Appendix A

APR- 2-93 FRI 8:57 ←1

MX-6 - well W01

E - DT-6

Log No.	25141
Permit No.	
Basin	

WELL DRILLERS REPORT

Please complete this form in its entirety

1. OWNER [illegible] ADDRESS [illegible]
[illegible] ([illegible] Inc) [illegible] Road [illegible]
[illegible]

2. LOCATION SE ¼ NE ¼ Sec. 22A T. 13 S N/S R. 64 E E. Clark Co
PERMIT NO. 74 [illegible] #N-5-21-11 13

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

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
Fill dirt		0	10	10
Clay with sand + gravel		10	30	20
Sand + boulders		30	40	10
Sand, clay + rock		40	50	10
Boulders		50	70	20
Chert + limestone		70	110	40
Clay with limestone		110	130	10
Chert with limestone		130	140	20
White limestone		140	150	40
Limestone with clay		180	210	30
[illegible]		210	253	43
Clay with little limestone		253	275	22
Chert + limestone		275	288	13
Red limestone		288	315	27
Brown + yellow limestone		315	340	25
White limestone		340	352	12
Limestone		352	917	565
			937	

Drilled 12", 937' [illegible]

Date started April 20, 1981
Date completed June 3, 1981

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 9 7/8 inches Total depth 937
Casing record 55' 20" - 325' 8 5/8"
Weight per foot .... Thickness ....

Diameter	From	To
20 inches	0 feet	55'
8 5/8 inches	2.11 feet	325'
inches	feet	
inches	feet	
inches	feet	
inches	feet	

Surface seal: Yes ☒ No ☐ Type Cement
Depth of seal 85'
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 2142
Static water level [redacted] Feet below land surface 45
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 Layne-Western Co. Inc
Address 1605 S Hardy Dr. Tempe Az
Nevada contractor's license number 889
Nevada driller's license number 1289
Signed [signature]
Date June 3, 1981

DIVISION OF WATER RESOURCES

STATE OF NEVADA

DIVISION OF WATER RESOURCES

Arrow Canyon Well WO 2

WELL DRILLERS REPORT

Please complete this form in its entirety

1" = 200' Arrow Canyon Well #4

OFFICE USE ONLY
Log No.
Permit No.
Basin

1. OWNER Moapa Valley Water Dist ADDRESS P.O. Box 257 Logandale, Nevada 89021

2. LOCATION SE ¼ NE ¼ Sec. 7 T. 14S N/S R. 65 E. M.D.B.&M. Clark Co.
PERMIT NO. 52520

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
Cobble Stone		0	26	26'
Clay + Sand		26	66	40'
Cobble + Sand		66	80	14'
Cemented gravel		80	460	380'
Bed rock		460	565	105'
Note: Hit fault at		503'	to	565'

RECEIVED
JUN 17 1991
Div. of Water Resources
Branch Office - Las Vegas, NV

Date started Sept. 3, 1990
Date completed Jan. 25, 1991

7. WELL TEST DATA

Pump RPM	G.P.M.	Draw Down	After Hours Pump
	3795	30'	35 hrs.
	4500	39'	1 hr.

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 18 inches Total depth 565
Casing record
Weight per foot ..... Thickness

Diameter		From		To
16	inches	0	feet	195
14	inches	195	feet	205
14	inches	255	feet	265
	inches		feet	
	inches		feet	
	inches		feet	

Surface seal: Yes ☑ No ☐ Type Cement
Depth of seal 120'
Gravel packed: Yes ☐ No ☑
Gravel packed from ..... feet to .....

Perforations:
Type perforation
Size perforation
From 205 feet to 255 mill slot
From 265 feet to 315 mill slot
From 315 feet to 565 screen
From ..... feet to .....
From ..... feet to .....

9. WATER LEVEL
Static water level 44.8 Feet below land surface
Flow ..... G.P.M.
Water temperature 90 ° F. Quality 596 05 ph 7.15

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

Name A-A Pump + Drilling
Address Star Route New Castle Ut. 8427
Nevada contractor's license number CO.18.239
Nevada driller's license number 811
Signed [signature]
Date 2-18-91

Nevada Division of Water Resources

Well Log Database

AC-1

Query Results

Type of Site: N

Log No.: 35210

Sequence No.: 10947

Permit No.: 52520

Basin: 219

Notice of Intent#: 0

Owner: MOAPA VALLEY WATER DISTRICT
Mailing/Well Address: P O BOX 257 LOGANDALE NV

Location SE NE **Sec:** 07 **Twn:** 14S **Rng:** 65E **Ref:** MD **State/Co. Code:** 32003

Waiver No: **Parcel No.:** **Lot No.:** **Block No.:**

Type of Work: N **Proposed Use:** P **Drilling Method** H **Subdiv. Name:**

Source Agency: NV003

Depth to Bedrock:

Construction Data Quality: G

Lithologic Data Quality: G

Aquifer Type:

Date Started: 9/3/1990

Date Complete: 1/25/1991

Yield 3795 **G.P.M.**

Draw Down: 30 **After Hours Pump:** 35

Pumping Water Level:

Specific Capacity:

Test Method: C

Work Type Remarks:

General Remarks:

Additional Remarks:

Well Construction

Hole Depth: 565 **feet**

Surface Casing Diameter: 16 **inches**

Cased To: 565 **feet**

Casing Reductions: 1

Perforations:

From 205 **feet to** 565 **feet**

Perforation Length:

Perforation Intervals: 3

Depth of Seal: 120 **feet**

Gravel Packed: N

from 0 **feet to** 0 **feet**

Static Water Level: 45 **ft below LSD**

Water Temperature: 90° **F**

Contractor Name: A & A PUMP AND DRILLING

Contractor License Number: 18239

Address: HC 76 BOX 60 BERYL JUNCTION UT 84714

Contractor's Drlr No.: 811

Driller Lic.No.: 811

Code Definitions

Nevada Division of Water Resources

Well Log Database

AC#2

Query Results

Type of Site: N

Sequence No.: 82530

Log No.: 93147

Permit No.: 66043

Basin: 219

Notice of Intent#: 26347

Owner: MOAPA VALLEY WATER DISTRICT
Mailing/Well Address: P O BOX 257 LOGANDALE NV 89021

Location SE NE **Sec:** 07 **Twn:** 14S **Rng:** 65E **Ref:** MD **State/Co. Code:** 32003

Waiver No: **Parcel No.:** **Lot No.:** **Block No.:**

Type of Work: N **Proposed Use:** P **Drilling Method** R **Subdiv. Name:**

Source Agency: NV003

Depth to Bedrock:

Construction Data Quality: G

Lithologic Data Quality: G

Aquifer Type:

Date Started: 3/25/2004

Date Complete: 4/24/2004

Yield 900 **G.P.M.**

Draw Down: 127.6 **After Hours Pump:** 24

Pumping Water Level:

Specific Capacity:

Test Method: P

Work Type Remarks:

General Remarks:

Additional Remarks:

Well Construction

Hole Depth: 746 **feet**

Surface Casing Diameter: 16.62 **inches**

Cased To: 742 **feet**

Casing Reductions: 0

Perforations:

From 480 **feet to** 742 **feet**

Perforation Length:

Perforation Intervals: 3

Depth of Seal: 459 **feet**

Gravel Packed: Y

from 470 **feet to** 746 **feet**

Static Water Level: 44.4 **ft below LSD**

Water Temperature: 87° **F**

Contractor Name: ZIM IRRIGATION & BAKERSFIELD WELL & PUMP CO

Contractor License Number: 37248

Address: 4545 E LINCOLN FRESNO CA 93725

Contractor's Drlr No.:

Driller Lic.No.: 2268

Code Definitions

ZIM INDUSTRIES

DRILLING REPORT

AC #2

JOB NUMBER 04102

JOB NAME AND DESCRIPTION : ARROW CANYON CULINARY WATER WELL

OWNER : MOAPA VALLEY WATER DISTRICT
2625 NORTH MOAPA VALLEY BLVD.
P. O. BOX 257
LOGANDALE, NEVADA 89021

CONTACT: VAN ROBINSON GENERAL MANAGER
PHONE: (702)397-6893 FAX: (702)397-6894

ENGINEER: LESLIE & ASSOCIATES, INC.
444 SOUTH MAIN STREET A-4
CEDAR CITY, UTAH 84720

CONTACT: JOEY LESLIE VICE PRESIDENT
PHONE: (435) 586-9474

WELL LOCATION: SE. ¼ NE. ¼

SECTION 7 TOWNSHIP 14 S. RANGE 65 E. COUNTY CLARK
PERMIT NUMBER: 66043 NOTICE OF INTENT # 26347

. *DRILLING METHOD : (FLOOD) REVERSE*

SURFACE PIPE REQUESTED: YES

DIAMETER 30 IN. LENGTH 100 FT. WALL THICKNESS 3/8
39 IN. BORE HOLE DRILLED BY ALLEN DRILLING TO 100 FT.

ZIM INDUSTRIES

CEMENT : 30 YDS. 27SK. NEAT CEMENT PUMPED VIA. TRIMMIE
SOURCE: ALL STAR TRANSIT MIX COMMODITY CODE AS-1270

PILOT HOLE REQUIRED: NO
DRILL ONE PASS 26 IN.

START DRILLING 4-02-04 @9:00 AM.
T.D. 4-15-04 @ 7:15 AM 746 FT.

GEOPHYSICAL LOGS
RAN BY SOUTHWEST EXPLORATION SERVICES
E- LOG
3- ARM CALIPER
DEVIATION

(NOTE) LOGS WERE RAN @ 725 FT.
LOG TIME: 2 ¼ HR.
6 HRS. TO TRIP IN AND OUT OF HOLE TO DRILL TO 746FT
14 ½ HRS. STANDBY WAITING ON EXTRA CASING

CASING DESIGN:
TOTAL CASING: 753 FT.
SET @ 742 FT.
ALL CASING ROSCO MOSS HSLA
BLANK 16 IN. .375 WALL 15 7/8 ID.
LOUVERED 16 IN. .312 WALL 16 ID. 1/8 IN. SLOT
+2 - 480 BLANK
480 - 520 LOUVERED
520 - 550 BLANK
550 - 610 LOUVERED
610 - 650 BLANK
650 - 742 LOUVERED

ZIM INDUSTRIES

LITHOLOGY LOG

ENCOUNTERED FIRST WATER @ 47 FT.

0 - 21 6 IN. - 2 FT. COBBLES AND BOULDERS INBEDDED IN CLAY
21 - 45 SAND GRAVEL
45 - 52 SAND GRAVEL AND LARGE COBBLES
52 - 59 SAND GRAVEL
59 - 75 SANDY BROWN CLAY WITH GRAVEL
75 - 330 CONGLOMERATE
330 - 460 CONGLOMERATE WITH INCREASED GRAVEL
460 - 467 BROKEN STONE
467 - 746 BEDROCK (LIMESTONE)

HIT FRACTURE @ 701 TOOK WATER TO STATIC
725 - 746 PICKED UP INCREASE IN WATER

PUMP DEVELOPMENT AND TESTING

11 ¼ HR. STEP TEST WITH PUMP AND SURGE BETWEEN STEPS
300 GPM 600 GPM 900 GPM

24 HR. CONSTANT RATE @ 900 GPM
STATIC WATER LEVEL 44.4
PUMPING WATER LEVEL 172
BOWLS SET @ 290 FT.

ZIM INDUSTRIES

GRAVEL FEED TUBE

3 IN. GRAVEL TUBE +1 - 475 FT.

SOUNDING TUBE

2 IN. SOUNDING TUBE WITH ENTRANCE BOX +1 - 215 FT.

GRAVEL PACK

3/8 X 8 TACNA
746 FT. - 470 FT. 25 SUPER SKS. 37.5 TONS

TOP BENTONITE SEAL

470 FT. - 459 FT. 40 SKS. 3/8 HOLE PLUG

TOP CEMENT SEAL

459 FT. - 0 FT. 66 YDS. NEET CEMENT
SOURCE: PERCISSION AGGEREATE 24 SK. NEET CMNT

BIT RECORD:

100 FT. - 460 FT. 17 ½ MILL TOOTH 4 CONE BUTTON 2ND.STAGE 26IN.
460FT. - 746 FT. 17 ½ BUTTON 5 CONE BUTTON 2ND. STAGE 26 IN.

RIG DEVELOPMENT

SWABBING: 28 HRS.

SOUND PANELS

NOT REQUIRED

MATERIAL USED

BASE ROCK 48 TON
QUICK GEL 70 SKS. (USED ON SURFACE HOLE)
HOLE PLUG 40 SKS.
GRAVEL PACK 37.5 TON (3/8 X 8 TACNA)
CEMENT 96 YDS NEET CEMENT

Muddy Ri r

WELL LOG AND REPORT TO THE STATE ENGINEER OF NEVADA

W03

Log No.....
Rec.....19....
Well No.....
Permit No. 23872 U

Do not fill in. 24008

PLEASE COMPLETE THIS FORM IN ITS ENTIRETY

Owner Virgin Valley Water Co. Driller D.E.SIDES

Address Logan Dale Nev. Address D ALAMO NEV Lic. No. 458

Location of well: NW ¼ NW ¼ Sec. 22, T 15 S, R 67 E, in Clark Coun

or 0° 27' East, 860.9' From NW Corner sec 22 T.15s R.27 E., M.D.B& M

Water will be used for CITY & IRRIG PURPOSE Total depth of well 154 ft

Size of drilled hole ~~24in to 60ft~~ 16 ~~154 ft~~ Weight of casing per linear foot 42 lb

Thickness of casing ¼ on 250 Temp. of water 68 Degree

Diameter and length of casing 16 10

(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 22 ft

If flowing well describe control works.....

(Type and size of valve, etc.)

Date of commencement of well 4-10-67 Date of completion of well 4-24-67

Type of well rig 1936 Model Fort Worth Spudder Cable tool

LOG OF FORMATIONS

From feet	To feet	Thickness feet	Type of material
0	27	27	Small Boulders & Top Soil
27	48	21	Silt Sand lime Gravel
48	57	9	Soft lime Rock
57	70	13	Very hard Rock
70	89	19	Porous lime Stone) water
89	94	5	Sand Rock
94	120	26	white lime Stone Porous
120	134	14	Course Gravel Strong wate
134	150	16	Very hard Rock
150	154	4	Cherts) tools full
			Dr wedge, S-Taps
			Drilling

Water-bearing Formation, Casing Perforations, etc.

Chief aquifer (water-bearing formation)

from 60 to 154 ft

Other aquifers.....

First water at 60 ± feet.

Casing ~~perforated~~

from 0 to 60 ft

Size of perforations

~~1½~~ in.

919

LOG OF FORMATIONS—Continued

...om feet	To feet	Thickness	Type of material

CASING RECORD

Diam. casing	From feet	To feet	Length	REMARKS—Seals, Grouting, etc.
				Drilled 24 in hole to 54 ft then Drilled 14 in hole to 154 ft Set 70 ft 10 in Casing used 14 yards Cement to Seal all Contamination & Top Water

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

WELL DRILLER'S STATEMENT

...is well was drilled under my jurisdiction and the ...ove information is true to my best information and ...lief.

Signed D. P. Sisler
Well Driller

By.....

License No. 458

...ed 4-24-..., 19 67

(Not to be filled in by Driller)

Appendix B

Moapa Valley Water District

2003 WATER ANALYSIS

PARAMETER	SOURCE ("W" = Well "S" Spring)				FED / STATE MCL (mg/L)
	Arrow Canyon "W"	Baldwin "S"	Jones "S"	MX-6 "W"	
Arsenic	.016	.012	.017	.019	0.05
Calcium	58	60	61	55	N/A
Copper	0.015	ND	.0147	.098	1.3
Iron	ND	ND	ND	ND	0.60
Magnesium	24	26	27	24	150
Manganese	ND	ND	ND	ND	0.10
Potassium	11	11	11	10	N/A
Sodium	90	88	91	87	Advisory 20 mg/L
Zinc	ND	ND	ND	ND	5.0
Total Dissolved Solids	534	568	576	485	1000
Hardness, Total (as $CaCO_3$)	250	250	260	240	N/A
Alkalinity, Total (as $CaCO_3$)	220	200	200	220	N/A
Alkalinity - Hydroxide	ND	ND	ND	ND	N/A
Alkalinity - Carbonate	ND	ND	ND	ND	N/A
Alkalinity - Bicarbonate	220	200	200	220	N/A
Fluoride	2.14	2.09	2.15	2.08	4.0 / 2.0
Chloride	68	180	73	180	400
Sulfate	160	180	180	170	500
Nitrate, as N	.41	.40	.40	.41	10

Results in milligrams per liter (mg/L), same as parts per million
ND - Not detected at or above minimum detection limit
MCL – Maximum contaminant level
N/A – No regulatory standard for this constituent

PARAMETER	RESULT (units)				FED/STATE (units)
	Arrow Canyon	Baldwin	Jones	MX-6	
pH	7.61 pH Units	7.58 pH Units	7.61 pH Units	7.75 pH Units	Between 6.5 - 8.5

USGS HYDRAULIC PROPERTIES DATABASE FOR UCA AND LCA

Well Name	Geologic Units and Lithologies Present in Test Interval	Pumped Well	Test Start Date	Test Finish Date	Length of Test (min)	Type of Aquifer Test	Average Discharge (L/sec)	Hydraulic Conductivity (m/d)	Transmissivity (m2/day)
ATS TH-1	Bonanza King and Carrara Fms	TH-2	10/6/1967	10/7/1967	1140	Constant discharge	59.9	186.05	12000
ATS TH-3	Bonanza King and Carrara Fms	TH-2	10/6/1967	10/7/1967	1140	Constant discharge	59.9	226.29	13600
ATS SH-1	Bonanza King Fm rust-faulted, brecciated, vuggy dolomite and limestone	ATS TH-2	10/6/1967	10/7/1967	1140	Constant discharge	59.9	824.24	13600
Five Springs shallow well	Bonanza King Fm Fractured dolomite cut by intersecting normal faults	Five Springs deep	2/17/1971	2/18/1971	1350	Constant discharge	33.9	12.18	330
MX-CE-DT-4	Monte Cristo Limestone Karstic, fratured, fine-grained and cherty limestone on normal fault	MX-CE-DT-5	8/28/1981	9/27/1981	29021	Constant discharge	214.5	8.00	744
MX-CE-DT-4	Monte Cristo Limestone Karstic, fratured, fine-grained and cherty limestone on normal fault	n/a	12/20/1980	12/23/1980	4620	Constant discharge	34	197.10	19000
MX-CE-DT-5	Monte Cristo Limestone Karstic, fratured, cherty, silicsous and fine-grained limestone on limestone on normal fault	n/a	8/28/1981	9/27/1981	19581	Constant discharge	214.5	318.40	27000
MX-CE-DT-6	Monte Cristo Limestone Fractured, shaly, cherty, and siliceous limestone in a zone of normal and thrust faults	n/a	12/9/1986	12/12/1986	3963	Constant discharge	29.8	5.06	740
Arrow Canyon Well	Bird Spring Formation Karstic, fractured dolomite and partly cherty limestone	n/a	12/9/1993	4/9/1994	174240	Constant discharge	183	264.36	29000
EH-4	Bird Spring Formation Karstic, fractured dolomite and partly cherty limestone	Arrow Canyon Well	12/9/1993	4/9/1994	174240	Constant discharge	183	656.37	34000
NCAP-DR-1	Simonson Dolomite Sparsely fractured, very fine-grained to granular dolomite	n/a	2/3/1989	2/4/1989	1638	Constant discharge	0.91	1.38	42
Grant Canyon #1	Simonson Dolomite Vuggy, brecciated dolomite	n/a	9/1/1983	9/1/1983	60	Drill-stem	0.65	0.03	0.79
Grant Canyon #5	Guilmette Formation Limestone and dolomite	n/a	8/1/1984	8/1/1984	60	Drill-stem	2.14	0.14	4.3
Grant Canyon #4	Guilmette Formation Limestone and dolomite	n/a	6/1/1984	6/1/1984	62	Drill-stem	5.2	5.61	46
Grant Canyon #3	Guilmette Formation Limestone and dolomite	n/a	8/1/1984	8/1/1984	60	Drill-stem	1.42	2.56	21
Bacon Flat #1	Guilmette Formation Limestone and dolomite	n/a	7/1/1981	7/1/1981	nd	Drill-stem	0.25	0.04	0.39
Adobe Federal 16-1	Guilmette Formation Limestone and dolomite	n/a	10/1/1982	10/1/1982	60	Drill-stem	1.59	0.75	33
Lone Tree 1/14/1943	Guilmette Formation Limestone and dolomite	n/a	2/1/1987	2/1/1987	120	Drill-stem	11.8	0.03	0.58
DOC Federal 5/18/204	Joana Limstone Cherty limestone	n/a	11/1/1986	nd	120	Drill-stem	3.88	0.47	7.8
Dobbin Creek Fed A-1-6	Laketown and Sevy Dolomites	n/a	1/1/1985	1/1/1985	1245	Drill-stem	1.57	0.01	0.76
Dobbin Creek Fed A-1-6	Guilmette Formation Dolomite	n/a	1/1/1985	1/1/1985	93	Drill-stem	0.12	0.003	0.049
Dobbin Creek Fed A-1-6	Guilmette Formation Dolomite	n/a	1/1/1985	1/1/1985	3,768	Drill-stem	1	0.01	1.1
Adobe Federal 19-1	Joana Limstone Cherty limestone	n/a	10/1/1979	10/1/1979	120	Drill-stem	nd	1.21	76
UE-25 p#1	Laketown and Simonson Dolomites Faulted, fractured, variably brecciated, vuggy, and finely to medium-crystalline dolomite	n/a	5/8/1983	5/12/1983	6,080	Constant discharge	31.5	0.22	110
UE-25 p#1	Simonson Dolomite Faulted, fractured, brecciated, finely to medium-crystalline dolomite	n/a	5/1/1983	5/1/1983	150	Slug-injection recovery	nd	0.06	0.69
UE-1q	Nopah Formation dolomite olded, fractured, shaly, finely crystallina limestone and dolomite	n/a	nd	nd	nd	Constant discharge	nd	15.58	670

Table X-2. Geologic units and hydrogeologic units in the Death Valley regional ground-water flow system (DVRFS). Source: Modified from Belcher et al (2002, USGS WRIR 01-4210)

Hydrogeologic unit	Representative geologic units
Younger and older alluvial aquifers (YAA and OAA)	Quaternary stream-channel alluvium Quaternary eolian deposits Quaternary-Tertiary fan alluvium Quaternary-Tertiary landslide deposits
Alluvial confining unit (ACU)	Quaternary-Tertiary lacustrine and playa sediments Quaternary-Tertiary spring-carbonate deposits
Lava flow unit (LFU)	Basalt of Crater Flat – Amargosa Valley area Basalt of Jackass Flats Post-Thirsty Canyon basalt flows Funeral Formation Basalt of Lunar Crater area
Younger volcanic unit and volcaniclastic and sedimentary rock units (YVU and VSU)	Furnace Creek Formation Artist Drive Formation Muddy Creek Formation Horse Spring Formation Pavits Spring Formation Panuga Formation Amargosa Valley Formation Titus Canyon Formation Sheep Pass Formation
Tertiary volcanic rocks (TV, TMVA, PVA, CHVU, WVU, and BRCFU)	Volcanics of Fortymile Canyon Volcanics of Stonewall Mountain Thirsty Canyon Group Timber Mountain Group Paintbrush Group Crater Flat Group Belted Range Group Calico Hills Formation Wahmonie Formation
Older volcanic unit (OVU)	Kane Wash Tuff Tub Spring Tuff Hiko Tuff Shingle Pass Tuff Monotony Tuff Volcanics of Quartz Mountain Volcanic of Oak Spring Butte Volcanics of Kawich Valley Tunnel Formation Leach Canyon Formation Pahranagat Formation Tuff of Williams Ridge and Morey Peak
Intrusive confining unit (ICU)	Tertiary intrusive rocks Cretaceous intrusive rocks Jurassic intrusive rocks
Sedimentary rocks confining unit (SCU)	Chinle Formation Moenkopi Formation Kaibab Limestone Toroweap Formation Permian redbeds
Upper and lower carbonate aquifer (UCA and LCA)	Monte Cristo Group Pogonip Group Joana Limestone Guilmette Formation Nopah Formation Bonanza King Formation Carrara Formation Ely Springs Dolomite Bird Spring Formation Simonson Dolomite Sevy Dolomite Laketown Dolomite Ely Springs Dolomite
Upper and lower clastic confining units (UCCU and LCCU)	Eleana Formation Chainman Shale Johnnie Formation Pilot Shale Wood Canyon Formation Zabriskie Quartzite Stirling Quartzite Pahrump Group
Crystalline confining unit (XCU)	Middle Proterozoic igneous and metamorphic rocks

WRIR 01-4210: Hydraulic-Property Estimates for Use With a Transient Ground-Water Flow Model of the Death Valley Regional Ground-Water Flow System, Nevada and California

Table of Contents | Conversion Factors and Acronyms | Report Home Page

Table 2. Hydraulic conductivity distribution in Death Valley regional ground-water flow system hydrogeologic units

[Abbreviations: --, no data; m/d, meters per day; ACU, alluvial confining unit; BRU, Belted Range unit; CFVU, Crater Flat volcanic unit; ICU, intrusive confining unit; K, hydraulic conductivity in meters per day; LCA, lower carbonate aquifer; LCCU, lower clastic confining unit; LFU, lava flow unit; OAA, older alluvial aquifer; OVU, older volcanic unit; PVA, Paintbrush volcanic aquifer; SCU, sedimentary rocks confining unit; TMVA, Thirsty Canyon/Timber Mountain volcanic aquifer; TV, Tertiary volcanic rocks; UCA, upper carbonate aquifer; UCCU, upper clastic confining unit; VSU, volcaniclastic and sedimentary rocks unit; XCU, crystalline confining unit; YAA, younger alluvial aquifer; YVU, younger volcanic unit]

Hydrogeologic unit or subunit	Geometric mean K (m/d)	Arithmetic mean K (m/d)	Minimum K (m/d)	Maximum K (m/d)	95-percent confidence interval of geometric mean (m/d)	Number of analyses
YAA and OAA	2	11	0.001	130	0.6 - 4	43
ACU	3	11	.003	34	.6 - 10	13
LFU	--	--	.002	4	--	2
YVU and VSU	.06	1.5	.00004	6	.01 - .4	15
TV	.1	4	.000001	180	.08 - .2	159
Rhyolitic to rhyodacitic lava flows	.1	.6	.000007	4	.04 - .4	25
Ash-flow tuff	.1	5	.000002	180	.06 - .2	109
Non-welded to partially welded	.06	7	.003	180	.03 - .2	43
Partially to moderately welded	.04	1	.000002	19	.03 - .1	35
Moderately to densely welded	2	13	.02	55	.18 - 15	7
Unaltered		8	.00002	180	.2 - .9	71
Zeolitized and argillized	.04	1	.000002	25	.02 - .08	63
Tuff breccia and ash-flow tuff	.3	4	.0008	15	.03 - 3	11
Bedded ash-fall and reworked tuff and ash-flow tuff	.1	2	.00009	15	.03 - .7	14
TMVA	.01	2	.0002	20	.001 - .01	11
PVA	.02	4	.000007	22	.001 - .09	9
CHVU	.2	.6	.008	2	.08 - .5	14
BRU	.3	1	.01	4	.06 - 2	6
CFVU	.2	6	.000002	180	.09 - .3	91
OVU	.004	.07	.000001	1	.001 - .01	46

ICU	.01	.3	.0006	1	.001 - .01	7
SCU	.002	.02	.0002	.3	.0007 - .005	16
UCA and LCA	.6	90	.00001	820	.2 - 2	51
Faulted and karstic	3	120	.01	820	3 - 4	18
Unfaulted	.1	2	.0001	14	.02 - .5	19
UCCU and LCCU	.00003	.2	.00000003	5	.000003 - .0003	30
UCCU (shales)	.01	.07	.0003	.4	.002 - .06	9
LCCU (quartzites)	.0000006	5	.00000003	5	.00000007 - .000005	19
XCU	–	–	.00000002	[1]<.4	–	–

[1] Based on the 14.5 percent upper confidence level of Bedinger and others (1989) weathered metamorphic rocks hydraulic conductivities, and the lower 14.5 percent estimate for deep unweathered metamorphic rocks. Confidence levels are based on the 50th percentile estimate of their sample.

WRIR 01-4210: Hydraulic-Property Estimates for Use With a Transient Ground-Water Flow Model of the Death Valley Regional Ground-Water Flow System, Nevada and California

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APPENDIX A: HYDRAULIC-PROPERTIES DATABASE

A hydraulic-properties database was compiled to support current Death Valley ground-water flow system simulations. The database contains individual worksheets for 10 of the 11 hydrogeologic units (HGU's) in the study area (see table 1 for descriptions). No data were collected, and hence, no worksheet was required, for the crystalline confining unit (XCU). Data reported in the body of the report for the XCU are from Bedinger and others (1989). Entries for each HGU are organized by the well from which data were obtained (the observation well, if different from the pumping or injection well).

Complete database (Microsoft Excel file):

- Database (970 Kb) – contains full set of individual worksheets.

Individual worksheets (tab-delimited text files):

- YAA & OAA (21 Kb) – Younger and older alluvial aquifers.
- ACU (6 Kb) – Alluvial confining unit.
- LFU (3 Kb) – Lava flow unit.
- YVU & VSU (25 Kb) – Younger volcanic unit and volcaniclastic and sedimentary rocks unit.
- Tertiary volcanic rocks (93 Kb).
- OVU (38 Kb) – Older volcanic unit.
- ICU (12 Kb) – Intrusive confining unit.
- SCU (41 Kb) – Sedimentary rocks confining unit.
- UCA & LCA (17 Kb) – Upper and lower carbonate aquifer.
- UCCU & LCCU (26 Kb) – Upper and lower clastic confining units.
- Data sites (13 Kb).
- References (23 Kb).

Each entry in the database contains the following information:

1. Observation well name -- A name commonly applied to the well from which hydraulic-property data were obtained.
2. USGS site identification (ID) number -- A unique 15-digit number given to all inventoried wells in the USGS National Water Information System (NWIS) database. The site ID number consists of latitude, in degrees, minutes, and seconds, followed by longitude, in degrees, minutes, and seconds, followed by a sequence number. This field was left blank for wells that did not have a site ID number. Because data for wells in Permian sedimentary rocks from the Colorado Plateau that are in the database were obtained from a report in which these wells are identified by their land-net coordinates, a column containing land-net coordinates was added for these wells.
3. Universal Transverse Mercator (UTM) coordinates (meters). All well coordinates are in UTM zone 11, except those on the Colorado Plateau which are in UTM zone 12.
4. Land surface altitude at the well (meters). All altitudes are referenced to the National Geodetic Vertical Datum of 1929.
5. Well depth (meters).
6. Depths to the top and bottom of the test interval (meters).
7. Thickness (meters) -- open interval of borehole.
8. Radius or interwell distance (meters) -- for single-well aquifer tests, the borehole radius was listed if known; if the borehole radius was unknown, the casing radius was listed. For multiple-well aquifer tests, the reported, calculated, or scaled distance between the pumping or injection well and the observation well was listed.
9. Geologic units and lithologies present in the test interval -- in test intervals spanning several geologic units, negligibly transmissive geologic units were omitted. For the Tertiary volcanics unit, columns describing alteration, degree of welding in ash-flow tuff, and the intensity of fracturing and faulting were added.
10. Pumped or injection well if different from the observation well (for HGU's with no multiple-well test data, this column was omitted).
11. Starting and ending test dates.
12. Length of the analyzed record, in minutes.
13. Type of aquifer test
14. Average discharge or injection rate (liters per second).

15. Analyzed data (typically drawdown, residual drawdown, recovery, specific capacity, or flux).
16. Hydraulic conductivity (meters per day) – Depending on available data, columns were added to list horizontal, vertical, fracture, and matrix hydraulic conductivity separately.
17. Vertical to horizontal anisotropy (for HGU's without data necessary to calculate this property, this column was omitted).
18. Transmissivity (meters squared per day).
19. Storativity (unitless).
20. Specific yield (unitless).
21. Analytical method, with analyses performed for this study identified.
22. Sources of hydraulic-property data, the aquifer-test analysis, and supporting data.

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Appendix C

RR 10/6/03
entered 10/24/03 VH

Public Water Supply Groundwater Vulnerability Information

PWS ID: 160 | System Type: C | Last Modifie: 7/21/03

PWS Name: MOAPA VALLEY WATER DISTRICT | Updated By: Admin

Public Water Supply Name: MOAPA VALLEY WATER DISTRICT

Facility Address: 601 N MOAPA VALLEY BLVD

City: OVERTON | State: NV | Zip: 89040-

County: Clark | Telephone #: (702) 397-6893

Fax: (702) 397-6894 | EMail: robinson@comnett.net

Operator Information

Name: VAN ROBINSON | Address: PO BOX 257/MOAPA VALLEY WATER LOGANDALE NV 89021 | Telephone: (702) 397-689

Fax: (702) 397-6894 | eMail: robinson@comnett.net

Owner Information

Name: VAN ROBINSON | Address: PO BOX 257/MOAPA VALLEY WATER LOGANDALE NV 8902 | Telephone: (702) 397-689

Fax: (702) 397-6894 | eMail: robinson@comnett.net

EPA SWAP Information

Status: Active | Location Method: GPS | Delineation Metho: EPA_WHPA

SW Assessment Complete: ☑ | SW Protectection in Plac: ☐ | EPA Approved State SWA: ☑

Highest Operator Certification Lev:

Population Served: 8000 | Quantity of Service Connectio: 1523

# of Well: 2 | # of Spring: 2

WaterTanks: 4 | Total Tank Capacit: 5000000

Tanks

TankName	Size	InteriorCoating	ModDate	UpdatedBy
LOGANDALE EAST	1500000	CONCRETE	8/9/00	Admin
LOGANDALE WEST	1000000	CONCRETE	8/9/00	Admin
MOAPA	1000000	CONCRETE	8/9/00	Admin
OVERTON	1500000	CONCRETE	8/9/00	Admin

Is A/C pipe used in the distribution syste: Yes | Is lead pipe used in the distribution syste: No

State endorsed Well Head Protection Program: No

WHPA status: No Activity | Is a Chlorinator used in the system?: Y

Maps

Map Type	Map Name	Map Number	Map Year
USGS	OVERTON 1:100,000	36114-E1-TM-100	1987

Public Water Supply Groundwater Vulnerability Information

PWS ID: 160 System Type: C Last Modifie: 7/21/03

PWS Name: MOAPA VALLEY WATER DISTRICT Updated By: Admin

USGS Hydrologic Unit Code: 15010012 USGS Water Recon Survey Available? Yes

USGS Water Recon Name: EAKIN (1964) REPT #25, RUSH (1968) REPT 50

Nevada Division of Environmental Protection Info. Availabl: No

Other Hydrogeologic Refences Used: BUQO (1993), BUQO (1994)

BHPS Water Quality Info Used? Yes BHPS Sanitary Survey Info. Used: Yes

Summary Date: 12/10/2002 Assessor: State

☑ In Compliance with All State of Nevada and federal water quality standards.

THE MOAPA VALLEY WATER DISTRICT COMMUNITY WATER SYSTEM OPERATES TWO GROUND WATER WELLS AND TWO GROUNDWATER SPRINGS TO SUPPLY DRINKING WATER. THE WATER SYSTEM HAS APPLIED AND HAS BEEN GRANTED A VARIANCE FROM THE NEVADA STATE BOARD OF HEALTH TO SUPPLY DRINKING WATER WITH A CONCENTRATION OF FLOURIDE AT 2.12 PARTS PER MILLION (PPM). THE MAXIMUM CONTAMINANT LEVEL FOR FLUORIDE AT 2.12 PPM. THE MAXIMUM CONTAMINANT LEVEL FOR FLUORIDE IS PRESENTLY 2.0 PPM. THE WATER SYSTEM IS PRESENTLY N COMPLIANCE WITH ALL OTHER STATE AND FEDERAL DRINKING WATER MAXIMUM CONTAMINANT LEVELS, AND IS CONSIDERED TO HAVE LOW VULNERABILITY TO CONTAMINATION.

☑ The above referenced water system is considered to have low vulnerability potential from contamination.

The above referenced water system is considered potentially vulnerable to the following contaminant groups:

VOC's ☐ SOC's ☐ IOC's ☐ Microbiological ☐ Radionuclides ☐

The water system is considered vulnerable to the activities/sources associated with the contaminant groups checked in the boxes above for the following reasons:

A copy of the complete assessment is available for viewing at the Bureau of Health Protection Services (BHPS) Carson City office between the hours of 8:00 AM and 5:00 PM, Monday through Friday. It is suggested that an appointment be made if you are interested in viewing a report. The BHPS office is located at 1179 Fairview Drive, Suite 101, Carson City, Nevada 89701-5405. Telephone 1-775-687-4754 Toll Free 1-800-992-0900.

PWS Vulnerability Sources

PWS ID: 160 | Source ID: 1 | Tag Number: W01

Last Modified: 7/23/03 | Updated By: Admin

Source Name: MX WELL | Well or Spring: Well

Latitude Deg.: 36 | Latitude Min: 46 | Latitude Sec: 3.596557293

Longitude Deg: -114 | Longitude Min.: 47 | Longitude Sec.: 14.531123579

UTM N Coord.: 4071382.38 | UTM E Coord.: 697482.548

Assessor's Parcel#: UNK 26

Township: 13S | Range: 64E | Section: 36 | Qtr Section: ~~NE~~ SE | Qtr Qtr Sectio: ~~NE~~ SE

Well Log: Yes | Well Log Number: 141 | Well Log Attached: ☑

Geophysical Log Available & Referenced?: No | Other Well Log Available: ☐

Sanitary Seal?: ☑ | Seal Depth (ft: 85 | Casing Depth (ft): 325 | Casing Size (in): 8 5/8"

Well Depth (ft: 937 | Casing terminate is at least 12" above ground surface?: Yes

In 100 Year Floo: ☐

Predominant water bearing stratum(s) (ft)

Material Type	TopDepth	BottomDepth
CALICHE/GRAVEL	0	50

If low permeability layer above top screen placement, then exp: Limestone 50-937 Bedrock

NO

NOTE: OPEN BOREHOLE COMPLETION FROM 325' TO 937'

NONE

Pump Size (HP): 100 | Avg pumping rate (GPM): 450 | Max Pumping Rate (GPM): 450

PumpType: SUBMERSIBLE | Pump Age (yrs): 15 | PCB's in pump?: No

Screening Intervals (ft)

TopDepth	BottomDepth
325	937

Estimated porosity of primary water bearing stratu: 0.1 | Estimated aquifer transmissivity (ft2/da: 225000

Static Water Level(s) from ground surfa

DateTaken	StaticWaterLevel	Elevation (ft)
4/1/94	456	1819

Estimated local hydraulic gradient magnitud: 0 | Direction (degrees): 272

Single Well: ☐

Groundwater Modelin: MWCAP

Approx. radius of capture zone (ft: 100

Explain if pump interference between wells: NO INTERFERENCE WITH ARROW CANYON WELL

PWS Vulnerability Sources

PWS ID 160 Source ID 1 Tag Number W01

Explain contaminant sources within a 10 year capture zone: THERE ARE NO CONTAMINANT SOURCES IN THE 10 YEAR CAPTURE ZONE.

For springs - evaluate watershed area: N/A

For springs - maximum/minimum flo: N/A

Are Water Quality Results Attached? ☑ Contaminants Detected ☑ Are there IOC's detected above 50% of the MCL or are there any detects of SOC's or VOC's ☑

Water Quality Result

Date	Group	Analysis	Method	Units	Result	Qualifier

Significant variation in reported concentration ☐ Significant changes in pumping rates? No

Change in systems configuratio ☐ Changes in the systems operating procedure ☐

GW system hydraulically connected to surface water with dioxin detect within 1000 ft GW sourc No

Explain: NO DIOXIN DETECTIONS

The predominant land development around the source is Rural

Predominant land usage around the source is Wildeness

Additional land use commen WILDERNESS STUDY AREA OPEN TO NORTH & SOUTH

Explain if access restricted in the capture zone NO

Explain if agriculture restricted in the capture zone BASIN CLOSED TO NEW AG WATER PERMITS

Explain if new industry restricted in the capture zone WILDERNESS STUDY AREA

If surface water present in capture zone, list distance, source and type NO

Explain if historical/environmental land usage in the capture zone which could impact water Not aware of any

Explain if there are potential sources within a 2 year TOT No

Explain if there are other wells (agricultural, commercial, residential) No

Explain if obvious well/spring construction NO

Explain if the well/spring isn't adequately protected HOUSED & LOCKED

Explain if there are unplugged abandoned wells in the capture zone No

Has the well/spring been tagged ☑

PWS Vulnerability Sources

PWS ID 160 Source ID 1 Tag Number W01

PP 10/6/3

PWS Vulnerability Sources

PWS ID 160 Source ID 2 Tag Number W02

Last Modified 8/4/03 Updated By Admin

Source Name ARROW CYN WELL Well or Spring Well

Latitude Deg. 36 Latitude Min 44 Latitude Sec 3.530693741

Longitude Deg -114 Longitude Min. 44 Longitude Sec. 51.993706744

UTM N Coord. 4067764.383 UTM E Coord. 701103.979

Assessor's Parcel# 030-07-000-001

Township 14S Range 65E Section 7 Qtr Section SE Qtr Qtr Sectio NE

Well Log Yes Well Log Number UNKNOWN Well Log Attached ☑

Geophysical Log Available & Referenced? No Other Well Log Available ☐

Sanitary Seal? ☑ Seal Depth (ft 120 Casing Depth (ft) 565 Casing Size (in) 14"

Well Depth (ft 565 Casing terminate is at least 12" above ground surface? Yes

In 100 Year Floo ☐

Predominant water bearing stratum(s) (ft)

Material Type	TopDepth	BottomDepth	
SAND/GRAVEL	0	26	
SAND	26	66	
GRAVEL	66	80	

If low permeability layer above top screen placement, then expl

MUDDY CREEK FORMATION FROM 80-460' WITH 80-205 ABOVE UPPERMOST SLOTTED CASING.

Pump Size (HP) 200 Avg pumping rate (GPM) 900 Max Pumping Rate (GPM) 2900

PumpType VERT TURB Pump Age (yrs) 9 PCB's in pump? No

Screening Intervals (ft)

TopDepth(ft)	BottomDepth(ft)	
205	255	
265	315	
315	565	

Estimated porosity of primary water bearing stratu 0.1 Estimated aquifer transmissivity (ft2/da 310120

Static Water Level(s) from ground surfa

DateTaken	StaticWaterLevel	Elevation (ft)	
10/16/93	45	1825	

Estimated local hydraulic gradient magnitud 0 Direction (degrees) 342

Single Well ☐

Groundwater Modelin MWCAP

PWS Vulnerability Sources

PWS ID 160 Source ID 2 Tag Number W02

Approx. radius of capture zone (ft 300

Explain if pump interference between wells: NO INTERFERENCE WITH MX-6; HYDROLICALLY ISOLATED FROM NPC WELL FIELD

Explain contaminant sources within a 10 year capture zone: NO SOURCES

For springs - evaluate watershed area: N/A

For springs - maximum/minimum flo: N/A

Are Water Quality Results Attached? ☑ Contaminants Detected ☑ Are there IOC's detected above 50% of the MCL or are there any detects of SOC's or VOC's ☑

Water Quality Result

Date	*Group*	*Analysis*	*Method*	*Units*	*Result*	*Qualifier*

Significant variation in reported concentration ☐ Significant changes in pumping rates? No

Change in systems configuratio ☐ Changes in the systems operating procedure ☐

GW system hydraulically connected to surface water with dioxin detect within 1000 ft GW sourc No

Explain: NO DIOXIN DETECTIONS

The predominant land development around the source is Rural

Predominant land usage around the source is Wildeness

Additional land use commen: SINGLE RESIDENT IS LOCATED ABOUT 250' FROM WELL

Explain if access restricted in the capture zone: NO

Explain if agriculture restricted in the capture zone: BASIN CLOSED TO NEW AG WATER RIGHTS

Explain if new industry restricted in the capture zone: WILDERNESS STUDY AREA

If surface water present in capture zone, list distance, source and type: NO

Explain if historical/environmental land usage in the capture zone which could impact water: HISTORICALLY, AREA DOWNGRADIENT WAS USED FOR AGRICULTURE BUT HASN'T BEEN FARMED SINCE 1970S & ISOLATED HYDROLICALLY FROM PWS SOURCE WELL

Explain if there are potential sources within a 2 year TOT: NO

Explain if there are other wells (agricultural, commercial, residential) NO

Explain if obvious well/spring construction: NO

Explain if the well/spring isn't adequately protected: HOUSED & LOCKED

Explain if there are unplugged abandoned wells in the capture zone: DRI HAS A CARBONATE MONITORING WELL 1800' AWAY

PWS Vulnerability Sources

PWS ID 160 Source ID 2 Tag Number W02

Has the well/spring been tagged ☑

PWS Vulnerability Sources

PWS ID: 160 | Source ID: 3 | Tag Number: W03

Last Modified: 7/15/03 | Updated By: Admin

Source Name: LOGANDALE WELL (OFF-LIN | Well or Spring: Well

Latitude Deg.: 36 | Latitude Min: 37 | Latitude Sec: 13.378702396

Longitude Deg: -114 | Longitude Min.: 29 | Longitude Sec.: 33.775393292

UTM N Coord.: 4055689.023 | UTM E Coord.: 724213.275

Assessor's Parcel#: 041-22-101-0007

Township: 15S | Range: 67E | Section: 22 | Qtr Section: NW | Qtr Qtr Sectio: NW

Well Log: Yes | Well Log Number: | Well Log Attached: ☑

Geophysical Log Available & Referenced?: No | Other Well Log Available: ☐

Sanitary Seal?: ☑ | Seal Depth (ft: 54 | Casing Depth (ft): 70 | Casing Size (in): 16"

Well Depth (ft: 154 | Casing terminate is at least 12" above ground surface?: Yes

In 100 Year Floo: ☐

Predominant water bearing stratum(s) (ft)

MaterialType	TopDepth	BottomDepth	
SILT	0	48	

If low permeability layer above top screen placement, then expl

Pump Size (HP): 75 | Avg pumping rate (GPM): 650 | Max Pumping Rate (GPM): 650

PumpType: SUBMERSIBLE | Pump Age (yrs): 50 | PCB's in pump?: No

Screening Intervals (ft)

TopDepth	BottomDepth	
54	154	

Estimated porosity of primary water bearing stratu: 0.1 | Estimated aquifer transmissivity (ft2/da: 2700

Static Water Level(s) from ground surfa

DateTaken	StaticWaterLevel	Elevation (ft)	
1/1/67	22		

Estimated local hydraulic gradient magnitud: 0 | Direction (degrees): 243

Single Well: ☑

Groundwater Modelin: MWCAP

Approx. radius of capture zone (ft: 750

Explain if pump interference between wells

RR 10/6/2

PWS Vulnerability Sources

PWS ID 160 Source ID 4 Tag Number SP04

Last Modified 7/23/03 Updated By Admin

Source Name BALDWIN SPRING Well or Spring Spring

Latitude Deg. 36 Latitude Min 43 Latitude Sec 13.26737065

Longitude Deg -114 Longitude Min. 43 Longitude Sec. 26.59645161

UTM N Coord. 4066265.344 UTM E Coord. 703259.235

Assessor's Parcel# 03c-16-101-001

Township 14S Range 65E Section 16 Qtr Section NW Qtr Qtr Sectio SW SE

Well Log Well Log Number Well Log Attached ☐

Geophysical Log Available & Referenced? Other Well Log Available ☐

Sanitary Seal? ☐ Seal Depth (ft Casing Depth (ft) Casing Size (in)

Well Depth (ft Casing terminate is at least 12" above ground surface?

In 100 Year Floo ☐

Predominant water bearing stratum(s) (ft)

If low permeability layer above top screen placement, then expl

Pump Size (HP) Avg pumping rate (GPM) Max Pumping Rate (GPM)

PumpType Pump Age (yrs) PCB's in pump?

Screening Intervals (ft)

Estimated porosity of primary water bearing stratu Estimated aquifer transmissivity (ft2/da

Static Water Level(s) from ground surfa

Estimated local hydraulic gradient magnitud Direction (degrees)

Single Well ☐

Groundwater Modelin EVALUATED WATERSHED

Approx. radius of capture zone (ft

Explain if pump interference between wells N/A

Explain contaminant sources within a 10 year capture zone NO

For springs - evaluate watershed area NO SOURCES IN WATERSHED AREA.

For springs - maximum/minimum flo

Are Water Quality Results Attached? ☑ Contaminants Detected ☑ Are there IOC's detected above 50% of the MCL or are there any detects of SOC's or VOC's ☑

PWS Vulnerability Sources

PWS ID 160 Source ID 4 Tag Number SP04

RR 10/6/3

PWS Vulnerability Sources

PWS ID 160 Source ID 5 Tag Number SP05

Last Modified 7/23/03 Updated By Admin

Source Name JONES SPRING Well or Spring Spring

Latitude Deg. 36 Latitude Min 42 Latitude Sec 53.17818848

Longitude Deg -114 Longitude Min. 43 Longitude Sec. 9.03388243

UTM N Coord. 4065656.554 UTM E Coord. 703709.731

Assessor's Parcel# 030-16-101-001

Township 14S Range 65E Section 16 Qtr Section NW Qtr Qtr Sectio SE

Well Log Well Log Number Well Log Attached ☐

Geophysical Log Available & Referenced? Other Well Log Available ☐

Sanitary Seal? ☐ Seal Depth (ft Casing Depth (ft) Casing Size (in)

Well Depth (ft Casing terminate is at least 12" above ground surface?

In 100 Year Floo ☐

Predominant water bearing stratum(s) (ft)

If low permeability layer above top screen placement, then expl

Pump Size (HP) Avg pumping rate (GPM) Max Pumping Rate (GPM)

PumpType Pump Age (yrs) PCB's in pump?

Screening Intervals (ft)

Estimated porosity of primary water bearing stratu Estimated aquifer transmissivity (ft2/da

Static Water Level(s) from ground surfa

Estimated local hydraulic gradient magnitud Direction (degrees)

Single Well ☐

Groundwater Modelin EVALUATED WATERSHED

Approx. radius of capture zone (ft

Explain if pump interference between wells N/A

Explain contaminant sources within a 10 year capture zone NO

For springs - evaluate watershed area NO SOURCES IN WATERSHED AREA.

For springs - maximum/minimum flo

Are Water Quality Results Attached? ☑ Contaminants Detected ☑ Are there IOC's detected above 50% of the MCL or are there any detects of SOC's or VOC's ☑

PWS Vulnerability Sources

PWS ID 160 Source ID 5 Tag Number SP05

Water Quality Result

Date	*Group*	*Analysis*	*Method*	*Units*	*Result*	*Qualifier*

Significant variation in reported concentration ☐ Significant changes in pumping rates? No

Change in systems configuratio ☐ Changes in the systems operating procedure ☐

GW system hydraulically connected to surface water with dioxin detect within 1000 ft GW sourc No

Explain: NO DIOXIN DETECTIONS

The predominant land development around the source is Rural

Predominant land usage around the source is Recreational

Additional land use commen PWS SOURCE IS LOCATED ADJACENT TO MOAPA WILDLIFE REFUGE

Explain if access restricted in the capture zone FISH & WILDLIFE & WILDERNESS STUDY AREA

Explain if agriculture restricted in the capture zone NO NEW AG PERMITS, UPGRADIENT AREA NOT SUITABLE FOR AGRICULTURE

Explain if new industry restricted in the capture zone FISH, WILDLIFE AND WIDLERNESS STUDY AREA

If surface water present in capture zone, list distance, source and type No

Explain if historical/environmental land usage in the capture zone which could impact water Not aware of any

Explain if there are potential sources within a 2 year TOT No

Explain if there are other wells (agricultural, commercial, residential) No

Explain if obvious well/spring construction No

Explain if the well/spring isn't adequately protected FENCED, HOUSED AND LOCKED

Explain if there are unplugged abandoned wells in the capture zone No

Has the well/spring been tagged ☑

PWS Vulnerability Sources

PWS ID 160 Source ID 5 Tag Number SP05

VULNERABILITY ASSESSMENT DOCUMENTATION

PWS: 0000160 Facility Name: MOAPA VALLEY WATER DISTRICT

Water Level Data

Well Location (T-R)S 1/4-1/4-1/4)	Static Water Level (ft<ls)	Elevation (ft>msl)	Data Source
see attached table			

Data Sources:
1- USGS Great Basin Database
2 - Bunch & Harrill (1984)
3 - NDCNR Recon. Rpt. # _____
4 - Nevada Water Resources Water Year _____
5. -DWR Well Drillers Report
7 - O'Brien et al (1995)
8 -Maurer (1989)
9. ~~FIELD SURVEY~~ Bodo (1993)

Peak Monthly Pumping Volume: _____ gallons per minute

Source of Data: ___ Meter Data ___ Estimate based on population ___ Pump Capacity

Population: _____ Water Use (gpd/capita) _____

Basis of Use Rate: Pumping rates for each well

Aquifer Data:

Geologic Media Limestone Degree of Confinement Uncon-? Confined

Transmissivity 1-2,000,000 gpd/ft Transmissivity _____ ft²/day

Type of Test: Constant Q Data Source: Bodo (1994)

Porosity: (from Recommended Procedures, page 2). Aquifer Thickness:
0.10

Other Operating Wells in Vicinity

Location	Water Right Duty (mga)	Type of Use	Date Source

Other Information on the Local or Regional Hydrogeology

Flow System: Colorado

Location within Flow System: Discharge Area

Interaction with Regional Carbonate Aquifer: Upward discharge from carbonates.

Published Hydraulic Parameters:

Transmissivity	Storativity	Porosity	Source
2,320,000 gpd/ft	.005	0.10	BUSCH (94) Arrow Canyon
1,700,000 gpd/ft	.06	0.10	" MX-6 well
20,000 gpd/ft			M. Uhlin & Emerson (84) Logandale well

Hydraulic Gradient Estimates

Gradient (dimensionless): See below Hydraulic Gradient Vector (Degrees) See below

Hydraulic Gradient Vector Uncertainty) 10% ±

Capture Zone Width (<20% Uncertainty) ____

Capture Zone Width A (>20% Uncertainty) ____

Capture Zone Width A (>20% Uncertainty) ____

Composite Capture Zone Width ____

ADDITIONAL OBSERVATIONS

Source	Name	Gradient	Vector	Pumping Rate
W01 -	MX-6	.004	272°	950 gpm
W02 -	Arrow Canyon	.002	342°	900 gpm
W03 -	Logandale	.004	243°	650 gpm *

* Used only in July & Aug for blending to meet peak demand. Actual water use in July '95 all time peak 11.7 mg. = 390,000 gpd = 271 gpm = 52 132 ft³/day

REFERENCES

Eakin (1964) Groundwater Appraisal of Coyote Spring and Kane Spring Valleys and Muddy Springs Area, NOCNR Recon. Rept. #25

Rush (1968) Water-Resources Appraisal of the Lower Moapa-Lake Mead Area, NOCNR Recon Rept. #50

BuRO (1993) Hydrology and Water Resources of the Moapa Valley Water District Service Area. MVWD Technical Rept.

BuRO (1994) Results of Long-Term Testing of the Arrow Canyon Well. MVWD Technical Rept.

Mifflin & Zimmerman (1984) Ground-Water Availability in the Lower Meadow Valley Wash Near Glendale, Nevada, Desert Research Institute.

NOTE: COPIES OF THE SPECIFIC PAGES USED FOLLOW THIS REFERENCE LIST.

Table 1. Summary Well Information. Source: U.S. Geological Survey unpublished data.

Well Location	Approximate Elevation (ft>msl)	Date	Depth to Water (ft)	Elevation of Water (ft>msl)
12S-63E 29 adc	2470	1986	542.1	1928
15S-68E 25 c	1260	1956	53.0	1207
16S-68E 30 bda	1250	1985	19.88	1230
16S-67E 1 cbb	1310	1985	9.26	1301
16S-67E 1 bc	1381	1967	8.5	1373
15S-67E 34 aab	1360	1985	8.36	1352
15S-67E 26 cbb	1380	1957	22.0	1358
15S-67E 22 abc	1400	1985	16.95	1383
15S-67E 22 bbc	1410	1967	22.0	1388
16S-63E 9 dda	2648	1989	830.9	1817
15S-67E 7 cbd	1500	1990	21.9	1478
15S-66E 9 bad	1580	1990	7.3	1572
15S-67E 7 ab	1640	1950	18.5	1622
15S-66E 1 ddc	1570	1985	19.65	1550
15S-66E 3 aaa	1540	1990	31.3	1509
14S-67E 31 dac	1695	1987	116.0	1579
14S-66E 35 cac	1530	1990	35.6	1494
15S-66E 2 bb	1550	1947	12.0	1538
15S-66E 4 aa	1580	1950	0	1580
14S-66E 27 ac	1560	1990	46.8	1513
14S-66E 21 dd	1600	1990	44.0	1556
14S-66E 22 dbd	1560	1990	41.0	1519
15S-65E 15 aac	1860	1990	53.2	1807
15S-66E 7 ab	1740	1990	167.2	1573
14S-65E 36 bad	1638	1990	6.7	1631
15S-66E 6	1580	1950	1.0	1579
14S-65E 25 cdb	1655	1990	8.9	1646
14S-65E 23 daa	1710	1990	11.7	1698
14S-65E 15 bbc	1800	1969	3.9	1796
14S-65E 9 ccc	1510	1985	15.72	1794
14S-65E 8 dbb	1932	1985	22.53	1809
14S-63E 28 acd	2414.3	1991	589.6	1825
14S-63E 10	2320	1944	332.0	1988
13S-66E 32 dd	1660	1990	48.3	1612
13S-66E 29 dd	1720	1990	57.0	1663
13S-65E 28 bda	2185.9	1992	391.5	1793.5
13S-66E 19 ba	1720	1990	66.6	1653
13S-66E 7 cc	1760	1990	48.8	1711
13S-66E 18 b	1770	1963	58.0	1712
12S-65E 25 cd	1845	1990	15.7	1829
13S-64E 34 daa	2158.6	1991	344.59	1814
13S-63E 26 aaa	2169.1	1991	349.14	1820
13S-63E 11 bac	2220	1985	166.34	2054
12S-63E 29 adc	2470	1986	542.1	1928
12S-65E 13 bac	1950	1990	6.9	1943
12S-65E 12 abc	1965	1985	19.2	1946
14S-65E 7 ac	1873	1993	44.8	1828

Source bvGO (1993)

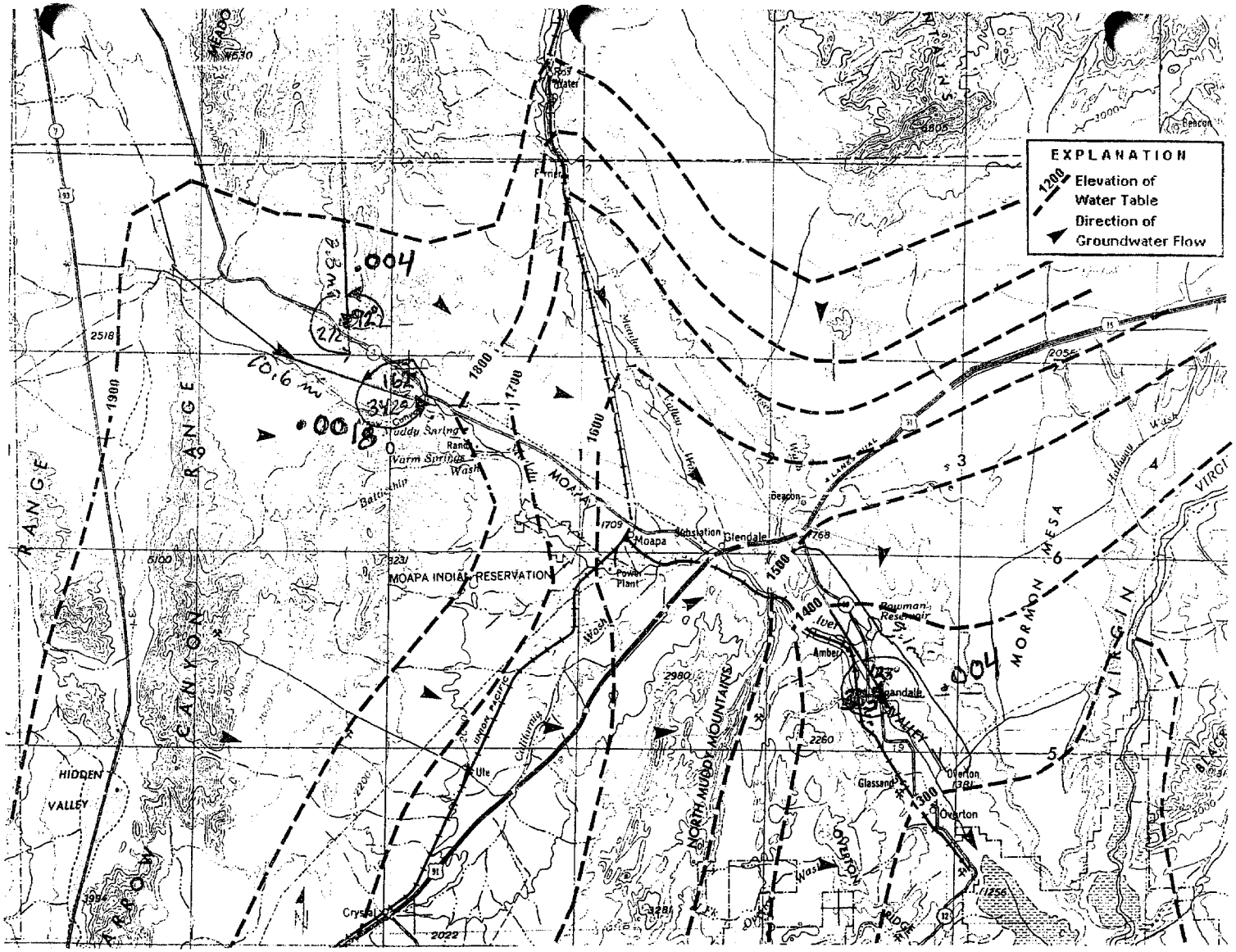
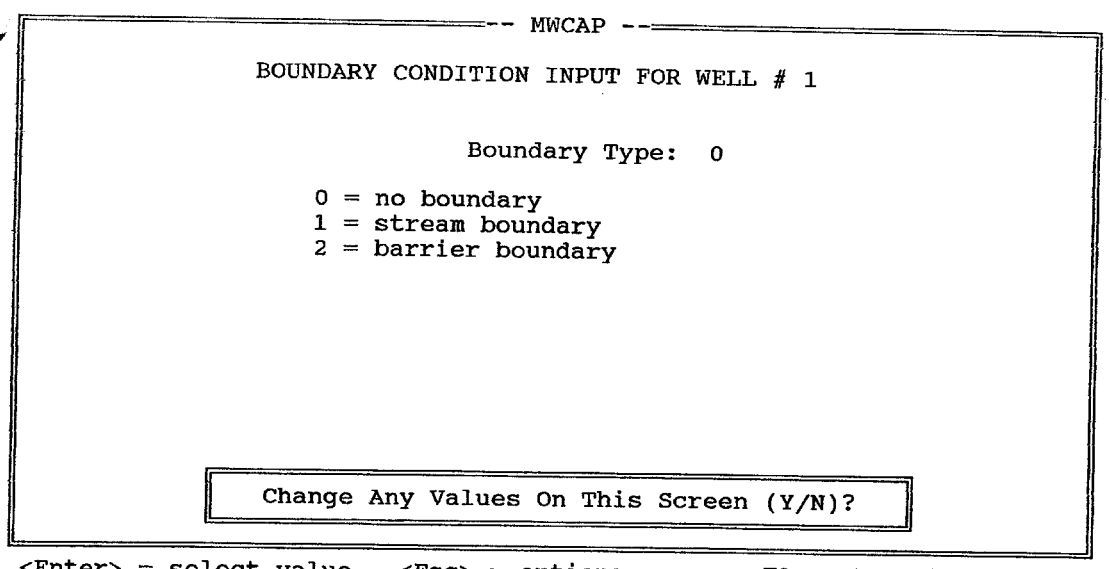


Figure 3. General Potentiometric Map

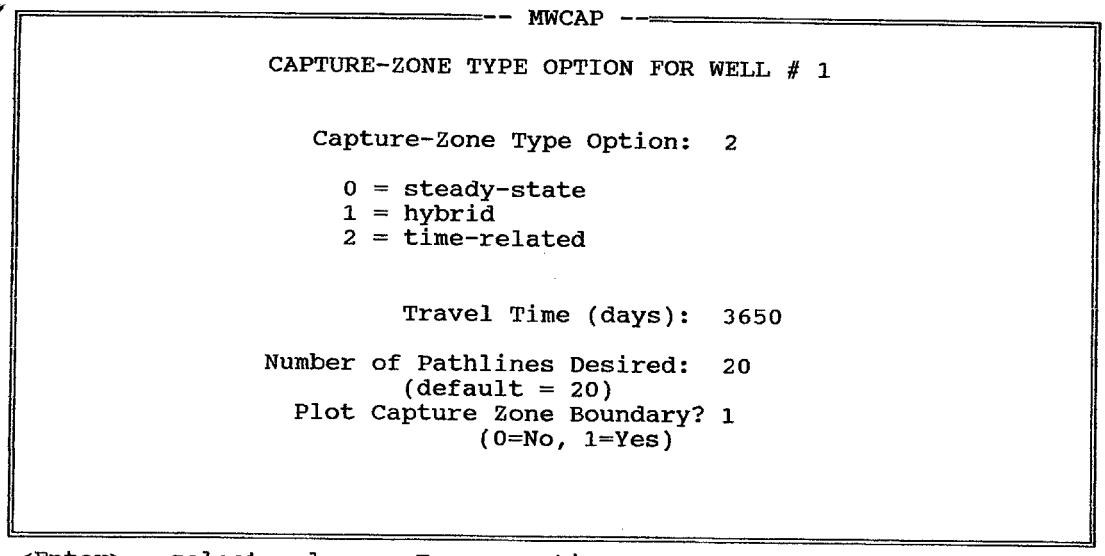
Source BUSCH(1993)

```
-- MWCAP --

Run Title: MVWD MX-6 WELL

    Units to use for Current Problem:  1
            0 = meters and days
            1 = feet and days

          Number of Wells for which
          Capture-Zones are desired:  1   <= Should be 1 if
                                             plotting heads!
               Minimum X-Coordinate:  0
               Maximum X-Coordinate:  10000
               Minimum Y-Coordinate:  0
               Maximum Y-Coordinate:  10000

        Maximum Spatial Step Length:  50

     Perform Hydraulic Head Calculation:  0
                (1 = yes, 0 = no)

<Enter> = select value   <Esc> = options menu   <F1> = DOS shell
```

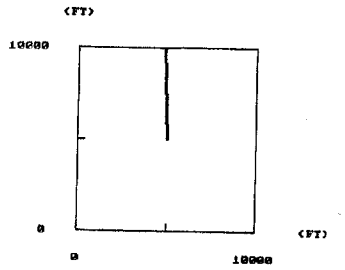
```
-- MWCAP --

    AQUIFER PROPERTIES AND LOCATION FOR WELL # 1

                  X Coordinate (ft): 5000
                  Y Coordinate (ft): 5000
    Well Discharge Rate (ft**3/d): 86620
         Transmissivity (ft**2/d): 225000
Hydraulic Gradient (dimensionless): 0.004
   Angle of Ambient Flow (degrees): 272
  Aquifer Porosity (dimensionless): 0.10
            Aquifer Thickness (ft): 481

<Enter> = select value   <Esc> = options menu   <F1> = DOS shell
```



<Enter> = select value <Esc> = options menu <F1> = DOS shell



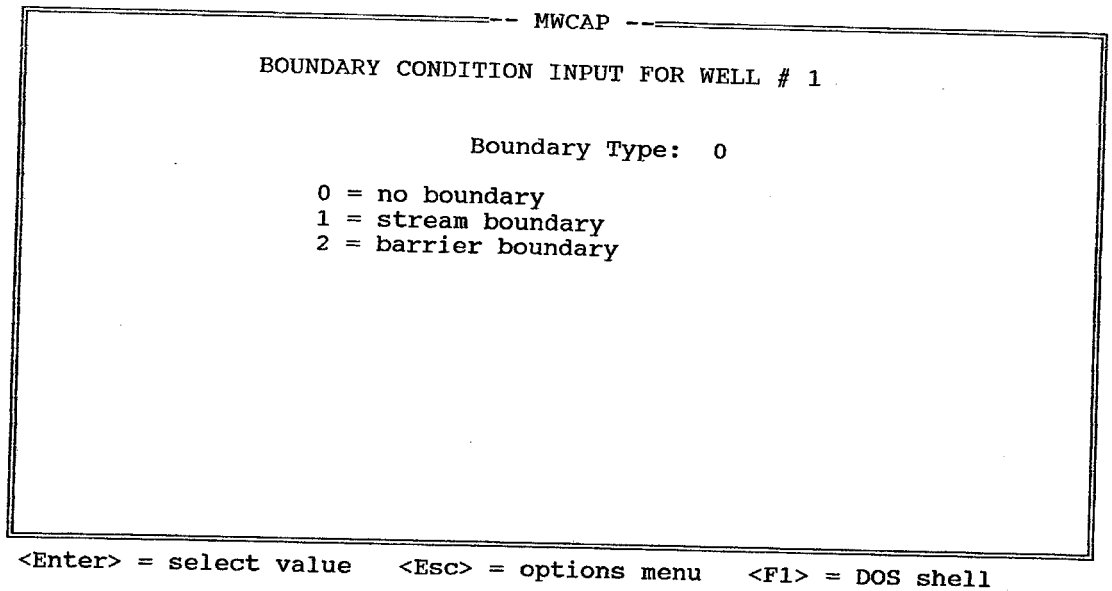
<Enter> = select value <Esc> = options menu <F1> = DOS shell



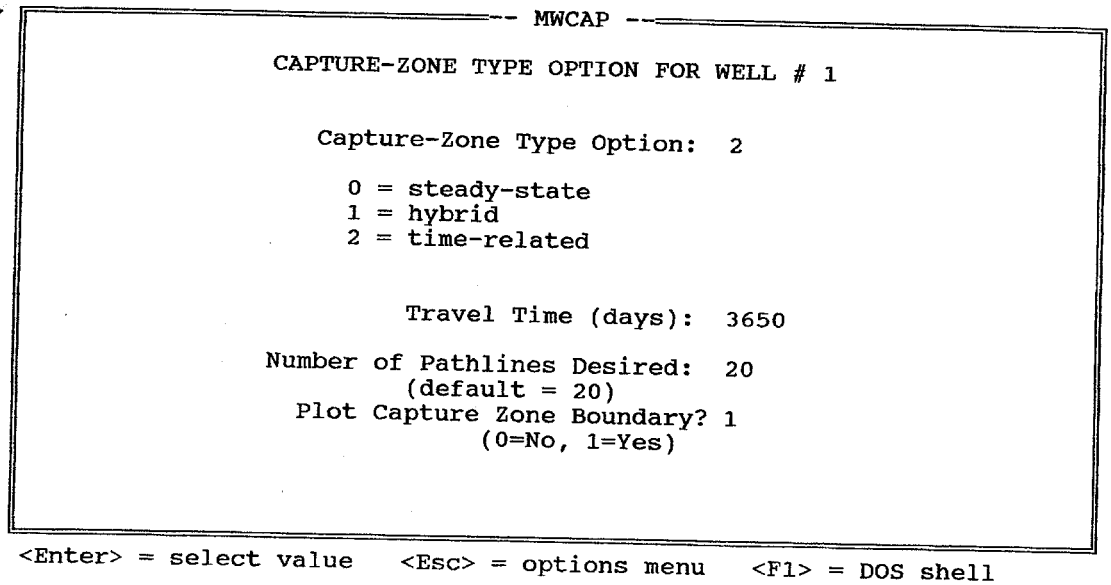
MX-6
1:100,000

```
-------- MWCAP --

        Run Title: ARROW CANYON WELL

            Units to use for Current Problem:  1
                    0 = meters and days
                    1 = feet and days

                  Number of Wells for which
                  Capture-Zones are desired:  1  <= Should be 1 if
                                                    plotting heads!
                       Minimum X-Coordinate:  0
                       Maximum X-Coordinate:  10000
                       Minimum Y-Coordinate:  0
                       Maximum Y-Coordinate:  10000

                 Maximum Spatial Step Length:  50

              Perform Hydraulic Head Calculation:  0
                        (1 = yes, 0 = no)

<Enter> = select value   <Esc> = options menu   <F1> = DOS shell
```

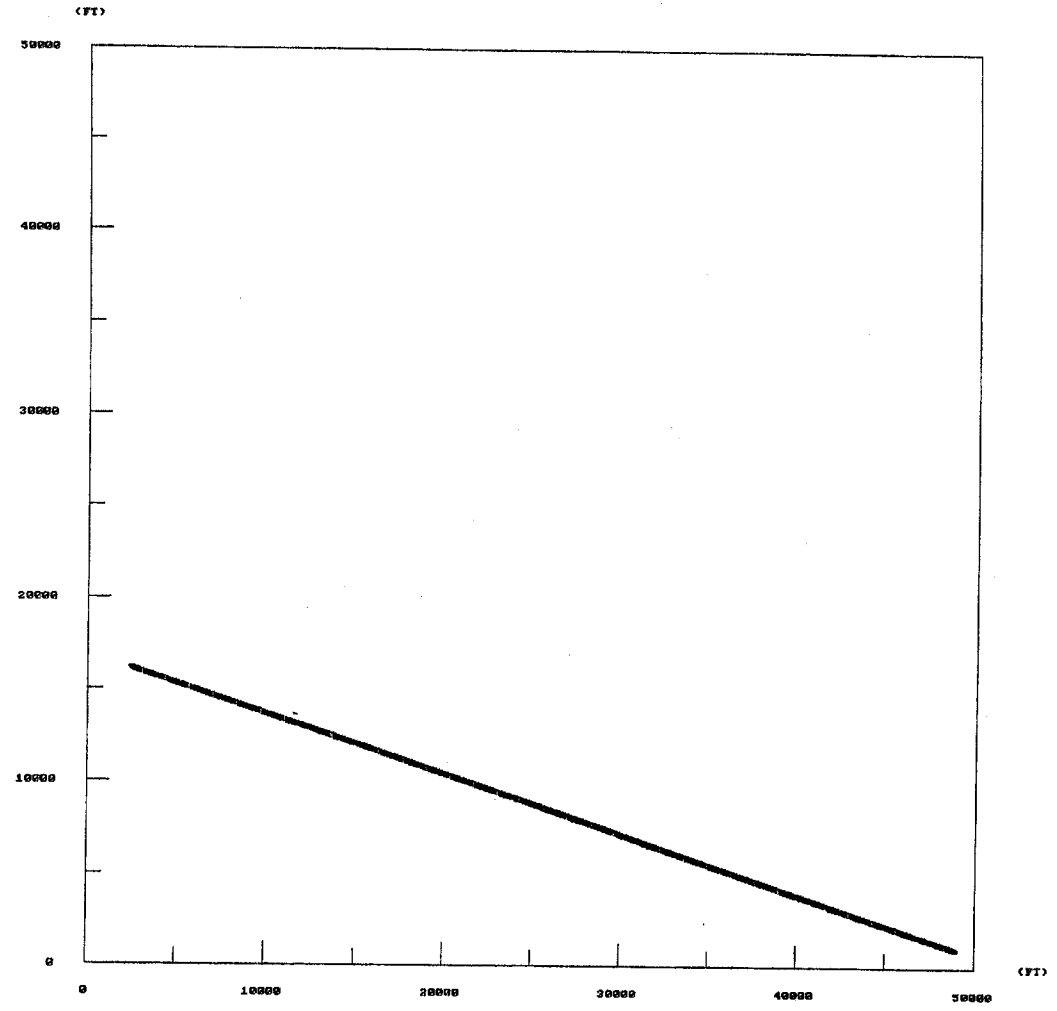
```
-------- MWCAP --

        AQUIFER PROPERTIES AND LOCATION FOR WELL # 1



                       X Coordinate (ft): 5000
                       Y Coordinate (ft): 5000
          Well Discharge Rate (ft**3/d): 173240
                Transmissivity (ft**2/d): 310120
    Hydraulic Gradient (dimensionless): .002
       Angle of Ambient Flow (degrees): 342
      Aquifer Porosity (dimensionless): 0.1
                 Aquifer Thickness (ft): 350

            Change Any Values On This Screen (Y/N)?

<Enter> = select value   <Esc> = options menu   <F1> = DOS shell
```



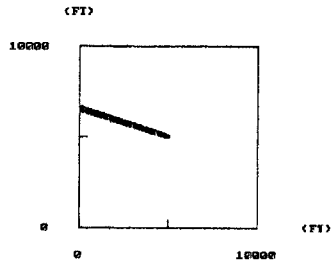
<Enter> = select value <Esc> = options menu <F1> = DOS shell



<Enter> = select value <Esc> = options menu <F1> = DOS shell



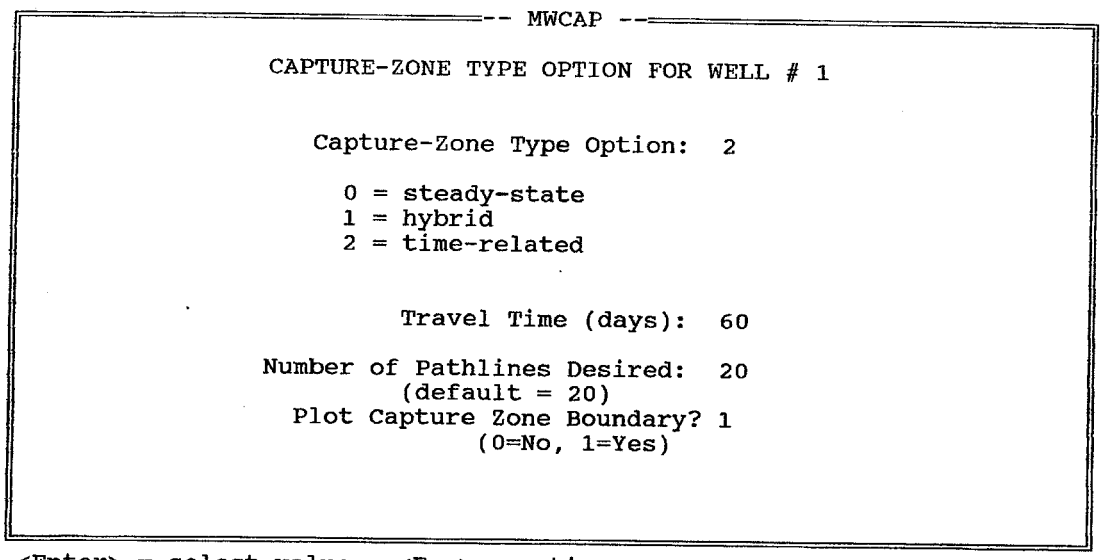
ARROW CANYON
1:100,000



1:100,000

```
-- MWCAP --

Run Title: LOGANDALE WELL

    Units to use for Current Problem:  1
            0 = meters and days
            1 = feet and days

          Number of Wells for which
          Capture-Zones are desired:  1   <= Should be 1 if
                                             plotting heads!
               Minimum X-Coordinate:
               Maximum X-Coordinate:  10000.0
               Minimum Y-Coordinate:
               Maximum Y-Coordinate:  10000.0

        Maximum Spatial Step Length:  50.0

     Perform Hydraulic Head Calculation:  0
                (1 = yes, 0 = no)

<Enter> = select value   <Esc> = options menu   <F1> = DOS shell
```

```
-- MWCAP --

    AQUIFER PROPERTIES AND LOCATION FOR WELL # 1

                  X Coordinate (ft): 5000.0
                  Y Coordinate (ft): 5000.0
    Well Discharge Rate (ft**3/d): 52132.0
         Transmissivity (ft**2/d): 2700.0
Hydraulic Gradient (dimensionless): 0.004000
   Angle of Ambient Flow (degrees): 303.00
  Aquifer Porosity (dimensionless): 0.10
            Aquifer Thickness (ft): 100.00

<Enter> = select value   <Esc> = options menu   <F1> = DOS shell
```



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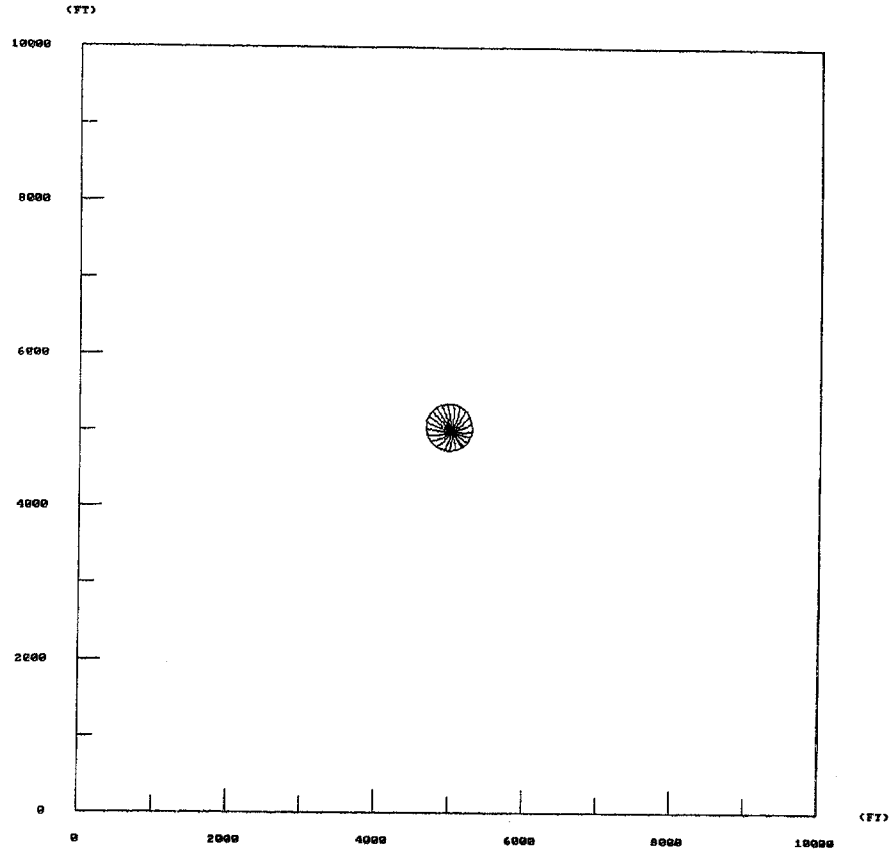
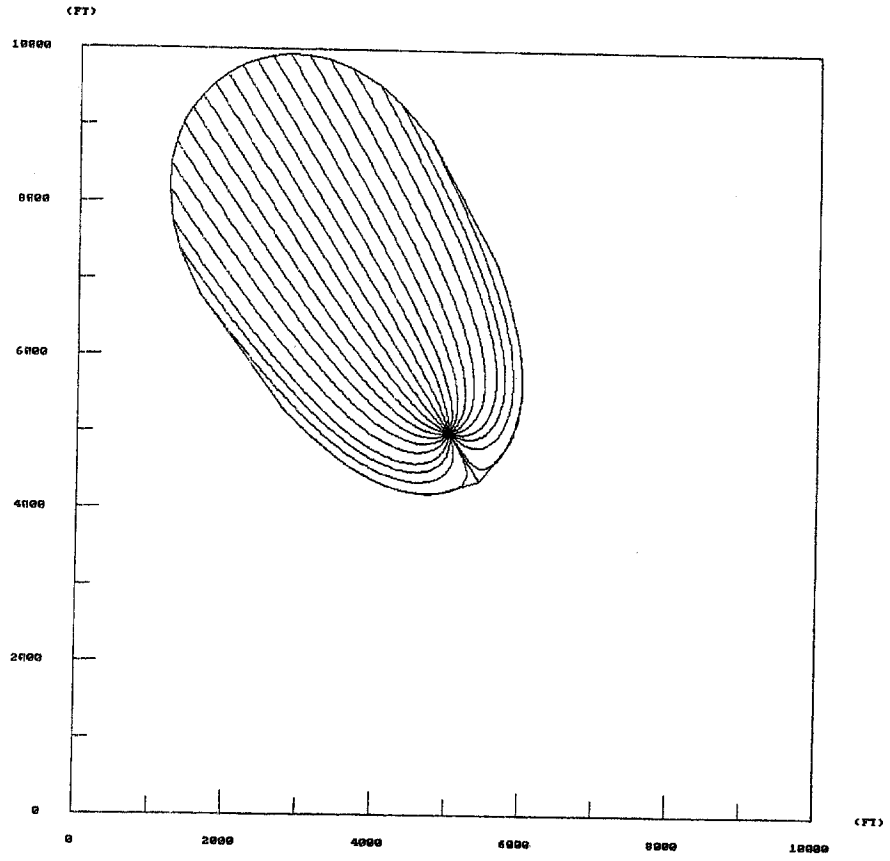


Los Andale well
Continuous for 60 days
1: 24,000

```
-- MWCAP --

BOUNDARY CONDITION INPUT FOR WELL # 1

                Boundary Type:  0

        0 = no boundary
        1 = stream boundary
        2 = barrier boundary

<Enter> = select value    <Esc> = options menu    <F1> = DOS shell
```

```
-- MWCAP --

CAPTURE-ZONE TYPE OPTION FOR WELL # 1

     Capture-Zone Type Option:  2

       0 = steady-state
       1 = hybrid
       2 = time-related

          Travel Time (days):  3650.00

  Number of Pathlines Desired:  20
            (default = 20)
    Plot Capture Zone Boundary? 1
                (0=No, 1=Yes)

<Enter> = select value    <Esc> = options menu    <F1> = DOS shell
```

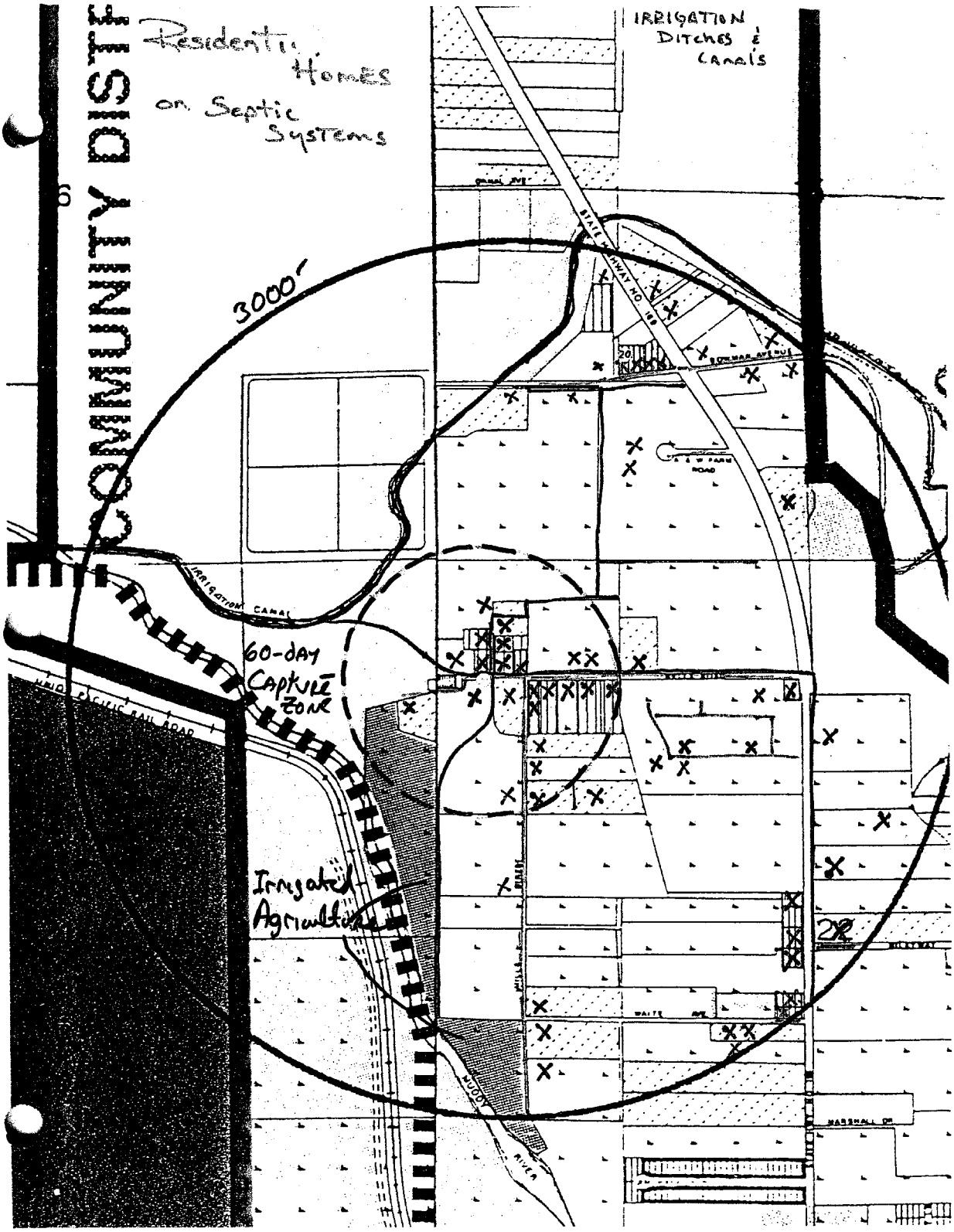
LOGANDALE WELL - RUN 2 - 10 YEARS

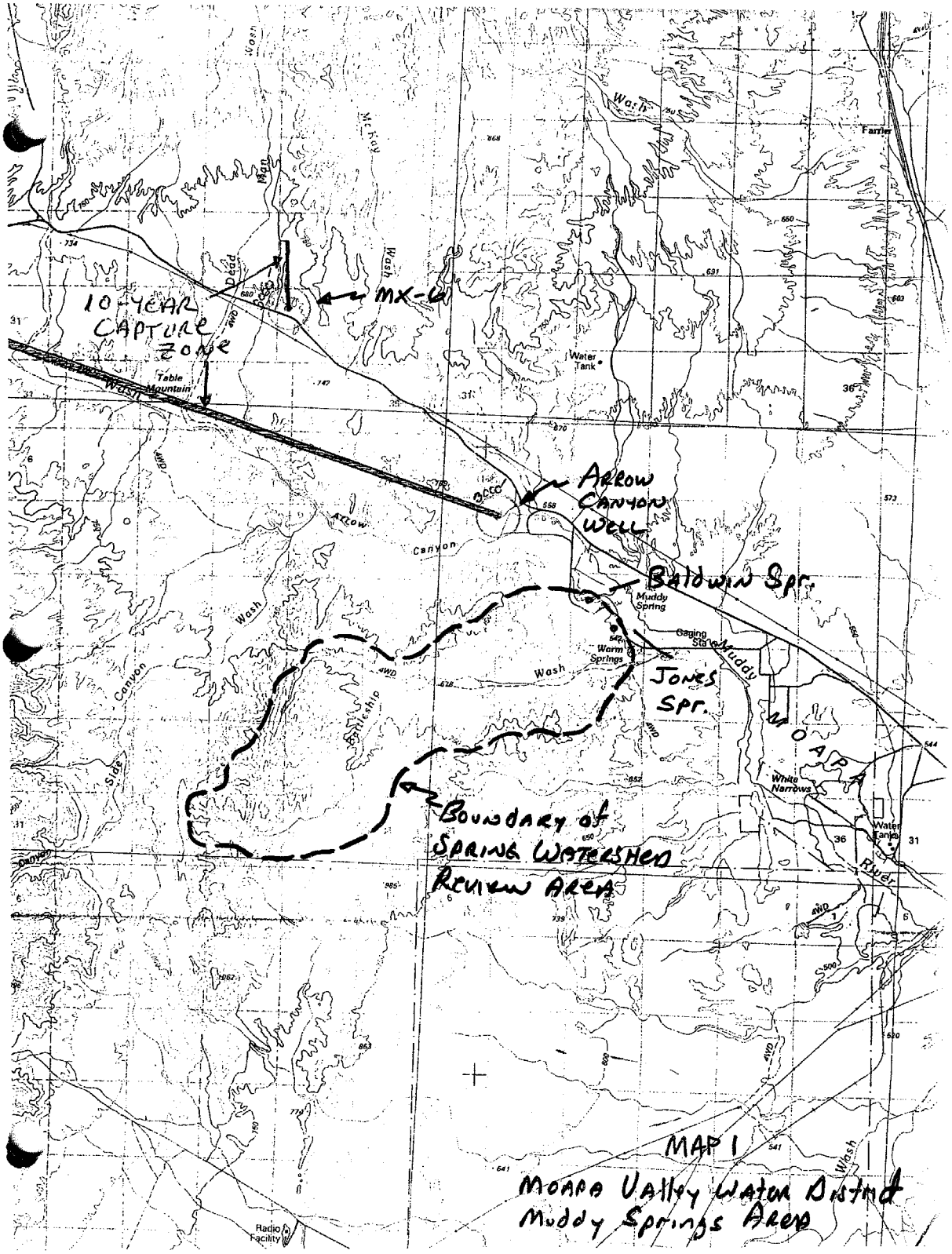


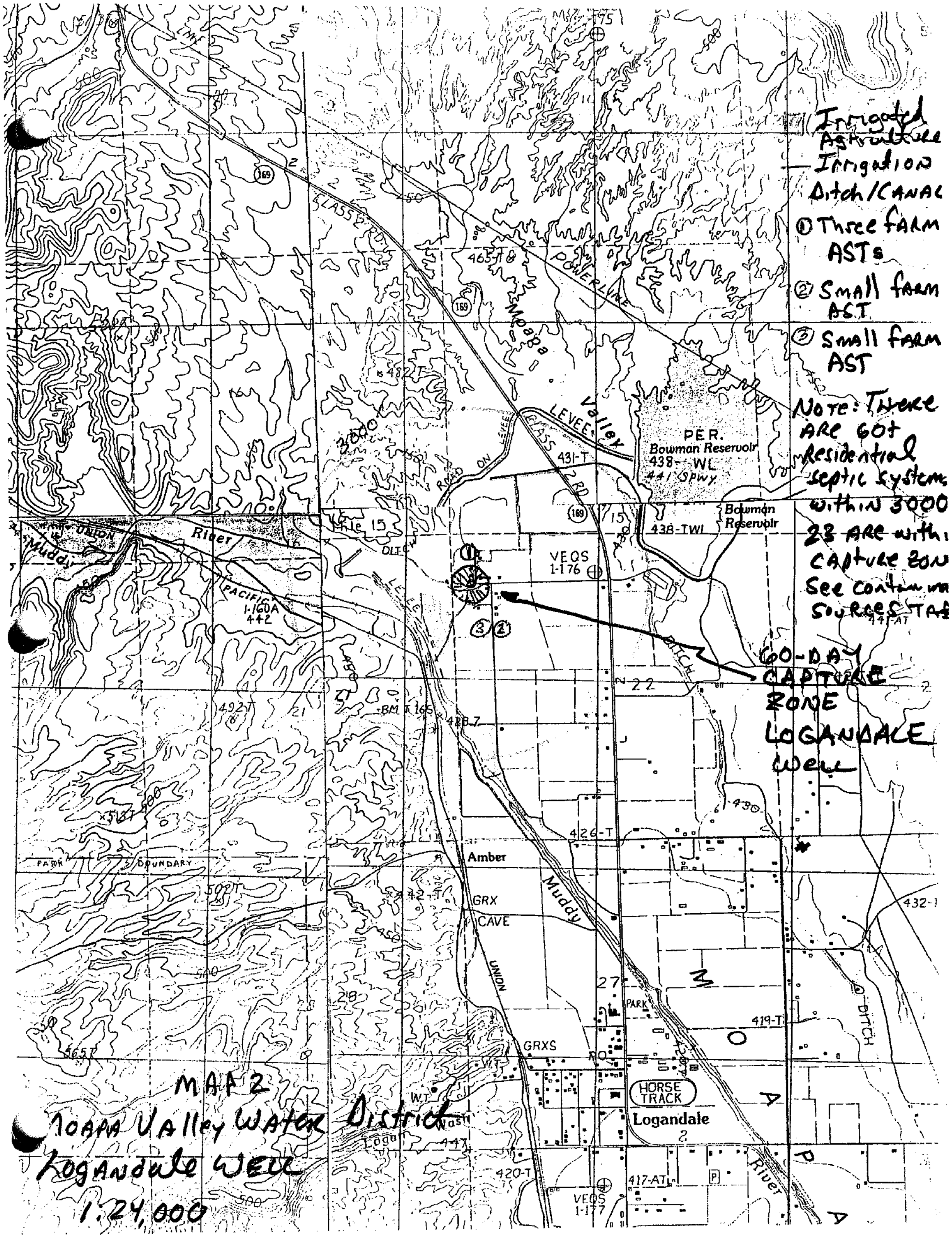
Logandale
continuous for 10 years
1:24,000

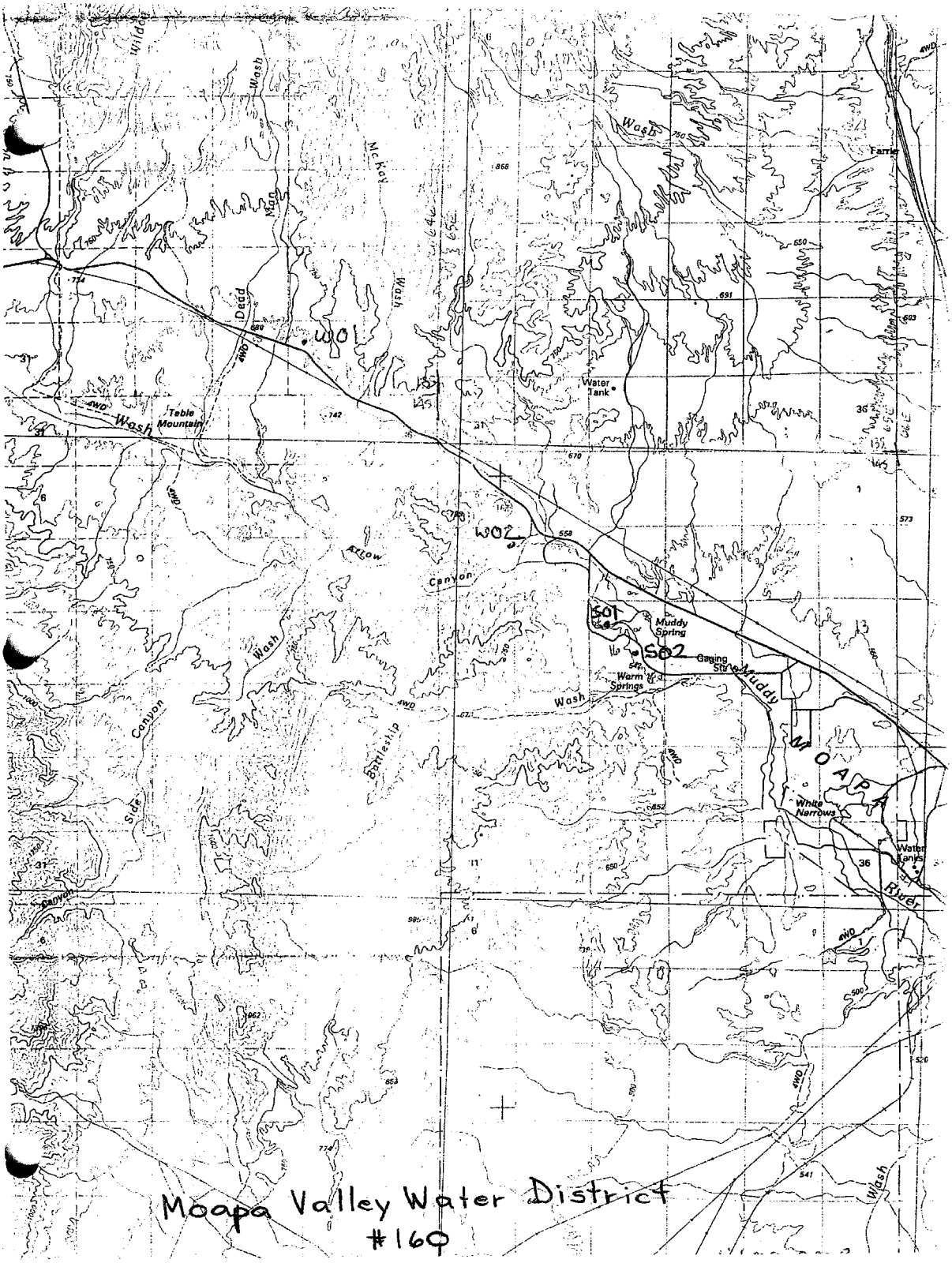
NOTE: NO CONTAMINANT SOURCES WERE IDENTIFIED WITHIN THE 10-YEAR CAPTURE ZONE THAT REQUIRED SURVEYING WITH THE GPS. THREE CONTAMINANT SOURCES WERE IDENTIFIED WITHIN 3000' OF THE PWS SUPPLY WELL. THE LOCATIONS OF THESE SOURCES ARE SHOWN ON THE WHPA MODEL TAB (MAP 2).

THE LOCATION OF IRRIGATED AGRICULTURAL LAND, IRRIGATION DITCHES, AND SEPTIC SYSTEMS WITHIN THE CAPTURE ZONE AND WITHIN 3000' OF THE PWS SUPPLY WELL ARE SHOWN ON THE ATTACHED MAP.

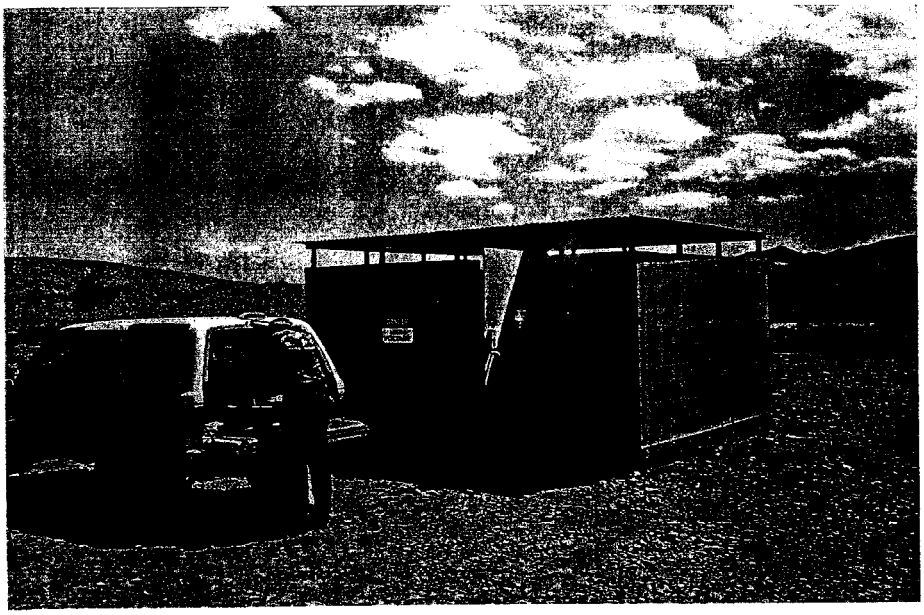

COMMUNITY DIST
Residential Homes on Septic Systems
IRRIGATION DITCHES & CANALS
3000'
IRRIGATION CANAL
60-DAY CAPTURE ZONE
Irrigated Agriculture
UNION PACIFIC RAILROAD
WAITE AVE
MARSHALL DR
RIVER


MX-4
10-YEAR CAPTURE ZONE
Arrow Canyon Well
Baldwin Spr.
Jones Spr.
Boundary of Spring Watershed Review Area
MAP 1
Moapa Valley Water District
Muddy Springs Area
Table Mountain
Muddy Spring
Warm Springs
White Narrows
Water Tank
Radio Facility
Farrier
Gaging Sta
Muddy River
Moapa
Wash
Canyon


Irrigated Agriculture
Irrigation Ditch/Canal
① Three farm ASTs
② Small farm AST
③ Small farm AST
Note: There are 60+ residential septic systems within 3000
23 are within capture zon
See contam sources tab
60-DAY CAPTURE ZONE LOGANDALE WELL
PER.
Bowman Reservoir
438 WL
441 Spwy
Bowman Reservoir
438-TWI
VEQS 1-176
Moapa Valley
LEVEE
POWERLINE
Muddy River
UNION PACIFIC
Amber
GRX
CAVE
GRXS
Muddy River
DITCH
HORSE TRACK
Logandale
VEQS 1-177
MOAPA
MAP 2
Moapa Valley Water District
Logandale WELL
1:24,000

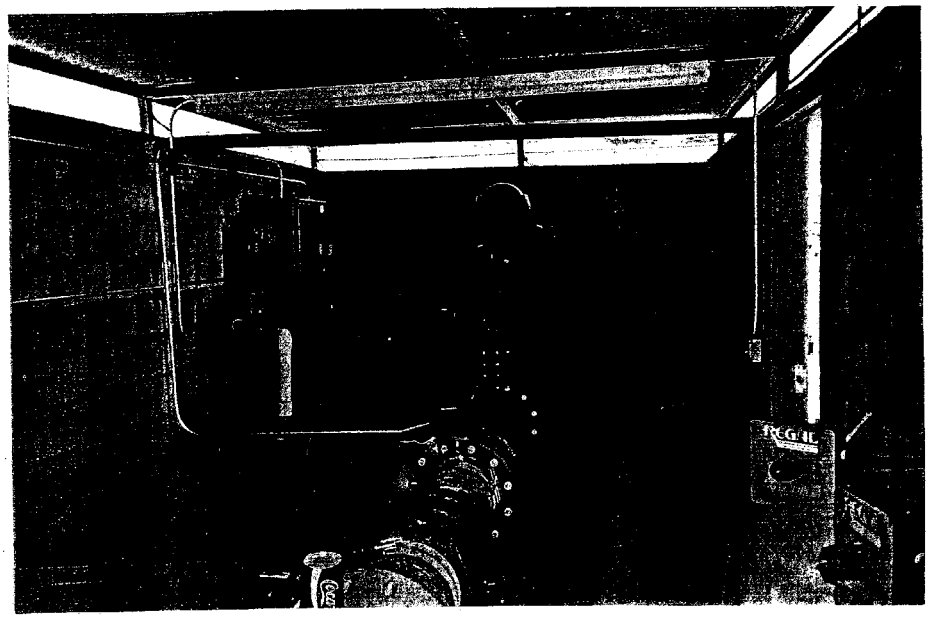


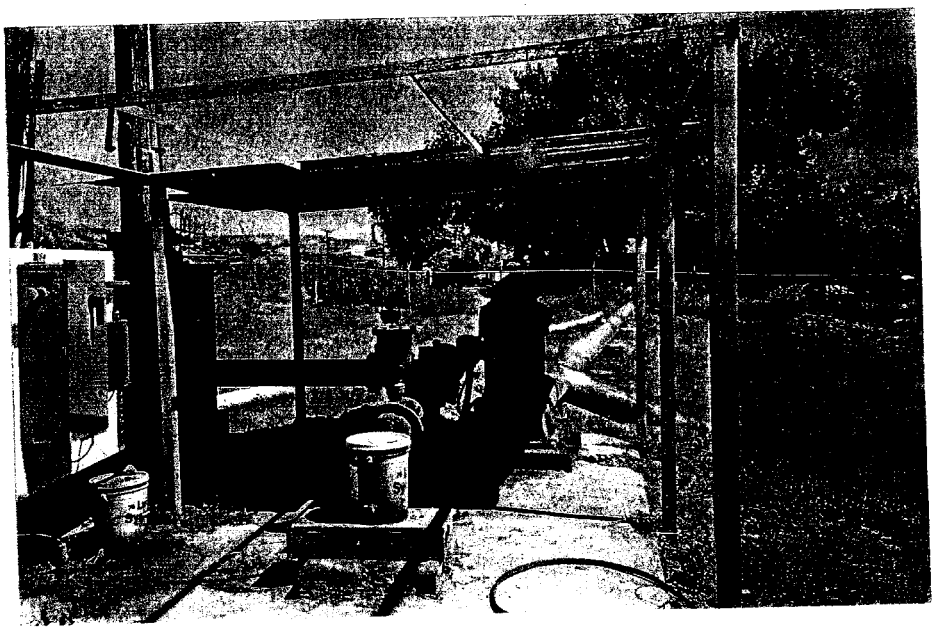
Moapa Valley Water District
#169



SOURCE W01 - MX WELL

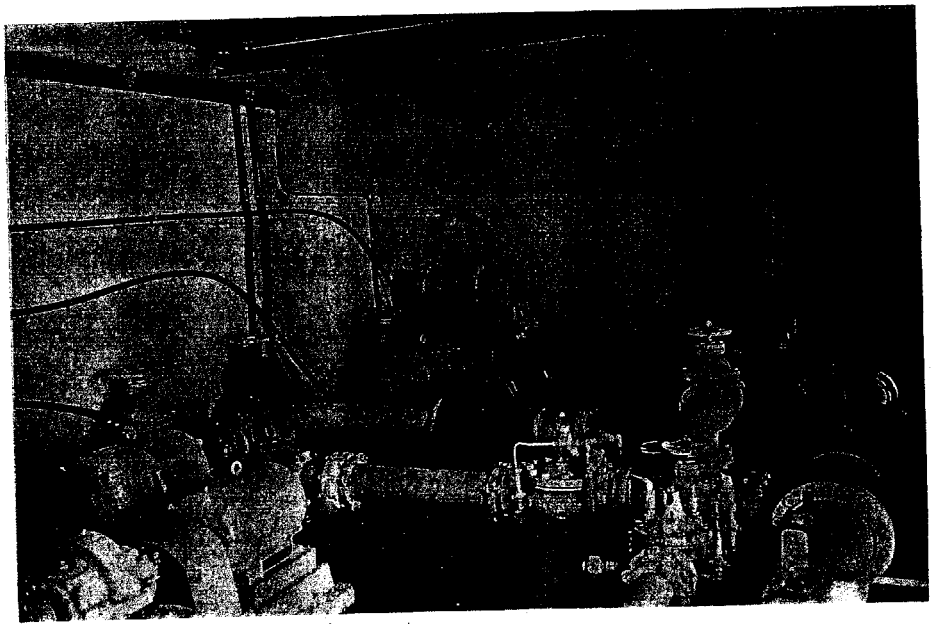
SOURCE NO2- ARROW CANYON WELL



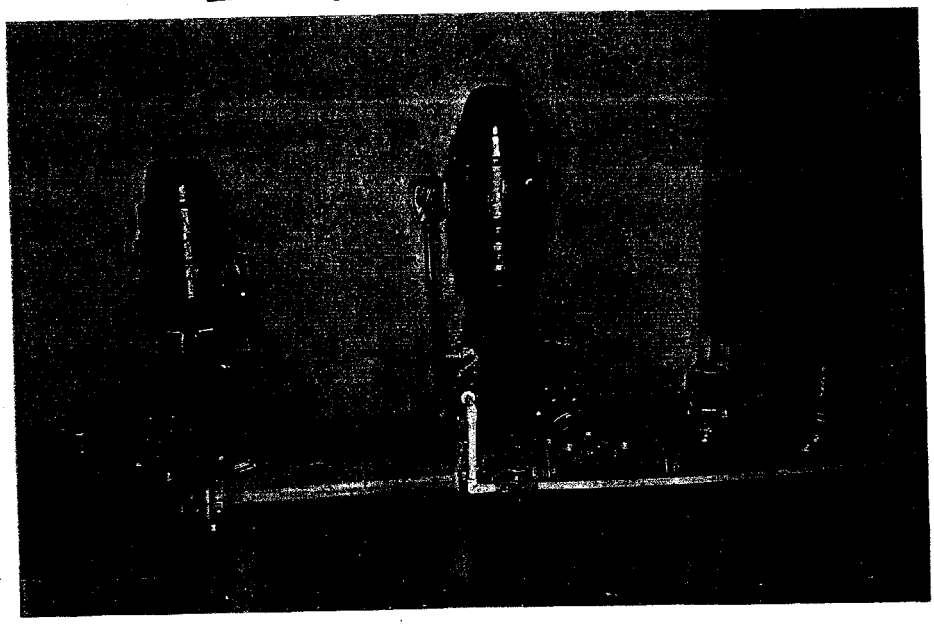


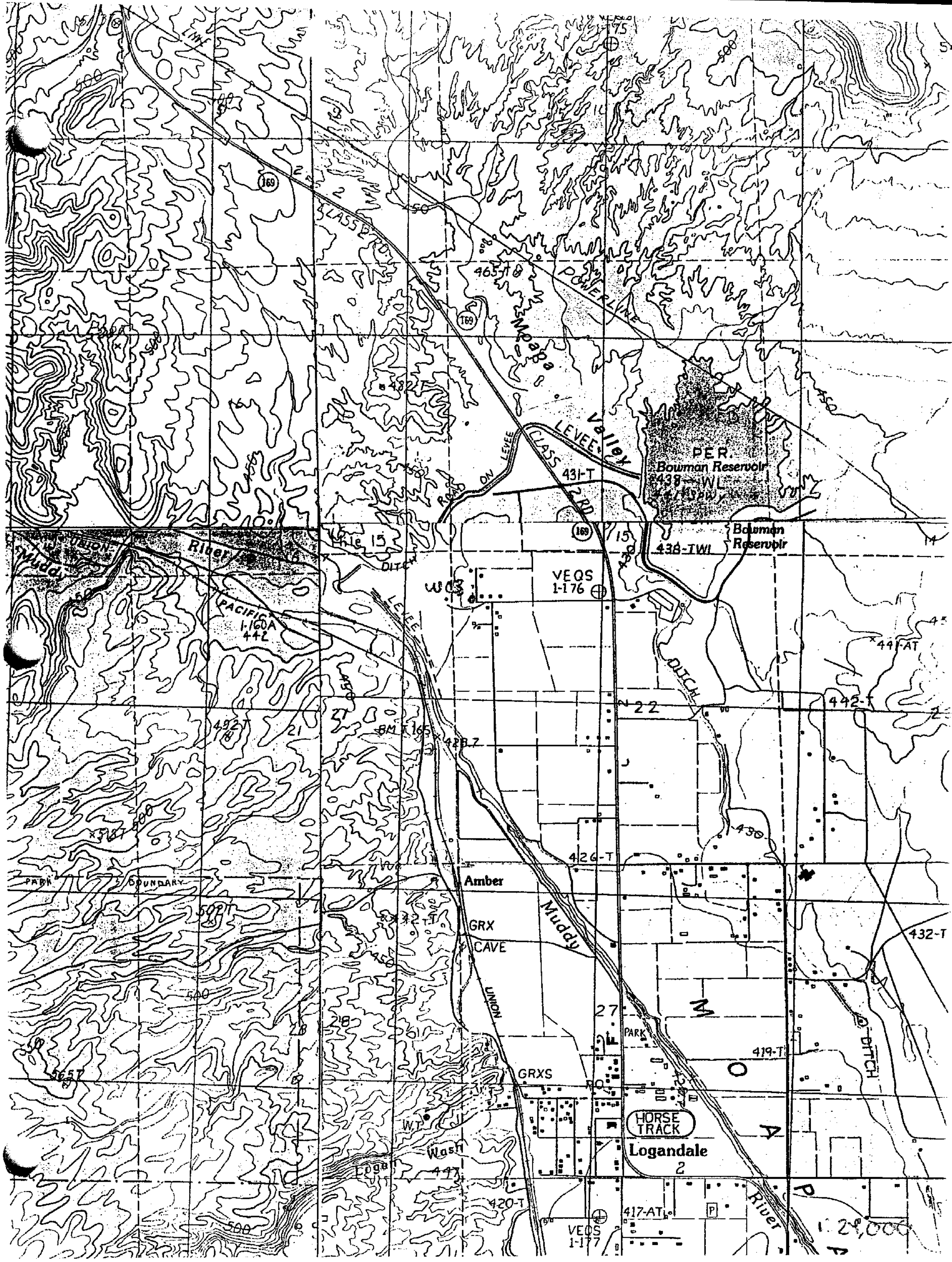
SOURCE W03 - LOGANDALE WELL

SOURCE S01 - BALDWIN SPRING



SOURCE SO2 - JONES SPRING





Bowman Reservoir
PER.
Bowman Reservoir
438-TWI
431-T
VEQS
1-176
VEQS
1-177
Valley
LEVEE
DITCH
CLASS 2 RD
POWERLINE
169
River
Muddy
PACIFIC
UNION
1-160A
442
Amber
GRX
CAVE
GRXS
PARK
HORSE
TRACK
Logandale
417-AT
420-T
426-T
419-T
432-T
442-T
441-AT
BM 1165
PARK BOUNDARY
Wash
M
O
A
P
1:24,000

Moapa Data
13-Jan-05

OWNER

AltFacilityII	Name	Address	City	State	ZIP	Phone
8-000213	CHARLIE HESTER	2335 E GLENDALE BLVD	MOAPA	NV	89025	(702) 864-2486
8-000499	MOAPA DEVELOPEI	PO BOX 520	MOAPA	NV	89025	(702) 864-2335
8-001085	CHARLIE HESTER	2335 E GLENDALE BLVD	MOAPA	NV	89025	(702) 864-2486
8-001325	VERNON ASHCRAF	PO BOX 609	MOAPA	NV	89025	
8-001373	MOAPA VALLEY OIL	PO BOX 460	MOAPA	NV	89025	(702) 864-2260
8-001635	C AND V HESTER	2335 GLENDALE BLVD	MOAPA	NV	89025	(702) 864-2486

TANK

AltFacilityII	TankID	TankStatusDesc	TankCapa	Subst	TankM	TankModsDesc
8-000213	8	Currently in Use	12000	Gasoli	Fiberg	Double-Walled
8-000213	9	Currently in Use	12000	Gasoli	Fiberg	Double-Walled
8-000213	10	Currently in Use	12000	Gasoli	Fiberg	Double-Walled
8-000499	1	Permanently Out of Use	1500	Used (	Epoxy	None
8-000499	2	Permanently Out of Use	20000	Diesel	Epoxy	None
8-000499	3	Permanently Out of Use	10000	Gasoli	Compc	None
8-000499	4	Permanently Out of Use	12000	Diesel	Compc	None
8-000499	5	Permanently Out of Use	1500	Gasoli	Epoxy	None
8-001085						
8-001325						
8-001373	1	Permanently Out of Use	10000	Gasoli	Cathoc	None
8-001373	2	Permanently Out of Use	9500	Diesel	Compc	None
8-001373	3	Permanently Out of Use	9500	Gasoli	Compc	None
8-001635						

FACILITY

AltFacilityII	LocName	LocStr	City	State	ZIP
8-000213	GLENDALE ENTERP	2300 E GLENDALE BLVD	MOAPA	NV	89025
8-000461	REID GARDNER ST/	EXIT 88 @ I-15 NORTH □□	MOAPA	NV	89025
8-000499	MOAPA DEVELOPEI	1501 HIGHWAY 168	MOAPA	NV	89025
8-000509	HIDDEN VALLEY DA	1000 HIDDEN VALLEY RD	MOAPA	NV	89025
8-000712	DRY LAKE-MILEPOS	MILEPOST 363.2	MOAPA	NV	89025
8-000713	FARRIER STATION-I	MILEPOST 393.0	MOAPA	NV	89025
8-000714	MOAPA STATION-MI	MILEPOST 383.1	MOAPA	NV	89025
8-000975	MOAPA MARKET: OI	1701 SR HWY 168	MOAPA	NV	89025
8-001085	SAME AS 8000213	2300 GLENDALE BLVD.	MOAPA	NV	89025
8-001137	UTE PERKINS ELEM	1255 PATRIOTS WAY	MOAPA	NV	89025
8-001325	SAME AS 8000975	PO BOX 609	MOAPA	NV	89025
8-001373	ARROWHEAD SERV	I-15 @ EXIT 91	MOAPA	NV	89025
8-001624	MOAPA WARD LOG/	Address Unknown	MOAPA	NV	89025
8-001635	SAME AS 8000213	2306 GLENDALE BLVD	MOAPA	NV	89025

TANK

AltFacilityII	TankID	TankStatusDesc	TankCapa	Subst	TankM	TankModsDesc
8-000461	1	Permanently Out of Use	1023	Gasoli	Cathoc	None
8-000461	2	Permanently Out of Use	1000	Diesel	Cathoc	None
8-000461	3	Permanently Out of Use	1000	Diesel	Cathoc	None
8-000461	4	Currently in Use	2550	Gasoli	Fiberg	None

8-000461	5 Currently in Use	2550	Diesel Fibergl	None
8-000461	6 Currently in Use	10000	Diesel Asphal	None
8-000461	7 Currently in Use	10000	Diesel Asphal	None
8-000509	1 Permanently Out of Use	2000	Diesel Asphal	None
8-000712	1 Permanently Out of Use	1000	Gasoli Fibergl	None
8-000712	2 Permanently Out of Use	500	Gasoli Asphal	None
8-000713	1 Permanently Out of Use	800	Gasoli Asphal	None
8-000714	1 Permanently Out of Use	500	Gasoli Asphal	None
8-000714	2 Permanently Out of Use	500	Gasoli Asphal	None
8-000975	1 Currently In Use	10000	Gasoli Fibergl	None
8-000975	2 Temporarily Out of Use	5000	Gasoli Cathoc	None
8-000975	3 Currently In Use	2000	Diesel Fibergl	None
8-000975	4 Permanently Out of Use	500	Not Li: Asphal	None
8-001137	1 Currently in Use	12000	Diesel Fibergl	Double-Walled
8-001624	1 Permanently Out of Use	1000	Heatin Fibergl	None

RTK NET MASTER AREA REPORT

search used- Zip Code: 89025
City: MOAPA
State: NV
Year: ALL

Mailing as well as facility addresses were searched.
Database(s) FINDS were not searched.

This search was taken from RTK NET's (the Right-To-Know Network)'s copies of various EPA databases. RTK NET is run by OMB Watch at 1742 Connecticut Ave., NW, Washington DC, 20009 - Phone: 202-234-8494
The search was done on 01/12/2005.

If you don't see the words *END OF REPORT* at the end of this search, then this Web search didn't complete -- back up and try it again.

TRI DATA

TRI (Toxic Release Inventory) data shows releases and transfers of toxic chemicals from manufacturers only. Data exists for the years 1987 - 2002. The first line of each record below shows the TRI facility name, city, state, and reporting year.

TOMKINS IND. INC., LASCO BATHW MOAPA NV 1995
TRI ID: 89025LSCBT201NM Waste Generated (lbs): 231,691
Lbs Released: 231,691 Lbs Transferred: 0
TOMKINS IND. INC., LASCO BATHW MOAPA NV 1996
TRI ID: 89025LSCBT201NM Waste Generated (lbs): 401,927
Lbs Released: 401,927 Lbs Transferred: 0
TOMKINS IND. INC., LASCO BATHW MOAPA NV 1997
TRI ID: 89025LSCBT201NM Waste Generated (lbs): 435,050
Lbs Released: 435,050 Lbs Transferred: 0
NEVADA POWER CO. -REID GARDNER MOAPA NV 1998
TRI ID: 89025RDGRD1WALL Waste Generated (lbs): 1,226,240
Lbs Released: 589,929 Lbs Transferred: 0
TOMKINS IND. INC. LASCO BATHWA MOAPA NV 1998
TRI ID: 89025LSCBT201NM Waste Generated (lbs): 436,631
Lbs Released: 436,630 Lbs Transferred: 0
LASCO BATHWARE INC. MOAPA NV 1999
TRI ID: 89025LSCBT201NM Waste Generated (lbs): 338,538
Lbs Released: 338,538 Lbs Transferred: 0
REID GARDNER STATION MOAPA NV 1999
TRI ID: 89025RDGRD1WALL Waste Generated (lbs): 662,400
Lbs Released: 561,000 Lbs Transferred: 50,700
LASCO BATHWARE INC. MOAPA NV 2000
TRI ID: 89025LSCBT201NM Waste Generated (lbs): 48,904
Lbs Released: 48,904 Lbs Transferred: 0
NEVADA POWER REID GARDNER STAT MOAPA NV 2000
TRI ID: 89025RDGRD1WALL Waste Generated (lbs): 706,608
Lbs Released: 706,606 Lbs Transferred: 0
LASCO BATHWARE INC. MOAPA NV 2001
TRI ID: 89025LSCBT201NM Waste Generated (lbs): 49,971
Lbs Released: 49,980 Lbs Transferred: 0
NEVADA POWER REID GARDNER STAT MOAPA NV 2001
TRI ID: 89025RDGRD1WALL Waste Generated (lbs): 643,577
Lbs Released: 643,557 Lbs Transferred: 0
LASCO BATHWARE INC. MOAPA NV 2002
TRI ID: 89025LSCBT201NM Waste Generated (lbs): 58,584
Lbs Released: 56,660 Lbs Transferred: 1,924

REID GARDNER STATION MOAPA NV 2002
Mail City & State: LAS VEGAS NV
TRI ID: 89025RDGRD1WALL Waste Generated (lbs): 674,855
Lbs Released: 674,855 Lbs Transferred: 0

BRS DATA

BRS (RCRA Biennial Reporting System) data shows generation and shipment of RCRA and other waste. The 1989 through 2001 data years are available through this program. The first line of each record below shows the BRS facility name, city, state, and reporting year.

REID GARDNER STATION MOAPA NV 1991
Tons generated: 5 Tons shipped: 0
Tons managed : 0 Tons received: 0 EPA ID: NVD093065852
NEVADA POWER CO REID GARDNER MOAPA NV 1999
Mail City & State: LAS VEGAS NV
Tons generated: 3 Tons shipped: 3
Tons managed : 3 Tons received: 0 EPA ID: NVD093065852

DOCKET DATA

DOCKET is a database of all court cases filed by the Dept. of Justice on behalf of EPA in civil court. It lists all cases since the beginning of EPA. A partial database of EPA Administrative Actions is also included. The first line of each record below shows the facility name, city, and state.

NEVADA POWER COMPANY REID GARD MOAPA NV
Case Name: NEVADA POWER COMPANY Case result: Consent instrument with pe
TOMKINS IND INC DIV LASCO BATH MOAPA NV
Case Name: TOMKINS INDUSTRIES - LASCO BAT Case result:
TOMKINS IND INC DIV LASCO BATH MOAPA NV
Case Name: TOMKINS INDUSTRIES,INC. Case result:
TOMKINS IND. INC. LASCO BATHWA MOAPA NV
Case Name: TOMKINS INDUSTRIES,INC. Case result:

CERCLIS DATA

The CERCLA List of sites is a list of potential and actual sites that might have to be cleaned up under Superfund. All currently known sites are in this database, including NPL sites. The first line of each record below shows the site name, city, state, and EPA ID.

NEVADA POWER STATION/REID GARDNER STATIO MO
NPL Status: Not on the NPL
Discovery Date: 19920415
This is a "No Further Remedial Action Planned" site
This site has had 1 enforcement activities

ERNS DATA

ERNS (Emergency Response Notification System) data are records of phone calls reporting toxic releases and spills to the National Response Center. Data is currently available for 1982-2003. The first line of each record below shows the name of the discharging organization (if any could be identified) plus the city, state and reporting year of the spill.

No discharger listed OVERTON NV 2001
Discharger located in: MOAPA NV
1st chemical: GASOLINE: AUTOMOTIVE (UNLEADED) Amount released: 5 GALLON(S)

RCRIS DATA

RCRIS (RCRA Information System) data shows hazardous waste permits for generators, receivers, and transporters of hazardous waste. The first line of each record below shows the handler (facility) name, city, and state.

AMER TELE & TELE CO ARROW CANYON MOAPA NV
Mail City & State: SAN FRANCISCO CA
Generator Status : None
Treatment, Storage & Disposal Status: None
MOAPA BAND OF PAIUTES MOAPA NV
Generator Status : None
Treatment, Storage & Disposal Status: None
NEVADA POWER CO REID GARDNER MOAPA NV
Mail City & State: LAS VEGAS NV
Generator Status : Small Quantity Generator (SQG)
Treatment, Storage & Disposal Status: None

Total numbers of records found from each database-
# of TRI facilities found : 13
# of RCRIS handlers found : 3
# of NPRI submissions found: 0
# of BRS facilities found : 2
# of PCS permits found : 0
# of ERNS reports found : 1
# of ARIP reports found : 0
# of DOCKET cases found : 4
# of CERCLA sites found : 1
# of RODS sites found : 0
# of CUS submissions found : 0
# of NPL sites found : 0
# of SETS PRPs found : 0

END OF REPORT

Appendix D

Potential Contaminant Sources: **Entry Date** 2 / 15 / 05

PWS ID #. 160 SOURCE ID #: 1 (PWS-01, 02, 03 etc.)
Water Resources App. #: Water Resources Cert. #.
Facility Description:
Facility Address:
Contaminant Code: **(see list)**
Risk Ranking: Revised Risk Ranking:

Contaminant Location:

Latitude Deg.: 36 Longitude Deg.: -114 Township: 13S
Latitude Min.: 46 Longitude Min.: 47 Range: 64E
Latitude Sec.: 3.596 Longitude Sec.: 14.581 Section: 26
UTM: ¼ Section: SE
¼ ¼ Section: SE

Name of facility: MX Well

Chemical(s) used at facility, if known:

If unknown, suspected chemical sources: SOC___ VOC___ IOC___ Microbiological___ Radionuclides___
Does facility have approved management plan?___ NDEP Permit #:
Have spills/contaminations occurred?___(Y/N/U)
Sources referenced, list:

Proximity of spill to water source (well/spring):___ft.
the spill up gradient?___ Is the spill down gradient?___
Remedial action taken:

Status of contaminant:

Approximate septic systems:

Approximate septic distance:

Approximate water wells:

Approximate well distance:

Approved method in place to control contamination?___(Y/N/U) If yes, explain:

Contaminant is mobile?___ (Y/N/U) If contaminant(s) mobility is known, explain:

Contaminant(s) is persistent in the environment (half-life). If persistence is known, explain:

Potential Contaminant Sources: **Entry Date** 2 / 15 / 05

PWS ID #. 160 SOURCE ID #: 2 (PWS-01, 02, 03 etc.)
Water Resources App. #: Water Resources Cert. #.
Facility Description:
Facility Address:
Contaminant Code: **(see list)**
Risk Ranking: Revised Risk Ranking:

Contaminant Location:

Latitude Deg.: 36 Longitude Deg.: -114 Township: 14S
Latitude Min.: 44 Longitude Min.: 44 Range: 65E
Latitude Sec.: 3.531 Longitude Sec.: 51.993 Section: 7
UTM: ¼ Section: SE
¼ ¼ Section: NE

Name of facility: Arrow Canyon #1

Chemical(s) used at facility, if known:

If unknown, suspected chemical sources: SOC___ VOC___ IOC___ Microbiological___ Radionuclides___
Does facility have approved management plan?___ NDEP Permit #:
Have spills/contaminations occurred?___(Y/N/U)
Sources referenced, list:

Proximity of spill to water source (well/spring):___ft.
Is the spill up gradient?___ Is the spill down gradient?___
Remedial action taken:

Status of contaminant:

Approximate septic systems:

Approximate septic distance:

Approximate water wells:

Approximate well distance:

Approved method in place to control contamination?___(Y/N/U) If yes, explain:

Contaminant is mobile?___ (Y/N/U) If contaminant(s) mobility is known, explain:

Contaminant(s) is persistent in the environment (half-life). If persistence is known, explain:

Potential Contaminant Sources: **Entry Date** 2 / 15 / 05

PWS ID #. 160 SOURCE ID #: 2 (PWS-01, 02, 03 etc.)
Water Resources App. #: Water Resources Cert. #:
Facility Description:
Facility Address:
Contaminant Code: **(see list)**
Risk Ranking: Revised Risk Ranking:

Contaminant Location:

Latitude Deg.: 36 Longitude Deg.: -114 Township: 14S
Latitude Min.: 44 Longitude Min.: 44 Range: 65E
Latitude Sec.: 3.531 Longitude Sec.: 51.993 Section: 7
UTM: ¼ Section: SE
¼ ¼ Section: NE

Name of facility: Arrow Canyon #2

Chemical(s) used at facility, if known:

If unknown, suspected chemical sources: SOC___ VOC___ IOC___ Microbiological___ Radionuclides___
Does facility have approved management plan?___ NDEP Permit #:
Have spills/contaminations occurred?___(Y/N/U)
Sources referenced, list:

Proximity of spill to water source (well/spring):___ft.
Is the spill up gradient?___ Is the spill down gradient?___
Remedial action taken:

Status of contaminant:

Approximate septic systems:

Approximate septic distance:

Approximate water wells:

Approximate well distance:

Approved method in place to control contamination?___(Y/N/U) If yes, explain:

Contaminant is mobile?___ (Y/N/U) If contaminant(s) mobility is known, explain:

Contaminant(s) is persistent in the environment (half-life). If persistence is known, explain:

Potential Contaminant Sources: **Entry Date** 2 / 15 / 05

PWS ID #. 160 SOURCE ID #: 4 (PWS-01, 02, 03 etc.)
Water Resources App. #: Water Resources Cert. #:
Facility Description:
Facility Address:
Contaminant Code: **(see list)**
Risk Ranking: Revised Risk Ranking:

Contaminant Location:

Latitude Deg.: 36 Longitude Deg.: -114 Township: 14S
Latitude Min.: 43 Longitude Min.: 43 Range: 65E
Latitude Sec.: 13.267 Longitude Sec.: 26.596 Section: 16
UTM: ¼ Section: NW
¼ ¼ Section: SE

Name of facility: Baldwin Spring

Chemical(s) used at facility, if known:

If unknown, suspected chemical sources: SOC___ VOC___ IOC___ Microbiological___ Radionuclides___
Does facility have approved management plan?___ NDEP Permit #:
Have spills/contaminations occurred?___(Y/N/U)
Sources referenced, list:

Proximity of spill to water source (well/spring):___ft.
the spill up gradient?___ Is the spill down gradient?___
Remedial action taken:

Status of contaminant:

Approximate septic systems:

Approximate septic distance:

Approximate water wells:

Approximate well distance:

Approved method in place to control contamination?___(Y/N/U) If yes, explain:

Contaminant is mobile?___ (Y/N/U) If contaminant(s) mobility is known, explain:

Contaminant(s) is persistent in the environment (half-life). If persistence is known, explain:

Potential Contaminant Sources: **Entry Date** 2 / 15 / 05

PWS ID #. 160 SOURCE ID #: 6 (PWS-01, 02, 03 etc.)

Water Resources App. #: Water Resources Cert. #.

Facility Description:

Facility Address:

Contaminant Code: **(see list)**

Risk Ranking: Revised Risk Ranking:

Contaminant Location:

Latitude Deg.: 36 Longitude Deg.: 114 Township: 14 S

Latitude Min.: 42 Longitude Min.: 43 Range: 65E

Latitude Sec.: 53.178 Longitude Sec.: 9.033 Section: 16

UTM: ¼ Section: NW

¼ ¼ Section: SE

Name of facility: Jones Spring

Chemical(s) used at facility, if known:

If unknown, suspected chemical sources: SOC___ VOC___ IOC___ Microbiological___ Radionuclides___

Does facility have approved management plan?___ NDEP Permit #:

Have spills/contaminations occurred?___(Y/N/U)

Sources referenced, list:

Proximity of spill to water source (well/spring):___ft.

Is the spill up gradient?___ Is the spill down gradient?___

Remedial action taken:

Status of contaminant:

Approximate septic systems:

Approximate septic distance:

Approximate water wells:

Approximate well distance:

Approved method in place to control contamination?___(Y/N/U) If yes, explain:

Contaminant is mobile?___ (Y/N/U) If contaminant(s) mobility is known, explain:

Contaminant(s) is persistent in the environment (half-life). If persistence is known, explain:

Potential Contaminant Sources: **Entry Date** 2 / 15 / 05

PWS ID #. 160 SOURCE ID #: 3 (PWS-01, 02, 03 etc.)

Water Resources App. #: Water Resources Cert. #:

Facility Description:

Facility Address:

Contaminant Code: **(see list)**

Risk Ranking: Revised Risk Ranking:

Contaminant Location:

Latitude Deg.: 36 Longitude Deg.: -114 Township: 15S

Latitude Min.: 37 Longitude Min.: 29 Range: 67E

Latitude Sec.: 13.378 Longitude Sec.: 33.775 Section: 22

UTM: ¼ Section: NW

¼ ¼ Section: NW

Name of facility: Logandale Well

Chemical(s) used at facility, if known:

If unknown, suspected chemical sources: SOC___ VOC___ IOC___ Microbiological___ Radionuclides___

Does facility have approved management plan?___ NDEP Permit #:

Have spills/contaminations occurred?___(Y/N/U)

Sources referenced, list:

Proximity of spill to water source (well/spring):___ft.

Is the spill up gradient?___ Is the spill down gradient?___

Remedial action taken:

Status of contaminant:

Approximate septic systems:

Approximate septic distance:

Approximate water wells:

Approximate well distance:

Approved method in place to control contamination?___(Y/N/U) If yes, explain:

Contaminant is mobile?___ (Y/N/U) If contaminant(s) mobility is known, explain:

Contaminant(s) is persistent in the environment (half-life). If persistence is known, explain:

Potential Contaminant Sources: **Entry Date** / /

PWS ID #. 160 SOURCE ID #:_____(PWS-01, 02, 03 etc.)

Water Resources App. #:_____ Water Resources Cert. #._____

Facility Description:_____

Facility Address:_____

Contaminant Code:_____ **(see list)**

Risk Ranking:_____ Revised Risk Ranking:_____

Contaminant Location:

Latitude Deg.:_____ Longitude Deg.:_____ Township:_____

Latitude Min.:_____ Longitude Min.:_____ Range:_____

Latitude Sec.:_____ Longitude Sec.:_____ Section:_____

UTM:_____ ¼ Section:_____

¼ ¼ Section:_____

Name of facility:_____

Chemical(s) used at facility, if known:_____

If unknown, suspected chemical sources: SOC___ VOC___ IOC___ Microbiological___ Radionuclides_____

Does facility have approved management plan?_____ NDEP Permit #:_____

Have spills/contaminations occurred?___(Y/N/U)

Sources referenced, list:_____

Proximity of spill to water source (well/spring):_____ft.

Is the spill up gradient?____ Is the spill down gradient?_____

Remedial action taken:

Status of contaminant:_____

Approximate septic systems:_____

Approximate septic distance:_____

Approximate water wells:_____

Approximate well distance:_____

Approved method in place to control contamination?_____(Y/N/U) If yes, explain:_____

Contaminant is mobile?_____ (Y/N/U) If contaminant(s) mobility is known, explain:_____

Contaminant(s) is persistent in the environment (half-life). If persistence is known, explain:_____

Appendix E

November 4, 2004

Name of Utility (or PCS Manager)
Name of Contact Person
P. O. Box 1000
Sparks, NV 89431

Dear Mr. :

The State of Nevada is working with the Moapa Valley Water District (MVWD) to develop a Wellhead Protection Program (WHPP) for the Moapa Valley area, in order to protect groundwater resources. As part of the program, an effort is being made to contact Utility Providers and other entities whose operations may impact groundwater quality.

The objective is to open a line of communication between your organization and the MVWD, to aid in the exchange of information relevant to wellhead protection, and reduce emergency response time.

A copy of the WHPP will be provided to you, at your request. This document contains information relevant to wellhead protection in the Moapa Valley area, including maps of the delineated Wellhead Protection Areas, where careful management of potential contaminant sources is most important.

Thank you for your assistance in this important program. If you have any questions, please contact me at ( ) - .

Sincerely,

Name of Contact Person
Title: Contact Person
Name of issuing entity

October 27, 2004

Mr. John Doe
P.O.Box 1000
Sparks, NV 89431

Dear Mr. :

The State of Nevada is working with the Moapa Valley Water District (MVWD) to develop a Wellhead Protection Program for the Moapa Valley area. As part of the program, I am investigating the hydrologic properties and water quality of the regional groundwater regime. As a domestic well user, I would appreciate receiving any information that you may have on your well.

Moapa Valley Area Well Survey

Name:_____ Phone #:_____

(Please circle one)

1. Do you have more than one well on your property? Yes. No.
2. Do you know the date(s) drilled? Yes. No. If yes, what was the date_____?
3. Do you know who the driller was? Yes. No. If yes, name is_____?
4. Do you know the depth of your well(s)? Yes. No. If yes, the depth is_____?
5. Do you know the depth to water? Yes. No. If yes, the depth to water is____?
6. Are you the original property owner? Yes. No. If no, original owner was__?
7. Has a chemical analyses of water quality been conducted? Yes. No.

I plan to be in the Moapa Valley area the week of_____, and would like to make an appointment to discuss the above with you. Please provide me with a time that would be convenient for you._____

Thank you for your assistance with this important program. If you have any questions, please contact me at ( ) - .

Sincerely,

Name of Inspector
Title

ANNUAL REVIEW FORM

Date	Reviewer	Changes or Comments