provided in Table 1 and well locations are shown on Figure 1. Detailed information on well construction, pump/motor specifications, and well driller's reports are contained in Appendix A. Abandoned and inactive and wells in the GRGID system include Well 3 and Well 7 which are also shown on Figure 1. Well 7 is inactive and not planned for future use but is still equipped with a pump/motor and is included in the details of Appendix A. Well 3 was abandoned due to poor production.

Table 1: Existing Groundwater Wells

Well No.	Location	Year Drilled/ Rehabbed	Casing Diameter (ft)	Ground EL	Static Water Level[1] (ft)	Static Water Level EL[1]	Well Capacity[2] (gpm)
1	Fairway Dr.	1965/2007	1.2	4832	54.8	4,777	1,350
2	Riverview Dr.	2004	1.3	4830	44.5	4,786	1,750
4	Putter Ct.	1978	1.3	4846	25.0[3]	4,821	300
5	Kimmerling Rd.	1984	1.3	4805	66.0	4,739	1,200
6	Sierra Vista Dr.	1989	1.5	4800	57.5	4,743	700
8	Glenwood Dr.	1997	1.3	4800	46.5	4,754	1,200
9	Rocky Terrace Dr.	2005	1.0	4762	36.9	4,725	800
						Total	7,300

[1] Average static water levels for winter/spring of 2017.

[2] Well capacities provided by GRGID on 5/3/17.

[3] Based on test well drilling for the Well 4 replacement [5].

Six of the GRGID groundwater wells are pumped on a regular basis (Wells 1, 2, 4, 6, 8, and 9). Well 5 is only used on an emergency basis due to high arsenic levels that frequently exceed the maximum contaminant level (MCL) of 10 micrograms per liter (µg/L). Well 4 is manually throttled back to avoid pumping air and sand, but is planned for replacement during the 2017-2018 winter.

3.1.2 Historical Well Production

Annual well production from 2012-2016 is summarized in Table 2. Average annual pumping for the five year period was 1,079.6 million gallons (MG) which equates to an average pumping rate of 2,055 gallons per minute (gpm).

Table 2: Historical Well Production, 2012-2016

Well No.	Annual Pumping (MG)					Average Annual (MG)	Average Pumping Rate (gpm)
	2012	2013	2014	2015	2016		
1	308.1	256.6	589	339.9	304.4	309.5	589
2	235.9	258.3	417	165.6	236.0	219.0	417
4	186.3	170.4	318	153.1	149.0	167.3	318
5	0.0	0.0	13	0.0	34.3	6.9	13
6	192.7	199.4	355	234.9	195.6	186.5	355
8	56.8	109.3	118	38.6	46.0	61.8	118
9	179.3	132.7	245	48.5	41.4	128.6	245
Total	1,159.0	1,126.6	2,055	980.5	1,006.5	1,079.6	2,055

3.1.3 Local Hydrogeology

The Carson Valley lies between the Carson Range on the west and the Pine Nut Range on the east. GRGID is located within the southeast portion of the Carson Valley and overlies saturated, alluvial sediments that are several hundred feet thick that make up the aquifer. Groundwater is introduced into the aquifer as snowmelt from the Carson and Pine Nut Ranges flow to the valley floor. The Carson Valley is generally sloped from south to north and groundwater flows northward into Eagle Valley and then eastward into Dayton and Lahontan Valleys following the Carson River [6].

The U.S. Geological Survey (USGS) has published numerous studies on water resources in the Carson Valley. As part of these studies, groundwater contours and general direction of groundwater flow have been developed. A map of compiled groundwater information for the Carson Valley is included in Appendix B as presented in the 2009 USGS Report, *Analysis of Streamflow Trends, Ground-Water and Surface-Water Interactions, and Water Quality in the Upper Carson River Basin, Nevada and California* [7]. The general direction of groundwater flow in Gardnerville Ranchos is northwest and along the East Fork of the Caron River. Analysis in the 2009 USGS Report also indicates that the "potential for streamflow losses in Carson Valley is greatest in the southern part of the valley along the East Fork of the Carson River" [7] which supports the groundwater contours and flow direction shown in the map in Appendix B.

3.2 Delineation of Wellhead Protection Areas

A wellhead protection area (aka source water protection area) is defined by the NDEP Bureau of Water Pollution Control (BWPC) as an area on the ground surface that encompasses and contributes water to a public groundwater supply well [2]. Methodology for delineating wellhead protection areas and modeling results are presented in the sections to follow.

3.2.1 Groundwater Modeling

Wellhead protection areas for the GRGID water supply sources were derived using the Wellhead Analytic Element Model (WhAEM2000, Version 3.2.1). WhAEM is a two-dimensional groundwater flow computer model provided by the U.S. Environmental Protection Agency (EPA) in support of State WHPPs. Inputs to the WhAEM model include well locations and pumping rates, aquifer characteristics, groundwater flow direction and gradient, and linear features ("linesinks") representing rivers or areas of known groundwater levels. Test points can also be added to the model which are observed groundwater levels at local wells for model calibration. The WhAEM model determines the distance traveled by a particle of water entering the groundwater supply over a fixed period of time (times of travel - TOT) from which a capture zone can be defined. The resulting capture zone up gradient of the well represents the average water residence times in the subsurface and defines the wellhead protection area for that particular well and time period.

A list of modeling assumptions and sources of information used in the WhAEM model are included in Table 3.

Table 3: WhAEM Modeling Assumptions

Item	Value/Item Used	Source
Model Base Map	USGS 7.5 Minute Quadrangles for Minden and Gardnerville	WhAEM200 BBM Files provided by U.S. EPA [8]
Aquifer Thickness	500 ft	1997 GRGID WHPP [1]
Horizontal Hydraulic Conductivity	8.6 ft/day	1997 GRGID WHPP [1] based on 1986 USGS Study by Maurer [9]
Aquifer Porosity	0.15	1997 GRGID WHPP [1], 2012 Douglas County WHPP [4]
Regional Hydraulic Gradient	0.005 ft/ft	2009 USGS Groundwater Map [7]
Angle of Flow	Azimuth 303°	Approximated from USGS Groundwater Map (Appendix B)
Well Pumping Rates	2012-2016 Average	Historical Well Pumping Records (see Table 2)
Test Points for Calibration	Winter/Spring 2017 Averages	Static Water Levels for GRGID Wells (see Table 1)
Times of Travel (TOT)	2-year, 5-year, 10-year, and 20-year	2, 5, and 10-year recommended by Nevada ISWPP [2]

For the GRGID WhAEM model, approximate water surface elevations for the East Fork of the Carson River were input to the model as a "linesink" feature to help define the groundwater flow in the aquifer. The WhAEM uniform flow feature and regional hydraulic gradient of 0.005 ft/ft was used to generate groundwater contours that closely resemble the USGS groundwater contour map (Appendix B). The resulting groundwater contours were within 1.5 to 23.5 ft of the static water levels for the GRGID wells, which is an acceptable variation considering seasonal variances.

The times of travel (TOTs) used to define the primary wellhead protection areas for GRGID were

2-years, 5-years, and 10-years in accordance with Nevada ISWPP guidelines [2]. A 20-year TOT was also modeled as a secondary, conservative wellhead protection area to represent a buffer zone directly up gradient of the primary wellhead protection areas.

3.2.2 Delineation Results

Primary (2, 5, and 10-year) and secondary (20-year) wellhead protection areas for each GRGID well are shown on Figure 2. The shape and size of the protection areas are defined by pumping rates and aquifer characteristics and are subject to change with variation in well pumping patterns and modeling assumptions. The GRGID wellhead protection areas generally extend from the wellheads in a southeasterly direction showing the capture/recharge zones up gradient from the well. As shown in Figure 2, smaller pumping rates result in narrower wellhead protection areas (e.g. Well 5) and higher pumping rates result in wider wellhead protection areas.

Previous wellhead protection areas for the 1997 GRGID WHPP were based on a 1996 Wellhead Protection Area Delineation Report [10]. The protection areas delineated in the 1996 Report extend in the opposite direction from the current results and may be a result of assumptions regarding the impact of the Carson River or the availability of groundwater flow information at that time. The USGS report dated March 2009 [7] includes the best currently available data regarding groundwater flow in the Carson Valley.

3.3 Potential Contaminant Sources

A potential contaminant source (PCS) is any pollutant source that may have a negative impact on groundwater quality. A list of typical PCSs and their associated risk level is included in Appendix C as provided by the Nevada ISWPP [2].

3.3.1 PCS Inventory and Ranking

An inventory of PCSs was developed within each wellhead protection area for the GRGID wells using available databases, previous studies, aerial mapping, and general knowledge of land use practices and businesses within District. A list of sources used to identify PCSs is provided below:

- Previous GRGID WHPP prepared in 1997 [1]
- Douglas County WHPP prepared in 2012 [4]
- Nevada Well Database and Well Log Search [11,12]
- NDEP Underground Storage Tank Program [13]

The PCSs for each well were ranked in order of greatest perceived level of threat to the drinking water supply source based on the following factors:

- Risk levels provided by the Nevada ISWPP [2]
- Proximity of the PCS to the wellhead
- Quantity of hazardous material at the PCS
- Characteristics of hazardous material (mobility, toxicity concerns, etc.)
- Professional judgement

Ranking the PCSs helps to identify the most threatening sources of contamination so that the WHPP management strategies can be focused on the areas of greatest concern. An inventory of PCSs and the priority ranking for each well are included in Tables 4-10 below. PCSs locations for each well are shown on Figure 2.

Table 4: Well 1 PCS Inventory and Ranking

PCS ID	PCS Class	PCS Source	WHPA (Years) 2	5	10	20	Risk Level	Priority Ranking
48	Miscellaneous	Golf Courses (Fertilizer)	x	x	x	x	High	1
52	Miscellaneous	Surface Water Streams/Ditches	x		x	x	High	2
3	Agricultural	Chemical Application (Fertilizer)		x	x	x	High	3
5	Agricultural	Irrigation Field		x	x	x	Moderate	4
27	Residential	Septic Systems				x	High	5
26	Residential	Private Wells				x	Moderate	6
55	Miscellaneous	Municipal Well	x				Low	7

Table 5: Well 2 PCS Inventory and Ranking

PCS ID	PCS Class	PCS Source	WHPA (Years) 2	5	10	20	Risk Level	Priority Ranking
27	Residential	Septic Systems	x	x	x	x	High	1
52	Miscellaneous	Surface Water Streams/Ditches	x	x	x	x	High	2
48	Miscellaneous	Golf Courses (Fertilizer)		x	x	x	High	3
7	Agricultural	Irrigation Well			x		High	4
26	Residential	Private Wells	x	x	x	x	Moderate	5
3	Agricultural	Chemical Application (Fertilizer)				x	High	6
5	Agricultural	Irrigation Field				x	Moderate	7
55	Miscellaneous	Municipal Well	x			x	Low	8

Table 6: Well 4 PCS Inventory and Ranking

PCS ID	PCS Class	PCS Source	WHPA (Years) 2	5	10	20	Risk Level	Priority Ranking
48	Miscellaneous	Golf Courses (Fertilizer)	x	x			High	1
52	Miscellaneous	Surface Water Streams/Ditches		x	x		High	2
3	Agricultural	Chemical Application (Fertilizer)				x	High	3
5	Agricultural	Irrigation Field				x	Moderate	4
55	Miscellaneous	Municipal Well	x			x	Low	5

Table 7: Well 5 PCS Inventory and Ranking

PCS ID	PCS Class	PCS Source	WHPA (Years) 2	5	10	20	Risk Level	Priority Ranking
53	Miscellaneous	Storm Water Drains & Basins	x	x			High	1
3	Agricultural	Chemical Application (Fertilizer)				x	High	2
5	Agricultural	Irrigation Field				x	Moderate	3
55	Miscellaneous	Municipal Well	x				Low	4

Table 8: Well 6 PCS Inventory and Ranking

PCS ID	PCS Class	PCS Source	WHPA (Years) 2	5	10	20	Risk Level	Priority Ranking
52	Miscellaneous	Surface Water Streams/Ditches		x	x	x	High	1
55	Miscellaneous	Municipal Well	x				Low	2

Table 9: Well 8 PCS Inventory and Ranking

PCS ID	PCS Class	PCS Source	WHPA (Years) 2	5	10	20	Risk Level	Priority Ranking
3	Agricultural	Chemical Application (Fertilizer)	x	x	x		High	1
52	Miscellaneous	Surface Water Streams/Ditches	x	x	x	x	High	2
5	Agricultural	Irrigation Field	x	x	x		Moderate	3
55	Miscellaneous	Municipal Well				x	Low	4

Table 10: Well 9 PCS Inventory and Ranking

PCS ID	PCS Class	PCS Source	WHPA (Years) 2	5	10	20	Risk Level	Priority Ranking
27	Residential	Septic Systems		x	x	x	High	1
26	Residential	Private Wells		x	x	x	Moderate	2
55	Miscellaneous	Municipal Well				x	Low	3

3.3.2 Highest Risk Sources

In general, the most prevalent PCSs in the wellhead protection areas with the highest risk of contaminating the GRIGD water supply sources are septic systems, chemical application for golf course and agricultural areas, storm water drains/basins, surface water streams/ditches, and private residential wells. Threats associated with each are described below:

- Septic Systems: There are many residences outside of the GRGID service area that use septic system for sewage disposal. Septic system can pose a significant risk of

contamination to a water supply source when they are in close proximity to the wellhead at high densities. Potential contaminants that could escape septic systems into the groundwater supply include synthetic organic compounds, inorganic compounds, and microbial agents.

- Chemical Application: Some of the wellhead protection areas include agricultural areas and the golf course which can pose a threat to the groundwater through use of fertilizers and pesticides.
- Storm Water Drains/Basins: Storm water runoff poses a potential threat to groundwater because it can carry pollutants such as oils and chemicals.
- Surface Water Streams/Ditches: Surface water streams and ditches located within the wellhead protection areas include the East Fork of the Carson River, the Edna Wilslef Ditch, the Rocky Slough, and the Henningson Slough. Surface water features can present pathways for contamination to spread, especially in the event of a spill to land that reaches a waterway.
- Private Residential Wells: As with septic systems, many residences outside of the GRGID service area use private domestic wells for water supply. These wells likely share the same aquifer as the municipal wells and can provide a direct pathway for contamination to enter the groundwater system if they have not been properly installed, maintained, or abandoned.

Other PCSs that could affect the wellhead protection zones and should be considered in the management strategies include illegal dumping, accidental spills, pesticide waste disposal, and hazardous waste disposal.

Municipal wells themselves can also serve as a direct conduit for contamination to reach groundwater, however, this PCS is rated as low for GRGID wells which have been properly installed and sealed in accordance with State requirements.

3.4 Management Strategies

A management strategy was developed based on the results of the wellhead protection area delineations and inventory of potential contaminants. Regulatory and non-regulatory management options listed in the Nevada ISWPP [2] include the following:

Regulatory

- Zoning Ordinances
- Source Prohibitions
- Special use Permits
- Subdivision Ordinances
- Operating Standards

Non-Regulatory

- Groundwater Monitoring
- Local Business Owner Education
- Household Hazardous Waste Collection
- Public Education

In general, the wellhead protection areas fall within existing and future residential and agricultural land uses. Based on current development trends, land use zoning, and water system master

planning, it does not appear that there is strong potential for development of land uses that would serve as a significant or different sources of contamination than those already identified, therefore the regulatory management options are not necessary at this time.

Non-regulatory management options as recommend in the previous 1997 GRGID WHPP [1] have worked well in providing long-term protection of the District's water supply resources. Recommended management tools and activities compiled from the previous 1997 WHPP [1], the 2012 Douglas County WHPP [4], and from the Nevada ISWPP [2] are summarized in Table 11.

Table 11: Recommended Management Tools and Activities

Non-Regulatory Strategy	Suggested Management Tool[1]	Management Activities for GRGID
Groundwater Monitoring	A groundwater monitoring program consists of regular sampling of wells for contaminants. It helps the community to measure the effectiveness of its source controls and compliance with drinking water standards.	• Continue monitoring water supply wells in accordance with State requirements • Require more rigorous monitoring as necessary for new projects
Local Business Owner Education	Encourage local business owners to take advantage of the Business Environmental Program offered by Nevada Small Business Development Center (NSBDC).	• Notify existing and future businesses of available resources
Household Hazardous Waste Collection	A good management tool to reduce the amount of hazardous waste going to the landfill or septic systems. Coordinate with the local government to implement a Household Hazardous Waste Collection Day. Funding is available through NDEP's Solid Waste Program. This option helps to educate the public about the types of household products which are toxic or hazardous. It encourages public involvement. Educate citizens in the community by distributing NDEP's flyer about Safer Alternatives to Hazardous Household Products.	• Promote participation in Douglas County's hazardous waste collection program through public education
Wellhead Protection Sign	Place signs on perimeters of WHPAs. A sign would reduce the risk of an accident. It serves as notification in case of an accidental spill of contaminant. Signs help to educate the public.	• Maintain existing signs and identify needs for improved signage • Provide signage for new well sites
Public Education	Public Education is a key aspect of any WHPP. Public education efforts are important in building public support for regulatory changes and local funding.	• Implement public education plan (see Section 5.0)

[1] Suggested management tool provided by Nevada ISWPP/BWPC [14].

Management approaches and activities for specific PCSs are summarized in Table 12.

Table 12: Management Approaches for Specific PCSs

PCS	Suggested Management Approach[1]	Management Activities for GRGID
Abandoned Water Wells	Poorly constructed wells and improperly abandoned wells can act as a 'direct route' for groundwater contamination. The State regulations require proper plugging of water wells. Educate citizens in the community by distributing NDEP's Abandoning Unused Water Wells fact sheets. Coordinate with NDEP for financial assistance to plug unused wells.	• Domestic Wells: o Public Education o Encourage Out-of-District customers to connect to GRGID's water system • Municipal Wells: o Review inactive wells for potential abandonment
Illegal Dumping	Monitor WHPAs to detect illegal dumping. Use Nevada's Recycling Hotline (1-800-597-5865) to report illegal dumping.	• Public Education • Enforcement through penalties
Accidental Spills	Monitor WHPAs for accidental spills. Place wellhead protection signs on perimeters of WHPAs. Have an emergency response/ contingency plan ready if an accidental event threatens the water supply.	• Maintain Up-to-Date Emergency Response Plan
Septic Systems	Proper design, construction and maintenance of septic systems are vital to water quality. It is important not to dispose of common household hazardous materials into septic systems. Educate citizens in the community by distributing NDEP's Domestic Septic Systems fact sheets.	• Public Education • Encourage Out-of-District customers to connect to GRGID's sewer collection system
Pesticides and Pesticide Wastes	Unused pesticides and pesticide wastes can contaminate Nevada's streams, lakes and groundwater. Proper disposal of these substances is important. Participate in the Nevada Department of Agriculture (NDOA) Pesticide Disposal Program. Educate citizens in the community by distributing NDOA's Pesticide Disposal Program pamphlet.	• Public Education
Surface Runoff	Divert surface runoff to protect WHPAs by constructing lined ditches or swales, siltation or filter berms, grassed waterways and outlets, etc.	• Continue to conduct street cleaning and erosion control to reduce sediments in runoff

[1] Suggested management approach provided by Nevada ISWPP/BWPC [14].

3.5 Contingency Planning

Contingency plans, within the context of the WHPP, should be built upon a system's emergency response plan to provide guidance in the event that the drinking water supply source becomes contaminated or unavailable. Recommended short-term and long-term contingency planning options as well as existing emergency response plan resources are provided below.

3.5.1 Short Term Contingency

In the event of a short-term emergency affecting availability or quality of the drinking water supply, some potential short-term solutions include:

- Water Storage: GRGID maintains a storage tank reserve equivalent to 75% of the average day water demand to maintain water supply during an emergency or maintenance event.
- Boil Water/Do Not Drink Order: A Boil Water/Do Not Drink Order may be issued by the GRGID in the event of a potential bacterial contamination. Public notice templates are available on the NDEP website.
- Bottled Water: Bottled water is available at numerous local locations and can be trucked in from outside regions as part of a relief effort.
- Potable Water Trucks: Potable water could be trucked in from unaffected communities to fill GRGID's storage tanks.
- Backup Power: Emergency generators are available for Wells 1, 2, 5, 8, and 9 to provide backup power in the event of a power failure.

3.5.2 Long Term Contingency

GRGID's long-term water supply goal is to have a diversified water supply system consisting of District groundwater wells and a regional connection. The 2017 GRGID Water Master Plan includes a regional connection as part of the long-term Capital Improvement Plan to accommodate future growth and to diversify the water supply.

3.5.3 Emergency Response Plans

Local and county wide emergency planning resources for GRGID are listed below.

GRGID Emergency Response Plan

GRGID has an Emergency Response Plan to address emergency conditions such as water system failures, natural disasters, and unnatural events (e.g. toxic spills). The Emergency Response Plan includes an inventory of water system components, a list of contact names and numbers, preventative maintenance activities, and procedures to follow during emergency events.

GRGID Water Use Restrictions

Water Use Restrictions adopted by GRGID as part of the Policy and Procedures Manual are included for reference in Appendix D. Water use restrictions can be imposed by GRGID in the event of a water emergency or shortage and penalties can be enforced for violations of the restrictions.

Douglas County Hazard Mitigation Plan and Emergency Operations Plan

The 2013 Douglas County Hazard Mitigation Plan [15] includes preparedness, response, and recovery measures for natural and human-caused disasters. The top five hazards identified

for Douglas County include floods, wildland fires, earthquakes, drought, and severe weather events. In addition the East Fork Fire Protection District (EFFPD) maintains an Emergency Operations Plan to address emergency events for all systems in the County.

3.6 New Well Siting

Development of new drinking water sources and related drilling activities are regulated and permitted by the Nevada Division of Water Resources (NDWR). From the perspective of the WHPP, the following criteria for new well sites should be considered:

- A projected pumping capacity should be estimated for the new well.
- Water quality studies must be conducted to ensure that supply source is in compliance with water quality standards.
- Wellhead protection zones should be estimated around the proposed well.
- PCSs should be identified within the estimated wellhead protection zones.
- Relevant management options should be developed for PCSs within the wellhead protection zone.

In addition to the above criteria, a new well siting process developed for the 2012 Douglas County WHPP [4] is included in Appendix E as a reference for developing new water supply sources.

4.0 PLAN IMPLEMENTATION

4.1 Implementation Activities

Based on the management activities listed in Tables 11 and 12, recommended near-term action items for plan implementation include:

- Review inactive wells for abandonment to reduce potential as a contaminant source for other water supply wells.
- Develop public education plan using available State and County resources.

4.2 Program Updates

The WHPP is a living document that should be reviewed and updated at regular intervals to reflect current conditions and to re-evaluate wellhead protection areas, potential threats to the groundwater supply, and management strategies. The WHPP should be amended with the addition and/or replacement of wells and with changes in groundwater pumping trends due to operational changes or growth.

It is recommended that GRGID participate in the next Douglas County WHPP update for collaboration with other water systems and local jurisdictions, technical assistance from NDEP, and to take advantage of potential funding opportunities.

5.0 PUBLIC PARTICIPATION

Public participation is an important component to the long-term success of a WHPP. The goal of public outreach and education is to demonstrate to the community that every effort is being made to secure the public's source of safe drinking water for the present and the future. Public education can include brochures, mailers, presentations, seminars, and interactive activities for community members and schools.

The U.S. EPA has developed learning resources for kids, students, and teachers which can be accessed through the following website link: https://www3.epa.gov/safewater/kids/index.html.

In addition, a Public Education Plan that was developed as part of the 2012 Douglas County WHPP [4] is included in Appendix F as a resource and guide for public outreach. The Douglas County Public Education Plan is geared towards community members and sixth grade students.

6.0 REFERENCES

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[10] Gardnerville Ranchos General Improvement District Wellhead Protection Area Delineation Report, prepared by Wateresource Consulting Engineers, Inc., prepared November 1996.

[11] State of Nevada Division of Water Resources, "Mapping Application Links: Nevada

Hydrology Data", Accessed 3 October 2017. <http://water.nv.gov/mapping.aspx?mapping=Mapping Application Links>

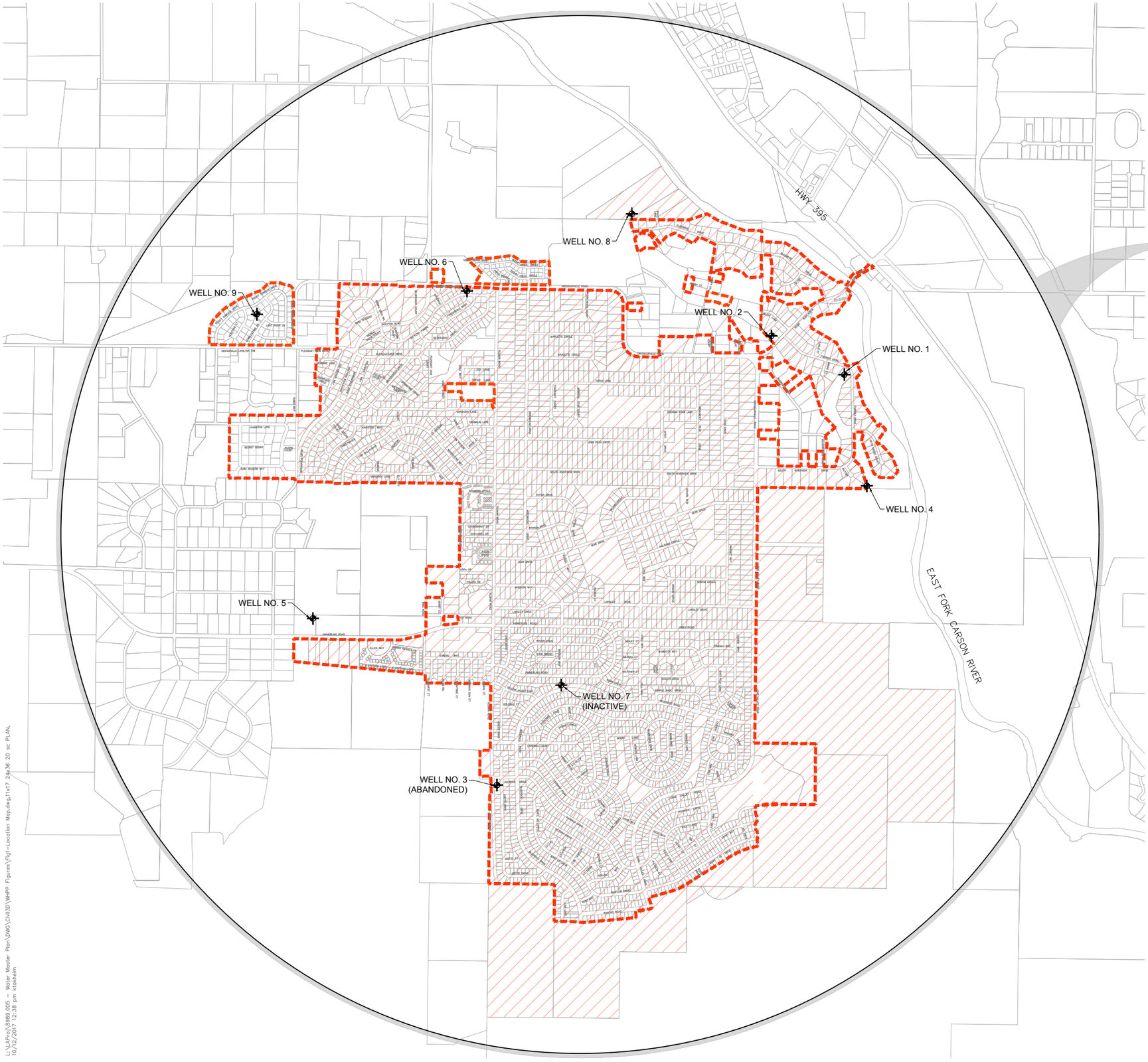
[12] State of Nevada Division of Water Resources, "Well Log Search", Accessed 3 October 2017. <http://water.nv.gov/WellLogQuery.aspx>

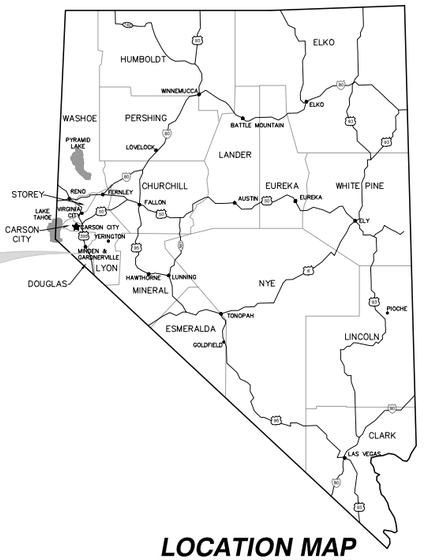
[13] Nevada Division of Environmental Protection, Underground Storage Tank Program – Public Record, Accessed 2 October 2017. <https://ndep.nv.gov/land/underground-storage-tanks>

[14] Nevada Division of Environmental Protection, Bureau of Water Pollution Control, "Suggested Management Approaches for Potential Sources of Contamination", accessed 5 October 2017. <https://ndep.nv.gov/uploads/documents/pcs_mngmntapproach.pdf>

[15] Douglas County Hazard Mitigation Plan, prepared by Douglas County, 2013. <http://www.douglascountynv.gov/485/Emergency-Management>

FIGURES





LOCATION MAP

1000 500 0 1000 2000

LEGEND

- AREAS CURRENTLY SERVED BY GRGID WATER SYSTEM
- AREAS CURRENTLY IN GRGID
- WELL

LUMOS & ASSOCIATES

800 EAST COLLEGE PARKWAY
CARSON CITY, NEVADA 89706
TEL (775) 883-7077
FAX (775) 883-7114

WWW.LUMOSINC.COM

CIVIL ENGINEERING
STRUCTURAL ENGINEERING
GEOTECHNICAL ENGINEERING
PLANNING LANDSCAPE
ARCHITECTURE SURVEYING / GIS
CONSTRUCTION SERVICES
MATERIALS TESTING

GRGID

GRGID WELLHEAD PROTECTION PROGRAM
GRGID LOCATION AND SERVICE AREA
FIGURE 1

DOUGLAS COUNTY

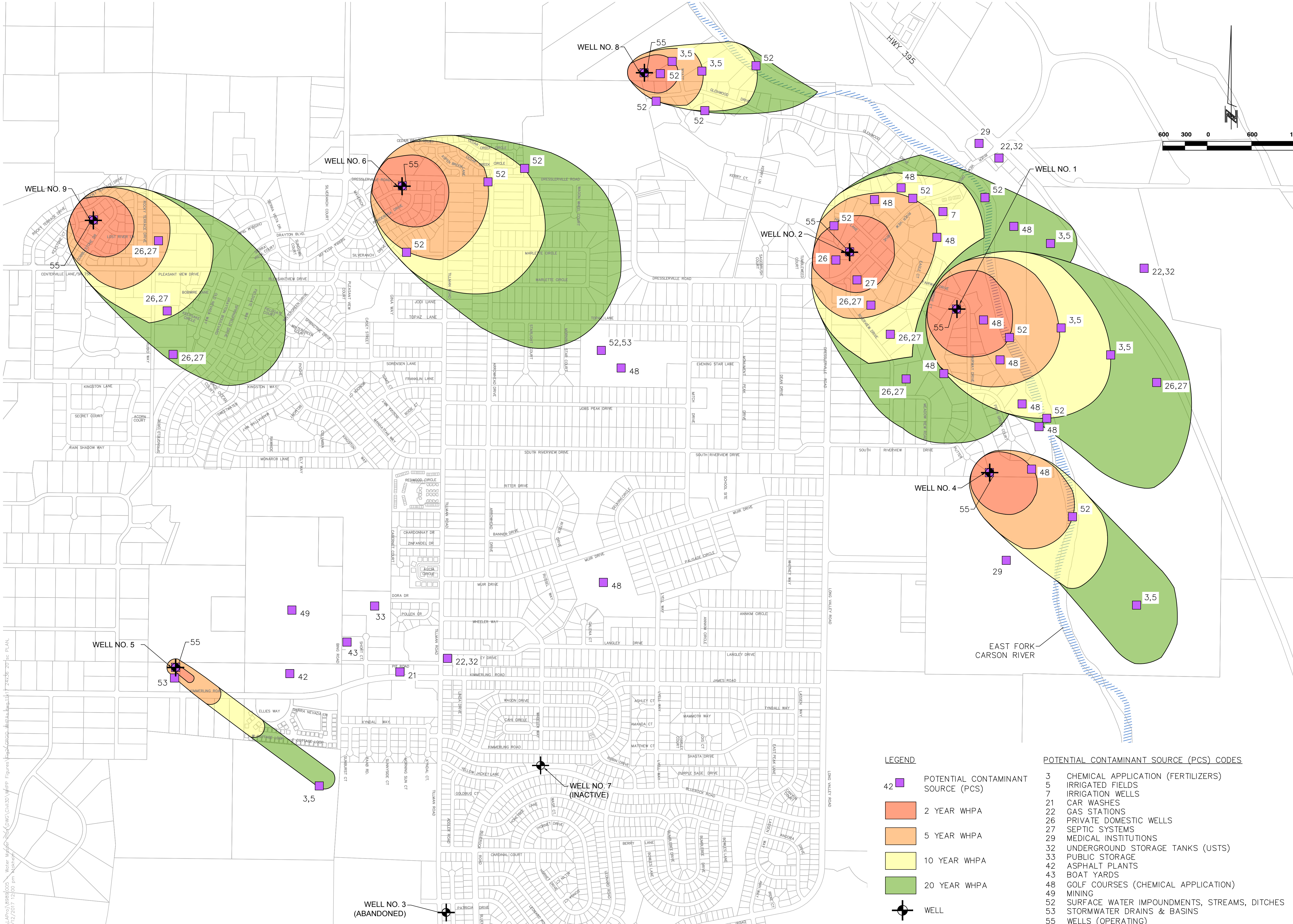
GARDNERVILLE

NEVADA

REV	DATE	DESCRIPTION	BY

1

DATE: OCTOBER 2017
DRAWN BY: KT
DESIGNED BY:
CHECKED BY: MB
JOB NO.: 8989.005



LEGEND

- 42 POTENTIAL CONTAMINANT SOURCE (PCS)
- 2 YEAR WHPA
- 5 YEAR WHPA
- 10 YEAR WHPA
- 20 YEAR WHPA
- WELL

POTENTIAL CONTAMINANT SOURCE (PCS) CODES

3	CHEMICAL APPLICATION (FERTILIZERS)
5	IRRIGATED FIELDS
7	IRRIGATION WELLS
21	CAR WASHES
22	GAS STATIONS
26	PRIVATE DOMESTIC WELLS
27	SEPTIC SYSTEMS
29	MEDICAL INSTITUTIONS
32	UNDERGROUND STORAGE TANKS (USTS)
33	PUBLIC STORAGE
42	ASPHALT PLANTS
43	BOAT YARDS
48	GOLF COURSES (CHEMICAL APPLICATION)
49	MINING
52	SURFACE WATER IMPOUNDMENTS, STREAMS, DITCHES
53	STORMWATER DRAINS & BASINS
55	WELLS (OPERATING)

LUMOS & ASSOCIATES
800 EAST COLLEGE PARKWAY
CARSON CITY, NEVADA 89706
TEL (775) 883-7077
FAX (775) 883-7114
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CONSTRUCTION SERVICES
MATERIALS TESTING

GRGID

GRGID WELLHEAD PROTECTION PROGRAM
WELLHEAD PROTECTION AREAS
FIGURE 2

GARDNERVILLE DOUGLAS COUNTY NEVADA

REV	DATE	DESCRIPTION	BY

2

DATE:	OCTOBER 2017
DRAWN BY:	KT
DESIGNED BY:	
CHECKED BY:	MB
JOB NO.:	8989.005

Appendix A

Well Database

Well Construction, Pump and Motor Data updated May 2014				
Well	1	2	4	5
Year Drilled	1965/2007	2004	1978	1984
State Log #	9832/103124	93217	18097/19471	25320
electric log	no	yes	no	
As Built	no	no	no	no
rated capacity gpm)	2250/1350	2000+	350	1200
seal depth (ft)	52	115	**none**	138
pumping level_original (ft)	70	180' @ 1800gpm		152'@1200gpm
pumping level_current (ft)	196	110	95	
original static (ft)	5	35	7	55.5
Org. specific capacity (gpm/ft)	34 @2250gpm	12 @1800gpm		12 @ 1200gpm
current specific capacity (gpm/ft)	9.5 @ 1100gpm			
casing dia. (in)	18"w/14"sleeve	16	16	16
total depth (ft)	420	670	375	450
screen from (ft)	140	270	183	200
screen to (ft)	420	650	372	450
slot size (in)	0.1	0.1	1/4 x 3"	0.2
screen type	wirewrap	wire wrap	mill slot	wire wrap
gravel pack	3/8" minus		none	1/4"x3/8"
graveled section (ft)	20'-420'	115' to 670'	none	138'-450'
T/R/Section	nene15T12R20	swse10T12R20	sene15N12E20	nene20T12R20
easting	-119.71730143	-119.72277666	-119.71700261	-119.75464457
northing	38.90947714	38.91159207	38.90334746	38.89591288
elevation, well head (ft)	~4832	~4830	~4846	~4805
recent rehab	2007-rebuilt		2008	
pump column	10" x 235'	10" x 262'	6" x 210'	8" x 200'
pump intake setting (ft)	240'	268	214	204
pump capacity (gpm)	1500	1600	600	1200
pump curve				
pump manf	National	Goulds	Goulds	Floway
pump model #	K12HC	14RJMC	8RJHC	12LKH
pump stages	7	5 x 13.6"OD	5 x 7.5"OD	6
pump set date	2007	2004	1997	1992?
motor manf.	USMotors	USMotors	Franklin	
motor HP	200	250	100	150
motor rpm	1775	1780	3600	1770
motor type	line shaft	line shaft	submersible	line shaft
motor electrical	460v 230amp	460v 292amps	460v	
motor model	AA70A	hollowshaft		
motor serial number	H020052SLG	110250v2SLH-C		
motor set date	2001	2004	1997	
discharge pressure (psi)	104	110	95	
TDH (ft)	380	450	400	360
last camera log	2007			

Well Construction, Pump and Motor Data updated May 2014				
Well	6	7	8	9
Year Drilled	1989	1994	1997	2005
State Log #	32531	44114	67795	98220
electric log	no		yes	yes
As Built	no	no	no	no
rated capacity (gpm)				1000
seal depth (ft)	50	53	100	100
pumping level_original (ft)		414'@235gpm	170'@1000gpm	149' @ 1000gpm
Pumping level_current (ft)	175		175' @ 1000gpm	145' @ 845gpm
original static (ft)	45	40	46	28
Org. specific capacity (gpm/ft)		0.6 @ 235gpm	9.2 @ 1194gpm	8 @ 1000gpm
current specific capacity (gpm/ft)	7 @ 706gpm		7 @ 1050 gpm	8 @ 814gpm
casing dia. (in)	18	6	16	12
total depth (ft)	434	480	500	390
screen from (ft)	210	300/460	260	240
screen to (ft)	430	320/480	500	390
slot size (in)	0.1	1/8 x 3"	0.08	0.05
screen type	wire wrap	slot	wire wrap	wire wrap
gravel pack	1/8x1/4	yes	#4 x #8	yes
graveled section (ft)	50'-434'	53'-480'	0-500'	0-390
T/R/Section	sesw9T12R20	sese21T12R20	nenw10T12R20	swse8T12R20
easting	-119.74391699	-119.73730140	-119.73297441	-119.75887240
northing	38.91384831	38.89230296	38.91812375	38.91242917
elevation, well head (ft)	~4800	~4871	~4800	~4809
recent rehab	2006		2005	
pump column	6"x212'	3"x275'	8" x 235'	8" x 180'
pump intake setting (ft)	~216	279	245'	202
pump capacity (gpm)	700	135	1350	800
pump curve	yes		yes	yes
pump manf	Gould	Fairbanks	Floway	Weir 10"
pump model #	9RCLC	6L	12JKH	10DKH
pump stages	3 x 9"	8	7	13
pump set date	2006	1995	1999	2006
motor manf.	Franklin	Franklin	US motor	USMotor
motor HP	100	20	200	125
motor rpm	3550		1785	1780
motor type	submersible	submersible	line shaft	line shaft
motor electrical	400v 126amp		460v 228amp	460v 142amp
motor model				
motor serial number	E94		R488A-BO5-5832m	60361-1-1
motor set date	2006	1995	1999	2006
discharge pressure (psi)	95		125	116
TDH (ft)	400	410	385	414
last camera log	2006			2006

WELL LOG AND REPORT TO THE STATE ENGINEER OF NEVADA

Log No. 9832
Rec. Nov. 12 1965
Well No.
Permit No. 22787-22932
Do not fill in.

PLEASE COMPLETE THIS FORM IN ITS ENTIRETY

Owner Swift Builders, Unit #3 Driller Wayne Burroughs

Address Gardnerville, Nevada Address 2171 E Second St. Reno, Nevada Lic. No. 257

Location of well: NE ¼ NE ¼ Sec. 15, T. 12N/8, R. 20E, in Douglas County

Permit No.

Water will be used for Commercial & Domestic Total depth of well 450 Feet

Size of drilled hole 24 inch Weight of casing per linear foot 8 Gauge

Thickness of casing 8 Gauge Temp. of water Cold

Diameter and length of casing 18 " X 420 ' 14 " X 34'
(Casing 12" in diameter and under give inside diameter; casing 12" in diameter give outside diameter.)

If flowing well give flow in c.f.s. or g.p.m. and pressure

If nonflowing well give depth of standing water from surface 18'

If flowing well describe control works
(Type and size of valve, etc.)

Date of commencement of well 7-15-65 Date of completion of well 10-25-65

Type of well rig 72 Star Cable Tool

LOG OF FORMATIONS

From feet	To feet	Thickness feet	Type of material
-0-	4	4	Topsoil
4	49	45	Sandy Clay, Boulders & Gravel
49	82	33	Boulders & Gravel, Yellow Clay
82	163	81	Gravel & Boulders packed in Sandy Yellow Clay
163	189	26	Sandy Clay & Gravel
189	361	172	Sticky Yel. Clay & Sand
361	389	28	Cemented Gravel
389	440	53	Large Gravel & Course Sand
442	450	8	Boulders & Gravel Bedded in Yellow Clay

(OVER)

Water-bearing Formation, Casing Perforations, etc.

Chief aquifer (water-bearing formation)
from 5 to 442 ft.

Other aquifers 63 to 66 ft.
167 to 174 ft.
249 to 258 ft.
389 to 442 ft.

First water at 5 feet.

Casing perforated
from 160 to 420 ft.

Size of perforations
1/4 X 2

919

LOG OF FORMATIONS—Continued

From feet	To feet	Thickness	Type of material

CASING RECORD

Diam. casing	From feet	To feet	Length	REMARKS—Seals, Grouting, etc.
26"	-0-	52		Conducter Casing concreted in from 52' to datum
18"	-0-	420		
14"	416	450	450	Set in 24" drilled hole and gravel packed with river washed gravel from 52' to 450'

GENERAL INFORMATION—Pumping Test, or Boiling Test, Quality of Water, etc.

2250 GPM at 70'

WELL DRILLER'S STATEMENT

This well was drilled under my jurisdiction and the above information is true to my best information and belief.

Signed Wayne E. Burroughs
Well Driller

By.....

License No. 257

Dated Nov. 8, 1965

(Not to be filled in by Driller)

WHITE - DIVISION OF WATER RESOURCES
CANARY - CLIENT'S COPY
PINK - WELL DRILLER'S COPY

PRINT OR TYPE ONLY
DO NOT WRITE ON BACK

STATE OF NEVADA
DIVISION OF WATER RESOURCES
WELL DRILLER'S REPORT

Please complete this form in its entirety in accordance with NRS 534.170 and NAC 534.340

OFFICE USE ONLY
Log No. 103124
Permit No.
Basin 105

NOTICE OF INTENT NO. 58649

1. OWNER Gardnerville Ranchos General Improvement Dist
MAILING ADDRESS 931 Mitch Drive
Gardnerville, NV 89410

ADDRESS AT WELL LOCATION 1/4 mile south of the intersection of Fairway & Riverview Drive in Gardnerville Ranchos

2. LOCATION NE 1/4 NE 1/4 Sec. 15 T 12N N/S R 20E E Douglas County
PERMIT NO. 22787-22982 (Issued by Water Resources) | Parcel No. | Subdivision Name

3. WORK PERFORMED: [ ] New Well [ ] Replace [X] Recondition [ ] Deepen [ ] Abandon [ ] Other
4. PROPOSED USE: [ ] Domestic [ ] Irrigation [ ] Test [X] Municipal/Industrial [ ] Monitor [ ] Stock
5. WELL TYPE: [ ] Cable [ ] Rotary [ ] RVC [ ] Air [ ] Other

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
After well rehabilitation, we conducted a video of well and found several holes in the 18" casing. It was decided to install a 14" steel liner to extend the life of the well. During the video of the well, we saw that the area from 140' to 320' was slotted with a Mills Knife with only 4 rows per foot. Many of the slots were on one side of the casing. We decided to re-perforate this area to allow more water in. We used an 18" Mills Knife and perforated the 18" casing from 140' tp 320' with 6 rows per foot. We bailed the well to 420' and installed 280' of 14" wire screen and 140' of 14" blank casing. After the casing installation, we filled the surrounding annulus with 3/8 minus gravel pack. We then swabbed the gravel pack into place to within 20' of surface.				

Date started 1/24/2007 , 19___
Date completed 2/24/1907 , 19___

7. WELL TEST DATA

TEST METHOD: [ ] Bailer [ ] Pump [ ] Air Lift

G.P.M.	Draw Down (Feet Below Static)	Time (Hours)

8. WELL CONSTRUCTION

Depth Drilled ____ Feet Depth Cased 420' Feet

HOLE DIAMETER (BIT SIZE)

	From	To
____ Inches	____ Feet	____ Feet
____ Inches	____ Feet	____ Feet
____ Inches	____ Feet	____ Feet

CASING SCHEDULE

Size O.D. (Inches)	Weight/Ft. (Pounds)	Wall Thickness (Inches)	From (Feet)	To (Feet)
14"		.250	surface	140'

Perforations:
Type perforation Johnson HyCap screen
Size perforation .100 slot
From 140' feet to 420' feet
From ____ feet to ____ feet
From ____ feet to ____ feet
From ____ feet to ____ feet
From ____ feet to ____ feet

Surface Seal: [X] Yes [ ] No
Depth of Seal 52'
Placement Method: [ ] Pumped [ ] Poured
Seal Type: [ ] Neat Cement [ ] Cement Grout [X] Concrete Grout

Gravel Packed: [ ] Yes [X] No
From 20' feet to 420' feet

9. WATER LEVEL

Static water level 38' feet below land surface
Artesian flow ____ G.P.M. ____ P.S.I.
Water temperature ____ °F Quality ____

10. DRILLER'S CERTIFICATION

This well was drilled under my supervision and the report is true to the best of my knowledge.

Name Carson Pump (Contractor)
Address p.o. Box 20159 (Contractor)
Carson City, NV. 89721

Nevada contractor's license number issued by the State Contractor's Board 39920

Nevada driller's license number issued by the Division of Water Resources, the on-site driller 1482

Signed ____ (By driller performing actual drilling on-site or contractor)
Date 3/17/2007

USE ADDITIONAL SHEETS IF NECESSARY

WHITE - DIVISION OF WATER RESOURCES
CANARY - CLIENT'S COPY
PINK - WELL DRILLER'S COPY

PRINT OR TYPE ONLY
DO NOT WRITE ON BACK

STATE OF NEVADA
DIVISION OF WATER RESOURCES
WELL DRILLER'S REPORT

Please complete this form in its entirety in accordance with NRS 534.170 and NAC 534.340

OFFICE USE ONLY
Log No. 93217
Permit No. 48752
Basin 105

NOTICE OF INTENT NO. 51942

OWNER Gardnerville Ranchos GID
MAILING ADDRESS 931 Mitch Drive
Gardnerville, NV 89410

ADDRESS AT WELL LOCATION Well #2A

2. LOCATION SW 1/4 SE 1/4 Sec. 10 T 12N N/S R 20E E Douglas County
PERMIT NO. 48752 (Issued by Water Resources) 1220-10-811-014 (Parcel No.) (Subdivision Name)

3. WORK PERFORMED: [X] New Well [ ] Replace [ ] Recondition [ ] Deepen [ ] Abandon [ ] Other
4. PROPOSED USE: [ ] Domestic [ ] Irrigation [ ] Test [X] Municipal/Industrial [ ] Monitor [ ] Stock
5. WELL TYPE: [ ] Cable [ ] Rotary [X] RVC [ ] Air [ ] Other

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
sand/cobbles w/s clay		0	40	
sand & gravel w/cobbles		40	128	88
sand & gravel w/clay		128		
stringers			151	23
br. clay w/sand		151	170	19
sand/gravel w/cobbles		170	296	126
tan clay w/sand, gravel		296		
& cobbles			303	7
tan clay w/s sand		303	309	6
sand & gravel w/tan clay		309	320	11
clay w/sm. gravel & sand		320	325	5
sand & gravel w/cobbles		325	350	25
clay w/sand & gravel		350	375	25
gravel & coarse sand		375	381	6
hd. rock w/sand & gravel		381	406	25
clay		406		
w/sand,gravel,cobbles			414	8
sand/gravel/cobbles		414		
w/clay stringers			463	49
sand/gravel/clay w/s		463		
cobbles			472	9
sand/gravel/cobbles w/s		472		
clay			491	19
hd. rock, sand & gravel		491	562	71
Continued on next page				

Date started 4/2/04 , 19__
Date completed 4/26/04 , 19__

7. WELL TEST DATA

TEST METHOD: [ ] Bailer [X] Pump [ ] Air Lift

	G.P.M.	Draw Down (Feet Below Static)	Time (Hours)
P/L 179.23	1800	144.30	91.5 hrs

8. WELL CONSTRUCTION

Depth Drilled 696 Feet Depth Cased 670 Feet

HOLE DIAMETER (BIT SIZE)

	From	To
36 Inches	0 Feet	40 Feet
24 Inches	40 Feet	696 Feet
Inches	Feet	Feet

CASING SCHEDULE

Size O.D. (Inches)	Weight/Ft. (Pounds)	Wall Thickness (Inches)	From (Feet)	To (Feet)
30		.375	0	40
16		.312	+2	270
16		.312	340	360

continued pg 2

Perforations:
Type perforation wire wrap
Size perforation .100 slot

From	270 feet to	340	feet
From	360 feet to	440	feet
From	460 feet to	530	feet
From	550 feet to	650	feet
From	feet to		feet

Surface Seal: [X] Yes [ ] No
Depth of Seal 115
Placement Method: [X] Pumped [ ] Poured
Seal Type: [ ] Neat Cement [X] Cement Grout [ ] Concrete Grout

Gravel Packed: [X] Yes [ ] No
From 115 feet to 696 feet

9. WATER LEVEL

Static water level 34.90 feet below land surface
Artesian flow G.P.M. P.S.I.
Water temperature cool °F Quality good

10. DRILLER'S CERTIFICATION

This well was drilled under my supervision and the report is true to the best of my knowledge.

Name Humboldt Drilling & Pump Co., Inc. (Contractor)
Address 4675 W. Winnemucca Blvd (Contractor)
Winnemucca, Nevada 89445

Nevada contractor's license number issued by the State Contractor's Board 56797
Nevada driller's license number issued by the Division of Water Resources, the on-site driller 2177

Signed (By driller performing actual drilling on-site or contractor)
Date 4/30/04

WHITE - DIVISION OF WATER RESOURCES
CANARY - CLIENT'S COPY
PINK - WELL DRILLER'S COPY

PRINT OR TYPE ONLY
DO NOT WRITE ON BACK

STATE OF NEVADA
DIVISION OF WATER RESOURCES
WELL DRILLER'S REPORT
Please complete this form in its entirety in accordance with NRS 534.170 and NAC 534.340

OFFICE USE ONLY
Log No. 43217
Permit No. 48752
Basin 106

Page 2
NOTICE OF INTENT NO. 51942

1. OWNER Gardnerville Ranchose GID
MAILING ADDRESS 931 Mitch Drive
Gardnerville, NV 89410

ADDRESS AT WELL LOCATION Well #2A

2. LOCATION SW 1/4 SE 1/4 Sec. 10 T 12N N/S R 20E E Douglas County
PERMIT NO. 48752 (Issued by Water Resources) | 1220-10-811-014 (Parcel No.) | Subdivision Name

3. WORK PERFORMED
☐ New Well ☐ Replace ☐ Recondition
☐ Deepen ☐ Abandon ☐ Other

4. PROPOSED USE
☐ Domestic ☐ Irrigation ☐ Test
☐ Municipal/Industrial ☐ Monitor ☐ Stock

5. WELL TYPE
☐ Cable ☐ Rotary ☐ RVC
☐ Air ☐ Other

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
sand,gravel,cobbles w/s		562		
clay			577	15
clay w/sand & gravel		577	581	4
sand/gravel/cobbles w/s		581		
clay			611	30
sand & clay		611	614	3
clay w/s sand		614	629	15
sand/gravel/clay		629	638	9
sandy clay		638	696	58

Date started 4/2/04 , 19__
Date completed 4/26/04 , 19__

7. WELL TEST DATA
TEST METHOD: ☐ Bailer ☐ Pump ☐ Air Lift

G.P.M.	Draw Down (Feet Below Static)	Time (Hours)

8. WELL CONSTRUCTION
Depth Drilled _____ Feet Depth Cased _____ Feet

HOLE DIAMETER (BIT SIZE)

	From	To
_____ Inches	_____ Feet	_____ Feet
_____ Inches	_____ Feet	_____ Feet
_____ Inches	_____ Feet	_____ Feet

CASING SCHEDULE

Size O.D. (Inches)	Weight/Ft. (Pounds)	Wall Thickness (Inches)	From (Feet)	To (Feet)
16"		.312	440	460
16"		.312	530	550
16"		.312	650	670

Perforations:
Type perforation _____
Size perforation _____
From _____ feet to _____ feet
From _____ feet to _____ feet
From _____ feet to _____ feet
From _____ feet to _____ feet
From _____ feet to _____ feet

Surface Seal: ☐ Yes ☐ No
Depth of Seal _____
Placement Method: ☐ Pumped ☐ Poured
Seal Type: ☐ Neat Cement ☐ Cement Grout ☐ Concrete Grout

Gravel Packed: ☐ Yes ☐ No
From _____ feet to _____ feet

9. WATER LEVEL
Static water level _____ feet below land surface
Artesian flow _____ G.P.M. _____ P.S.I.
Water temperature _____ °F Quality _____

10. DRILLER'S CERTIFICATION
This well was drilled under my supervision and the report is true to the best of my knowledge.

Name Humboldt Drilling & Pump Co., Inc. (Contractor)
Address 4675 W. Winnemucca Blvd (Contractor)
Winnemucca, Nevada 89445

Nevada contractor's license number issued by the State Contractor's Board 56797

Nevada driller's license number issued by the Division of Water Resources, the on-site driller 2177

Signed _____ (By driller performing actual drilling on-site or contractor)
Date 4/30/04

WHITE—DIVISION OF WATER RESOURCES
CANARY—CLIENT'S COPY
PINK—WELL DRILLER'S COPY

STATE OF NEVADA
DIVISION OF WATER RESOURCES

WELL DRILLERS REPORT

Please complete this form in its entirety

OFFICE USE ONLY
Log No. 18097
Permit No. 29361 36027
Basin Carson Valley

1. OWNER Gardnerville Rancho's Gen. Imp. Distss Gardnerville Nev.

2. LOCATION SE NE ¼ NE ¼ Sec. 15 T. 12 N/S R. 20 E. Douglas County
PERMIT NO. [redacted] 29561

3. TYPE OF WORK				4. PROPOSED USE				5. TYPE WELL			
New Well	☐	Recondition	☐	Domestic	☐	Irrigation	☐	Test	☒	Cable	☒	Rotary	☐
Deepen	☐	Other	☐	Municipal	☐	Industrial	☐	Stock	☐	Other	☐		

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
Silt & Gravel		0	6	6
Boulder & Gravel		6	15	9
Hardpack Gravel & Boulders		15	40	25
Hardpack Gravel, Cobblestone & sand		40	50	10
Hardpack Gravel, Sand-streaks & Cobblestone		50	60	10
Gravel & Sand, hardpacked		60	65	5
Large Gravel & Samd		65	70	5
Coarse sand		70	80	5
Clay, Gravel & Sand		80	90	10
Fine sand		90	100	10
Sand & Gravel		100	105	5
Coarse Gravel		105	110	5
Cobblestones, Bouldres & Sand		110	115	5
Cobblestones & Sand		115	120	5
Fine Sand		120	132	12
Clay & Gravel, hardpacked		132	135	3
Sand & Gravel & Boulders		135	140	5
Sand		140	145	5
Coarse Gravel & Sand		145	150	5
Coarse Sand		150	155	5
Hardpacked Sand & Gravel		155	160	5
Cobblestones & Sand		160	165	5
Boulders, Clay & Sand		165	175	10
Sand & Gravel		175	180	5

Date started April - 3, 1978
Date completed April - 26, 1978

7. WELL TEST DATA

Pump RPM	G.P.M.	Draw Down	After Hours Pump

BAILER TEST

G.P.M. ..... Draw down ..... feet ..... hours
G.P.M. ..... Draw down ..... feet ..... hours
G.P.M. ..... Draw down ..... feet ..... hours

8. WELL CONSTRUCTION

Diameter hole 6 inches Total depth 370 feet
Casing record 370 feet---.188 wall
Weight per foot 10 Thickness

Diameter	From	To
inches	0 feet	370 feet
inches	feet	feet
inches	feet	feet
inches	feet	feet
inches	feet	feet
inches	feet	feet

Surface seal: Yes ☐ No ☒ Type
Depth of seal feet
Gravel packed: Yes ☐ No ☒
Gravel packed from feet to feet

Perforations:
Type perforation
Size perforation
From feet to feet
From feet to feet
From feet to feet
From feet to feet
From feet to feet

9. WATER LEVEL

Static water level 7 Feet below land surface
Flow G.P.M.
Water temperature 66 ° F. Quality Good

10. DRILLERS CERTIFICATION

This well was drilled under my supervision and the report is true to the best of my knowledge.

Name Austin W Graham
Address 945 Fairway Drive - Gardnerville
Nevada contractor's license number 12953
Nevada driller's license number 751
Signed Austin Graham
Date May 18 - 1978

USE ADDITIONAL SHEETS IF NECESSARY

5471

WHITE—DIVISION OF WATER RESOURCES
CANARY—CLIENT'S COPY
PINK—WELL DRILLER'S COPY

PAGE 2

STATE OF NEVADA
DIVISION OF WATER RESOURCES

WELL DRILLERS REPORT

Please complete this form in its entirety

OFFICE USE ONLY
Log No.
Permit No.
Basin

1. OWNER Gardnerville Rancho's Gen. Imp. District ADDRESS Gardnerville, Nevada

2. LOCATION NE ¼ NE ¼ Sec. 15 T. 12 N/S R. 20 E. Douglas County
PERMIT NO. 29561

3. TYPE OF WORK: New Well ☐ Recondition ☐ Deepen ☐ Other ☐

4. PROPOSED USE: Domestic ☐ Irrigation ☐ Test ☒ Municipal ☐ Industrial ☐ Stock ☐

5. TYPE WELL: Cable ☒ Rotary ☐ Other ☐

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
Cobblestones & Sand		180	185	5
Hardpacked Gravel & Cobblestones		185	200	15
Hardpacked Gravel, Clay & Sand		200	205	5
Hardpacked sand & coarse Gravel		205	210	5
Some Gravel, hardpacked clay & Sand		210	220	10
Sandy Clay, some Gravel		220	225	5
Sandstone & streaks of Clay		225	232	7
Hardpacked Gravel & Sand		232	235	3
Sand, coarse Gravel & Boulders		235	245	10
Hardpacked Gravel-large & small		245	250	5
Coarse Sand		250	255	5
Coarse & fine Sand, Rock		255	c260	5
Coarse sand, Gravel & Boulders		260	270	10
Boulders, Coarse Sand & Gravel		270	280	10
Coarse Gravel, Boulders & Sarp Sand		280	295	15
Sharp sand, Cobblestones & Boulders		295	300	5

Date started ....., 19.....
Date completed ....., 19.....

7. WELL TEST DATA

Pump RPM	G.P.M.	Draw Down	After Hours Pump

BAILER TEST
G.P.M. ..... Draw down ..... feet ..... hours
G.P.M. ..... Draw down ..... feet ..... hours
G.P.M. ..... Draw down ..... feet ..... hours

8. WELL CONSTRUCTION
Diameter hole 6 inches Total depth 370 feet
Casing record 370 ----.188 wall
Weight per foot ..... Thickness .....

Diameter	From	To
..... inches	..... feet	..... feet
..... inches	..... feet	..... feet
..... inches	..... feet	..... feet
..... inches	..... feet	..... feet
..... inches	..... feet	..... feet
..... inches	..... feet	..... feet

Surface seal: Yes ☐ No ☐ Type .....
Depth of seal ..... feet
Gravel packed: Yes ☐ No ☐
Gravel packed from ..... feet to ..... feet

Perforations:
Type perforation .....
Size perforation .....
From ..... feet to ..... feet
From ..... feet to ..... feet
From ..... feet to ..... feet
From ..... feet to ..... feet
From ..... feet to ..... feet

9. WATER LEVEL
Static water level ..... Feet below land surface .....
Flow ..... G.P.M. .....
Water temperature ..... ° F. Quality .....

10. DRILLERS CERTIFICATION
This well was drilled under my supervision and the report is true to the best of my knowledge.

Name .....
Address .....
Nevada contractor's license number .....
Nevada driller's license number .....
Signed .....
Date .....

USE ADDITIONAL SHEETS IF NECESSARY

5471

WHITE—DIVISION OF WATER RESOURCES
CANARY—CLIENT'S COPY
PINK—WELL DRILLER'S COPY

PAGE 3

STATE OF NEVADA
DIVISION OF WATER RESOURCES

WELL DRILLERS REPORT

Please complete this form in its entirety

OFFICE USE ONLY
Log No.....
Permit No.....
Basin.....

1. OWNER Gardnerville Rancho's Gen. Impr. Distr. ADDRESS Gardnerville, Nevada 89410

2. LOCATION NE SE ¼ NE ¼ Sec. 15 T. 12 N/S R. 20 E. Douglas County
PERMIT NO. 29561

3. TYPE OF WORK
New Well ☐ Recondition ☐
Deepen ☐ Other ☐

4. PROPOSED USE
Domestic ☐ Irrigation ☒ Test ☐
Municipal ☐ Industrial ☐ Stock ☐

5. TYPE WELL
Cable ☒ Rotary ☐
Other ☐

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
Coarse Sand		300	305	5
Boulders & Clay		305	315	10
Cement Gravel		315	325	10
Boulders & some Clay		325	335	10
Boulders, Coarse Gravel & Clay		335	345	10
Boulders, Clay & hard-packed Sand		345	350	5
Coarse Sand & Clay, hard & Compact		350	355	5
Cement formation with Boulders		355	360	5
Boulders & Clay		360	370	10

Date started....., 19.....
Date completed....., 19.....

7. WELL TEST DATA

Pump RPM	G.P.M.	Draw Down	After Hours Pump

BAILER TEST
G.P.M..... Draw down.....feet .....hours
G.P.M..... Draw down.....feet .....hours
G.P.M..... Draw down.....feet .....hours

8. WELL CONSTRUCTION
Diameter hole 6 inches Total depth 370 feet
Casing record 370 feet---.188 wall
Weight per foot.....Thickness.....

Diameter	From	To
.....inches	.....feet	.....feet
.....inches	.....feet	.....feet
.....inches	.....feet	.....feet
.....inches	.....feet	.....feet
.....inches	.....feet	.....feet
.....inches	.....feet	.....feet

Surface seal: Yes ☐ No ☐ Type.....
Depth of seal.....feet
Gravel packed: Yes ☐ No ☐
Gravel packed from.....feet to.....feet

Perforations:
Type perforation.....
Size perforation.....
From.....feet to.....feet
From.....feet to.....feet
From.....feet to.....feet
From.....feet to.....feet
From.....feet to.....feet

9. WATER LEVEL
Static water level.....Feet below land surface.....
Flow.....G.P.M.....
Water temperature.....° F. Quality.....

10. DRILLERS CERTIFICATION
This well was drilled under my supervision and the report is true to the best of my knowledge.

Name.....
Address.....
11.52
Nevada contractor's license number.....
Nevada driller's license number.....
Signed.....
Date.....

USE ADDITIONAL SHEETS IF NECESSARY

5471

DIVISION OF WATER RESOURCES

STATE OF NEVADA
DIVISION OF WATER RESOURCES

WELL DRILLERS REPORT

Please complete this form in its entirety

OFFICE USE ONLY
Log No. 1947 1
Permit No.
Basin

1. OWNER Gardnerville Ranchos GID ADDRESS 931 Mitch Drive
Gardnerville, Nevada 89410

2. LOCATION SE ¼ NE ¼ Sec. 15 T. 12N (N) S R. 20 E. Douglas County
PERMIT NO. 29561

3. TYPE OF WORK
New Well [X] Recondition [ ]
Deepen [ ] Other [ ]

4. PROPOSED USE
Domestic [ ] Irrigation [ ] Test [ ]
Municipal [X] Industrial [ ] Stock [ ]

5. TYPE WELL
Cable [X] Rotary [ ]
Other [ ]

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
Yellow Clay/Boulders		0	20	20
Loose Cobblestones	WB	20	31	11
Yellow Clay/Boulders		31	42	11
Small Gravel	WB	42	52	10
Gravel/Cobblestones	WB	52	112	60
Yellow Clay/Boulders		112	122	10
Yellow Clay/Gravel		122	162	40
Coarse Gravel/Cobbles	WB	162	186	24
Yellow Clay/Cobbles		186	231	45
Cemented Gravel/Cobbles		231	258	27
Yellow Clay/Gravel		258	286	28
Cemented Gravel		286	334	48
Yellow Clay/Gravel		334	350	16
Cemented Gravel		350	375	25

Date started October 9, 1978, 19
Date completed November 29, 1978, 19

7. WELL TEST DATA

Pump RPM	G.P.M.	Draw Down	After Hours Pump

BAILER TEST
G.P.M. Draw down feet hours
G.P.M. Draw down feet hours
G.P.M. Draw down feet hours

8. WELL CONSTRUCTION
Diameter hole 16 inches Total depth 375 feet
Casing record
Weight per foot 42.05 Thickness .250

Diameter	From	To
16 inches	Plus 2 feet	M 375 feet
inches	feet	feet
inches	feet	feet
inches	feet	feet
inches	feet	feet
inches	feet	feet

Surface seal: Yes [X] No [ ] Type Cement Grout
Depth of seal 53'-6" feet
Gravel packed: Yes [ ] No [X]
Gravel packed from feet to feet

Perforations:
Type perforation Factory Milled Slots
Size perforation 1/4" x 3"
From 183 feet to 372 feet
From feet to feet
From feet to feet
From feet to feet
From feet to feet

9. WATER LEVEL
Static water level 14 Feet below land surface
Flow G.P.M.
Water temperature Cold° F. Quality

10. DRILLERS CERTIFICATION
This well was drilled under my supervision and the report is true to the best of my knowledge.

Name Reno Pump & Supply
7468 South Virginia Street
Address Reno, Nevada 89511

Nevada contractor's license number 5307
Nevada driller's license number 285
Signed Harry W. Jones
Date 12/1/78

USE ADDITIONAL SHEETS IF NECESSARY

5471

WHITE—DIVISION OF WATER RESOURCES
CANARY—CLIENT'S COPY
PINK—WELL DRILLER'S COPY

STATE OF NEVADA
DIVISION OF WATER RESOURCES

WELL DRILLERS REPORT

PRINT OR TYPE ONLY — **Please complete this form in its entirety**

OFFICE USE ONLY
Log No. 25320
Permit No.
Basin CARSON V. 8-105

NOTICE OF INTENT NO. 2553

1. OWNER GARDNERVILLE RANCHOS GENERAL IMPROVEMENT DISTRICT
MAILING ADDRESS 931 MITCH DRIVE GARDNERVILLE, NV 89410
ADDRESS AT WELL LOCATION ON KIMMERLING ROAD - 1.5 MILES WEST OF TILLMAN

2. LOCATION NE ¼ NE ¼ Sec. 20 T 12 N/S R 20 E DOUGLAS County
PERMIT NO. 47106 (Issued by Water Resources) | Parcel No. | Subdivision Name

3. TYPE OF WORK: New Well ☒ Recondition ☐ Deepen ☐ Other ☐

4. PROPOSED USE: Domestic ☐ Irrigation ☐ Test ☐ Municipal ☒ Industrial ☐ Stock ☐

5. TYPE WELL: Cable ☐ Rotary ☒ Other ☐ REVERSE

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
brn silty sand, small boulders		0	20	20
sand & small boulders		20	40	20
sand & gravel & cobbles		40	100	60
fine sand & gravel w/trace of clay		100	140	40
fine sand, gravel & cobbles		140	220	80
fine sand, gravel & cobbles w/trace of clay		220	240	20
fine sand, gravel & cobbles	xx	240	260	20
fine sand & gravel	xx	260	300	40
fine sand & gravel w/ small clay layers	xx	300	320	20
fine sand & gravel & clay layers	xx	320	355	35
gravel (hard)	xx	355	360	5
sand & gravel	xx	360	380	20
fine sand & gravel	xx	380	420	30
sand & gravel w/small clay layers	xx	420	440	20
clay		440	455	15
sand & gravel	xx	455	460	5
clay, sand & gravel layers small		460	520	60

Test Hole to 520 ft abandoned/Production well to 450 ft

Date started MARCH 29, 19 84
Date completed MAY 2, 19 84

7. WELL TEST DATA

Pump RPM	G.P.M.	Draw Down	After Hours Pump
1400	1200	97	48

BAILER TEST
G.P.M. ..... Draw down ..... feet ..... hours
G.P.M. ..... Draw down ..... feet ..... hours
G.P.M. ..... Draw down ..... feet ..... hours

8. WELL CONSTRUCTION
Diameter hole 22 inches Total depth 450 feet
Casing record 16" x .250 wall
Weight per foot 42.05 Thickness

Diameter	From	To
16 inches	+1 feet	450 feet
inches	feet	feet
inches	feet	feet
inches	feet	feet
inches	feet	feet
inches	feet	feet

Surface seal: Yes ☒ No ☐ Type sand-cement grout
Depth of seal 138 feet
Gravel packed: Yes ☒ No ☐
Gravel packed from 138 feet to 450 feet
1/4" to 3/8" quartz pebbles
Perforations:
Type perforation Johnson Screen 16" Double Extra Heavy
Size perforation 200th slot
From 200 feet to 450 feet
From ..... feet to ..... feet
From ..... feet to ..... feet
From ..... feet to ..... feet
From ..... feet to ..... feet

9. WATER LEVEL
Static water level 55½ feet below land surface
Flow ..... G.P.M. ..... P.S.I.
Water temperature 64.4 ° F. Quality good

10. DRILLERS CERTIFICATION
This well was drilled under my supervision and the report is true to the best of my knowledge.
Name CHARLES SARGENT IRRIGATION, INC. (Contractor)
Address P. O. BOX 2480 RENO, NV 89505 (Contractor)
Nevada contractor's license number 21246
Nevada contractor's drillers number 1391 LARRY WHITESEL
Nevada driller's license number 1388 GENE MAPEL (Actual Driller)
Signed Gene Mapel (Contractor)
Date MAY 3, 1984

USE ADDITIONAL SHEETS IF NECESSARY

(Rev 6-81) O-627 CR434

WHITE—DIVISION OF WATER RESOURCES
CANARY—CLIENT'S COPY
PINK—WELL DRILLER'S COPY

STATE OF NEVADA
DIVISION OF WATER RESOURCES

WELL DRILLER'S REPORT

Please complete this form in its entirety

PRINT OR TYPE ONLY

OFFICE USE ONLY
Log No. 32531
Permit No. 51308
Basin 8-105 Carson V.

NOTICE OF INTENT NO. 10801

1. OWNER GARDNERVILLE RANCHOS
MAILING ADDRESS c/o Lumos & Associates
800 E. Graves, Carson City, Nv. 89701

ADDRESS AT WELL LOCATION
GARDNERVILLE RANCHOS / Dresserville & Tomlin
Gardnervile, nv.

2. LOCATION SE ¼ SW ¼ Sec. 9 T. 12 (N)S R. 20 E. Douglas County
PERMIT NO. 51308 (Issued by Water Resources) | Parcel No. | Subdivision Name

3. TYPE OF WORK: New Well ☒ Recondition ☐ Deepen ☐ Other ☐

4. PROPOSED USE: Domestic ☐ Irrigation ☐ Test ☐ GRID #6 Municipal ☒ Industrial ☐ Stock ☐

5. TYPE WELL: Cable ☐ Rotary ☒ Other ☐

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
Top soil		0	3	3
Coarse sand, gravel, and small boulders		3	40	37
Sand & gravel		40	429	389
Clay		429	434	5

RECEIVED '89 NOV 21 A10:14 STATE ENGINEERS OFFICE

Date started September 12 19 89
Date completed Ocotboer 20 19 89

7. WELL TEST DATA

Pump RPM	G.P.M.	Draw Down	After Hours Pump

BAILER TEST
G.P.M. ..... Draw down ..... feet ..... hours
G.P.M. ..... Draw down ..... feet ..... hours
G.P.M. ..... Draw down ..... feet ..... hours

8. WELL CONSTRUCTION
Diameter 26 inches Total depth 434 feet
..... inches
..... inches
Casing record 18 inch x .375 inch wall
Weight per foot 70.59 Thickness .....

Diameter	From	To
18 inches	+1 feet	210 feet
..... inches	..... feet	..... feet
..... inches	430 feet	434 feet
..... inches	..... feet	..... feet
..... inches	..... feet	..... feet
..... inches	..... feet	..... feet

Surface seal: Yes ☒ No ☐ Type Cement sand grout
Depth of seal 50 feet
Gravel packed: Yes ☒ No ☐
Gravel packed from 50 feet to 434 feet
Chevreaux 1/8 icnh x 1/4 inch Quartz Pebbles

Perforations:
Type perforation Roscoe Moss 18 inch wire wrap screen
Size perforation .100 inch slot mild steel Heavy wieght

From ..... feet to ..... feet
From 210 feet to 430 feet
From ..... feet to ..... feet
From ..... feet to ..... feet
From ..... feet to ..... feet

9. WATER LEVEL
Static water level 45 feet below land surface
Flow ..... G.P.M. ..... P.S.I.
Water temperature cold °F Quality good

10. DRILLER'S CERTIFICATION
This well was drilled under my supervision and the report is true to the best of my knowledge.
Name CHAS. SARGENT IRRIGAITON INC. (Contractor)
Address 9955 N. VIRGINIA ST., RENO, NV. 89506 (Contractor)
Nevada contractor's license number issued by the State Contractor's Board 21246
Nevada contractor's driller's number issued by the Division of Water Resources 1391
Nevada driller's license number issued by the Division of Water Resources the on-site driller 1573
Signed ..... (By driller performing actual drilling on site or contractor)
Date 11-20-89

(Rev. 11-85) USE ADDITIONAL SHEETS IF NECESSARY (O)-627

Corrected

REPORT NO. 94.14

STATE OF NEVADA
DIVISION OF WATER RESOURCES
WELL DRILLER'S REPORT

LOG NO 4474
PERMIT NO.
BASIN 8-105

NOTICE OF INTENT NO. 23892

1. OWNER Gardnerville Ranchos General Improvement District
MAILING ADDRESS Gardnerville, Nv 89706

ADDRESS OF WELL Kimmerling Rd Blue Rock
Test Well #7

2. WELL LOCATION SE 1/4 SE 1/4 SEC. 21 T 12N R 20 E DOUGLAS COUNTY

PERMIT NO M/O-748 PARCEL NO _____ SUBDIVISION NAME GARDNERVILLE RANCHOS

3. TYPE OF WORK			4. PROPOSED USE				5. WELL TYPE			
[X] New Well	[ ] Replace	[ ] Recondition	[ ] Domestic	[ ] Irrigation	[X] Test		[ ] Cable	[X] Rotary	[ ] RVC	
[ ] Deepen	[ ] Abandon	[ ] Other	[X] Municipal/Industrial	[ ] Monitor	[ ] Stock		[ ] Air	[X] Mud		

6. LITHOLOGIC LOG

MATERIAL	STRATA	FROM	TO	THICKNESS
Granite, cobbles & boulders		0	47	47
Grn,yellow,brn,wht,red,orange,coarse		47		
sands & gravels, traces of brown clay		47	146	99
Tan,yellow,wht,semi-decomposed		146		
granite, tan clay stringers		146	223	77
Blk & wht granite, some fractures with		223		
traces of green & tan D.G.		223	480	

'94 MAR 31 A10:22 STATE ENGINEERS OFFICE

Notes: Test pumped at 235 GPM with a drawdown of 374'.

Date Started 2/3/94 Date Completed 2/15/94

7. WELL TEST DATA

TEST METHOD [ ] Bailer [X] Pump [ ] Air Lift

	GPM	DRAWDOWN	TIME (HRS)
1	235	374	4

8. WELL CONSTRUCTION

Depth Drilled 480 Depth Cased 480

HOLE DIAMETER (BIT SIZE)

10 5/8 Inches +1.5 Feet 480 Feet
_____ Inches _____ Feet _____ Feet
_____ Inches _____ Feet _____ Feet

CASING SCHEDULE

Size O.D.	Weight/Ft	Wall Thickness	From	To
6 5/8	12.92	.188	+1.5	480

PERFORATIONS:

Type Perforation Factory Size Perforation 1/8 x 3 tri.
From 460 Feet to 480 Feet
From 300 Feet to 320 Feet
From _____ Feet to _____ Feet

SURFACE SEAL: [X] Yes [ ] No SEAL TYPE:
Seal Depth 53'
PLACEMENT METHOD: [X] Pumped [ ] Poured
[X] Neat Cement [ ] Cement Grout [ ] Concrete Grout

GRAVEL PACKED: [X] Yes [ ] No
From 53 Feet to 480 Feet

9. WATER LEVEL

Static Water Level 40 Feet Below Land Surface
Artesian Flow _____ GPM _____ PSI
Water Temperature COOL F Quality _____

10. DRILLER'S CERTIFICATION

This well was drilled under my supervision and the report is true to the best of my knowledge.

Name AQUA DRILLING & WELL SERVICE, INC
Address 625 SPICE ISLANDS DR STE L
SPARKS, NV 89431

NV. CONTRACTOR'S LIC. NO. 15291 DRILLER'S LIC. NO. ON SITE 1152

Signed Roger Thiel
By driller performing actual drilling on site or contractor

Dated 3/11/94

WHITE - DIVISION OF WATER RESOURCES
CANARY - CLIENT'S COPY
PINK - WELL DRILLER'S COPY

PRINT OR TYPE ONLY
DO NOT WRITE ON BACK

STATE OF NEVADA
DIVISION OF WATER RESOURCES

WELL DRILLER'S REPORT

Please complete this form in its entirety in accordance with NRS 534.170 and NAC 534.340

OFFICE USE ONLY
Log No. 67795
Permit No.
Basin 165

NOTICE OF INTENT NO. 36941

1. OWNER Gardnerville Ranchos Gen. Improvement Dist.
MAILING ADDRESS 931 Mitch Drive
Gardnerville, NV 89410

ADDRESS AT WELL LOCATION
Wyatt Lane, Gardnerville

2. LOCATION NE 1/4 NW 1/4 Sec. 10 T 12N N/S R 20E E Douglas County
PERMIT NO. 62004 (Issued by Water Resources) | Parcel No. | Subdivision Name

3. WORK PERFORMED
[X] New Well [ ] Replace [ ] Recondition
[ ] Deepen [ ] Abandon [ ] Other

4. PROPOSED USE
[ ] Domestic [ ] Irrigation [ ] Test
[X] Municipal/Industrial [ ] Monitor [ ] Stock

5. WELL TYPE
[ ] Cable [ ] Rotary [X] RVC
[ ] Air [ ] Other

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
Top soil		0	2	2
Small gravel w/sand		2	14	12
Rock, cobbles, gravel to 1"	x	14	40	26
Sand	x	40	42	2
Rock, cobbles, gravel		42	48	6
Cemented sand, rock		48	77	29
Sandy clay		77	79	2
Cemented sand, rock		79	89	10
Gravel w/streaks of clay		89	99	10
Hard rock		99	103	4
Cemented gravel/rock		103	106	3
Hard rock		106	117	11
Cemented gravel w/sand		117	189	72
See next line		189	228	39
Cemented gravel w/sand & streaks of clay				
See next line		228	258	30
Small gravel w/sand & streaks of gray clay				
See next line		258	310	52
Small gravel w/sand & streaks of clay				
See next line		310	394	84
Small to medium gravel w/sand & streaks of clay				
Sand w/clay		394	399	5
See next line		399	412	13
Small to medium gravel w/streaks of clay				
See next line		412	435	23
Sandy brn clay w/streaks of sand				
Brown sandy clay		435	441	6

Date started 7/29/97 , 19__
Date completed 8/8/97 , 19__

7. WELL TEST DATA
TEST METHOD: [ ] Bailer [X] Pump [ ] Air Lift

G.P.M.	Draw Down (Feet Below Static)	Time (Hours)
1000	170	24 hrs.

8. WELL CONSTRUCTION
Depth Drilled 524 Feet Depth Cased 500 Feet

HOLE DIAMETER (BIT SIZE)

		From		To	
48	Inches	0	Feet	20	Feet
28	Inches	20	Feet	100	Feet
22	Inches	100	Feet	524	Feet

CASING SCHEDULE

Size O.D. (Inches)	Weight/Ft. (Pounds)	Wall Thickness (Inches)	From (Feet)	To (Feet)
16		1/4	+2	500

Perforations:
Type perforation Johnson wire wrap
Size perforation .08
From 260 feet to 500 feet
From __ feet to __ feet
From __ feet to __ feet
From __ feet to __ feet
From __ feet to __ feet

Surface Seal: [X] Yes [ ] No
Depth of Seal 100
Placement Method: [X] Pumped [ ] Poured
Seal Type: [ ] Neat Cement [X] Cement Grout [ ] Concrete Grout

Gravel Packed: [X] Yes [ ] No
From 0 feet to 524 feet

9. WATER LEVEL
Static water level 46 feet below land surface
Artesian flow __ G.P.M. __ P.S.I.
Water temperature Cool °F Quality Good

10. DRILLER'S CERTIFICATION
This well was drilled under my supervision and the report is true to the best of my knowledge.

Name Humboldt Drilling & Pump Co., Inc. (Contractor)
Address 4675 W. Winnemucca Blvd (Contractor)
Winnemucca, NV 89445

Nevada contractor's license number issued by the State Contractor's Board 015234

Nevada driller's license number issued by the Division of Water Resources, the on-site driller 1572

Signed [signature] (By driller performing actual drilling on-site or contractor)
Date 8-30-97

DIVISION OF WATER RESOURCES
CLIENT'S COPY
WELL DRILLER'S COPY

TYPE ONLY
WRITE ON BACK

STATE OF NEVADA
DIVISION OF WATER RESOURCES
WELL DRILLER'S REPORT
Please complete this form in its entirety in accordance with NRS 534.170 and NAC 534.340

OFFICE USE ONLY
Log No. 62795
Permit No.
Basin 105

NOTICE OF INTENT NO. 36941

1. OWNER Gardnerville Ranchos Gen. Improvement Dist.
MAILING ADDRESS 931 Mitch Drive
Gardnerville, NV 89410

ADDRESS AT WELL LOCATION
Wyatt Lane, Gardnerville

2. LOCATION NE 1/4 NW 1/4 Sec. 10 T 12N N/S R 20E E Douglas County
PERMIT NO. 62004 (Issued by Water Resources) | Parcel No. | Subdivision Name

3. WORK PERFORMED
☐ New Well ☐ Replace ☐ Recondition
☐ Deepen ☐ Abandon ☐ Other

4. PROPOSED USE
☐ Domestic ☐ Irrigation ☐ Test
☐ Municipal/Industrial ☐ Monitor ☐ Stock

5. WELL TYPE
☐ Cable ☐ Rotary ☐ RVC
☐ Air ☐ Other

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
See next line		441	470	29
Sand & small gravel w/streaks of sandy clay				
See next line		470	478	8
Small gravel w/sand & streaks of clay				
See next line		478	524	46
Small to medium gravel w/sand & streaks of clay				

RECEIVED
97 SEP 2 AM 10:49
STATE ENGINEER'S OFFICE

Date started 7/29/97 , 19__
Date completed 8/8/97 , 19__

7. WELL TEST DATA
TEST METHOD: ☐ Bailer ☐ Pump ☐ Air Lift

G.P.M.	Draw Down (Feet Below Static)	Time (Hours)

8. WELL CONSTRUCTION
Depth Drilled _____ Feet Depth Cased _____ Feet

HOLE DIAMETER (BIT SIZE)

	From	To
_____ Inches	_____ Feet	_____ Feet
_____ Inches	_____ Feet	_____ Feet
_____ Inches	_____ Feet	_____ Feet

CASING SCHEDULE

Size O.D. (Inches)	Weight/Ft. (Pounds)	Wall Thickness (Inches)	From (Feet)	To (Feet)

Perforations:
Type perforation _____
Size perforation _____
From _____ feet to _____ feet
From _____ feet to _____ feet
From _____ feet to _____ feet
From _____ feet to _____ feet
From _____ feet to _____ feet

Surface Seal: ☐ Yes ☐ No
Depth of Seal _____
Placement Method: ☐ Pumped ☐ Poured
Seal Type: ☐ Neat Cement ☐ Cement Grout ☐ Concrete Grout

Gravel Packed: ☐ Yes ☐ No
From _____ feet to _____ feet

9. WATER LEVEL
Static water level _____ feet below land surface
Artesian flow _____ G.P.M. _____ P.S.I.
Water temperature _____ °F Quality _____

10. DRILLER'S CERTIFICATION
This well was drilled under my supervision and the report is true to the best of my knowledge.

Name Humboldt Drilling & Pump Co., Inc.
Contractor
Address 4675 W. Winnemucca Blvd
Contractor
Winnemucca, NV 89445

Nevada contractor's license number issued by the State Contractor's Board 015234

Nevada driller's license number issued by the Division of Water Resources, the on-site driller 1572

Signed _____
By driller performing actual drilling on-site or contractor

Date _____

STATE OF NEVADA
DIVISION OF WATER RESOURCES

WELL DRILLER'S REPORT

Please complete this form in its entirety in accordance with NRS 534.170 and NAC 534.340

OFFICE USE ONLY
Log No. 98220
Permit No.
Basin 105

NOTICE OF INTENT NO. 56294

1. OWNER Rocky Terrace Estates
MAILING ADDRESS 1080 Centerville Lane
Gardnerville, NV 89410
ADDRESS AT WELL LOCATION Gardnerville, NV

2. LOCATION SW 1/4 SE Sec. 8 T 12 N/S R 20 E Douglas County
PERMIT NO. 71727 Issued By Water Resources
Parcel No.
Subdivision Name

3. WORK PERFORMED
[x] New Well [ ] Replace [ ] Recondition
[ ] Deepen [ ] Abandon [ ] Other

4. PROPOSED USE
[ ] Domestic [ ] Irrigation [ ] Test
[x] Municipal/Indu [ ] Monitor [ ] Shock

5. WELL TYPE
[ ] Cable [ ] Rotary [x] RVC
[ ] Air [ ] Other

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
Fill dirt		0	2	2
Sand, gravel and cobbles		2	116	114
Clay w/coarse sand		116	119	3
Sand, gravel and cobles		119	148	29
Sand and gravel		148	160	12
Sand and gravel w/clay stringers		160	287	127
Clay w/sand layers		287	299	12
Sand & gravel w/clay layers		299	309	10
Sand & gravel w/hard rock		309	356	47
Sand & gravel-few cobbles		356	400	44
Sand & gravel, little clay		400	416	16

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8. WELL CONSTRUCTION
Depth Drilled 416 Feet Depth Cased 390 Feet

HOLE DIAMETER (BIT SIZE)

		From		To	
30	Inches	0	Feet	100	Feet
22	Inches	100	Feet	416	Feet
	Inches		Feet		Feet

CASING SCHEDULE

Size O.D. (inches)	Weight (pounds)	Wall Thickness (Inches)	From (Feet)	To (Feet)
24		0.250	0	100
12 3/4		0.250	+2	390

Type Perforation Wire Wrap
Size Perforation 0.050
From 240 feet to 390 feet
From feet to feet
From feet to feet

Surface Seal : [x] Yes [ ] No
Depth of Seal 100'
as per conv w/ Humboldt Drilling 7/23/08
Placement Method : [x] Pumped [ ] Poured
Seal Type : [ ] Neat Cement [x] Cement Grout [ ] Concrete Grout

Gravel Packed : [x] Yes [ ] No
From 3 feet to 416 feet
From feet to feet

9. WATER LEVEL
Static Water Level 28 feet below land surface
Artesian flow NA G.P.M. P.S.I.
Water temperature Cool °F Quality Good

Date Started May 6 2005
Date Completed May 11 2005

7. WELL TEST DATA
TEST METHOD :
[ ] BAILER [x] PUMP [ ] AIR LIFT

	G.P.M.	Draw Down (Feet Below Static)	Time (Hours)
Pumping Level 149'	1000	121	24

10. DRILLER'S CERTIFICATION
This well was drilled under my supervision and the report is true to the best of my knowledge.

Name Hydro Resources Nevada Inc. dba Humboldt Drilling and Pump Co.
Address 4975 West Winnemucca Boulevard
Winnemucca, Nevada 89445

NV Contractor's LIC# issued by the State Contractor's Board	56797
NV Driller's LIC# issued by Div. of Water Resources, on-site driller	2177
Signed : C. Jaynes - Office	Date : 7/8/05

Appendix B

USGS Groundwater Map for Carson Valley

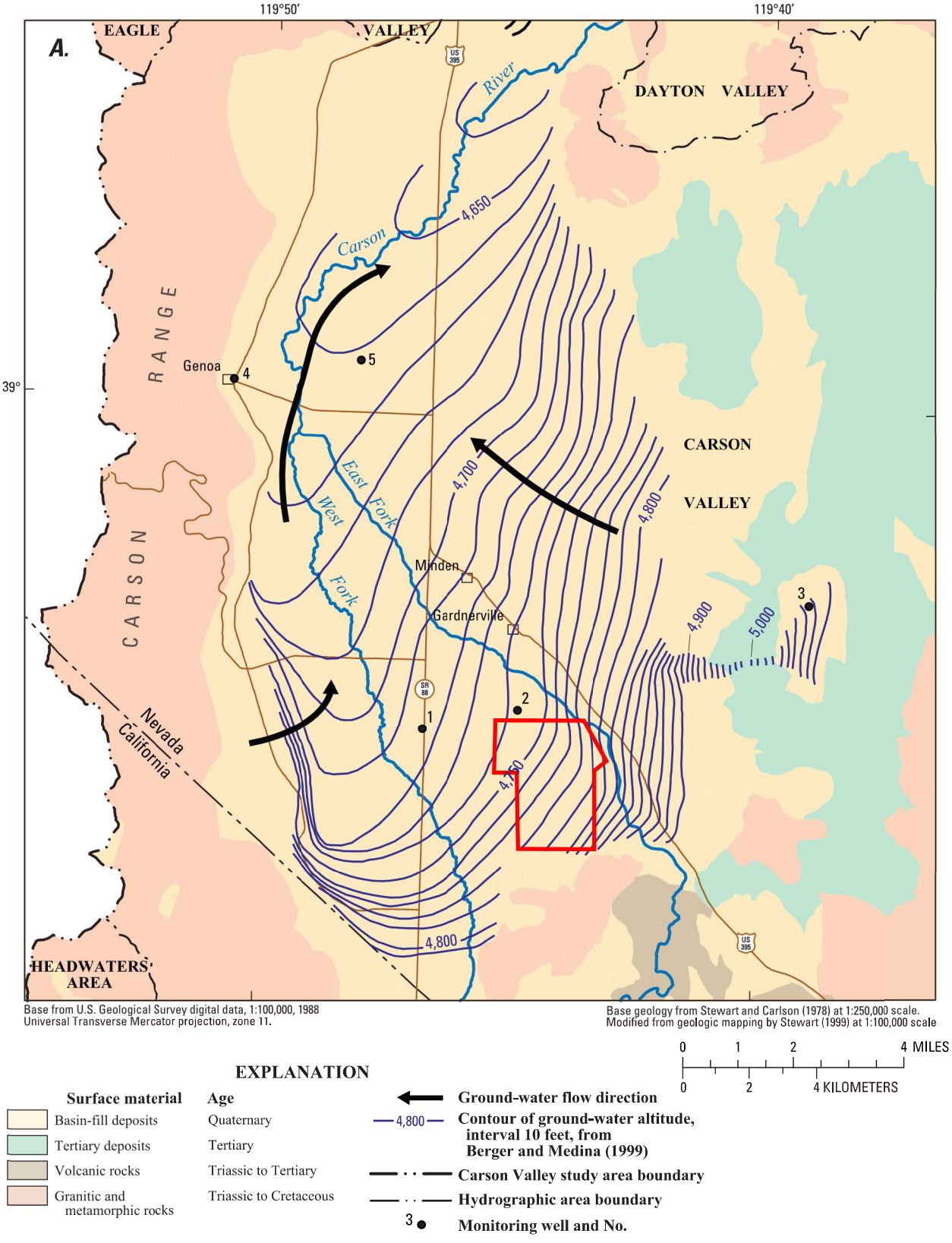


Figure 6. Compilation of previously published contours of ground-water level altitude, ground-water flow directions, location of selected monitoring wells, geologic units, and percent of water sampled from selected wells contributed from surface-water sources for hydrographic areas of the upper Carson River basin, Nevada and California (*A*) Carson Valley, (*B*) Eagle Valley and Riverview and Moundhouse subbasins of Dayton Valley, (*C*) Carson Plains and Stagecoach subbasins of Dayton Valley, and (*D*) Churchill Valley.

Appendix C

List of Potential Contaminant Sources and Rankings

Nevada Potential Contamination Sources

CODE	CLASS	SOURCE	CATEGORY A	B	C	D	E	RISK RANKING
1	Agricultural	Animal burial areas			X	X		High
2		Animal feedlots		X	X	X		Moderate 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		X				Moderate
		Irrigation ditches			X			High
6		Manure spreading & pits	X		X			Moderate
7		Unsealed irrigation wells	X		X			High
8	Industrial	Chemical manufacturers, 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
14	Commercial	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
20	Automotive	Auto repair shops	X					High
21		Car washes	X		X	X		Moderate
22		Gas stations	X					High
23		Road deicing operations: storage & application areas (e.g. road			X			Moderate
24		Road maintenance depots	X		X			High
25	Residential	Household hazardous products	X	X	X			Moderate
26		Private wells	X	X		X		Moderate
27		Septic systems, cesspools		X	X	X		Moderate to High
28	Medical / Educational	Educational institutions (labs, lawns, & chemical storage areas)		X	X			Moderate
29		Medical institutions (medical, dental, vet offices)				X		Low
30		Research laboratories	X	X		X		High
31	Storage	Aboveground storage tanks	X					High
32		Underground storage tanks	X					High
33		Public storage	X					Low
34		Radioactive materials storage					X	High
35	Municipal Waste	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		Septage Lagoons, wastewater treatment plants		X	X	X		High
40		Sewer Transfer Stations		X	X	X		High
41	Miscellaneous	Airports	X					High
42		Asphalt plants	X					High
43		Boat yards	X					High
44		Cemeteries				X		Moderate
45		Construction areas	X					Moderate
46		Dry wells	X			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		Stormwater drains & retention basins	X	X	X	X		High
54		Unplugged abandoned well	X	X		X		High
55		Well: operating	X	X	X	X		High – Low

Contaminant Categories:

A = V.O.C.
B = S.O.C.
C = I.O. C.
D = MICROBIOLOGICAL
E = RADIONUCLIDES

Activities That May Contaminate Drinking Water

Residential Uses: *(viruses, bacteria, nitrates, chemical compounds)*

• Failing septic systems, chemical septic system cleaners
• Improper storage and application of fertilizers, pesticides and lawn care chemicals
• Disposal of household cleaners, automotive products, poisons, waste oil, paint thinners, gasoline, pet waste into septic systems, backyard pits and storm drains
• Driveway runoff of oils, gasoline, heavy metals, de-icing chemicals
• Leaking underground heating oil tanks

Schools and Institutions: *(chemical compounds, solvents, nitrates)*

• Disposal of oil, paints, chemicals into floor drains, sinks or directly to the ground
• Contaminated runoff from parking areas • Improper fertilization of recreation fields
• Equipment wash waste water

Municipal Uses: *(sodium chloride, heavy metals, petroleum)*

• Improper storage and application of deicing chemicals
• Street sweeping
• Public works garages; auto maintenance, equipment wash waste water
• Uncapped/Unlined landfills, open dumps
• Leaking sewer lines/oil lines
• Improper storage/application of pesticides and fertilizers
• Contaminated runoff from roads, parking lots

Commercial, Industrial Uses: *(heavy metals, petroleum, sodium chloride)*

• Improper storage, disposal and management of hazardous materials/waste
• Abandoned or leaking underground storage tanks
• Spills and releases that go unattended
• Floor drains which discharge directly to the ground
• Exposed bodies of water from mining, sand and gravel operations
• Waste storage lagoons
• Transportation spills and releases

Agriculture Uses: *(nitrates, bacteria, viruses)*

• Improper use/storage of pesticides, herbicides, animal manure, fertilizers
• Improper irrigation methods
• Animal burial
• Storage lagoons
• Concentrated animal feedlot operations
• Contaminated runoff and equipment wash waste water

Appendix D

Water Use Restrictions

APPENDIX D
WATER USE RESTRICTIONS

D.1 DECLARATION OF PURPOSE

D.1.1 The Board of Trustees of the GARDNERVILLE RANCHOS GENERAL IMPROVEMENT DISTRICT recognizes that in certain years there may be a shortage of water for domestic use by the residents of the District which requires the imposition of restrictions on use so that the District may provide adequate and equal amounts of water to its citizens.

D.1.2 In order to assure that the District can provide adequate supplies of water to its citizens, the Board of Trustees may, after a declaration of water shortage is made as provided herein, additionally restrict the use of water for certain irrigation or household purposes, and limit the time within which water may be used for the purposes. In furtherance of that goal, the Board enacts these restrictions pursuant to its authority granted by NRS 318.144, NRS 318.145, NRS 318.170(d) and NRS 318.199.

D.2 DEFINITIONS

As used in the Appendix the following words or phrases are defined as follows:

D.2.1 **"Board":** The Board of Trustees of the Gardnerville Ranchos General Improvement District.

D.2.2 **"Commercial":** A commercial area or commercial use as defined in these restrictions is any area or use which has been designated by any commercial zoning by the Douglas County Board of Commissioners, which has a use upon it which is the subject of any licensure from the County or from the State of Nevada, or which conducts upon it a commercially related activity for remuneration. The Board of Trustees shall determine each definition of "commercial" on a case by case basis for the purposes of the determining the applicability of these restrictions to such use. For the purposes of these restrictions all areas and uses which are not determined to be commercial are defined as residential.

D.2.3 **"Declaration":** Means a declaration of water shortage by the Board when it appears to a majority of the Board that either insufficient water is available to meet the reasonable needs and requirements of the District, or that there is insufficient potable water for human consumption as determined by the Nevada State Health Department, the Douglas County Health Officer, or the District agent.

D.2.4 **"District Agent":** Means the District's Manager, Engineer, Maintenance Supervisor, or a Board Member.

D.2.5 **"Household Purposes":** Means the purposes for which a person uses water inside a residence, and excluding all outside irrigation uses.

D.2.6 **"Irrigation":** Means, but is not limited to, irrigate, water, moisten, sprinkle, soak, waterlog, flow, wet or any supply of water to land by natural or artificial means for other than household purposes.

D.2.7 **"User":** Means, but is not limited to, the record owner of the property or location as such owner is identified by the records of the Douglas County Assessor, or a tenant or other person residing, at, or on, such property.

D.2.8 **"Water Waste":** Means, but is not limited to, violation of these water use restrictions, or the careless consumption of water as evidenced by irrigation overflowing or puddling on a property.

D.3 EMERGENCY WATER USE RESTRICTIONS

D.3.1 Upon declaration by the Chairman of the Board, after a majority vote of the Board, taken at a regularly held meeting, at a specially called meeting, or in an emergency meeting after a telephone canvass of Board members by the District agent, the District may impose any or all of the following restrictions:

A) i) Require houses whose street address ends with an even number irrigate on even numbered days of the week; and

ii) Require houses whose street address ends with an odd number irrigate on odd numbered days of the week; and

iii) In months with a greater number of days than thirty (30), there shall be no irrigation permitted on the 31st day.

B) Require that irrigation be conducted, when permitted, during the hours of 7:00 p.m. to 10:00 a.m.

C) Prohibit the use of water for other than household purposes.

D.4 NON-EMERGENCY WATER USE RESTRICTIONS

D.4.1 Without declaration by the Board of a water emergency or shortage, in no event shall a water user irrigate or use water for other than household purposes between the hours of 1:00 p.m. to 5:00 p.m.

D.4.2 In no event shall a water user waste water in violation of these restrictions, in using water for household purposes or irrigation, as water uses are defined in Section II hereinabove.

D.5 EXEMPTIONS TO NON-EMERGENCY WATER USE RESTRICTIONS

D.5.1 The Board may exempt the following uses of water in non-emergency situations.

A) Upon notice to the District by a property owner of lawns which have been newly planted within thirty (30) days.

B) Professional gardeners or landscapers when performing services to install, repair, or maintain a sprinkler system or related mechanical devices.

C) Automatic irrigation systems set to operate on any day between 10:00 p.m. and 6:00 a.m.

D) Accidental flow of water due to equipment failure.

E) Children's toys such as water slides and inflatable pools.

D.6 PENALTIES

D.6.1 **IT IS THE INTENTION OF THE BOARD OF TRUSTEES OF THE GARDNERVILLE RANCHOS GENERAL IMPROVEMENT DISTRICT THAT ANY AND ALL PENALTIES DELINEATED HEREIN SHALL BE PAID BY THE RECORD OWNER OF THE PROPERTY IN VIOLATION. ANY PENALTY AMOUNT OR WATER METER INSTALLATION COSTS ASSESSED AGAINST A PROPERTY OWNER SHALL, IN ALL CASES, CONSTITUTE A LIEN AGAINST THE PROPERTY UNTIL PAID. AN AGENT OF THE DISTRICT IS DIRECTED TO FILE FOR RECORD ANY LIEN RESULTING FROM A VIOLATION OF THE PROVISIONS OF THESE RESTRICTIONS.**

D.6.2 Any user found by the agent of the District to be in violation of these restrictions, may, in addition to being subject to all rights and remedies of the District at law or in equity, be subject to the following:

A) Warnings: A user found to be in violation of the provisions of these restrictions shall be warned by the District agent, orally and/or by a citation in writing, of violations of these restrictions. A person warned of violation of the provisions of these restrictions on more than three occasions within a two year period shall be subject to the penalties contained in subsections B and C of this section.

i) It is the intention of the Board that violations shall be consecutive in nature during a two year period. The Board may not consider a violation which has occurred two years or more prior to the latest warning issued by the District for enhancement of the penalties provided for herein.

B) Fourth Violation: On a fourth violation within a two year period a user found to be in violation of the provisions of these restrictions shall be assessed a penalty in the amount of Fifty Dollars ($50).

C) Fifth Violation: Mandatory Metering: A user found to be in violation of the provisions of these restrictions on a fifth occasion within a two year period shall be assessed a penalty in the amount of Fifty Dollars ($50), and shall have water service discontinued until such time as the District or owner installs a water meter consistent with the District's standards and specifications. If a water meter is installed by the District, the costs of the meter and the installation shall be billed to the owner of the property in violation, and shall be filed by the District as a lien of record against the property of the owner until paid. Thereafter, the account for the user at the location in violation shall be determined based upon the actual use of water as measured by the water meter installed.

D) Change of Ownership: An owner and/or occupant of a property found to be in violation of the provisions of these restrictions resulting in the installation of a water meter shall not be exempt from the requirements of these restrictions, and shall pay for water based on actual use of water as determined by the meter installed.

i) Any change of ownership of a property reflected by recorded documents of record in the Office of the Douglas County Recorder shall operate to cancel previous warnings issued to a prior user of water at the property. If a water meter has been installed at a location, which is subsequently sold, the water meter shall remain installed, but the new owner or user of water at the property shall be billed for water use as other metered properties within the District.

E) Consecutive Violations: Each and every violation of these restrictions is deemed to be a separate and succeeding violation.

D.6.3 Nothing contained herein shall prevent the District agent, without notice to any owner or occupant of a property, from entering a property to halt water waste. If entrance to the property is not reasonably possible, the District agent may cause water service to the property to be halted.

A) When it is reasonably determined that water waste results from a mechanical or other malfunction of the watering system located on the property, and upon adequate provision for the remedy of the malfunction, water service to the property shall be restored. In the case of water waste due to mechanical malfunction, a warning shall not be issued to the user, property owner or occupant if the malfunction is remedied within seventy-two hours. If the user, property owner or occupant neglects, refuses or fails to remedy the malfunction within seventy-two hours a citation shall be issued unless the District Manager, on sufficient cause shown, extends the period of time to repair a mechanical malfunction as in his discretion is appropriate on a case by case basis.

B) If the District agent determines that the water waste results from a cause other than mechanical or other malfunction of the watering system located on the property, a water violation shall be issued to the user, property owner or occupant.

C) If the user, property owner or occupant of the property, at the time that water service is halted, is found to have three or more violations of these restrictions within a two year period, water service to the property shall not be restored until a water meter is installed. Upon a fifth violation at such location where a water meter is installed pursuant to this section, the account of the user will be billed based upon the actual water use measured by the water meter installed. The cost of the installation of the water meter by the District shall be paid by the property owner of the premises, and shall constitute a lien against the property.

D) If the property owner or resident is found to have less than three violations within a two year period at the time that water service to the property is halted, water service to the property shall be immediately restored without the installation of a water meter by the District after a written warning is delivered to the owner of the property, resident or occupant thereof.

D.7 APPEALS

D.7.1 Any person aggrieved by the actions of the District agent in the enforcement of these restrictions may appeal such action to the District.

D.7.2 An appeal may be taken by filing a written statement of the reasons why the agent of the District acted in error, and shall be submitted to the District Manager for review and possible action. The District Manager is empowered to affirm, modify, or cancel any warning or citation issued, or penalty assessed. Should the District Manager deem it necessary, the District Manager may meet with the person appealing a warning or citation to discuss with the appellant the reasons for the appeal. At any such meeting minutes shall be taken of the conference between the appellant and the District Manager. At the conclusion of such meeting, the District Manager may act to affirm, modify or cancel any warning or citation issued. Thereafter, the District Manager shall submit a report to the Board of Trustees delineating his action to affirm, modify, or cancel any warning or citation issued.

D.7.3 At the next regularly scheduled Board of Trustees' meeting, the District Manager's recommendation regarding any appeal shall be considered by the Board, which shall accept or reject the recommendation of the District Manager on its Consent Agenda.

D.7.4 If the District Manager's recommendation is rejected, the District shall notify the appellant who may appear at a following Board meeting if the appellant complies with the procedures set forth in Paragraphs 5 through 7 of this Section 7.

D.7.5 Any person aggrieved by the recommendation of the District Manager, as accepted by the Board of Trustees on its Consent Agenda, may appeal such recommendation directly to the Board of Trustees upon receipt of written notification of the Board's acceptance of the recommendation made by the District Manager. Any appeal may be taken by payment of all penalty amounts assessed for the fourth and/or fifth violations, and by payment of a TWENTY-FIVE DOLLARS AND NO/100 CENTS ($25.00) filing fee.

D.7.6 An appeal may be taken within ten (10) days after written notice of the action of the Board in accepting the recommendation of the District's Manager.

D.7.7 Any person who fails to file a written request for hearing before the Board appealing the Board's acceptance of the District Manager's recommendation within ten (10) days after notice of the acceptance of the recommendation by the Board waives his right to appeal.

D.7.8 The Board shall hear the appeal at the next regularly scheduled meeting of the Board of Trustees following the filing of a written request for hearing appealing the District Manager's recommendation. Notice of the date, time and place of the hearing shall be given to the appellant. No new evidence which was not presented to the District Manager prior to his recommendation to the Board shall be presented at the time of the appellate hearing. The Board may affirm, modify or cancel any previous action by the Board or by the District Manager, including affirming, modifying, or canceling any warning or citation issued, penalty assessed and/or filing fee paid.

D.7.9 Upon a person's failure to timely file for appeal of the Board's acceptance of the District Manager's recommendation, or upon final action by the Board with respect to an acceptance or rejection of the District Manager's recommendation, the Board may pursue any of its rights and remedies contained at law or in equity, or in these restrictions.

Revisers Note: Appendix D adopted November 1, 1994, RES. 94-1; §7: Appeals Revised May 3, 1995.

Appendix E

Douglas County Well Siting Criteria

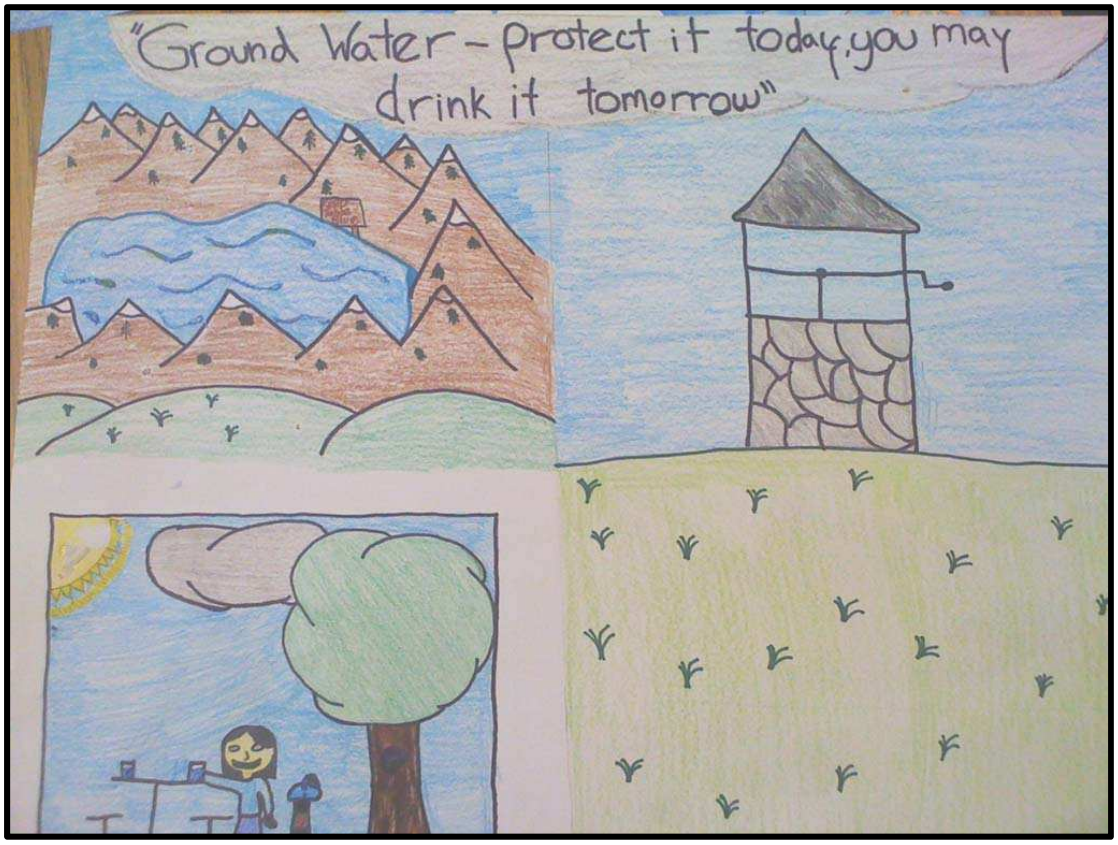
Table 5. Possible Source Development Plan Elements for New Water Supply Wells

Element	Considerations	Potential Application
Identify Undeveloped Water Sources	Suitable sites exist for future water supply well.	Suitable areas identified for additional water supply wells to augment or replace existing sources, but alternatives, such as existing wells that may be rendered redundant by the intertie projects should be evaluated for future use.
Examine Steps Required to Obtain Water Rights	The systems have adequate water rights to provide for future buildouts.	Change in point of diversion would have to be filed with NDWR after final well site selection.
Define WHPAs for New Well Sites	Site-specific data will not be available but existing data for region as a whole is considered adequate.	Deferred to final well location selection. Adequate information already exists for delineation of preliminary WHPA through AFR, such as for the Sawmill well. Final delineation will be based on results of well pump tests.
Identify PCSs	Contaminant inventories for proposed new wells should be completed prior to siting the well to promote advanced planning for the protection of these water supplies..	The PWS may not want to site wells in areas with high concentrations of PCSs or in areas with known contamination issues.
Select Management Strategies and Options	Source reviews have been identified for WHPAs to be implemented during the design/plan review process.	Public education program to continue. County Commission approvals needed prior to incorporation of the CWHP Plan and associated WHPAs into the Master Plan Amendment Update and associated design/plan review processes.
Perform Compliance Studies	Obtain permits and access and file environmental documentation. Can cost $5K to $50K depending on location and National Environmental Policy Act (NEPA) requirements. Sample water and test for chemical constituents to demonstrate compliance with SDWA. Costs can approach $5K per source for sampling, analyses, reporting, and contractor fees. Conduct aquifer test of new source well.	Permitting, rights-of-way and NEPA documentation initiated after funds secured. Sampling is typically done following well completion and development or during drilling of a pilot borehole. Will include SDWA parameters for chemistry. Aquifer test needed for final WHPA delineation; to be done at time of well completion.
Evaluate Financial Needs and Procure Funding	Ten-year planning horizon. Priority needs are evaluation of existing, inactive wells to determine their potential for future use as potable water source wells. Second priority is development of new ground water source or sources over five to ten-year timeframe ($200K+).	Potential funding sources identified for monitoring wells and grant proposals will be prepared. Funding sources for new supply wells will be sought.
Interconnect Water Systems	Many systems have been or are in the process of being interconnected. Continue that process and analyze the costs and benefits of additional interconnection.	Further interconnection may require additional agreements between PWSs and infrastructure improvements/extensions. Funding sources to be identified for additional interconnections.

Appendix F

Douglas County Public Education Plan

Douglas County
Community Wellhead Protection
Public Education Plan and Attachments



Acknowledgements

The Douglas County Community Wellhead Protection Team wishes to thank the hundreds of Douglas County residents who volunteered their time to complete informational questionnaires and to provide the invaluable comments and recommendations that have been incorporated into this document. Additionally, we recognize the significant support, involvement and artwork provided by sixth graders throughout the Douglas County School District. This document is dedicated to you: the future decision-makers of Douglas County.

Index of Attachments

Douglas County Community Wellhead Protection Public Education Plan

Introduction

This Public Education Plan is an organized and strategic approach to gain understanding of source water and wellhead protection. The intent is to motivate the residents served by public water purveyors to take action. In this case, that action is changing practices and personal behavior to prevent contamination of wellhead/source water and limit land uses in some areas to those compatible with the drinking water protection goals outlined in the "Community Wellhead Protection Plan for Public Water Systems in Douglas County, Nevada" (January 2012).

Situation

Source water protection programs in Nevada are initiated and implemented at local levels and depend on the willingness of a community to support the local program. Therefore, public education and participation is an effective strategy: to engage community members to be stewards of their local drinking water sources; to promote voluntary protection efforts; and to build public support.

The objective of this Plan is to provide water providers, community residents and various other stakeholders with a variety of tools and tactics to promote source water protection outreach and education.

How to get the most out of this Plan

The most effective communications begin with clear, consistent, meaningful messages used consistently in various venues (posters at a workplace, on the radio, at a special event, in a flyer, etc.) and reinforced over time. This allows your target audience (for the purposes of this Plan, the businesses and residents) the opportunity to see and hear the messages over a period of time and in different places which increases the chance of recognition.

Recognition can, in turn, make people recall a message and act on a message in some form – through investigation, inquiry or action.

Goals

1. Gain understanding of/and interest in, community wellhead/source water protection areas.
2. Motivate a change in practices and personal behavior to prevent contamination of wellhead/source and to guide land use planning to those practices most compatible with the drinking water protection goals of Douglas County.

Background

This Plan is organized by audience with suggested tactics and brief explanations. There is a range of ways to reach each audience and depending on an organization or provider's available resources, each will find tactics that will work for them and that best reach the identified audience.

The primary audience, public water users, is included because this audience has the potential to make the biggest impact. The secondary audience, sixth grade Douglas County School District students, is included and should be considered a viable venue for delivery of the message to young people and their families, who in turn, are members of the primary audience.

Education outreach tools/tactics were created in formats that allow each user to personalize them to their individual needs. The attachments support tactics outlined within this Plan. Depending on the tactics selected, users may need to create additional communication pieces. A few tips to remember when creating any communication piece:

- Simple is best;
- Allow whitespace – do not fill every space; and
- You don't need to say it all - the more you say the less effective the entire piece.

Be consistent in the look and message of every piece and limit it to no more than three messages. Finally, always include a call to action:

- "To learn more, log onto our website www.douglascountynv.gov;"
- "To register for a presentation call your water purveyor;"
- "Take oil to one of the following disposal locations: Douglas Disposal Transfer Station www.douglasdisposal.com or South Tahoe Refuse and Recycling www.southtahoerefuse.com."

Also, when thinking about how best to reach the audience, these are a few things to consider:

- What's my budget?
- How much time do I have?
- What will I do with the tactic? Do I have a plan to get it to my audience?
- What will follow this? And when?
- A great idea without the resources to execute it will not be effective, nor will brochures that simply sit on the counter at the community library when they need to be in people's hands.

The items below, which are part of your Douglas County Community Wellhead Protection (CWHP) Plan may be used as support in presentations, community meetings, and other opportunities that allow more information to be shared.

- Names and affiliations of the individuals who helped prepare the CWHP Plan (also known as the Douglas County CWHP Team);
- Location(s) and source(s) of drinking water for the community;
- The community's current water supply and projected demands on that water supply;
- A map of the areas around the drinking water source(s) that may be susceptible to contamination;
- Inventory of activities and conditions that may adversely affect drinking water quality;
- Strategies the community currently does or intends to use to protect its drinking water sources;
- Contingency Plan describing what the community would do to replace its drinking water supply if the source became contaminated; and
- Action Plan that provides a schedule for Outreach Plan implementation.

The Plan

Primary Audience:

Public water users

Messages:

What is wellhead protection?

Wellhead protection, also known as source water protection, is a way to prevent drinking water from becoming polluted. Much can be done to prevent pollution, such as the wise use of land and chemicals.

Why is it important to protect water at the wellhead?

Protecting public drinking water supplies at the wellhead, *before* pollution enters our drinking water supply, lessens associated health issues, the high costs of water treatment and source water development. Public water users can help protect our community's source water. For more information, call ***Cathe Pool at 775-783-6480.***

Managing land uses and human-caused sources of contamination are the keys to preventing pollution *before* it enters our drinking water supply at the wellhead.

What contaminates the water we drink?

There are numerous pollutants that can contaminate surface and ground water. Some contaminants are a result of improper disposal of common household products such as cleaning products, waste oil, pet waste, fertilizers and pesticides. Others may be used or generated by businesses such as dry cleaners, film processing centers, salons, cemeteries, petroleum storage and handling, etc. These and other harmful products, when improperly disposed of may threaten to contaminate our drinking water.

Tactics or Ways to deliver the message

CWHP Team members should consider themselves Plan Ambassadors. Water purveyors are best positioned to make contact with the primary audience, but the entire team should take every opportunity to convey the essence and objectives of the Plan. The following tactics provide means by which team members can increase knowledge and change behavior in accordance with protecting our drinking water sources. See Public Education Work Plan attached.

Team members identified these tactics as most likely to be used:

- Newsletter inserts;
- Fact sheets, brochures or handouts;
- PowerPoint presentations;
- Inserts in water bills; and
- Website inserts and links.

Newsletter inserts – scheduled to be distributed as newsworthy information becomes available. Items to be included: our community's updates on how the Plan is progressing, the testimonials collected, Nevada Division of Environmental Protection (NDEP) news related to this subject, what other communities are doing related to this subject, and real time changes happening at businesses or source water sites. Photos and links to information make newsletter inserts more interesting.

Fact sheet, brochures, handouts, flyers, etc. – all can be effective forms of communication. The key is to plan ahead as to how you want the audience to use them, how you will get them to the audience, and how you will evaluate their effectiveness. Libraries, community centers, builder associations and economic development authorities can be useful locations. However, unless your audience knows the materials are there and are offered to them, the materials will not be successful.

PowerPoint presentations – by a spokesperson educated in the community's source water and wellhead protection plan who could relate potential impacts on the source water and what practices could benefit the protection of the source water. Attached is a short PowerPoint template (Attachment B, pages H-13 through H-15) that can be customized for your sensitive wellhead area by including pertinent local source water names, maps or photos of the areas, etc.

Inserts in water bills – purveyors may want to insert information in water bills periodically to communicate a special event or speaker related to informational sessions on protecting our community's drinking water source.

Website inserts and links – the Douglas County website www.douglascountynv.gov will serve as the repository for education materials. The site or page could be as

simple as text that explains all the things happening related to the subject. Photos and links are very important on a website. Create a section on the website for businesses to learn how they can become source water protectors and share stories of how they are helping protect their community's source water. If resources allow, a more in-depth website or page can highlight source water and the protection projects related to that source with images. This will give users access to more detailed information. *All other tactics should include your website address.* Additionally, websites operated by public water systems can also be used to communicate the wellhead protection plan by incorporating information on the site or by containing links to the Douglas County website.

Other tactics identified as possible outreach means include:

- Talking points for presentations;
- Posters;
- Employee training materials;
- Inserts in employee paychecks;
- Press releases; and
- Social media.

Talking points for presentations – are notes from the PowerPoint presentation and other subjects of interest.

Posters – purveyors may want to use the water protection logo "Willie the Well" and the slogan from "Ground Water – protect it today, you may drink it tomorrow." Create appropriate signage as a reminder of Best Management Practices related to protecting your community's drinking water source.

Employee training on materials handling practices, emergency spill situations – purveyors should have these items on hand and, if asked, they may consider including information on the importance of protecting your community's source water.

Inserts in employee paychecks – could be something similar to the inserts in water bills but with emphasis on the employee's responsibility to prevent contamination and encouragement for them to serve as wellhead protection plan ambassadors.

Press releases - developing relationships with local media and pitching stories and event ideas to them is an effective way to reach several audiences including business leaders and residents. By sending out media releases, media advisories, and by participating in interviews, stories in local media outlets are a cost effective way to educate members of the community regarding the importance of source and drinking water protection efforts. Media relations is also a good tactic for recognizing residents, businesses, and owners who have made strides to protect source water. Attached you will find a list of media outlets in Nevada (Attachment A, page H-12). Contact persons at these outlets can change quickly so it is important to confirm this information before moving forward.

Social media (blogs, podcasts, Facebook, YouTube, Twitter, LinkedIn) – social media can be a crucial component to communications and worth consideration. Through websites, blogs, YouTube, etc., audiences have an opportunity to get information anytime. It can also provide an interactive experience. Be aware that this kind of media changes rapidly, however.

Tactics not identified to be used by team members but others to be considered:

- Site visits and education events at the wellhead;
- Direct mail;
- Testimonials;
- Site signage;
- Partnership with other organizations;
- Local government education and engagement;
- Guest columns/editorials;
- Case studies; and
- Public meetings and community events.

Sensitive wellhead area site visits – with a spokesperson (see Attachment G, page H-24 through H-26) who can explain how contamination can happen and how it affects the water supply in everyday terms. Organizers choose a date and can provide a shuttle or have attendees meet at the site. This also provides an opportunity for a question and answer session.

Direct mail – to water users promoting speakers or events that may be of interest to them.

Testimonials – water users who have changed their practices in an effort to lessen their impact on source water and how and what they did and the results. These could be used in many other forms: posters, electronic newsletters, at events and in presentations.

Site signage – at businesses that use best management practices to lessen their impact on source water indicating their dedication to their community's most important resource, drinking water. For example:

INSERT BUSINESS NAME HERE
Is dedicated to protection Douglas County (or community name) drinking water sources through the use and support of best management practices.

Partnership with local chamber of commerce – could include the creation of a "Source Water Protector of the Year" award or recognition through a partnership with the local Chamber of Commerce. Encourage local businesses and members of the Chamber to make affordable and effective changes at their place of business that will help protect the community's source water. Celebrate and honor all participants and award and recognize one business for being a key protector of source water.

City council and local government leader's education and engagement - educate city council members and other local government leaders regarding the importance of source water protection in our community. Also, engage local government leaders in a friendly challenge to protect source water. Ask leaders to participate in site visits, offer testimonials, and change their habits at both their place of business and home to protect source water.

Guest columns/editorials – providing guest columns and editorial pieces to local newspapers enables the source water protection team the opportunity to position the team as source water protection experts. Guest columns from respected and well-known community members also offer a medium to encourage, educate and motivate readers to protect their source water. Use the attached Nevada media list document (see Attachment A, page H-12) to assist you in pitching a guest column or editorial.

Case studies – give audiences an understanding of the issue and how it is being approached in our community. The studies should be brief with general information as to who, what, where, when and why and include photos where appropriate.

Public meetings/conferences/community events - identify where, when and plan ahead. Use other tactics as support to publicize the meeting or event and use other tactics to support the education at the meeting, conference, or event. Also, ask to be part of an agenda on existing community events. Local events such as Carson Valley Days are ideal venues to share information and materials. "Chuck the Duck", the mascot of the Nevada Rural Water Association can be a valuable contact for such public events.

Secondary Audience:

Sixth Grade Students of Douglas County School District

Messages:

What is source water?

Source water includes bodies of water such as lakes, springs, streams, rivers and ground water aquifers that become our drinking water. Our source water is primarily ground water.

Why is it important to protect source water?

Protecting public drinking water supplies at the source *before* pollution enters our drinking water supply lessens associated health issues, the high costs of water treatment and source water development. You can help with small changes you and your family can make to help protect our source water. Learn more at www.douglascountynv.gov.

Managing land uses and human-caused sources of contamination are the keys to preventing pollution *before* it enters our drinking water supply.

What contaminates source water?

There are numerous pollutants that can contaminate surface and ground water. Some contaminants are a result of improperly disposed of common household products such as cleaning products, waste oil, pet waste, fertilizers and pesticides. Others may be used or generated by businesses such as dry cleaners, film processing centers, salons, cemeteries, petroleum storage and handling, etc. These and other harmful products, when improperly disposed of may threaten to contaminate source water.

Tactics or Ways to deliver the message

Science education in Douglas County Elementary Schools is delivered via content specific kits, which are rich with information and are aligned with Nevada State Standards. Each grade level is responsible for teaching three science kits during the school year and each kit addresses one strand of the science standards – Earth Science, Life Science, or Physical Science. The sixth grade kit "Dynamic Earth" contains lessons particularly pertinent to the goals and message of this plan.

The goals of this kit are to provide students with the vision of Earth as a dynamic system of operations, and to instill a sense of stewardship toward Earth. These operations or "spheres", are weather & climate (the atmo**sphere**), land & geology (the geo**sphere**), freshwater and oceans (the hydro**sphere**), and living things (the bio**sphere**). The biosphere can be found within all the above spheres in that life exists in and on the land, in the air, and in water. They are interconnected and work together to provide us the perfect place to live. There is a fifth sphere – the area in space around the Earth, which is called the cosmo**sphere**. There is a balance to the system, and when something occurs in any of the spheres, the others may be affected. The big ideas of the kit include:

- Energy – The Earth system is powered by energy from two major sources: the Sun and the planet's internal heat;
- Cycles – The Earth system is characterized by overlapping cycles in which matter is recycled over and over. Cycles involve multiple spheres and systems interactions. Examples of cycles include day and night, the rock cycle, seasons, components of the water cycle, etc.;
- Scale – Processes operating in the Earth system take place on spatial scales and on time scales, both of which can be short or even instantaneous, or of long duration. Examples of instantaneous scales include breathing, rotation of the earth, tides, and earthquakes. Examples of long term scale include mountain building, making coal, components of the water cycle, and plate tectonics;
- Humans and the Earth system – People are part of the Earth system and they impact and are impacted by its materials and processes. Resource conservation education, including air and water quality, especially at the local level, are emphasized; and
- Science – Scientific ideas are developed through observation and reasoning; science does not prove or conclude, it is always a work in progress; and finally, science corrects itself.

Students are assessed within the scope of the kit, before, during, and after the curriculum is taught. Additionally, the kit includes a poster contest with the theme: "Ground water – protect it today, you may drink it tomorrow", which comes from NDEP. The kit has a durable presence in the schools; sixth graders for many years will learn about their water and the need to protect it.

Ways to measure

Effectiveness of outreach to the primary audience will be measured by a pre-post instrument administered before outreach efforts are initiated and at some point following outreach completion, as determined by the Douglas County CWHP Team. Pre-outreach survey analysis will also be used to identify audience knowledge gaps for curriculum development (Attachment E, pages H-18 through H-21). Impact of secondary audience education will be measured using a pre-post instrument as well (Attachment E, pages H-18 through H-21).

Evaluation

Effective evaluation is key in determining how effective your messages and tactics are received. There are many options for evaluation using both quantitative and qualitative measurements. Based on the tactic you've chosen and what resources you have, at least one form of measurement will work for each tactic. Establish the best form of evaluation as soon as you have decided on which tactics to execute.

Evaluating effectiveness is the foundation for a successful education plan. Without proper evaluation and reporting, communities, local Team members, and NDEP will not have a clear understanding of the effectiveness, resources will be wasted, and most importantly, the significance of the public's role in source water protection may suffer. When conducting outreach one should be thinking about the difference it is making and how best to measure the impact.

Quantitative – these measure the amount of information, not necessarily the quality of information.

- Quantity of presentations delivered and people in attendance;
- Quantity of distributed materials; and
- Quantity of inquiries – phone calls, e-mail, e-newsletter, website testimonials and visits.

Qualitative – these measure the quality of the information by giving an opportunity for feedback. In this way you can determine how the messages you are communicating are being received. This can be as simple as asking each and every person who has come into contact with your messages a few simple questions:

- Survey attendees of presentations;
- Email surveys to those who receive email communications; and/or
- Online survey of website visitors.

Attachment A

Nevada Media List

NEWSPAPERS:

- Bonanza (North Lake Tahoe)
- Clark County Legal News
- Desert Valley Times Online (Mesquite)
- Elko Daily Free Press (Elko)
- Ely Times (Ely)
- Lahontan Valley News (Fallon)
- Las Vegas Business Press (Las Vegas)
- Las Vegas City Life (Las Vegas)
- Las Vegas Review-Journal (Las Vegas)
- Las Vegas Sun (Las Vegas)
- Las Vegas Tribune (Las Vegas)
- Las Vegas Weekly (Las Vegas)
- Leader-Courier (North and Central Lyon County)
- Lovelock Review Miner (Lovelock)
- Mason Valley News (Yerington)
- Nevada Appeal (Carson City)
- Nevada Business Journal (Las Vegas)
- Nevada Legal News
- Nevada Legal Press
- Northern Nevada Business Weekly
- Pahrump Valley Times (Pahrump)
- Record-Courier (Gardnerville)
- Reno Gazette-Journal (Reno)
- Sparks Tribune (Sparks)
- Tahoe World (Lake Tahoe)
- The Nevada Rancher (Lovelock)
- The Pahrump Mirror (Pahrump)
- The Tahoe Daily Tribune (Lake Tahoe)
- Nevada Press Association [for other newspaper listings]
- NewsVoyager [for other newspaper listings in the U.S.]

TELEVISION

Elko:

- KENV-TV, Ch. 10, NBC

Las Vegas:

- KLAS, Ch .8, CBS
- KLVX, Ch. 10, PBS
- KTNV, Ch.13, ABC
- KVBC, Ch. 3, NBC
- KVVU, Ch. 5, FOX

Reno:

- KNPB, Ch. 5, PBS
- KOLO, Ch. 8, ABC
- KRNV, Ch. 4, NBC
- KTVN, Ch. 2, CBS

OTHER TYPES OF MEDIA

- Nevada Nonprofit News [An innovative online magazine, or e-zine, that highlights the news events, and topics of interest to professionals, volunteers, and supporters of the nonprofit sector in Nevada]

PowerPoint Template

A-6

Douglas County Community Wellhead Protection

Name
Title
Company

www.address.com
(xxx) xxx-xxx
name@address.org

INSERT LOGOS HERE

A-6

What is source water?

Source water includes bodies of water such as lakes, springs, streams, rivers and ground water/aquifers that become our water supply. Most of our water is groundwater.

A-6

Why is it important to protect source water?

Protecting public drinking water supplies at the source *before* pollution enters our drinking water supply lessens associated health issues, the high costs of water treatment and source water development.

A-6

What contaminates source water?

There are **numerous pollutants** that can contaminate source water.

Some contaminants are a result of improperly disposed of common household products like cleaning products, waste oil, pet waste, fertilizers and pesticides. Private septic systems also need to be pumped periodically.

Others may be used or generated by businesses such as dry cleaners, film processing centers, salons, cemeteries, petroleum storage and handling, etc.

A-6

Thank you.
Questions?

Name
Title
Company

www.address.com
(xxx) xxx-xxx
name@address.org

INSERT LOGOS HERE

Attachment C

Press Release Template

INSERT LOGO "Willie the Well" HERE

Date:
Contact: ***Cathe Pool***
email@email.com
(775) 783-6480
FOR IMMEDIATE RELEASE

Volunteer Team of Residents and Businesses Working Together
to Help Protect Drinking Water in Douglas County

(***Douglas County***, Nev.) – With an annual rain fall of less than 10 inches, few natural resources are as precious as water to residents of Nevada. Protecting our source water from possible contamination and pollution helps protect our drinking water. In ***Douglas County***, a Community Wellhead Protection (CWHP) Team made up of local residents and business owners has recently been formed with the goal of helping inform and educate residents of ***Douglas County*** about the importance of protecting our community's drinking water sources.

"We are looking forward to helping educate our community about the importance of protecting our drinking water sources," ***Cathe Pool*** said. "Our source water includes lakes, springs, streams, rivers, ground water and aquifers, which ultimately become our drinking water and it is important that we protect our water from being exposed to pollutants in the first place."

The Team was made up of both business owners and residents who live and work in ***Douglas County***. They represent a cross section of organizations including ***Douglas County Public Works***, ***Planning Commission***, and ***GIS***; the ***Towns of Minden and Gardnerville***; the ***Washoe Tribe***; ***University of Nevada Cooperative Extension***; ***Bently Agrowdynamics***; ***Resource Concepts, Inc. (RCI)***; ***Gardnerville Water Company***; ***Indian Hills General Improvement District***; ***Sierra Estates General Improvement District***; and many others.

The Team of volunteers is collaborating with ***Nevada Division of Environmental Protection's 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 supply.

"ISWPP is dedicated to empowering, encouraging and supporting local source water protection activities and we will be working closely with ***Douglas County*** team members to help them reach their goals," said ***Kim Borgzinner***, Division of Environmental Protection, Bureau of Water Pollution Control.

For more information on ***Douglas County's*** CWHP, please ***visit www.douglascountynv.gov or CONTACT Cathe Pool at 775-783-6480.***

###

INSERT "Willie the Well" LOGO HERE

Terms Defined

Aquifer: a naturally-occurring, underground "pocket" of water-soaked sand or gravel.

Best Management Practices: are barriers, methods, measures or practices designed to prevent or reduce water pollution.

Contamination: introduction of an undesirable chemical or biological substance not normally present in source water.

Ground water: water found beneath the earth's surface.

Source water: consists of bodies of water such as lakes, springs, streams, rivers and ground water/aquifers that become our water supply.

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 Water Pollution Control (BWPC): the mission of BWPC is to protect the waters of the State from the discharge of pollutants. This is accomplished by issuing discharge permits, which define the quality of the discharge necessary to protect the quality of the waters of the State, enforcing the state's water pollution control laws and regulations, and by providing technical and financial assistance to dischargers. Through the NDEP, BWPC helps communities protect their drinking water.

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 BWPC.

Protecting Your Drinking Water Sources

Thank you for taking just a few minutes to answer the following questions about your drinking water.

A team of State, County, and private organizations have embarked on a planning process that will lead to better protection of drinking water sources in Douglas County (excluding the Tahoe Basin).

Within the next year, information about this plan and how you can help protect your drinking water from contamination will be made available.

The purpose of this quick survey is to assess what you, the general public (local population) knows about drinking water source protection. Your answers will help us develop education outreach materials and, using a follow-up survey, measure the effectiveness of our education efforts.

Thanks very much for your input!

1. Which of the following are potential drinking water sources? (Check all that apply)

- ☐ A. Lakes
- ☐ B. Rivers
- ☐ C. Septic tanks
- ☐ D. Groundwater wells
- ☐ E. Springs
- ☐ F. Leach fields
- ☐ G. Don't know

2. What is the source of your drinking water? (Check one)

- ◯ A. Carson River
- ◯ B. Groundwater wells
- ◯ C. Lake Tahoe
- ◯ D. Don't know

3. A wellhead protection area may be thought of as...

- ◯ A. All the area in your watershed
- ◯ B. All the area in your community
- ◯ C. An area that could contribute pollutants to a well
- ◯ D. The area within 10 feet radius around a well
- ◯ E. Don't know

Protecting Your Drinking Water Sources

4. Is a wellhead protection area also referred to as source water protection area?

- ◯ A. Yes
- ◯ B. No
- ◯ C. Don't know

5. Is your house located in a wellhead protection area?

- ◯ A. Yes
- ◯ B. No
- ◯ C. Don't know

6. Is your place of work located in a wellhead protection area?

- ◯ A. Yes
- ◯ B. No
- ◯ C. Don't know
- ◯ D. Does not apply

7. Do you think drinking water sources can be impacted by your land management practices and what you do on your property?

- ◯ A. Yes
- ◯ B. No
- ◯ C. Don't know

8. How can you help keep drinking water safe? (Check all that apply)

- ☐ A. Dispose of leftover paint/solvents, medications, and household cleaners properly
- ☐ B. Follow pesticide and fertilizer label instructions
- ☐ C. Keep used motor oil off the ground
- ☐ D. Allow muddy water from your landscape to run into the storm drain
- ☐ E. Remove pet waste from your yard
- ☐ F. Know the location of your drinking water source
- ☐ G. Don't know

Protecting Your Drinking Water Sources

9. What kinds of land uses do communities often prohibit in wellhead protection areas? (Check all that apply)

- ☐ A. Outdoor swimming pools
- ☐ B. Dumps/landfills
- ☐ C. Waste storage lagoons
- ☐ D. Commercial retail
- ☐ E. Concentrated animal feedlots
- ☐ F. Dry Cleaners
- ☐ G. Don't know

10. In your opinion, how would you rate your knowledge level in source water/wellhead protection?

- ◯ A. No knowledge
- ◯ B. Little knowledge
- ◯ C. Some knowledge
- ◯ D. Moderate knowledge
- ◯ E. Fairly extensive knowledge
- ◯ F. Highly advanced knowledge

11. Please check all of the following that is true about you.

- ☐ A. You are a house owner
- ☐ B. You are a renter
- ☐ C. You have a private well
- ☐ D. You are served by a public water system
- ☐ E. You are 18 years old or younger
- ☐ F. You are between 19 years old and 35 years old
- ☐ G. You are between 36 years old and 55 years old
- ☐ H. You are between 56 years old and 65 years old
- ☐ I. You are 66 years old or over

12. Please share your comments regarding source water protection in Douglas County.

For more information on your drinking water and source water protection go to:

Nevada Source Water Protections – General Information
http://ndep.nv.gov/bwpc/sourcewater.htm

Nevada Integrated Source Water Protection Program
http://ndep.nv.gov/bwpc/wellhead.htm

Nevada Drinking Water
http://water.epa.gov/drink/local/nv.cfm

After the Storm: A Citizen's Guide to Understanding Stormwater
http://www.epa.gov/npdes/pubs/after_the_storm.pdf

Attachment F

Six Grade Pre-post Assessment

Name: _____ Date: _____

Dynamic Earth Pre-Assessment

1. The three parts of Earth that are closely connected are the atmosphere, the hydrosphere, and the geosphere. Together they make up the
   a. oceans.
   b. continents.
   c. biosphere.
   d. cosmosphere.

2. The Earth has three main layers. They are the
   a. crust, core, and oceans.
   b. crust, mantle, and continents.
   c. mantle, core, and oceans.
   d. crust, mantle, and core.

3. The motions of rising and sinking magma in Earth's mantle is an example of
   a. conduction.
   b. convection.
   c. radiation.
   d. evaporation.

4. Approximately what percentage of Earth is water?
   a. 100%
   b. 75%
   c. 50%
   d. 25%

5. The three main processes in the water cycle are
   a. evaporation, condensation, and precipitation.
   b. evaporation, precipitation, and runoff.
   c. precipitation, rain and snow, and runoff.
   d. condensation, rain and snow, and precipitation.

6. Water that falls as precipitation and soaks into the Earth is known as
    a. rivers and streams.
    b. lakes and oceans.
    c. surface water.
    d. ground water.

7. Ground water supplies us with much of the fresh water we need, but people can pollute ground water. Which of the following statements is **not** true about ground water pollution?
    a. Wells that pump water from an aquifer cause pollution.
    b. Sometimes harmful chemicals are buried in or dumped on the ground and mix with rain soaking into the ground.
    c. Chemicals can get into the aquifer.
    d. It is almost impossible to remove pollution once it has entered an aquifer.

8. Household hazardous wastes can pollute ground water. Which of the following is the **best** way to manage household hazardous materials and waste?
    a. Store all your household hazardous materials and waste together in one spot.
    b. Mix your household hazardous materials and waste together.
    c. Purchase fewer and the smallest amounts of hazardous materials possible.
    d. Dispose of your household hazardous materials and waste down the sink.

9. Ocean currents in the hydrosphere and global atmospheric winds both transfer heat energy around the Earth through the process of
    a. conduction.
    b. convection.
    c. radiation.
    d. evaporation.

10. How can people be good stewards or caretakers for Earth?
    a. Reduce, Reuse, and Recycle.
    b. Be careful of what goes into ground water.
    c. Protect resources.
    d. All of the above.

Attachment G

Public Education Work Plan

Entity: Nevada Rural Water Association

Action: Build Wellhead Protection Program awareness while working as a technical assistance provider for GID boards and water and wastewater systems

Entity: Town of Gardnerville

Contact: Tom Dallaire

Phone: (775) 782-7134

Actions: PowerPoint presentations for Town Board meeting (1st Tuesday/Month)

Posters (if provided)

Employee training at staff meetings

Insert in employee paychecks in any one (26 times per year)

Newsletter (January & July)

Website posting

Computer with link to pre-education outreach survey in the office along with a paper copy of the survey for customers

Entity: Town of Minden

Contact: Roger Van Alyne

Phone: (775) 782-5976

Actions: PowerPoint presentations for Town Board meeting (1st Wednesday/Month probably 2X/yr)

Talking points for presentations

Employee training probably 2X/yr

Insert in employee paychecks probably 4X/yr

Insert in water bills probably 2X/yr

Newsletter with water bills

Website

Entity: Indian Hills GID

Phone: (775) 267-2805

Actions: Employee training
Newsletter
Website

Entity: Sierra Estates GID
Contact: Judie Fisher, Larry English
Phone: (775) 267-3630
Actions: Insert in water bills
Social media tools such as Facebook

Contact: Bob Pohlman, Community advocate for water quality and protection
Actions: PowerPoint presentation
Talking points for presentation
Handouts
DVD

Entity: Gardnerville Water Company
Contact: Mark Gonzales
Phone: (775) 782-2339
Actions: Insert in water bills
Newsletter
Website
Handouts in office

Entity: Douglas County Community Development
Contact: Mimi Moss
Phone: (775) 782-9005
Actions: Press releases by end of 2011
Website by end of 2011

Entity: Douglas County Public Works
Contact: Cathe Pool
Phone: (775) 783-6480
Actions: Press releases by end of 2011
Website by end of 2011

Entity: Carson Water Subconservancy District
Contact: Ed James
Phone: (775) 887-7450
Actions: Newsletter 2011
Website 2011

Entity: Topaz Lodge
Contact: Rick Ross
Phone: (775) 266-3338
Action: Insert in water bills July 2011