SPANISH SPRINGS VALLEY
MONITORING WELL CONSTRUCTION
AUGUST - OCTOBER 1993

# **WASHOE COUNTY**

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

P.O. BOX 11130 RENO, NEVADA 89520



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Prepared by
WASHOE COUNTY UTILITY DIVISION
1195-B CORPORATE BLVD.
P.O. BOX 11130
RENO, NEVADA 89520

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### Summary

In 1992, Washoe County in cooperation with The Nevada Division of Water Resources and The United States Geological Survey (USGS) began a water resource study of Spanish Springs Valley. Washoe County was committed under the agreement to construct monitoring wells in selected valley areas. Additional monitoring wells were needed for ground water elevations, water quality sampling points and to determine geology.

Well drilling began in August, 1993 and was completed in October, 1993. Ten 2-1/2 inch diameter monitoring wells were constructed to depths between 168 and 649 feet. A monitoring well location map is shown in Figure 1.

Two potential production well sites were found at SSP2 and SSP4. The wells penetrate a fractured, volcanic aquifer that could produce high well yields. Water quality analyses were done at SSP2 and SSP4. Lead was initially measured in SSP2 at 0.015 ppm. A second water quality analyses measured the Lead concentration in SSP2 at 0.008 ppm. A residual product from drilling is the probable cause of lead in the well. SSP2 and SSP4 met primary and secondary drinking water standards in all other parameters tested.

### Drilling Operations

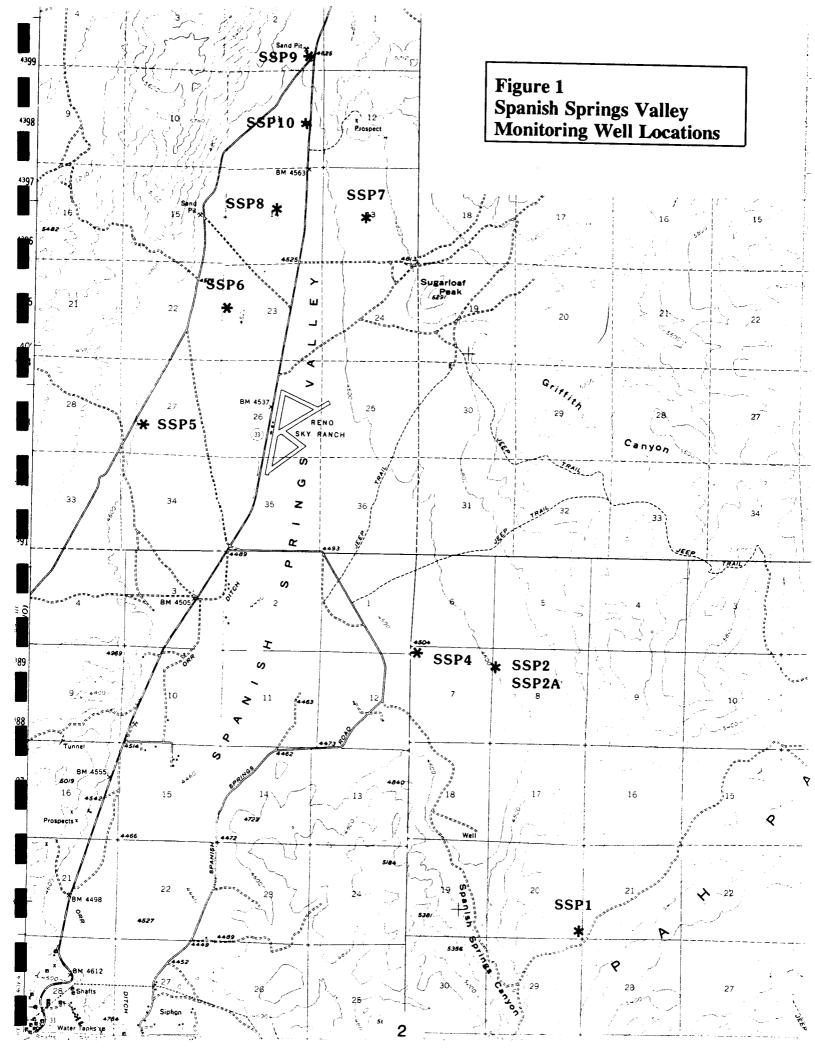
Monitoring well construction was done by Humboldt Drilling and Pump Company of Winnemucca, NV. An Ingersoll-Rand Model RO-300 table drive rotary drilling rig was used for borehole drilling. 7-7/8 inch boreholes were drilled at sites SSP2-10 using the mud rotary method. All 7-7/8 inch boreholes were drilled with tri-cone button bits. SSP1 was drilled using a down hole Halco air hammer with a 6-1/4 inch rock bit.

The drilling fluid consisted of high yield bentonite clay mixed with clean water in a portable mud pit. The auxiliary pit was equipped with a shale shaker and de-sanding cones to prevent circulation of borehole cuttings and maintain mud density. The drilling foam used during air drilling consisted of clean water and commercial surfactant.

Formation samples were collected during borehole drilling at ten foot intervals. Borehole geophysics were conducted at six well sites and consisted of guarded resistivity, long and short normal electric, natural gamma, caliper, and sonic logs. Design, construction supervision and sampling were done by Washoe County Utility Division personnel. Borehole logging was done by Century Geophysical Corporation, Las Vegas office.

### Well Construction

All monitoring wells were constructed using 2-1/2 inch galvanized steel pipe with steel caps threaded on the bottom. Perforated pipe with five 3/32" X 3" inch mill slots per foot was used in all



wells. All pipe joints were connected using threaded couplings. All wells were installed with a gravel envelope consisting of well rounded, siliceous 1/4" X 1/8" gravel supplied by Chevreaux Gravel, Auburn, California. Neat cement sanitary seals were installed with a grout pump and tremmie pipe. A six inch diameter protective casing and locking cap were cemented in place at each well head.

All monitoring wells were developed by air after the sanitary seals had hardened for a minimum of 24 hours. Air lift development was accomplished using an auxiliary air compressor, one inch steel discharge line and a five foot perforated jetting tool. Each well was developed until each slotted interval was surged and discharge was clear. A well construction summary is found in Table 1.

Table 1 Construction Summary					
Well	Total Depth (Ft.)	Casing Depth (Ft.)	Slotted Interval (Ft.)	Grout Seal (Ft.)	Static W.L. (Ft.)
SSP1	665	649	334-649	50	
SSP2	550	485	233-485	215	124.85
SSP2A	182	168	98-168	70	126.15
SSP4	565	544	250-544	53	21.26
SSP5	260	233	128-233	60	109.95
SSP6	220	208	124-208	60	62.86
SSP7	370	356	167-356	60	214.02
SSP8	240	229	103-229	57	58.17
SSP9	440	418	229-418	52	178.14
SSP10	260	250	103-247	58	95.08

### Lithology Description

Nine monitoring wells were constructed in Spanish Springs Valley. Monitoring well SSP1 was constructed in the Dry Lakes area of the Pah Rah Range, southeast of the valley. SSP2A,5,6,8, and 10 were completed in basin fill. Wells SSP4,7 and 9 were completed in unconsolidated and consolidated formations. SSP1 and 2 were completed in bedrock. Formation logs for each well are found in the appendix. A lithologic and borehole geophysics brief for each well is found in the following outline.

#### SSP1

Colluvium of red, scoriated volcanic gravel and red clay was found from 0 to 40 feet. Tertiary basalt of the Lousetown formation (Bell and Bonham, 1987) was drilled from 40 to 665 feet. Weathered, volcanic tuff with tuffaceous clay was found between 250 to 283 feet. Penetration of saturated volcanics was estimated between 550 to 600 feet. The borehole produced an estimated 1 gpm at the end of drilling. Borehole geophysics were not done at SSP1.

### **88P2**

Alluvium was found between 0 to 184 feet. A sticky, lacustrine clay exists from 106 to 184 feet. Basalt fragments with silty clay was found between 184 to 195 feet. Lousetown formation basalt was drilled from 195 to 550 feet. A zone of fractured, scoriated basalt was found from 425 to 550 feet. The drilling rate was rapid through this layer with substantial drilling fluid loss occurring. The volcanic bedrock is the primary aquifer penetrated by the well. SSP2 was completed as a bedrock monitoring well with a grout seal extending from 0 to 215 feet.

Borehole geophysics run were guarded resistivity, sonic, natural gamma and caliper logs. The guarded resistivity shows low porosity alluvial material with 10 to 30 ohm-m resistance from 0 to 184 feet. The basalt has a resistance between 15 and 90 ohm-m. A volcanic tuff found from 310 to 378 feet has a low 10 ohm-m resistance indicating clay alteration. The sonic log shows fractured bedrock between 200 to 315 feet and 450 to 550 feet. The borehole caved in after logging between 490 and 550 feet.

The site is considered favorable for production well development. Air lift development regularly produced surges with a discharge stream that filled the two inch eductor line. The borehole heaving suggests a potential high yield water bearing formation in the well. Geophysical logs for SSP2 are shown in Figure 2.

### 88P2A

The well was completed in alluvium and clay overlaying the basalt found in SSP2. The well was designed to verify a vertical hydraulic gradient with SSP2. Static water levels show a upward vertical gradient of 0.70 feet from SSP2A to SSP2. The higher water level in the bedrock monitoring well is a result of artesian pressure. The saturated alluvium in SSP2A is either perched water above the clay aquitard or a result of vertical leakage from the fractured volcanics. Leakage is possible since the aquitard is thinning near the site. Well yield was very minor during development.

### **88P4**

Volcanic /granitic sand and gravel with silty clay lenses exists from 0 to 118 feet. Brown and blue/gray lacustrine clay was found from 118 to 425 feet. Fractured and scoriated Lousetown formation was drilled from 435 to 565 feet. The Tertiary volcanic bedrock is the main aquifer penetrated by the well.

Borehole geophysics run were guarded resistivity, sonic, natural gamma and caliper logs. The guarded resistivity shows alluvium with 10 to 35 ohm-m resistance from 0 to 118 feet. The lacustrine clay unit from 118 to 435 feet has constant 10 ohm-m resistance. The fractured volcanics have a resistance of 25 to 100 ohm-m. The sonic log shows distinct fracturing after 425 feet. The volcanic bedrock drilled in SSP4 is slightly harder than bedrock found at SSP2. Geophysical logs for SSP4 are shown in Figure 3.

Figure 2 Geophysical Logs & Well Construction Monitoring Well SSP2

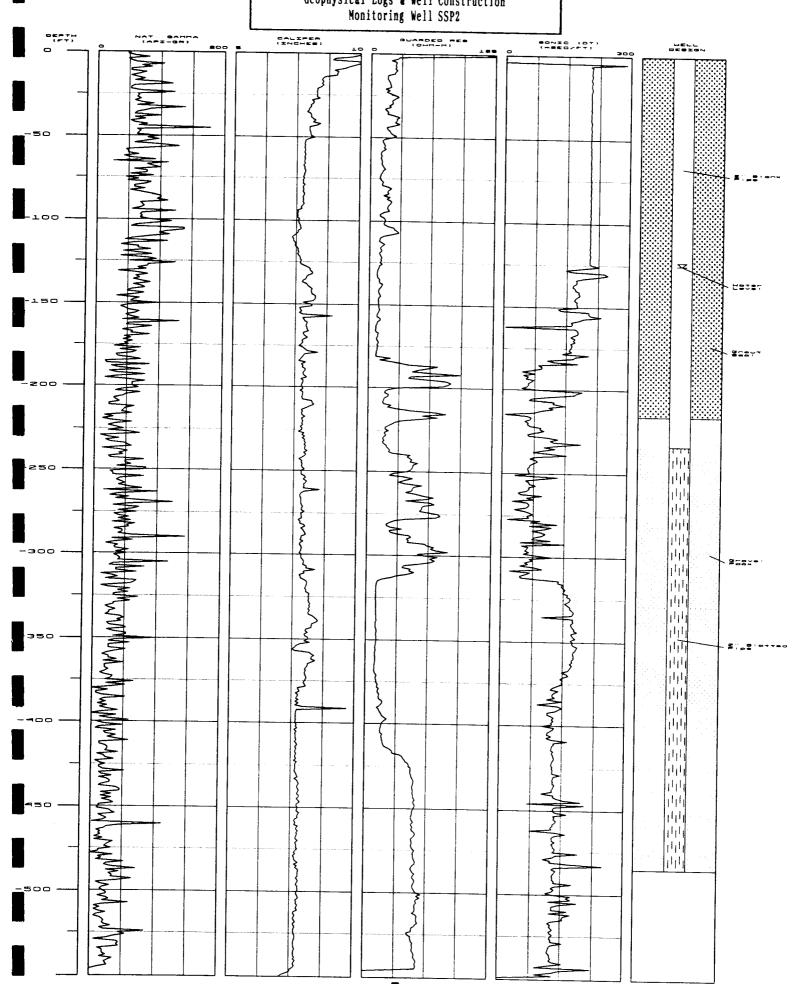
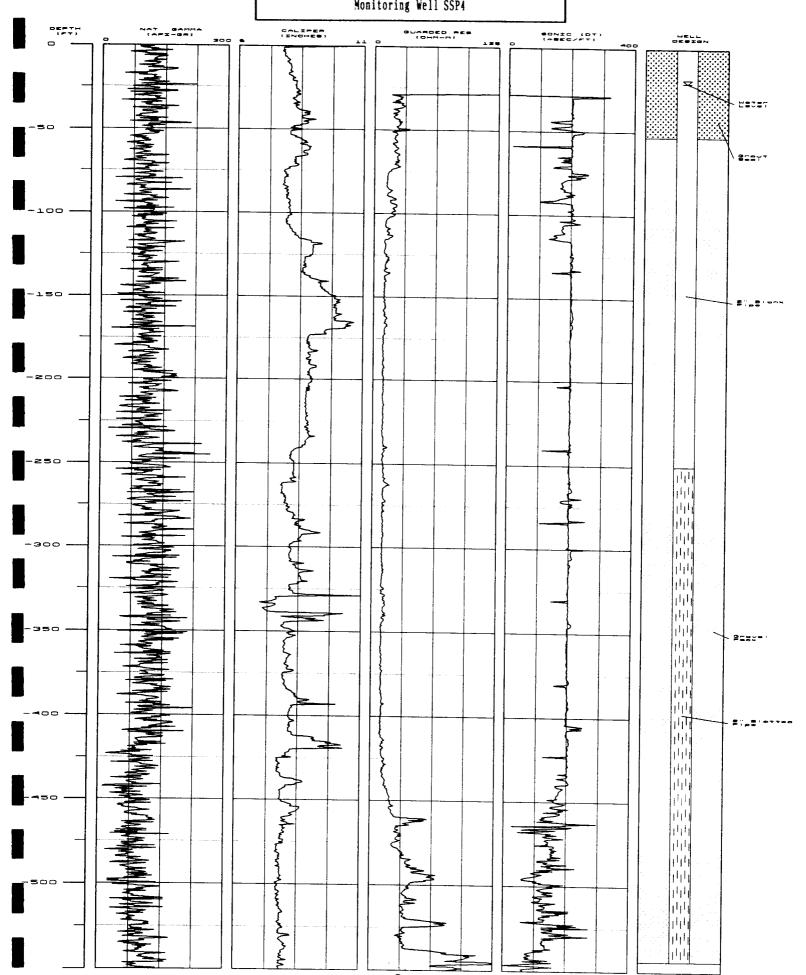


Figure 3
Geophysical Logs & Well Construction
Monitoring Well SSP4



The well site is considered favorable for a production well. The well often produced discharge surges that filled the two inch eductor line used for development. The development rig was unable to air lift the hole below 510 feet because the volume of water in the well exceeded the lifting capacity of the air lift compressor. The high static water level, thick clay above fractured volcanics and the discharge obtained during development, indicate a confined aquifer that may produce high well yields.

### 88**P**5

The well is completed in alluvium from 0 - 233 feet. The alluvium consists of volcanic and granitic sand with thin lenses of silty clay. A volcanic gravel and volcanic/granitic sand layer was found between 125 to 144 feet. This could be the major water bearing layer in the well. Well yield was minor during development.

Borehole geophysics run were 16 and 64 inch electric resistivity, sonic, natural gamma and caliper logs. The 16 and 64 inch resistivity log shows alluvial material with 20 to 60 ohm-m resistance from 110 to 260 feet. The natural gamma log shows alternating clay and sand lenses. The geophysics show the well is completed in low porosity alluvium. Geophysical logs for SSP5 are shown in Figure 4.

### 88P6

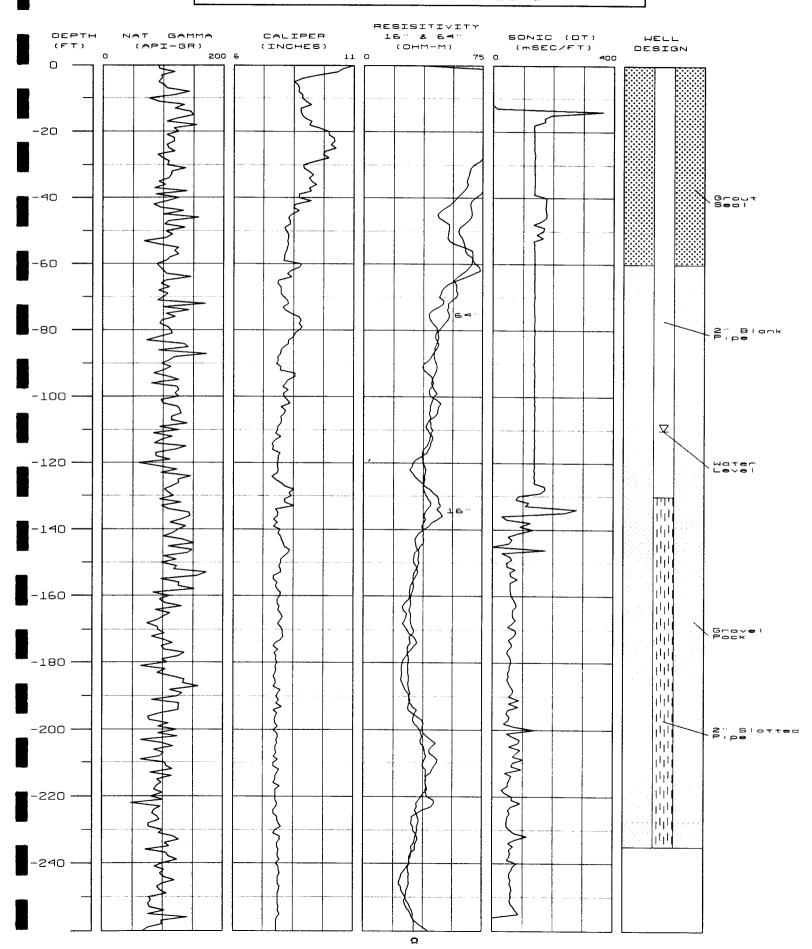
Alluvium consisting of sand and clay layers was found from 0 to 170 feet. A layer of well sorted, compacted sand was encountered from 170 to 190 feet. Tertiary sediments exist west of the well site (Bell and Bonham, 1987). This layer may be a Tertiary sandstone. The drilling mud thinned after drilling through a soft zone in the sand-sandstone unit at 180 feet, indicating water production. The well cleaned up rapidly during development with discharge estimated at 20 gpm.

Borehole geophysics conducted were 16 and 64 inch electric resistivity, sonic, natural gamma and caliper logs. The electric resistivity logs show low porosity material with 10 to 25 ohm-m resistance from 60 to 220 feet. The log shows a slight resistivity increase where the fluid loss occurred near 190 feet. The gamma log shows a low gamma unit layer after the "soft zone" at 180 feet. Geophysical logs for SSP6 are shown in Figure 5.

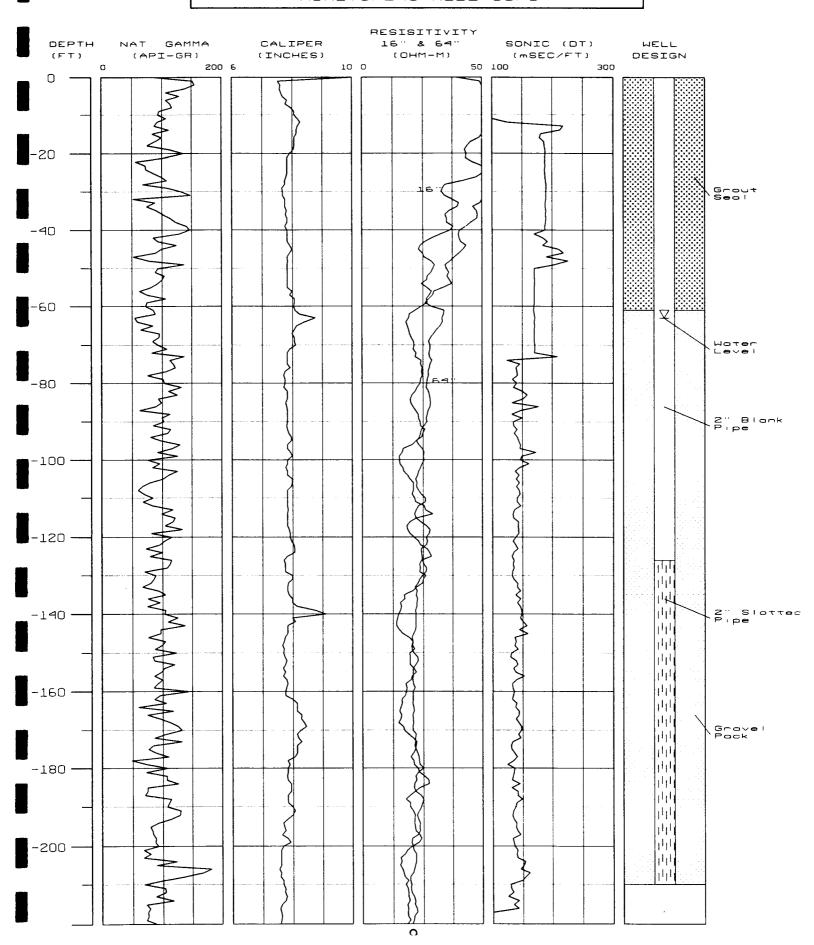
#### 88P7

Fine to coarse alluvium consisting of decomposed granodiorite with thin, silty clay lenses was drilled from 0 to 133 feet. Granodiorite with intermittent fractures exists from 133 to 370 feet. The fractures often contained white, non-competent, altered feldspar clay. Drilling fluid loss occurred between 250 to 260 feet. Well discharge was minor during development.

# FIGURE 4 GEOPHYSICAL LOGS & WELL CONSTRUCTION MONITORING WELL SSP5



# FIGURE 5 GEOPHYSICAL LOGS & WELL CONSTRUCTION MONITORING WELL SSP6



### **88P8**

Granitic and volcanic sand with fine silt was found from 0 to 20 feet. A brown, sticky clay was found from 20 to 50 feet. Layers of silty clay and sand are found from 50 to 240 feet. Substantial fluid loss occurred in a well rounded sand layer between 123 and 130 feet. This may be the major water bearing layer in the well. SSP8 cleaned up rapidly during development and had a well yield similar to SSP6.

Borehole geophysics conducted were guarded resistivity, sonic, natural gamma, and caliper logs. The guarded resistivity logs show low porosity, clay rich material with 5 to 25 ohm-m resistance throughout the borehole. Higher resistivity kicks after 180 feet indicate water bearing layers. The natural gamma log shows distinct low gamma unit readings in a coarse sand and silty clay layer between 180 and 190 feet. Geophysical logs for SSP8 are shown in Figure 6.

### **88P9**

Granitic sand and weathered volcanic tuff gravel were found from 0 to 27 feet. A fractured volcanic tuff exists between 27 and 157 feet. Substantial fluid loss occurred near 190 feet, coinciding with the water level in the well. A thick unit of multi-colored, sticky lacustrine clay was found from 190 to 360 feet. A tuffaceous clay found from 360 to 470 feet contains lenses of weathered quartz. Fractured volcanic tuff was drilled from 407 to 440 feet and appears to be a major water bearing unit in the well. Discharge during development was fair.

Borehole geophysics conducted were guarded electric resistivity, sonic, natural gamma, and caliper logs. The fractured volcanics between 27 to 157 feet have a 40 to 100 ohm-m resistance. The volcanic tuff at 407 feet shows a harder 10 to 40 ohm-m resistivity than the upper tuff. Fractures in both volcanic units are visible in the sonic log. Clay formations have a consistent 10 to 15 ohm-m resistivity. Geophysical logs for SSP9 are shown in Figure 7.

#### 88P10

Alluvial material composed of granitic sand, gravel and silty clay was found from 0 to 91 feet. Fractured volcanic tuff exists from 91 to 150 feet. A green lacustrine clay alternating with granitic sand lenses was found from 150 to 260 feet. The alternating sand and clay layers indicate formation in a shallow lacustrine environment. Well discharge during development was fair. Borehole geophysics were not done at SSP10.

### Cross Section A - A'

Cross section A - A' shows a conceptual view of the Tertiary volcanic aquifer and lacustrine clay aquitard penetrated by SSP2

# FIGURE 6 GEOPHYSICAL LOGS & WELL CONSTRUCTION MONITORING WELL SSP8

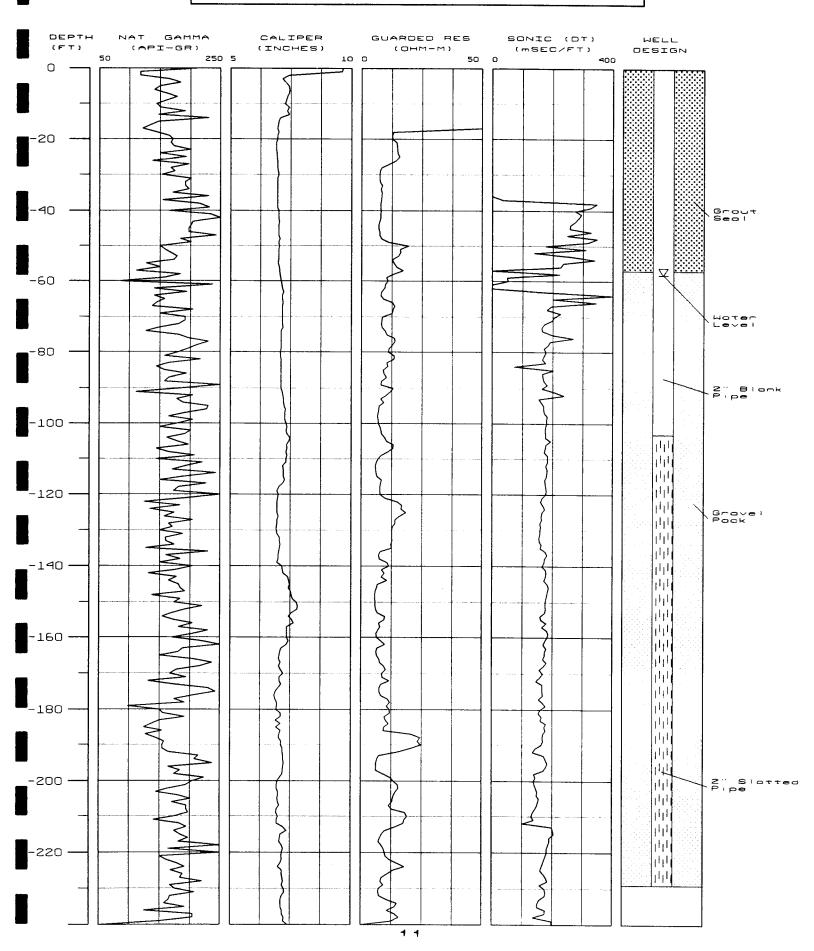
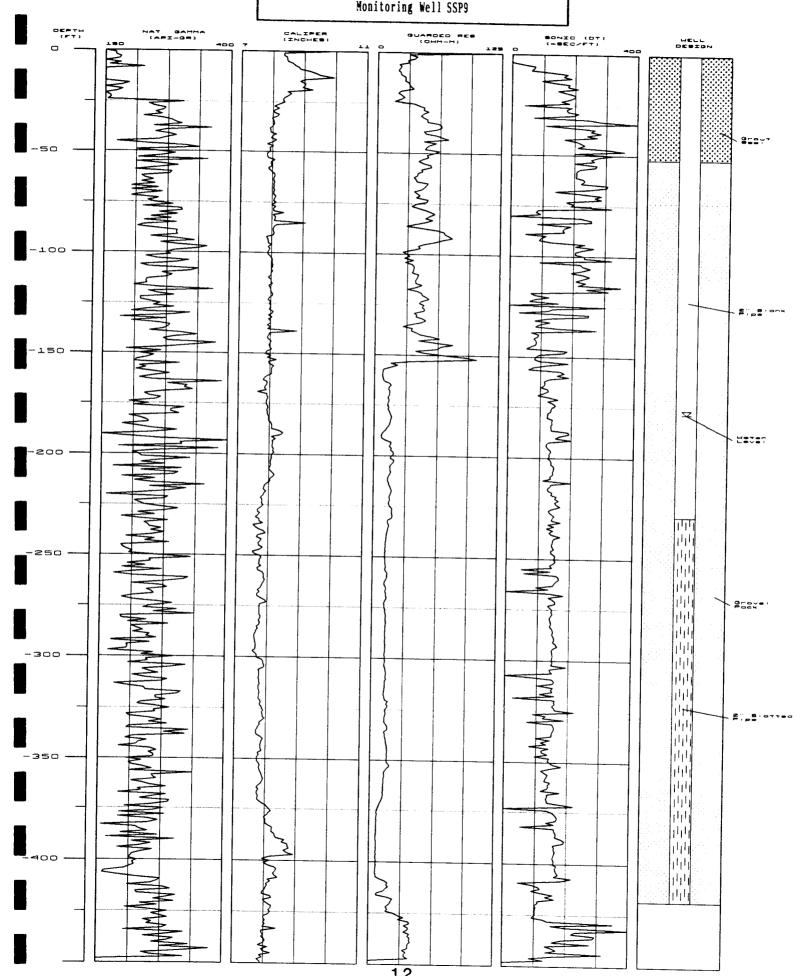


Figure 7
Geophysical Logs & Well Construction
Monitoring Well SSP9



and SSP4. A location map with related faulting is shown in Figure 8. Cross section A - A' is shown in Figure 9.

The cross section shows a dip-slip offset in the Tertiary volcanic bedrock of nearly 350 feet. The vertical offset was created by normal block faulting of the Tertiary volcanics. The faulted volcanics were eroded and covered by colluvium composed of basalt, scoriated volcanics and fine sediment originating from the Pah Rah Range.

The volcanic colluvium was covered by a thick clay unit deposited in a lacustrine environment. Thinning of the clay unit at SSP2 indicates a transition from lake to shoreline. Alluvium composed of sand, gravel and clay was deposited after the lacustrine environment disappeared. The clay and alluvium are slightly uplifted near SSP2, a result of occasional movement along the existing fault zone.

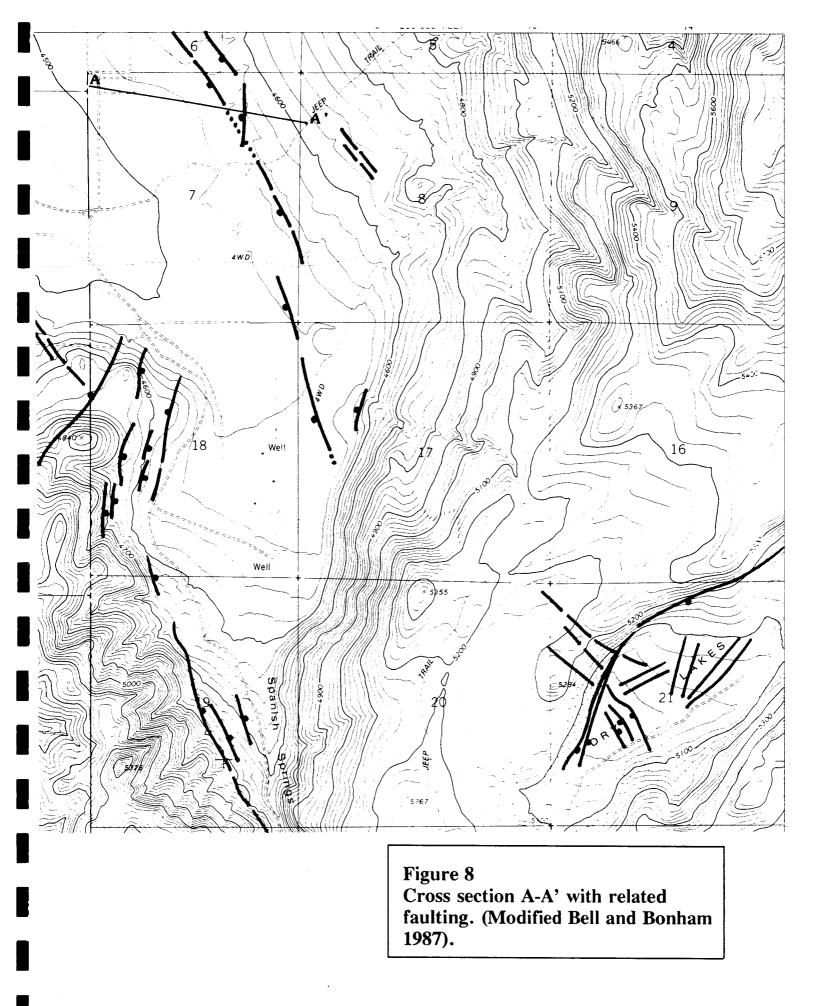
The piezometric surface between SSP2 and SSP4 is included on the cross section. The surface gradient is flat between the wells indicating the volcanic aquifer is very permeable. The location of the wells' piezometric surface above the clay aquitard indicates confining pressure.

### Water Quality

Water quality samples were collected at SSP2 and SSP4 since both wells are considered potential municipal well sites. Samples were collected using a Grundfos submersible sampling pump after each well had been purged 3 times its casing volume. The water samples were analyzed by the Nevada State Health Laboratory.

SSP2 initially met drinking water standards in all constituents except Lead (Pb) which was measured at 0.015 ppm. This level initiates treatment actions under the Lead and Copper Rule of the current Safe Water Drinking Act. A second analyses measured Lead in the well at 0.008 ppm. A casing residue that can be eventually removed from the well by pumping, is considered the source of lead. SSP4 met State of Nevada primary and secondary drinking water standards in all constituents. Complete water quality analyses for each well are found in the appendix. A general water quality summary for each well is found in Table 2.

			140	ater	Table Quality		ary				
Well	TDS	N	S04	cl	нсоз	Fe	Na	K	Ca	Fl	As
SSP2 SSP4	203 175	1.4	27 13	9 7	88 95		54 61	5 0		0.34 0.26	0.007 0.009



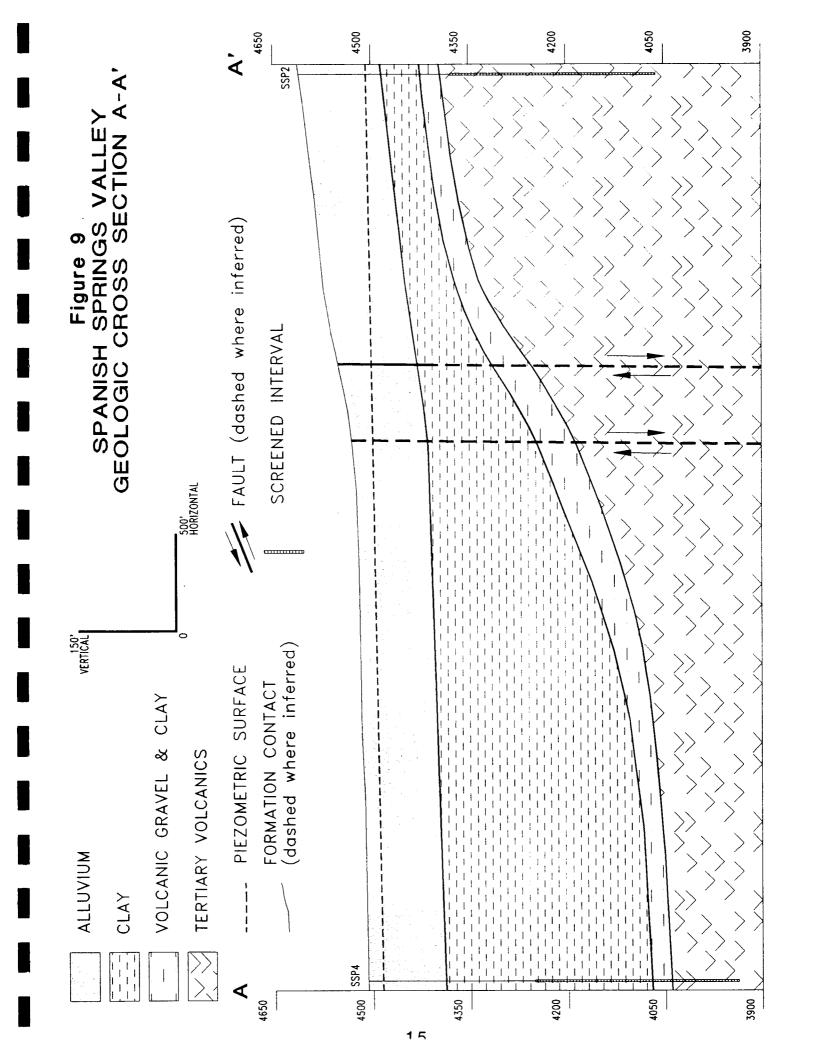


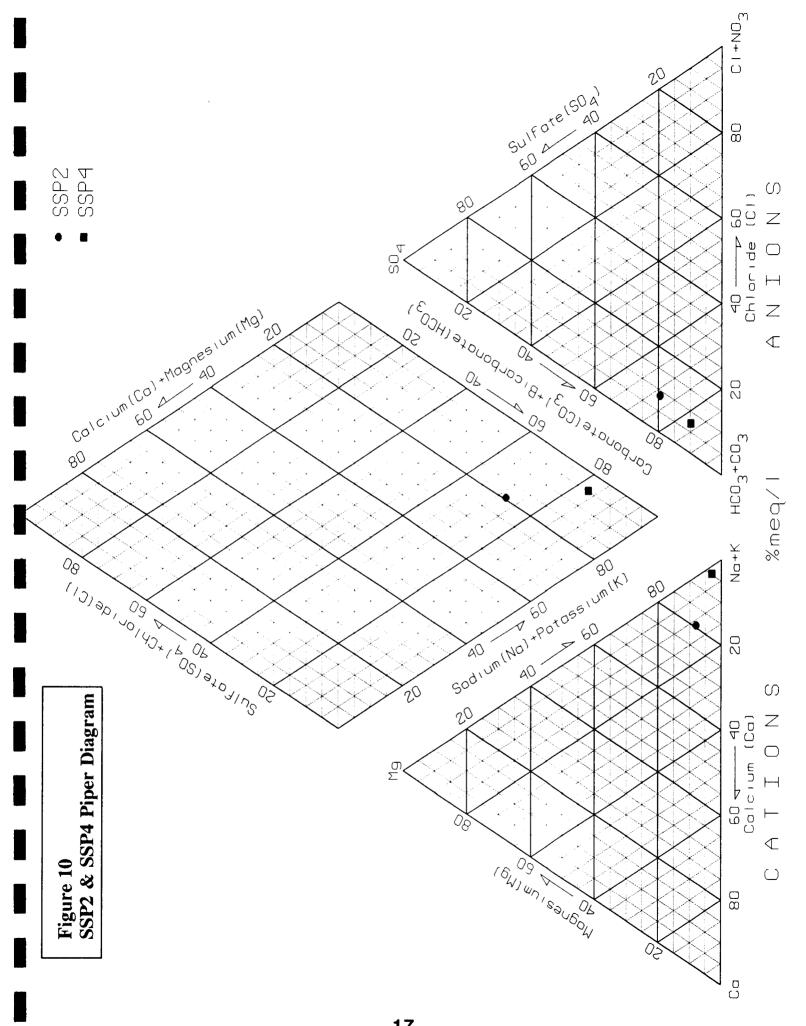
Figure 10 is a Piper diagram for SSP2 and SSP4. The diagram shows that both wells are completed in an aquifer containing Sodium - Potassium Bicarbonate waters.

### Conclusions

The monitoring wells in west to northwest Spanish Springs Valley, are completed in low permeability basin fill. SSP5 was not drilled deep enough to verify if sand rich basin fill found at Desert Springs #4 extends north. The volcanic tuff found in SSP9 and granodiorite found in SSP7 had low well yields during development. Wells SSP6 and 8 had better well yield than SSP5,7 and 9. This is due to their location in the central portion of the valley where saturated basin fill is more extensive.

Wells SSP2 and SSP4 were completed in a apparent confined volcanic aquifer that could be used for future production well locations. The location is desirable since it is upgradient and approximately 2 miles southeast of developed areas where ground water contamination is a concern. The presence of lead in SSP4 is site specific an not representative of aquifer hydrochemistry.

Further development of the fractured volcanics at SSP2 and SSP4 should be considered. The potential for developing a high yield production well field that would have small affect on existing wells appears feasible. Well development at SSP2 and SSP4 may provide Washoe County with production wells similar to the "Big Well".



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Bonham, H.F., 1969, Geology and mineral deposits of Washoe and Story Counties, Nevada, Nevada Bureau of Mines and Geology, Bulletin 70, p 51.

Environmental Protection Agency, June 1993, The Safe Water Drinking Act: A pocket guide to the requirements for the operations of small water systems. U.S. Government Printing Office. pp C-1, 16-19.

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Soil Conservation Service, Ground Water, National Engineering Handbook Section 18, Water Resources Publications, p 3-17.

Depth	Comple Decomination
<u>(Ft.)</u>	Sample Description
0 - 10	Dry Red Silty Clay
10 - 40	Red Clay with Red Scoriated Volcanic Rock
40 - 85	Red/Brown Basalt
85 - 95	Red Basalt with Red Clay
95 - 250	Red/Brown Weathered Basalt
250 - 260	Red Volcanic Tuff with Red Clay
260 - 283	Orange Tuffaceous Clay
283 - 295	Red/Brown Basalt
295 - 485	Weathered Brown Basalt
485 - 635	Red Scoriated Basalt
635 - 665	Black Basalt

Depth (Ft.)	Sample Description
0 - 5	Volcanic Cobbles and Sand
5 - 15	Angular Volcanic Sand and Gravel
15 - 20	Dry, Brown Clay with Volcanic Sand
20 - 33	Coarse Volcanic/Granitic Sand
33 - 38	Brown Clay with Fine Sand
38 - 50	Coarse Granitic/Volcanic Sand
50 - 58	Brown, Sandy Clay with Volcanic Sand
58 - 67	Brown, Silty Clay
67 - 86	Tan Clay with Volcanic/Granitic Sand
86 - 94	Volcanic/Quartz Rich Granitic Sand
94 - 100	Brown, Silty Clay with Volcanic Sand
100 - 106	Rounded, Medium Grained Volcanic Sand
106 - 184	Tan/Brown, Silty Clay
184 - 195	Angular Basalt with Tan/Gray Clay
195 - 213	Red Volcanic Fragments with Red Clay
213 - 225	Basalt
225 - 235	Brown Clay with Basalt Fragments
235 - 277	Basalt
277 - 285	Red, Scoriated Volcanics with Basalt
285 - 310	Basalt
310 - 378	Orange, Tuffaceous Clay with Basalt Gravel
378 - 425	Red/Brown, Scoriated Volcanic Fragments
425 - 550	Fractured, Scoriated Basalt

Depth (Ft.)	Sample Description
0 - 5	Coarse Granitic/Volcanic Sand
5 - 18	Volcanic Sand and Basalt Gravel
18 - 25	Granitic Sand with Brown, Silty Clay
25 - 36	Fine, Well Rounded Volcanic Sand
36 - 42	Tan, Silty Clay with Coarse Volcanic Sand
42 - 52	Medium Grained Granitic/Volcanic Sand
52 - 55	Tan, Silty Clay with Volcanic Sand
55 - 58	Coarse Volcanic/Granitic Sand
58 - 69	Brown, Silty Clay
69 - 74	Volcanic Sand with Brown, Silty Clay
74 - 82	Tan Clay with Volcanic Sand Lenses
82 - 98	Coarse Volcanic/Granitic Sand
98 - 107	Brown, Silty Clay with Volcanic Sand
107 - 118	Volcanic/Granitic Sand with Gray Clay
118 - 160	Tan/Brown, Sticky Clay
160 - 163	Brown Sandy Clay with Volcanic Sand
163 - 184	Brown Clay

Depth (Ft.)	Sample Description
0 - 18	Fine Volcanic/Granitic Sand
18 - 26	Granitic/Volcanic Sand with Brown Clay
26 - 28	Olive Green/Tan Clay with Sand
28 - 47	Quartz Rich, Well Rounded Granitic Sand
47 - 50	Gray, Silty Clay
50 - 76	Granitic Sand and Small Gravel with Brown, Sandy Clay Lenses
76 - 93	Tan Silty, Dry Clay with Sand Lenses
93 - 105	Coarse, Quartz Rich Volcanic Sand
105 - 112	Tan, Silty Clay with Volcanic Sand Lenses
112 - 118	Medium Grained Volcanic Sand with Tan,
	Silty Clay Lenses
118 - 265	Brown/Gray and Blue, Slick, Sticky Clay
265 - 275	Fine Volcanic Sand with Blue/Gray Clay
275 - 418	Blue/Gray, Slick, Sticky Clay
418 - 425	Brown, Silty Clay
425 - 435	Basalt/Volcanic Sand with Brown, Dry Clay
435 - 457	Red, Scoriated Volcanics with Red Clay
457 - 465	Fractured, Black Basalt
465 - 470	Red, Scoriated Volcanic and Basalt
	Fragments with Red Clay
470 - 487	Red, Scoriated Volanics with Red Clay
487 - 498	Basalt
498 - 519	Red, Scoriated Volcanics with Red Clay
519 - 565	Fractured Basalt

Depth (Ft.)	Sample Description
0 - 5	Fine Sand and Silt
5 - 15	Medium Grained Volcanic/Granitic Sand
15 - 20	Well Rounded Granitic Sand with Brown Clay
20 - 42	Quartz/Granitic Sand with Volcanic Gravel
42 - 46	Volcanic/Granitic Sand with Brown Clay
46 - 65	Volcanic/Granitic Sand with Small Gravel
65 - 76	Volcanic/Granitic Sand with Brown Clay
76 - 79	Brown, Sticky Clay
79 - 104	Granitic Sand with Brown Silty Clay
104 - 110	Granitic Sand with Brown Clay and Angular
	Basalt Gravel
110 - 125	Granitic Sand with Brown Silty Clay Lenses
125 - 144	Granitic Sand with Volcanic Gravel
144 - 178	Granitic/Volcanic Sand with Tuff Fragments
178 - 205	Granitic Sand with Brown Silty Clay
205 - 222	Fine Sand with Brown Silty Clay Lenses
222 - 240	Volcanic/Granitic Sand with Tuff Fragments
240 - 260	Granitic/Felsic Volcanic Sand with Brown Silty Clay

Depth (Ft.)	Sample Description
0 - 16	Fine Sand and Silt
16 - 20	Brown, Sticky Sandy Clay
20 - 26	Coarse Grained Granitic/Volcanic Sand
26 - 32	Brown Silty Clay
32 - 40	Volcanic Sand and Gravel with Silty Clay
40 - 46	Brown Silty Clay
46 - 52	Granitic Sand with Brown Sticky Clay
52 - 90	Brown Sticky Clay with Sand Lenses
90 - 98	Granitic Quartz Rich Sand
98 - 108	Brown Sticky Clay
108 - 114	Granitic Sand with Silty Clay
114 - 119	Brown Silty Clay
119 - 138	Granitic Sand with Brown Silty Clay
138 - 143	Brown Slick, Sticky Clay
143 - 148	Granitic Sand with Brown Silty Clay
148 - 163	Well Sorted Granitic/Felsic Volcanic Sand
163 - 170	Felsic Sand with Brown Silty Clay
170 - 190	Compacted Fine Mafic/Felsic Well Rounded
	Sand. Possible Tertiary Sediment.
190 - 193	Granitic/Volcanic Sand with Brown Clay
193 - 220	Granitic/ Felsic Volcanic Sand

Depth (Ft.)	Sample Description
0 - 5	Fine Sand and Silt
5 - 25	Coarse Quartz Rich Granitic Sand
25 - 29	Granitic/Felsic Volcanic Fine Gravel
29 - 52	Coarse Granitic Sand
52 - 64	Coarse Granitic Sand with Brown Silty Clay
64 - 72	Brown Silty Clay with Granitic Sand
72 - 85	Red/Brown Silty Clay with Coarse Sand
85 - 95	Tan Silty Clay with Felsic Volcanic Sand
95 - 105	White Granitic Sand with Brown Silty Clay
105 - 120	Fine Grained Decomposed Granodiorite
120 - 128	Decomposed Granodiorite with Tan Clay
128 - 133	Granodiorite Sand with Subangular Quartz and Biotite Flakes
133 - 183	Hard, Compacted Decomposed Granodiorite,
	or Granodiorite Outcrop
183 - 250	Granodiorite Cuttings with White, Mushy
	Altered Feldspar Clay
250 - 260	Large Drilling Fluid Loss
260 - 330	Granodiorite with Minor Altered Feldspar Clay
330 - 340	Granodiorite with White Altered Feldspar Clay
340 - 370	Granodiorite with Minor Alteration Clay

Depth (Ft.)	Sample Description
0 - 5	Fine Silt and Clay
5 - 20	Granitic/Volcanic Sand with Tan Silty Clay
20 - 50	Tan/Brown Slick Clay
50 - 77	Brown Silty Clay with Volcanic Sand and Small Volcanic Gravel
77 - 90	Granitic Sand and Small Volcanic Gravel with Gray Silty Clay
90 - 98	Brown Silty Clay with Volcanic/Granitic Sand
98 - 103	Hard Tan/Brown Clay
103 - 123	Brown Clay with Volcanic/Granitic Sand
123 - 130	Well Rounded Felsic Volcanic/Granitic Sand Large Fluid Loss at 130 ft
130 - 153	Tan, Silty, Semi-Dry Clay
153 - 168	Tan, Silty, Clay with Felsic Volcanic Sand
168 - 175	Tan Slick, Silty Clay
175 - 192	Tan, Sandy Clay with Coarse
	Volcanic/Granitic Sand
192 - 200	Brown, Slick Clay
200 - 226	Granitic/Volcanic Sand with Tan Silty Clay
226 - 240	Brown Sandy Clay with Granitic Sand

Depth (Ft.)	Sample Description
0 - 15	Decomposed Granitic Sand and Gravel
15 - 27	Granitic Sand with Red Stained Volcanic
	Sand and Gravel
27 - 70	Gray Rhyolite/Volcanic Tuff
70 - 140	Tan Rhyolite/Volcanic Tuff
140 - 157	Gray Rhyolite/Volcanic Tuff
157 - 190	Brown and Gray Clay with Angular Volcanic Gravel and Sand
190 - 225	Tan Clay with Orange Stained Weathered Tuff and Orange Alteration Clay
225 - 240	Blue - Gray, Sticky Clay
240 - 266	Brown/Gray, Sticky Clay
266 - 274	Green/Gray, Slick Clay with Green Volcanic
	Sand
274 - 300	Tan, Sticky Clay
300 - 335	Red/Gray, Sticky Clay
335 - 360	Tan/Gray, Sticky Clay
360 - 365	Red/Gray Tuffaceous Clay with Tuff
365 - 370	Tan Weathered Tuff with Red Discoloration
370 - 375	Poorly Sorted Volcanic/Quartz Granitic
	Sand and Small Volcanic Gravel
375 - 407	Gray Tuffaceous Clay with Quartz and Weathered Gray Tuff Fragments
407 - 422	Gray/Tan Fractured Rhyolite/Volcanic Tuff with Orange Staining
422 - 440	Gray Rhyolite/Volcanic Tuff

Depth (Ft.)	Sample Description
0 - 10	Coarse Granitic Sand
10 - 30	Granitic Sand and Gravel with Silt
30 - 50	Coarse Granitic/Volcanic Sand
50 - 62	Brown Silty Clay
62 - 82	Coarse Granitic/Volcanic Sand
82 - 91	Brown Silty Clay
91 - 150	Tan Rhyolite/Volcanic Tuff with Red Staining
150 - 200	Tan/Olive Green Clay with Quartz Rich
	Granitic Sand
200 - 220	Tan/Green Sandy Clay
220 - 238	Quartz Rich Granitic Sand with Green Clay
238 - 258	Olive Green Clay
258 - 262	Olive Green Clay Quartz Rich Granitic Sand

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

OFFICE USE ONLY
Log No
Permit No.
Basin

PRI	NT	O	R	T	YPE	ON	LY
DO	NO	T	W	R	ITE	ON	BACK

PRINT OR TYPE ( DO NOT WRITE ()		K				orm in its enti		L		
2.			accord	dance with	n NRS 53	4.170 and NAC	C 534.340	NOTICE OF IN	TENT NO.	24091
1. OWNER Was	hoe C	ounty Uti	lity D	ivisio	<b>ـــــــ</b> ـــــــــــــــــــــــــــــ	ADDRESS A	T WELL L	OCATION		
MAILING ADDRESS	s.P.Q.	Box 1113 89520	0	··		Spanish	Springs	Site#9	***************************************	
2 LOCATION SE	1/4	SE 1/4 Se	÷c	Т	21	N/S R 20	) E	Wa:	shoe	County
PERMIT NOIssu	NA		· 	NA.		*************************	••••••	NA		
			<u> </u>							
		FORMED	**	4.		PROPOSED		5.		
New Well Deepen D	Abando	☐ Recond			Municipal	∟ VIndustrial 😿	Monitor	☐ Test ☐ Ca☐ Stock ☐ Ai	r 🗌 Othe	r
6.		THOLOGIC L	<del> </del>			8.		ELL CONSTRUCTI		
Material		Water	From	То	Thick-	Depth Dril		Feet Depth		Feet
		Strata	<del> </del>	<del>                                      </del>	ness	-	HOLE	E DIAMETER (BIT		
Decomposed gr			10	15	15	<b>-</b>   -	7/9 1	From Ches Feet	To .	74
Granite sand/			15 27	27 70	43	11		chesFeet		
Gray volcanio			70	140	70	-		chesFeet		
Tan volcanic Gray volcanic		<del></del>	140	157	17	1				
Brown/gray cl			157	190	33	Si 0 D	Weight/Ft.	CASING SCHEDUL Wall Thickness	ī	j
tan clay			190	225	35	Size O.D. (Inches)	(Pounds)	(Inches)	From (Feet)	To (Feet)
Blue-gray cla			225	240	15	2"		Galvanized	+2	231
Brown/gray/re	d cla	v	240	370	130					<u> </u>
volcanie sand			370	375	5	<b>_</b>	<u> </u>	1		<u>-</u>
White tuff cl	ay		375	405	30_	Perforation	s:	<b>~</b>		
Gray volcanio	: tuff	·	405	440	35	Type p	erforation	Slotted /8 x 2%		
<u> </u>			<del> </del>			From	231	feet to	420	feet
			<del> </del>		+	From		feet to		feet
			+		+			feet to		
				<del></del>	+			feet to feet to		
			+	<b>+</b>	+	<b>−</b>		es 🗆 No		
			1					t		leat Cement
						11 -		X Pumped	□ c	ement Grout
								Poured		oncrete Grout
			<u> </u>	<del> </del>		Gravel Pac	ked: 💢			
			<del>                                     </del>		+	From	52	feet to	420	feet
						9.		WATER LEVEL		
						Static water		178.14		w land surface
				<del> </del>	<u> </u>	Artesian flo	perature CO			P.S.I.
			<del> </del>	<del> </del>	-	-  <u>-</u>				
		L		<u>.l</u>		10.		LLER'S CERTIFICATION  The supervision		t is true to the
Date started		•			, 19 <b>9.3</b> 19 <b>9.3</b>	best of my	knowledge.	nder my supervision	and the repor	t is true to the
Date completed		September			, 199.3	Name Hun	boldt D	rilling & Pun	np Co.,	Inc.
7.	w	ELL TEST DA				li				
TEST METH	IOD:	☐ Bailer [	Pump	☐ Air ː	Lift	Addressp	2.0. Box	Contractor		
G	i.P.M.	Draw Down (Feet Below Sta	tic)	Time (Ho	ours)	_ Wir	nemucca	, NV 89446		
di w	ot me	454PV	A.					ense number ontractor's Board	015234	
**************************************					•	Nevada dr	iller's licens	e number "issued by t	he	4405 1
						─ Division	of Water Re	sources the on-site	ir lerI	-1195-1
L* .						Signed	L'. C	". CPL	n	
			1				By driller	r performing acqual drilling	ng on site or con	tractor
						Date	1-1-9	2		,

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

### STATE OF NEVADA **DIVISION OF WATER RESOURCES**

# WELL DRILLER'S REPORT

OFFICE USE ONLY	
Log No	
Permit No.	
Basin	

PRINT OR TYPE ONLY Please complete							Basin		***************************************
DO NOT WRITE ON BACK					1.170 and NA				
							NOTICE OF IN		
1. OWNER Washoe County U	tilit	y Divi	sion		ADDRESS A	AT WELL L	OCATION		
1. OWNER Washoe County U MAILING ADDRESS P.O. BOX Reno, NV 89520	1113	0			Spanis	th Spring	ıs <u>Si</u> 1	e #8	
Keno, Ny 89520	· · · · ·	4 4		l.					
2. LOCATION SW 1/4 NE	¹/4 Se	c14	T	<u>د ا</u>		<u> </u>		inoe	County
PERMIT NO. Issued by Water Resour	ces		Parcel No.		•	***************************************	Subdivision Name		
3. WORK PERFORME	D		4.	•	PROPOSED	TICE	5.	WELL TY	DE
·	Recondi	tion		Domestic		Irrigation	**	ble 🛛 Rota	
					Industrial	Monitor	☐ Stock ☐ Air		f
6. LITHOLOG	GIC LO	G	<del>-                                    </del>		8.	WI	ELL CONSTRUCTI	ON	
	Water			Thick-	Depth Drill	led 240	Feet Depth	Cased23	0Feet
Material	Strata	From	То	ness		HOLE	DIAMETER (BIT		
Silt & clay		00	5	5			From	То	
Granite & clay		5	20	15	. <b>.</b>	.7/8_Inch	nesQFeet.	240	Feet
Brown clay		20	50	30		Incl	nesFeet.		Feet
Brown clay/fine sand		50	77	27	<b></b>	Incl	nesFeet.		Feet
Granitic sand/clay		77	90	13		C	CASING SCHEDUL	E	
Brown clay/sand	<del>-</del>	90	98	8	Size O.D.	Weight/Ft.	Wall Thickness	From	То
Hard brown clay		98_	103	5	(Inches)	(Pounds)	(Inches)	(Feet)	(Feet)
Brown clay/sand		103	123	20	2	<u> </u>	Galvanized	+2	105
<u>Granitic</u> sand		123	130	<b></b>	<b> </b>	ļ. <u></u>			<del></del>
Tan clay		130	153	23	<u> </u>		<u> </u>	<u></u>	<u> </u>
Tan clay/sand		153	192	39	Perforation		lotted		
Brown clay		192	200	8	Size ne	erforation 1	/8 X 2%	•••••	•••••••
Granitic sand		200 218	218 222	18	From	105	/8 X 2%	230	feet
Tan clay		222	226	4	From		feet to		feet
Granitic sand Brown clay/sand		226	240	14			feet to		
Brown Clay/Sand		220	270	17			feet to		
					Surface Se		No	Seal Ty  ▼ N	/pe: leat Cement
				<u> </u>	11 -				ement Grout
			<del></del>	1	Placement	Method: X	Poured		oncrete Grout
					1 C 1 D	_			
					Gravel Pac		es	240	£
					From				feet
		•			9.		WATER LEVEL		
					!!		58.17		
					Artesian flo		G		
				ļ	Water temp	perature_c_d	<b>⊘</b> °F Quality	9000	
			<u> </u>	<u> </u>	10.	DRIL	LER'S CERTIFICA	TION	
Date started Septem	ber 1	3		19 93			der my supervision a	and the repor	t is true to the
Date completed Septem				19.93	1	knowledge.			_
		<del> </del>		,	Name.Hun	boldt Di	cilling & Pun	ър. Со.,	Inc.
7. WELL TE					11	P.O. Box		A Commence of	
TEST METHOD:   Baile		Pump	Air I	_ift			Contractor		
	w Down elow Statio	c)	Time (Ho	urs)	Wir.	nemucca,	NV 89446	, 	***************************************
did not measure		110	ma	i	Nevada co	ntractor's lice	nse number		
O PU W LLUC					11		ontractor's Board(		
					Nevada dri	iller's license	number issued by the ources, the on-site of	ie ∕ Irillear Te⊥	1105_1
					1 214131011	77 %		11	
					Signed	By deille-	performing actual drilling		tenotoe
				<del></del>	Day (//	- 1- a	- 2	g on site of col	inacioi
					Date/	7-7			

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

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# STATE OF NEVADA

### **DIVISION OF WATER RESOURCES**

WELL DRILLER'S REPORT Please complete this form in its entirety in

OFFICE USE ONLY	
Log No.	
Permit No.	
Basin	

NOTICE OF INTEN  1. OWNER Washoe County Utility Division MAILING ADDRESS P.O. Box 11130 Reno, NV 89520  Self County Utility Division Address at Well Location Spanish Springs Site #6 \$5	P
Reno. NV 89520	Ρ
Reno. NV 89520	
Likahaa	
2. LOCATION JW 1/4 NW 1/4 Sec. 23/ g T 21 (NS R 24 2/E Washoe	County
2. LOCATION SW 1/4 NW 1/4 Sec. 23 g T 21 NS R 20 2 E Washoe  PERMIT NO NA NA NA Subdivision Name	
	ELL TYPE
3. WORK PERFORMED 4. PROPOSED USE 5. WE  New Well □ Replace □ Recondition □ Domestic □ Irrigation □ Test □ Cable	
□ Deepen □ Abandon □ Other □ Municipal/Industrial ☑ Monitor □ Stock □ Air	Other
6. LITHOLOGIC LOG 8. WELL CONSTRUCTION Water Thick Depth Drilled 210 Feet Depth Case	. 210 -
Material Water Strata From To Thickness HOLE DIAMETER (BIT SIZ	ed 210 Feet
Fine sand/silt   0   16   16   From	To
Brown clay 16 20 4 7 7/8 Inches 0 Feet 2	10 Feet
Granite/volcanic sand 20 26 6 Inches Feet	
Brown silty clay 26 32 6 Inches Feet	Feet
Granitic sand 32 40 8 CASING SCHEDULE	
Brown silty clay 40 46 6 Size O.D. Weight/Ft. Wall Thickness	From To
0/ 0/// 010 / 010/ 010/	(Feet) (Feet) +2 126
	+2 120
Granitic sand         90         98         8           Brown clay         98         108         10	
Granitic sand 108 130 22 Perforations:	
Granitic sand/clay 130 138 8 Type perforation Slotted pipe  Brown clay 138 143 5 Size perforation 1/8 X 2½ 4 C  Granitic sand/clay 143 170 27 From 126 feet to	er foot
Granitic sand/clay   143   170   27   From   12b   feet to	31U feet
Compacted granitic sand 170 210 40 From feet to From feet to	
From feet to	
Fromfeet to	feet
Surface Seal: X Yes \( \simega \) No	Seal Type:
Depth of Seal 61'	□ Neat Cement     □ Cement Grout
Placement Method: X Pumped	☐ Concrete Grout
Gravel Packed: 🔀 Yes No From. 61 feet to. 210	fe <del>e</del> t
9. WATER LEVEL	ea
	eet below land surface
Static water level. B. Z. i. S. C	
	ood
10. DRILLER'S CERTIFICATIO	N
Date started August 26 19 93 This well was drilled under my supervision and t	the report is true to the
Date completed August 28 19 93	0- 1
Name HUMBOIGT Drilling & Pump	LO., Inc.
Address P.O. Box 590	
Contractor	
G.P.M. (Feet Below Static) Time (Hours)	
Nevada contractor's license number issued by the State Contractor's Board0152	34
Nevada driller's license number issued by the	•
Division of Water Resources, the on-site drille	7-1-1195-1
Signed C. Cffil	<u></u>
By driller performing acquaidrilling on	site or contractor
Date.//	44404444400444000

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

# STATE OF NEVADA DIVISION OF WATER RESOURCES

### IVISION OF WATER RESOURCES

### WELL DRILLER'S REPORT

OFFICE USE ONLY
Log No
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Basin

PRINT OR TYPE ONLY DO NOT WRITE ON BACK					orm in its entire. 1.170 and NAC		NOTICE OF IN	TENT NO 2	4000	
	(I+ i 1 i + i	u Nivi	cion		ADDDECC A	T WELL L				
MAILING ADDRESS P. O. BOX	11130	yU.L.¥.L			ADDRESS AT WELL LOCATION					
Reno. NV 8952	<u> </u>			l.	O - 2	 ∩∠⊘ _				
2. LOCATION NE 4 SW	1/4 Sec	c <i>Lļ.z</i>	<u>* T</u>		(V/S R&	V LE	NA NA	siide	County	
2. LOCATION NE 1/4 SW PERMIT NO Issued by Water Reso	urces		Parcel No.				Subdivision Name	***************************************		
3. WORK PERFORM			4.		PROPOSED 1		5.	WELL TYP		
■ New Weil	Recondi	tion		Domestic Municipal		Irrigation	-	ible 🔀 Rotar		
	OGIC LO	G		•	8.	WE	ELL CONSTRUCT			
Material	Water Strata	From	То	Thick- ness	Depth Drill	ed250		Cased23	35Feet	
Fine sand/silt		Ω	5	5.		HOLE	DIAMETER (BIT	SIZE) To		
Granitic sand		5	46	41	7	7/8 Inch	nes 0 Feet		eet	
Granitic sand/sm grave	1	46	65	19	]		nesFeet		eet	
Granitic sand/brn clay		65	70	5	]		nesFeet		eet	
Granitic sand		70	75	5			ASING SCHEDUI	F	***	
Brown clay/sand		75	80	5	Size O.D.	Weight/Ft.	Wall Thickness	From	То	
Granitic sand		80	96	16	(Inches)	(Pounds)	(Inches)	(Feet)	(Feet)	
Granitic sand/brn clay		96	125	29	2"		galvanized	+2	130	
Granitic sand	, 1	125	144	19						
Granitic sand/brn clay	$I = I_{\mathcal{L}}$	144	205	61						
Granitic sand		205	210	5	Perforation	s:				
Granitic sand/brn clay	,	210	222	12	Туре р	erforation. S.	lotted pipe 8 X 2% 4 pe			
6(anitic sand		222	240	18	Size pe	rforation.1/1	8 X 2½ 4 pe	r_£oot		
Granitic sand/brn clay	,	240	250	10	From	130	feet tofeet to	235	teet	
				<u> </u>	From		feet to		feet	
					From		feet to		feet	
							feet to			
					Surface Se	al: 🔀 Ye	s 🗆 No	Seal Ty	pe:	
				<u> </u>	31		1	X	eat Cement	
						Method:			ement Grout	
					_		Poured	□ C	oncrete Grout	
			ļ	<u> </u>	Gravel Pac	ked: 🗓 Y	es □ No			
			<del> </del>		From	60	feet to	235	feet	
				1	9.		WATER LEVEL		<del></del>	
			<u> </u>	†	Static wate	r level	09.95	feet below	v land surface	
			<del>                                     </del>	<del>                                     </del>	Artesian flo	oww		G.P.M	P.S.I.	
			1	1	Water temp	perature Co	Guality.	9000		
	<b></b>				10.	DRII	LER'S CERTIFIC	ATION		
			1		<b>⊣</b> 1		der my supervision		t is true to the	
Date started	Augu	st23		_, 19. <b>9.3</b> .		knowledge.	,	•		
Date completed	Augu	st 25		, 19.93.	Name Hu	mbaldt D	rilling & Pu	mn Co	Inc.	
7. WELL	TEST DA	TA			1		Communic			
TEST METHOD:   Ba	iler 🗆	Pump	☐ Air I	_ift	AddressP.	-0. Box	590 Contracto			
G.P.M. D	raw Down Below Stati	ic)	Time (Ho	urs)	wi.	nnemucca	NV 89446			
did not neasone	DCIOW SIAL		e en R	-19	Nevada co	ntractor's lice		145224		
					il .		number issued by			
	*	_			Division	of Water Re	runiber issued by	drille I_1_1.1	95-1	
					4	11.7	· COM			
					Signed	/ Bufdriller	performing actual drilli	ng on site or con	tractor	
					⊢ Date ′/	1-1-4	3	<b></b>		

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

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### STATE OF NEVADA **DIVISION OF WATER RESOURCES**

### WELL DRILLER'S REPORT

Please complete this form in its entirety in

OFFICE USE ONLY	
Log No.	
Permit No	
Basin	

DO NOT WRITE ON BACK					rm in its entir		NOTICE OF IN	TENT NO	24092
: 1. OWNERWashoeCounty	ision		ADDRESS A	T WELL LO					
MAILING ADDRESS P. O. BOX.	11130	١			Snan	ish Spri	nas		
Reno, NV 895	20				S	SPIO	- 3		
2. LOCATIONNE1/4SE	1/4 Se	c. 11	тТ	21		0 E	Washo	Δ	County
PERMIT NO. Issued by Water Resou					_				
3. WORK PERFORM		<u> </u>	4.		PROPOSED		5.	WELL TY	
- ·	Recond	lition	1	Domestic		Irrigation		ole 🗓 Rota	
			·		/Industrial 👿				
6. LITHOLO	OGIC LO	)G			8.		ELL CONSTRUCTION	N	
Material	Water Strata	From	То	Thick- ness	Depth Drill	ed 260	Feet Depth DIAMETER (BIT	Cased 2	SZFeet
Coarse sand		0	20	20			From	То	
Silt, sand & gravel		20	30	10	7	7/8 Incl	hesOFeet_	260	Feet
Granitic-volcanic sand		30_	50	20	<u> </u>	Inc	hesFeet.	***************************************	Feet
Brown silty clay		50	62	12		Inc	hesFeet.		Feet
Granitic sand		62	82	20			ASING SCHEDULI	 3	
Brown silty clay		82	91	9	Size O.D.	Weight/Ft.	Wall Thickness	From	То
Tan royolite/tuff		91	150	59	(Inches)	(Pounds)	(Inches)	(Feet)	(Feet)
Tan-green clay/sand		150	190_	40	2		galvanized	+2	105
Quartz sand		190	200	10			_		
Tan-green clay/sand		200	220	20				=	
Quartz/clay		220	238	18	Perforations				
Green clay	238	260	22	Type perforation   Slotted					
		ļ		ļ	Size pe	rforationl.	/.BX. Z. 1/Zfeet to	252	feet
		ļ	<u> </u>	<b>_</b>	From		feet to		feet
							feet to		
							feet to		
					From		feet to	***************************************	feet
			<u> </u>	ļ	Surface Se	al: 🔣 Ye	s 🗆 No	Seal T	ype:
				<b></b>	Depth of Seal				
				<u> </u>	Placement Method:  Pumped				
					4		Poured		Concrete Grout
			ļ		Gravel Pac	ked: 🛛 Y	(es □ No		
				1	From	F0	feet to	252	feet
		ļ	<u> </u>		9.		WATER LEVEL 95.08'	6 . 1 1	
		<u> </u>	ļ		_11				w land surface
		ļ	<u> </u>	<u> </u>	Artesian flo		1	.P.M	P.S.I.
			ļ	-	<del> </del>	perature COL	<del></del>	<del></del>	
		<u> </u>	<u> </u>		10.		LER'S CERTIFICA		
Date startedSept	ember.	17		, 19. <b>93</b> .	hest of my	vas grilled un knowledge.	der my supervision a	ind the repor	nt is true to the
Date completedSept	ember.	20		, 19.93.	11	-	-1111 A D	0 -	*
					Name.HUII	potat u	cilling & Pum	ibro	ınc
				T :6	II	0. Box !	590		
TEST METHOD:   Ba		Pump	☐ Air l	Litt			Contractor		
G.P.M. D	raw Down Below Stat	tic)	Time (Ho	ours)	Win	nemucca	, NV 89446		
did not measure		A IP	on Rig	2 hrs.	Nevada con	ntractor's lice the State Co	ense number ontractor's Board0.1	5234	
			<u> </u>		Nevada dri	iller's license	number issued by th	e	
					Division	of Water Re	sources, the on-site d	riller. 191	4
<i>8</i>					-   ,	/1 B	So- 1	1	
					Signed	By driller	performing actual drilling	g on site or co	ntractor
					Date 12	-7-9	3	-	
					1 ~ "	·····			

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# 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
Permit No
Basin

86 5.					1.170 and NAC		NOTICE OF IN	TENT NO.2	4099	
1. OWNER Washoe County MAILING ADDRESS P. O. BOX	Utilii	ty Divi	sion		ADDRESS A	T WELL LO	CATION			
MAILING ADDRESSP. O. BOX			51te# 3	55P I	***************************************					
Reno, NV 895	20			l	<b>A</b> 2		Vachoo	••••••		
2. LOCATION. SE						1E	Masilioe			
PERMIT NOIssued by Water Reso	urces	P	arcel No.				Subdivision Name			
3. WORK PERFORM	IED		4.		PROPOSED	USE	5.	WELL TYP	E	
	Recondi	tion		Domestic	/Industrial 🗆	Irrigation	☐ Test ☐ Cat	ble 🛭 Rotai		
	OGIC LO				8.		LL CONSTRUCTION			
	Water	<del>-</del> -		Thick-	Depth Drill			Cased 65	1Feet	
Material	Strata	From	To	ness	-	HOLE	DIAMETER (BIT	SIZE)		
Dry red silty clay		0	10	10		7 7/0	From _	то 665 г		
Red clay/red volcanic		10	40 85	30 45	-	7 7/8 Inch			eet	
Red/brown basalt		40 85	95	10	-		esFeet.		eet	
Red basalt/red clay		95	250	155	1		esFeet.		ect	
Red/brown basalt		250	260	10	1	C.	ASING SCHEDULE	I		
Red volcanic tuff/clay		260	283	20	Size O.D. (Inches)	Weight/Ft. (Pounds)	Wall Thickness (Inches)	From (Feet)	To (Feet)	
Orange tuff clay		283	295	12	2	(10111)	galvanized	+2	336	
Red/brown basalt Weathered brown basalt		295	485	190	1		garvanized		300	
Red basalt		485	635	150						
Black basalt		635	665	30	Perforation	s:			<u> </u>	
DIGUN DUSCIL					Type n	erforation	Slotted pipe			
					Size pe	rforation 1/8	X2 1/2	4 per 1	oot	
							feet to	051	feet	
					From					
					From feet to fee					
					Surface Seal: 🛛 Yes 🗆 No Seal Type:					
					Depth of Seal 50   X Neat Cement					
					Placement	Method: 💢	Pumped Poured		oncrete Grout	
					Gravel Pac					
	<del> </del>				From		feet to	·····	feet	
					9.		WATER LEVEL			
					Static wate	r level	535'	feet belov	land surface	
					Artesian flo				P.S.I.	
					Water temp	peratureCO		<del></del>		
				<u> </u>	10.		LER'S CERTIFICA der my supervision a		is true to the	
		r 20			hest of my	vas urineu un knowledge.	der my supervision a	ma me tebou	is due to the	
Date completed	Octobe	r_22		, 199.	Name Huii	boldt Dr	illing & Pum	no Co	Inc.	
7. WELL	TEST DA	ГА			li		Contractor		44	
TEST METHOD: D		Pump	☐ Air L	ift	Address	2.0. Box	Contractor	*****	***************************************	
G.P.M. (Fee	raw Down Below Stati	c)	Time (Ho	urs)	NiM	nemucca,	N√ 89446		***************************************	
did Not measure		AIR	DAI R	19 2h	Nevada co issued by	ntractor's lice  the State Co	nse number ntractor's BoardQ.1	15234		
				-	Nevada dr	iller's license	number issued by the	ie Filler 440	<b>5</b>	
						\(\frac{1}{2}\)	1 / 10 m	2	<del></del>	
		1			Signed	By driller	performing actual drilling	g on site or con	tractor	
					Date	-7-9-				

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

PRINT OR TYPE ONLY
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# 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.
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Basin

DO NOT WARID ON BRIDE		accorda	nce with	NRS 534	1.170 and NAC	C <b>534.340</b>	NOTICE	OF INT	TENT NO	24097
1. OWNER Washoe County	Utilit	y Divi	sion		ADDRESS A	T WELL LO	CATION			
MAILING ADDRESS	Box1	1130			Spanis	h Spring	s	SSP2		***************************************
Reno, NV 8952	0			<u>.</u>					- t	_
Reno, NV 8952  2. LOCATION NE NA NE NE NA		18 g	<sub></sub> .T	.20	(N)S R28	- ZIE_		Wa.	snoe	County
PERMIT NO. Issued by Water Resor	irces	P	arcel No.				Subdivision N	lame		
	IED I		4.	<u>_</u>	PROPOSED	IISE	T	5.	WELL TYP	F
	Recondi	tion		Domestic		Irrigation [	1 1		ole 🛛 Rotar	
	Other				/Industrial 🙀		Stock	☐ Air		
	OGIC LO	G			8.		LL CONST			^
Material	Water Strata	From	То	Thick- ness	Depth Drill		Feet		Cased 49	<u>0</u> Feet
Coarse sand		0	5	5		HOLL	From	·	To	
Volcanic sand & gravel		5	15	10	Z	7/8Inch	es0_	Feet	350 F	eet
Sand w/brown clay		15	20	5_	<b>∄</b> —	Inch	nes	Feet_	F	eet
Volcanic/granitic sand		_20	33	13		Inch	nes	Feet	F	eet
Brown clay w/sand		33	38	5_	4	C	ASING SCH	IEDULE	3	
Granitic/volcanic sand		38	50_	12	Size O.D.	Weight/Ft.	Wall Thic		From	То
Brown clay w/sand		50	58	8	(Inches)	(Pounds)	(Inche:	<u> </u>	(Feet)	(Feet)
Brown silty clay		-58	67_	9	2		galvani	zed	+2	252
Tan clay w/sand		67	86	19	-					
Volcanic/granitic sand		86	94_	8	<u> </u>	<u> </u>	L			L
Brown clay w/sand		94	100	6	Perforation	S: fa	hattal			
Volcanic sand		100	_106_	6	Size ne	erforation	8 X 2 1	/2	4 ner	foot
Tan/brown clay		106	187	81	From	252	feet to	)	490	feet
Weathered black basalt		187	205	18						
Red c'inder w/red clay-		205	213	8	1				******************************	
Gray basalt		213 225	225 235	12	From					feet
BRown clay w/basalt		235	277	42	Surface Se					
Gray basalt Red cinder w/red clay		277	285	8	Depth of S				Seal Ty	eat Cement
		285	310	25		Method: 🔯	_	********		ement Grout
Gray basalt Tan clay w/basalt frag	monte	310	378	68	Tracement		Poured		□ <b>c</b> c	oncrete Grout
Red/brown cinder w/cla	11101165	378	425	47	Gravel Pac	ked: KVY	es 🗆 No			
Black scoriated basalt	9	425	550	125	From			) D	490	feet
DIACK SCOTTAGED DASATE		760	- 000	120		413	<del> </del>		4.3.U	
					9.		WATER L	EVEL		
					Static wate					land surface
					Artesian flo	peratureCO			.P.M	P.S.1.
					_					
	L	<u> </u>	l		10.	DKIL was drilled un	LER'S CER			ic two to the
Date started		tober 2			best of my	was drilled un knowledge.	der my supe	rvision a	ma me report	is true to the
Date completed	0c1	tober 2	27	, 1993.	11	•	nillina	g. Dun	nn Co	Inc
7. WELL	TEST DA	ΓΑ			Name_Du	mboldt D	<u></u>	ntractor	III	A.I.I. A
TEST METHOD:   Ba		Pump	☐ Air I	Lift	Address	P.O. Box	590	ontractor		
	raw Down Below Stati	.	Time (Ho	ours)	Wi.	nnemucca	NV88	39446		
did Not test	Below Stati		on R	ig 24	Nevada co	ntractor's lice y the State Co	nse number			
					Nevada dr	iller's license	number issu	ed by th	e	
					Division	of Water Re	sources, the	on-site d	riller19	14
					Signed	By driller	performing act	al drilling	g on site or con	tractor
					Date	1-7-9	3'			

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

	OFFICE USE ONLY	
Log No.		
Permit N	ło	
Basin		

		accorda	nce with	NRS 534	4.170 and NAC	534.340	NOTICE OF INT	TENT NO.	24110	
1. OWNER Washoe Count	y Utili	ty Div	ision.		ADDRESS A	r well lo	CATION			
MAILING ADDRESS.P.O. BO	x 11130				Spanish S	Springs_	SSP2A			
Reno, NV 89	520									
2. LOCATION NW 1/4 N					N/S R21.					
PERMIT NOIssued by Water Re	ources	P	arcel No.	·			Subdivision Name		1000-00-12-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	
3. WORK PERFOR	MED		4.		PROPOSED U	JSE	5.	WELL TY	PE	
X New Well ☐ Replace	☐ Recond	tion	Di	Domestic		Irrigation [	☐ Test ☐ Cat	le 🛛 Rota	ry 🗆 RVC	
☐ Deepen ☐ Abandon	Other			Municipal	/Industrial 🛛	Monitor [	□ Stock □ Air	☐ Othe	<u>r</u>	
6. LITHO	LOGIC LO	G			8.		LL CONSTRUCTIO		105	
Material	Water Strata	From	То	Thick- ness	Depth Drille		DIAMETER (BIT		185Feet	
Coarse sand		0	5	5_			From	То		
Volcanic sand & grave	1	5	18	13		7/8 Inch	ies 0 Feet	185	Feet	
Sand w/brown clay		18	25_	7		Inch	esFeet.		Feet	
Volcanic/granitic san	d	25	36	11		Inch	esFeet.		Feet	
Brown clay w/sand		36	42	6	_	C.	ASING SCHEDULE			
Granitic/volcanic san	d	42	48	6_	Size O.D.	Weight/Ft.	Wall Thickness	From	То	
Brown clay w/sand		48	55	7	(Inches)	(Pounds)	(Inches)	(Feet)	(Feet)	
Coarse sand		55	58	3	2		galvanized	+2	101	
Brown silty clay	<u> </u>	58	69_	11						
Volcanic sand		_69	74	5						
Ian clay w/sand	ļ	74	82_	8	Perforations	s:				
Volcanic/granitic san	<b>d</b>	82	98	16	Type p	erforation	lotted 8 X 2 1/2	/ na	r foot	
Brawn clay w/sand		98	107	9	Size pe	101	feet to	4 pe 185	feet	
Sand w/gray clay		107	118	11	11	·····				
Tan/brown clay		118	184	66	II .		feet to		feet	
Weathered brown basal	t	184	185	1 1	<b></b>					
				ļ	From		feet to		feet	
	-			-	Surface Sea		s 🗆 No	Seal T		
				ļ	Depth of Seal 67 Meat Cement Placement Method: Depth of Seal Cement Grout					
				ļ	Placement				Concrete Grout	
				<del> </del>	-		Poured			
				<del> </del>	Gravel Paci			405	_	
					From	0/	feet to		teet	
				ļ <u> </u>	9.	. 11 . 1.5	WATER LEVEL	fort bala	land ourfood	
				ļ		)W				
	_		ļ	<del> </del>	11	eraturecold				
	<del> </del>				10.		LER'S CERTIFICA			
		tober	22	,, 02	This well or		der my supervision a		rt is true to the	
Date started	•	tober				knowledge.		_		
Date completed	UC	ronei		, 19	Name_Hu	mboldt D	rilling & Pu	mp Co.,	Inc.	
7. WELL	TEST DA				11	O. Box	E00			
TEST METHOD:		Pump	☐ Air I	Lift			Contractor		•••••••••••••••••••••••••••••••••••••••	
G.P.M. (F	Draw Down eet Below Stat	ic)	Time (Ho	eurs)	<b>_</b> -}i		NV 89446		***************************************	
did not measure		ALP	in 21a	24	Nevada cor issued by	ntractor's lice  the State Co	onse number ontractor's BoardQ	15234		
					Nevada dri	ller's license	number issued by th	e		
					Division	or water Kes	sources, the on-site d	ruler19	1-14	
					Signed	Ry driller	performing tual drilling	on site or co	ntractor	
					Don 15	? - 7 - °		5 011 3150 01 00		
					Date 1 S	·				

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

OFFICE USE ONLY	
Log No	
Permit No	
Basin	

PRINT OR TYPE ONLY					CR'S REP		Basin		***************************************
DO NOT WRITE ON BACK					rm in its entir				
<b>*</b>		accorda	ance with	NRS 534	1.170 and NAC	334.340	NOTICE OF IN	TENT NO.2	4095
: OWNER Wachon County	, 11+ili	tv Div	ision	1	ADDRESS A	T WELL LO			
1. OWNER Washoe County MAILING ADDRESS P.O. BO	x 1113	0	. ( ) () (-,		Spanish	Springs	SSP4		1
Reno. NV 895	20								4
2T LOCATION SE 1/4 NA	1/4 Se	c 12 4	• т	20	Andra R 24	821 E	Washne		
Reno. NV 895 LOCATION SE NW PERMIT NO Issued by Water Res	W L	l	7	<u> </u>					
Issued by Water Res	ources	1	Parcel No.				Subdivision Name		
3. WORK PERFOR	MED		4.		PROPOSED		5.	WELL TY	
	☐ Recond			Domestic .		Irrigation		ble 🛛 Rota	
☐ Deepen ☐ Abandon	Other		<u>.   U N</u>	Aunicipal.	/Industrial 💢	Monitor	☐ Stock ☐ Air	· U Othe	er
6. LITHO	LOGIC LO	)G			8.		LL CONSTRUCTION		
	Water	From	То	Thick-	Depth Drill	led 565	Feet Depth	Cased	546Feet
Material	Strata	From	10	ness	4	HOLE	DIAMETER (BIT	SIZE)	
Fine sand	<del> </del>	0	18	18	╣ _	7.40	From	To	
Coarse sand	<del>- </del>	18	26	8	╣	-	nesOFeet.		
Green clay w/sand	<del> </del>	26	28	2	╣		hesFeet.		
Granitic sand	<del> </del>	28	47	19	-		hesFeet		Feet
Gray silty clay	<del>                                     </del>	47	50	3			ASING SCHEDULI	E	
Granitic sand/small g	ravei	50	76	26	Size O.D. (Inches)	Weight/Ft. (Pounds)	Wall Thickness (Inches)	From (Feet)	To (Feet)
Ian clay		76	96	20 9	<del>                                     </del>	(1 Odikus)	<del> </del>	<u> </u>	<del></del>
Coarse volcanic sand	<del>                                     </del>	96	105	7	2		galvanized	+2	252
Ian silty clay	+	105	118	6	1				<del> </del>
Granitic sand	<del>                                      </del>	118	126	8	D - 6 4			<u></u>	<u> </u>
Brown clay	<b>†</b>	126	265	-	Perforation Type n		Slotted		
Gray/brown clay		265	275	10	Size pe	erforation_1/	8 X 2 1/2 feet to	4 per fo	20t
Gray clay w/sand		275	418	143	From	252	feet to	546	feet
Blue/gray clay	<u> </u>	418	425	7	From		feet tofeet to		feet
Brown silty clay Brown clay w/basalt s	and	425	435	10			feet to		
Red cinder w/red clay		435	457	22	- 11				
Fractured coarse basa	1+	457	465	8	Surface Se	al: K Ye			
Red cinder		465	487	22	III				Neat Cement
Basalt		487	498	11	II -	Method: 🔎		_	Cement Grout
Red cinder w/red clay		498	519				Poured		Concrete Grout
Weathered basalt		519	565	46	Gravel Pac	ked: 🔽 Y	res □ No		
, Ruther Co ou sure					From	55	feet to	546	feet
								<del></del>	
					9.		WATER LEVEL		
					_11		21.26'		
			ļ	ļ <u>.</u>	11		C		
			ļ	<b></b>	Water tem		.d°F Quality		
		<u></u>	<u> </u>	<u></u>	10.	DRII	LLER'S CERTIFICA	TION	
Date startedQ	ctobor	27		19 03			nder my supervision	and the repor	rt is true to the
Date completed					.	knowledge.			
				,	NameHun	boldt Dr	cilling & Pum	<del>ip. Со.,</del>	Inc.
	TEST DA				Address D	2.0. Box	500		
TEST METHOD:	Bailer [	☐ Pump	☐ Air I	_ift				***************************************	
G.P.M.	Draw Down et Below Sta	tic)	Time (Ho	urs)	Wir	nemucca	NV 89446	·	
			- 4 0 .	2 hrs	Nevada co	ontractor's lic	ense number		
aid not measure		- INIS	an Riq	-( 14/3	issued b	y the State Co	ontractor's Board.0.1	5234	
	<del>_</del>						number issued by the		
	·				Division	or water Re	sources, the on-site of	17111er494	4
					Signed	L. ("	EILL	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
			<u>.</u>		T .	By driller	performing actual drilling	ng on site or co	ntractor
					Date/	-7-93			

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

(Rev. 3-91)

# STATE OF NEVADA DIVISION OF WATER RESOURCES

### WELL DRILLER'S REPORT

OFFICE USE ONLY
Log No
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Basin

PRINT OR TYPE ONLY					orm in its enti		Basin		
DO NOT WRITE ON BACK					1.170 and NA		Nomice of the		24094
1. OWNERWashoeCounty	11+ 1 1 1+	v Div	ision	1	ADDRESS A	T WELL 10	NOTICE OF IN	TENT NO	
MAILING ADDRESS P.O. B	ox 1113	0	4- <b>3-</b> 4-0++		Spanish	Springs	Site #7	***************************************	***************************************
Reno. NV 8952	20			<u></u>					
2. LOCATIONNE	1/4 Sec	13	т	21	(N)s r20	)E	Washoe		County
PERMIT NO. Issued by Water Reso	NITTES		NA			······································	NA N	***************************************	
	<u> </u>			!				<del></del>	
3. WORK PERFORM		•	4.	Domestic	PROPOSED		5.	WELL TY	
	Recondit Other				/Industrial 🖸	Irrigation Monitor	☐ Iest ☐ Ca	ble ☐ Rotar r ☐ Othe	ry
6. LITHOL	OGIC LO	3			8.		LL CONSTRUCTI		
Material	Water Strata	From	То	Thick- ness	Depth Drill	led 360		Cased3	50 Fee
Fine sand & silt	1	0	5	5		HOLE	DIAMETER (BIT From	•	
Coarse granite sand		5	52	47	1 7	7/8 Inch	nesFeet	3 <b>6</b> 0 ,	- Peet
Granitic sand/clay		52	64	12			iesFeet		reet
Brown silty clay/sand		64	72	8			nesFeet		
Brn/red silty clay		72	85	13		C	ASING SCHEDUL	F.	
Tan silty clay/sand		85	95	10	Size O.D.	Weight/Ft.	Wall Thickness	From	То
White sand/clay		95	105	10	(Inches)	(Pounds)	(Inches)	(Feet)	(Feet)
Decomposed granodiori		105	190	85	2		Galvanized	+2	169
Granodiorite/white cl	<b>y</b>	190	250	60	ļ				
Lost circulation		250	270	20	<del> </del>	]	l	<u> </u>	<u> </u>
Granodiorite (white a)	<u> </u>	270 330	330 360	60 30	Perforation:	s: erforation S	lotted pipe		
ranodiorite/white_cl	<del>py</del>	330	300	30	Size pe	rforation 17	lotted pipe 8 X 2½ feet to		
					From	169	feet to	360	feet
	<b>†</b>				From		feet tofeet to		feet
							feet to		
					11		feet to		
					Surface Se	al: 🗘 Yes	s □ No	Seal Ty	ne:
					Depth of S				eat Cement
					11 -	Method: 🖒			ement Grout
	+				4		Poured	ЦС	oncrete Grou
					Gravel Pac		es 🗆 No		
	<del> </del>				From	60	feet to	360	feet
					9.		WATER LEVEL		
		-		<u> </u>	Static water	level	214.02'	feet below	land surface
					Artesian flo			i.P.M	P.S.I
					Water temp	peratureCO	Ld °F Quality	9000	***************************************
<u> </u>	<u> </u>		İ		10.		LER'S CERTIFICA		
Date started	Augus	t 29		., 19 <b>93</b>		vas drilled und knowledge.	der my supervision	and the report	is true to the
Date completed	Septe	mber	1	., 19. <b>.93</b>	1	•	ril <b>i</b> ing & Pu	mn Co	Inc
7. WELL	TEST DAT	4					Contractor	mp co.,	AIIC.
TEST METHOD:   Ba	iler 🗌	Pump	☐ Air L	ift	Address	0. Box	590 Contractor	***************************************	
	raw Down Below Static	:	Time (Hou	ırs)	<b>∃</b> I	nnemucca			
did f		di	d MOT	Tost		ntractor's lice the State Cor	nse number ntractor's Board(	15234	
		A.	a on	Riq	Nevada dri Division	ller's license of Water Res	number issued by the	rillerT_	1195-1
				,	Signed	P. 1	OY CIA	Pa	
					,	By driller	performing ctue drilling	g on site or con	tractor

(PLEASE PRINT OR TYPE)

ALTH LABORATORY MADA DIVISION OF HEALTH

1660 N. Virginia Street Reno, Nevada \89503

(702) 688-1335

SAMPLE ID:

ろらP2

### V...TER CHEMISTRY ANALYSIS

Attn: Fees may apply to some types of samples.

TYPE OF ANALYSIS:

Check here for ROUTINE DOMESTIC ANALYSIS.

Circle the constituents needed for PARTIAL ANALYSIS.

### **SAMPLING INSTRUCTIONS:**

The sample submitted must be representative of the source. Spring and surface water samples should be as free of dirt and debris as possible. Wells should be pumped thoroughly before sampling, changing the water in the casing at least three times. Product water from filters should be sampled after running for about ten (10) minutes.

ED EVANS Owner WASHOE COUNTY Phone Address P.O. 130x 11130 City RENO

REPORT TO:

Name ED EVANS : WCUD Address P.O. Box 11130 City RENO State NV

NEVADA ..County.. .....Range..... SPANISH SPRINCS General Location....

All of the information below must be filled in

or the analysis will not be performed.

REASON FOR ANALYSIS:

Source Address MILE EAST OF

☐ Loan Personal health reasons

Purchase of the property

Rental or sale of property ☐ Subdivision approval

Other BASELINE WATER GUELITY

### USE OF WATER:

☐ Dornestic drinking water

☐ Geothermal

☐ Industrial or mining

☐ Irrigation

Other Didital Vit. Initials SSPZ

### **SOURCE OF WATER:**

Filter	☐ Yes	No X	
Public	☐ Yes	ĭ No	
Spring			
Well	D	epth 550	2
Hot		Cold×	٠
IN US	E 🗌 Ye	s 🗷 No	•

Surface.....

Casing diameter..... Casing depth... 485 ft.

The results below are representative only of the sample submitted to this laboratory.

- 1//-1	1 / 1			ORY USE ONLY	-		•	PRINT OTH	HER DESIRED
Constituent 1641	161 ppm	Constituent 5	15.5 <sub>ppm</sub>	4.5 Constituent	.7 <sub>ppm</sub> -2	754 onstituent 141	70 <sub>s.u.</sub>	Constituent	ppm
T.D.S. @ 103° C.	160	Chloride	10	Iron	.09	Color	3	Cá	10.00
Hardness	23	Nitrate -N	1.3	Manganese	.01	Turbidity	3.2	Cr	, 40.00
Calcium	6	Alkalinity	90	` Copper	0.00	pН	9.03	Pb	0.008
Magnesium	s	Bicarbonate	76	Zinc	2.56	EC	246	Hig	10000
Sodium	42	Carbonate	17	Barium	.02	219500	.26	Se	<0.00
Potassium	5	Fluoride	.24	Boron	0.0	DEAL	VED.	Ag	10.00
Sulfate	19	Arsenic	.004	Silica	33	RECEI	VEU	- 5	
						JUL 2 6	1994		
						BUREAU G: PROTECTION Carson	SEnv		
Fee			Remarks						KR

Fee	
Collected by	·••••
PWS I.D.	
WA—Pri Sec	

pm = parts per million, milligrams per liter

.U. = Standard Units

O-1561 (Rev 4-92)

IN TRIPLICATE (PLEASE PRINT OR TYPE)

1501 JAN 14 11 10 24

### NEVADA STATE HEALTH LABORATORY SAMPLE: SSP4

NEVADA DIVISION OF HEALTH

1660 N. Virginia Street Reno, Nevada 89503

(702) 688-1335

<b>9</b> 5		
<b>WATER</b>	<b>CHEMISTRY</b>	<b>ANALYSIS:</b>

All of the information below must be filled in

Attn: Fees may	apply to so	me types of sam	plės.	o transport de de de la companya de La companya de la co		•	naiysis will no			
YPE OF AN	ALYSIS:				State NEVADA County WASHOE  Township 20N Range 21E Section 7					
Check here for		E DOMESTIC A	ANALYSIS.		Comercial		Kange⊆ı.	Section.	T	
Circle the cor	nstituents ne	eded for PARTI	AL ANALYS	SIS.	General Location SPANISH SPIZINGS VALLEY Source Address 1/2 MILE EAST SPANISH SPRINGS ROAD					
AMPLING I The sample submit vater samples shou umped thoroughly tree times. Produ about ten (10) min	tted must be ruld be as free y before samuet water from the state of the samuet water from the same water from the samuet water from the samuet water from the same wa	representative of to of dirt and debri- pling, changing the m filters should	s as possible. V he water in the be sampled aft	Vells should be casing at least er running for	REASON FOR ANALYSIS:  USE OF WATER:  Domestic drinking water  Personal health reasons  Purchase of the property  Rental or sede of property  Irrigation					
ampled by Eo	EVANS		Date /	/94	🔲 Subdiv	vision approva	1		HORING WELL	
wner WASHOE					🔀 Other	BASELINE H	20 QUALITY	Initials Mou	TOAINL WELL SSP	
ity REN										
Address P.	EVANS 0. BOX 11	: Washor C			Filter Dublic Spring Well. X	Yes ★ N Yes ▼ N Yes ▼ N Yes ▼ N	o Typ No Nan Suri  565 ft. Cas Cas	nefacefaceface	in.	
·	Th	e results belov	w are repres	entative only	of the sampl	e submitted	to this labora	tory.	د در	
0.0228	3 <u>1</u> 7	FO BO.65 Constituent		ORY USE ONI		1100	)84 s.u.	PRINT OTH CONSTITUE	ER DESIRED NTS BELOW	
T.D.S. @ 103° C.	175	Chloride	7	Iron	0.12	Color	5	Cd	<0.001	
Hardness	7	Nitrate -N	0.0	Manganese	0.01	Turbidity	1.6	Cr	10.005	
Calcium	1	Alkalinity	114	Copper	0.00	рН	9.26	Pb	10005	
Magnesium	1	Bicarbonate	95	Zinc	0.49	EC	271	Hg	10.0005	
Sodium	61	Carbonate	55	Barium	0.03	219500	0-0.20	5e	10.001	
Potassium	0	Fluoride 🗼	0.26	Boron	0.1	"" REC	EIVED	Ag	<0.005	
Sulfate	13	Arsenic	0.009	Silica	30		2 8 1994	ŧ		
				CROSS ALPHA	K3 Pute	BABUMO	TECTION SERVICES	MBAS	(0,1	
				BETA	Ks Pula				1	
collected by	· · · · · · · · · · · · · · · · · · ·	12/194	Remarks	Po# 1	37892	2/24/94	P		*KR	
DWA—Pri	$\int \int \int ds$	† · · · · · · · · · · · · · · · · · · ·							······································	
(5)	d	.3rd						166/	94	
ate Rec'd om = parts per millio U. = Standard Units		Init per liter						Ty	<i>L</i>	
			1					O-15	61 (Rev. 4-92)	

# SPANISH SPRINGS MONITORING WELL CONSTRUCTION BID RESULTS JUNE 8, 1993

ITEM DESCRIPTION	\$237,900.00		\$143,850.00	<b>\$</b> 1	\$127,000.00	\$127,		\$119,725.00		TOTAL			
HUMBOLDT DRILLING   NEVADA D	00 \$ 3,500.00	\$ 350.	3,500.00	\$ 350.00 \$	830.00	4	<b>*</b>	\$ 1,650.00	\$ 165.00	EACH	10	PROTECTIVE WELL CAP	8
HUMBOLDT DRILLING   NEVADA D	00 \$ 15,000.00	<b>\$</b> 150.	24,000.00	\$ 240.00 \$	000.00	0	<b>₩</b>	\$ 25,000.00	\$ 250.00	HOUR	8	AIR DEVELOPMENT	7
HUMBOLDT DRILLING   NEVADA D	00 \$ 5,000.00	5	5,000.00	\$ 5.00 \$	00.00	0	44	\$ 3,600.00	\$ 3.60	FEET	1000	GROUT SANITARY SEAL	a
HUMBOLDT DRILLING   NEVADA D	00 \$ 6,400.00	\$ 160.	5,000.00	\$ 125.00 \$	400.00	0	49	\$ 4,400.00	\$ 110.00	CU.YD.	40	GRAVEL PACK	O
HUMBOLDT DRILLING   NEVADA D	00 \$ 19,500.00	\$ 13.	5,250.00	\$ 3.50 \$	250.00	0	49	\$ 6,150.00	\$ 4.10	阳	1500	2 INCH BLANK STEEL PIPE	4
HUMBOLDT DRILLING   NEVADA D	00 \$ 32,000.00	\$ 16.	11,000.00	\$ 5.50 \$	600.00  :	4.80 \$ 9,	49	\$ 12,900.00	\$ 6.45	FEET	2000	2 INCH SLOTTED STEEL PIPE	ω
HUMBOLDT DRILLING   NEVADA DRICE   TOTAL   PRICE   TOTAL   PRICE   MOBILIZATION   10   EACH   \$ 1100.00   \$ 11,000.00   \$ 1,777.00   \$ 125.00   \$ 5,000.00   \$ 60.00   \$ 1,777.00   \$ 11.15   \$ 39,025.00   \$ 14.50   \$ 14.50   \$ 11.15   \$ 39,025.00   \$ 14.5	00 \$ 17,500.00	\$3,500.	7,000.00	\$1,400.00 \$	000.00	XXX \$ 10,	<b>\$</b> 2,0	\$ 11,000.00	\$ 2200.00	EACH	<b>C</b> I	GEOPHYSICAL LOGS	N
HUMBOLDT DRILLING   NOBILIZATION   10   EACH   \$ 1100.00   \$ 5,000.00   \$ \$ 5,000.00   \$	00 \$ 105,000.00	<del>\$</del> 30.	45,500.00	\$ 13.00 \$	750.00	14.50 \$ 50,	49	\$ 39,025.00	\$ 11.15	<u>.</u>	3500	DRILL 7 6/8 INCH BOREHOLE	_
CRIPTION QUANTITY UNIT PRICE TOTAL PMOBILIZATION 10 EACH   \$ 1100.00 \$ 11,000.00   \$ 5,000.00   \$							-						SECTIO
CRIPTION QUANTITY UNIT PRICE TOTAL F MOBILIZTION/DEMOBILIZATION 10 EACH  \$ 1100.00 \$ 11,000.00  \$	00 \$ 10,000.00	\$ 250.	7,600.00	\$ 190.00 \$	400.00	60.00 \$ 2,	49	\$ 5,000.00	\$ 125.00		40	STANDBY TIME	N
CRIPTION QUANTITY UNIT PRICE TOTAL PRICE TOTAL PRICE TOTAL PRICE TOTAL	00 \$ 24,000.00	\$2,400	30,000.00	\$3,000.00 \$	770.00	77.00 \$ 17,	<del>*</del> -: .:	\$ 11,000.00	\$ 1100.00		10	MOBILIZTION/DEMOBILIZATION	_
HUMBOLDT DRILLING NEVADA DRILLING SARGENT DRILLING  QUANTITY UNIT PRICE TOTAL PRICE TOTAL PRICE TOTAL							-					_	SECTIO
NEVADA DRILLING SARGENT DRILLING	TOTAL	PRICE	TOTAL		≱		PR	TOTAL	PRICE	UNIT	QUANTITY	DESCRIPTION	TEM D
	K DRILLING	BEYL		SARGENT	<u>ଷ</u> 	/ADA DRILLI	NE NE	DRILLING	HUMBOLDI				

### Laboratory **Analysis Report**

WASHOE COUNTY UTILITY DIV.

ED EVANS

P.O. BOX 11130 **RENO NV 89520**  Environment Monitoring.

Client : WAS-314

Taken by: CLIENT-E. EVANS

Report : 15610 PO# : 154415

7/15/91

	Colle	cted	TOTAL DISSOL.	NITRATE-N	ARSENIC AA HYDRIDE	CHLORIDE	
Sample	Date	Time	MG/L	MG/L	MG/L	MG/L	
SSP5	2/15/96	10:30	334	6.8N	0.13	27	
SSP5 SSP6 SSP8 SSP10	2/15/96	11:25	325	3.2N	0.017	42	
SSP8	2/15/96		408	28N	0.051	60	
SSP10	2/15/96	12:50	312	5.6N	0.032	36	

Approved By:

This report is applicable only to the sample received by the laboratory. The liability of the laboratory is limited to the amount paid this report. This report is for the exclusive use of the client to whom it is addressed and upon the condition that the client umes all liability for the further distribution of the report or its contents.

### Laboratory Analysis Report

WASHOE COUNTY UTILITY DIV. ED EVANS P.O. BOX 11130

RENO NV 89520

Sierra Environmental Monitoring, Inc. 25181118 State of the state of t

Date : 1/17/96 Client : WAS-314

Taken by: CLIENT-E. EVANS

Report : 15327

PO# : 017333/017334

Page: 1

E FIRST SAMPLE 1/4/96

ample	Collected Date Time	MG/L CACO3	PH S.U.	TOTAL DISSOL. SOLIDS MG/L	NITRATE-M MG/L	ARSENIC AA HYDRIDE MG/L	BARIUM ICP MG/L
SP5	1/04/96 10:05	136B	7.73	340	6.3N	0.064	0.06
SP6	1/04/96 11:10	124B	7.70	334	3.3N	0.018	< 0.01
SP8	1/04/96 14:30	96B 96B	7.74 7.65	446 326	22N	0.039	0.02
SSP10	1/04/96 13:30	90B	7.65	326	5.3N	0.033	0.05
		CALCIUM	CHROMIUM	COPPER,	IRON,	MAGNESIUM	MANGANESE
	Collected	ICP	ICP	ICP	ICP	ICP	ICP
Sample	Date Time	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
SSP5	1/04/96 10:05	19	< 0.02	< 0.02	0.02	3.0	< 0.01
SSP6	1/04/96 11:10	57	< 0.02	< 0.02	0.03	9.4	< 0.01
SSP8	1/04/96 14:30	62	< 0.02	< 0.02	< 0.02	15	< 0.01
SSP10	1/04/96 13:30	35	< 0.02	< 0.02	< 0.02	9.2	< 0.01
		MERCURY	NICKEL	POTASSIUM	SELENIUM	SODIUM	ZINC
	Collected	AA COLD VAPOR		ICP	AA HYDRIDE	ICP	ICP
Sample	Date Time	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
SSP5	1/04/96 10:05	<0.0005	< 0.04	4.0	<0.001	86	0.94
SSP6	1/04/96 11:10	<0.0005	< 0.04	6.8	<0.001	27	6.0
SSP8	1/04/96 14:30	<0.0005	< 0.04	7.5	<0.001	33	0.75
SSP10	1/04/96 13:30	<0.0005	< 0.04	5.0	<0.001	45	0.79
	THE RESERVE AND DESCRIPTION OF THE PARTY OF	LEAD	CADMIUM	SILVER	CHLORIDE	FLUORIDE	SULFATE
	Collected	AA FURNACE	AA FURNACE	AA FURNACE			
Sample	Date Time	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
SSP5	1/04/96 10:05	0.003	<0.0002	<0.0005	24	1.8	49
SPÓ	1/04/95 11:10	0.007	<0.0002	<0.0005	35	0.2	50
SSP8	1/04/96 14:30	<0.002	<0.0002	<0.0005	49	0.2	42
SSP10	1/04/96 13:30	<0.002	<0.0002	<0.0005	31	0.4	66
	A. (1) A.	THALLIUM	BERYLLIUM	ANTIMONY			
	Collected	AA FURNACE	AA FURNACE	AA FURNACE			
Sample	Date Time	MG/L	MG/L	MG/L			
	n Next Page		The state of the s				

Approved By:

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WASHOE COUNTY UTILITY DIV.

ED EVANS

P.O. BOX 11130

**RENO NV 89520** 



### Sierra Environmental Monitoring, Inc.

Date : 1/17/96 Client : WAS-314

Taken by: CLIENT-E. EVANS

Report : 15327

PO# : 017333/017334

age: 2

					rage. E
Sample	Callected Date Time	THALLIUM AA FURNACE MG/L	BERYLLIUM AA FURNACE MG/L	ANTIMONY AA FURNACE MG/L	
SSP5	1/04/96 10:05 1/04/96 11:10	1	<0.0002 <0.0002	<0.002 <0.002	
SSP6 SSP8	1/04/96 11:10	<0.0005	<0.0002	<0.002	

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