APPENDIX A

SELECTED HYDROGEOLOGIC FEATURES

N

P-10
CBR-1
P-8
P-9
395
CBR-2
P-6
P-7
CBR-3
P-11
MW-3
B
RP-4
CBS-9
CGR-10
P-5
TH-1
A
PW-1
MW-2
MW-1
CBS-8
P-12
P-15
A'
CBS-7
CBS-6
CGR-9
RP-3
TH-2
CBS-1
CBS-2
CBR-4
RP-2
P-1
P-2
RP-5
TH-3
CBS-3
RP-1
CBS-4
P-13
P-4
CGR-8
TH-4
CBS-5
P-3
OW-7U
ES-1
OW-7M
CGR-4
CGR-6
ES-3A
CGR-2
B'

Legend

- Well
- Monitoring Well
- Piezometer
- Spring
- Test Hole
- Cross Section A to A'
- Cross Section B to B'
- Inferred Fault Line
- CBR Property Boundary

Notes:

NAD_1983_StatePlane_California_IV_FIPS_0404_Feet
Projection: Lambert_Conformal_Conic
GCS_North_American_1983

0 250 500 Feet

Location of Spring-Line Fault with Lines of Cross Section

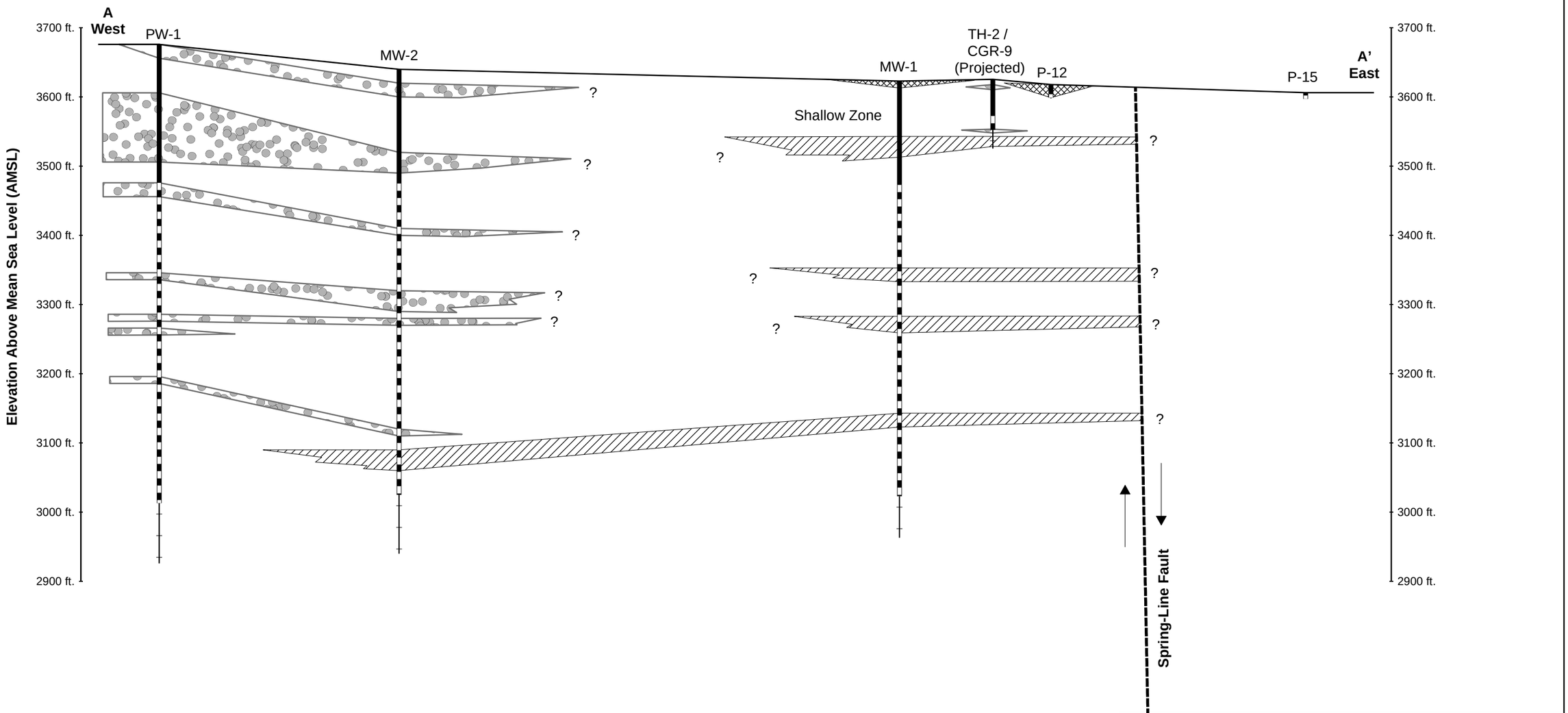
Cabin Bar Ranch, Olancha, CA

Geosyntec consultants

Santa Barbara | January 2011

Figure **A-1**

P:\GIS\SB0519 CrystalGeyser\Projects\Fig04_Cross_Section_Overhead.mxd HLE 20110106



Legend

- Surface
- Blank Casing
- Well Screen Interval
- Sub-Screen Boring
- Inferred Fault
- Sand
- Gravel
- Peat
- Silt / Clay / Very Fine Sand

150 75 0 150 Feet

Site Geologic Cross Section A - A'

Cabin Bar Ranch, Olancha, CA

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Figure **A-2**

P:\GIS\SB\0519 Crystal\Geyser\Projects\Fig06_Cross_Section_A.mxd HLE 20110207

B North

B' South

TH-1 / CGR-10

MW-1

TH-2 / CGR-9

P-4

TH-4 / CGR-8

OW-7M

OW-7U

CGR-4

CGR-2

3625 ft.

3600 ft.

3575 ft.

3550 ft.

3525 ft.

Elevation Above Mean Sea Level (AMSL)

Shallow Zone

?

Legend

- Surface
- Blank Casing
- Well Screen Interval
- Sub-Screen Boring
- Sand
- Gravel
- Peak
- Silt / Clay / Very Fine Sand

200 100 0 200 Feet

Site Geologic Cross Section B - B'

Cabin Bar Ranch, Olancha, CA

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February 2011

Figure

A-3

P:\GIS\SB\09\9 Crystal\Cross\Projects\Fig06_Cross_Section_B.mxd Int E 2011/02/27

APPENDIX B

WELL CONSTRUCTION INFORMATION

TABLE 1A
SUMMARY OF AVAILABLE WATER-SUPPLY WELL CONSTRUCTION DATA
CABIN BAR RANCH PROPERTY
INYO COUNTY, CALIFORNIA

Well No.	State Well Completion Report No.	Date Drilled	Method of Drilling	Pilot Hole Depth (ft)	Casing Type & Depth (ft)	Casing Diameter (in)	Borehole Diameter (in)	Sanitary Seal Depth (ft)	Perforation Intervals (ft)	Type of Perforations	Slot Opening of Perforations (in)	Type of Gravel Pack	Pumping Data Reported by Driller at Date of Construction				
													Date	Type of Test	Duration of Test (hrs)	Estimated Test Rate (gpm)	Static Water Level (ft)
CBR-1	ND	ND	direct rotary	198	steel, ND	10	14	ND	60-120	ND	ND	ND	ND	airlift	ND	300	artesian flow @ 60 gpm
CBR-2 (?)	231281 (?)	7/82	direct rotary	187	steel, 186	10	14	20	62-123, 143-186	louvers (?)	0.125	ND	8/4/82	airlift	2	250	artesian flow @ 50 gpm
CBR-3	ND	ND	direct rotary	300	none installed	N/A	6	ND	ND	ND	ND	N/A	ND	ND	ND	N/A	artesian flow at 6 gpm
CBR-4	N/A	ND	ND	60	steel, 60	6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CBR-5	575965	10/94	direct rotary	70	PVC to 52; then stainless steel to 67	all 10	17	49	52-67	well screen	0.06	coarse aquarium	10/7/94	ND	ND	ND	2
PW-1 (1989 test production well)	256267 E-logged on 2/9/89	3/89	direct rotary	753	steel 663	16	28	50	200-650	louvers	0.080 (80 slot)	ND	3/89	pumping	ND	2800 by pump	41
CGR-1	Geologic Log by Dames & Moore	4/90	direct rotary	94	PVC to 57; then stainless steel to 88	4 PVC; then 6 stainless steel	ND	52	57-88	well screen	0.020	#3 sand	ND	ND	ND	ND	ND
CGR-2	No E-log performed; Geologic Log by Dames & Moore	11/92	direct rotary	91	PVC to 50; then stainless steel to 65	All 10	22	50	51-65	well screen	0.080	#4 to #12 sand	ND	ND	ND	ND	ND
CGR-3	396391 E-logged on 9/20/03; Geologic Log by Dames & Moore	9/93	direct rotary	86	PVC to 52; then stainless steel to 72	All 10	17	53	56-72	well screen	0.050	#4 to #16 sand	ND	ND	ND	ND	ND
CGR-4	575694 E-logged on 8/2/94; Geologic log by Dames & Moore	8/94	direct rotary	100	PVC to 53; then stainless steel to 67	All 10	20	50	52-67	well screen	0.070	#4 to #12 sand	9/22/94	ND	ND	ND	5

TABLE 1A
SUMMARY OF AVAILABLE WATER-SUPPLY WELL CONSTRUCTION DATA
CABIN BAR RANCH PROPERTY
INYO COUNTY, CALIFORNIA

Well No.	State Well Completion Report No.	Date Drilled	Method of Drilling	Pilot Hole Depth (ft)	Casing Type & Depth (ft)	Casing Diameter (in)	Borehole Diameter (in)	Sanitary Seal Depth (ft)	Perforation Intervals (ft)	Type of Perforations	Slot Opening of Perforations (in)	Type of Gravel Pack	Pumping Data Reported by Driller at Date of Construction				
													Date	Type of Test	Duration of Test (hrs)	Estimated Test Rate (gpm)	Static Water Level (ft)
CGR-5	575695 E-logged on 8/3/94; Geologic log by Dames & Moore	8/94	direct rotary	97	PVC to 52; then stainless steel to 67	All 10	20	49	52-67	well screen	0.060 or 0.070	#4 to #12 sand	10/7/94	ND	ND	ND	2
CGR-6	575966 E-logged on 8/2/94; Geologic Log by Dames & Moore	8/94	direct rotary	100	PVC to 53; then stainless steel to 68	All 10	20	±50	53-68	well screen	0.060	#4 to #12 sand	10/94	ND	ND		3
GCR-7	575967 (log for test hole at site)	9/94	direct rotary	104	PVC to 55; then stainless steel to 70; then PVC to 100	All 10	17	50	55-70	well screen	0.060	coarse aquarium	9/94	ND	ND	ND	artesian flow of 3 to 5 gpm
CGR-8	e0116254; nearby TH-4 borehole E-logged on 5/27/10	8/10	direct rotary	68	stainless steel, 68	10	18	50	53-68	well screen	0.070	#4 to #12	8/16/10	with pump	8	Q=400 s=20 Q/s=20	11
CGR-9	e0116289; nearby TH-2 borehole E-logged on 5/26/10	8/10	direct rotary	73	stainless steel, 73	10	18	50	53-73	well screen	0.070	#4 to #12 sand	8/19/10	with pump	8	Q=400 s=20 Q/s=20	10
CGR-10	e0166312; nearby TH-1 borehole E-logged on 5/25/10	8/10	direct rotary	73	stainless steel, 73	10	18	50	53-73	well screen	0.070	#4 to #12 sand	8/23/10	with pump	8	Q=400 s=20 Q/s=20	5

NOTES: 1. ND = no data; NA = not available
2. Original Data for the CBR Wells 1 through 4 adapted from GSI 1982 report (Table 2).
3. Data shown for CGR-8, -9, and -10 are from official driller's logs of each well and may differ slightly from those data listed on the geologic log of each well. Also, it is not known why driller listed identical test rates and drawdown values on each of his logs for these wells.

TABLE 1B
SUMMARY OF AVAILABLE MONITORING WELL CONSTRUCTION DATA
CABIN BAR RANCH PROPERTY
INYO COUNTY, CALIFORNIA

Well No.	State Well Completion Report No.	Date Drilled	Method of Drilling	Pilot Hole Depth (ft)	Casing Type & Depth (ft)	Casing Diameter (In)	Borehole Diameter (in)	Sanitary Seal Depth (ft)	Perforation Intervals (ft)	Type of Perforations	Slot Opening of Perforations (in)	Type of Gravel Pack
OW-1	Geologic Log by Dames & Moore	8/90	direct rotary	70	PVC 69	4	ND	43	49-69	cut slots	#20	ND
OW-7U	Geologic Log by Dames & Moore	NA	direct rotary	704	NA 74½	5	NA	50	54½-74½	NA	NA	NA
OW-7M	Geologic Log by Dames & Moore	NA	direct rotary	704	NA 252	5	NA	188	212-252	NA	NA	NA
MW-1	256260 E-logged on 3/23/89	3/89	direct rotary	660	PVC 600	4	12	115	150-600	ND	0.060 (60-slot)	ND
MW-2	288949 E-logged on 4/5/89	4/89	direct rotary	700	steel(?) 615	4	12	130	165-615	louvers	0.060 (60-slot)	ND
MW-3	288952 E-logged on 4/18/99	4/89	direct rotary	510	steel 420	4	12	165	200-420	louvers	0.060 (60-slot)	ND
MW-4 (destroyed, 6/1987))	256303	1/89	direct rotary	91	steel 84	6	9	20	20-84	ND	ND	ND

NOTES: 1. ND = no data; NA = not available

TABLE 1C
PIEZOMETER PERFORATION INTERVALS
CABIN BAR RANCH
INYO COUNTY, CALIFORNIA

Piezometer Number	Date Installed	Perforation Interval (ft bgs)
P- 1	April 1988	23 to 28
P- 2		23 to 28
P- 3		24 to 29
P- 4		20 to 25
P- 5		23 to 28
P- 6		23 to 28
P- 7		29 to 34
P- 8		33 to 38
P- 9		20 to 25
P- 10		33 to 38
P- 11		14 to 19
P- 12		14 to 19
P- 13		14 to 19
P- 14		8 to 13
P- 15	April 1989	4 to 9
P- 16		5 to 10
RP- 1	Sept 2010	6 to 8
RP- 2		6 to 8
RP- 3		5 to 7
RP- 4		5 to 7
RP- 5		1 to 3

NOTES: The P series piezometers consist of 2-inch diameter galvanized steel tubes. No data available on the screened type or size. See JMM (1989) and MW (1993) for additional details on these piezometers.

The RP piezometers consisted of a 2-foot section of stainless steel screen with 0.020-inch slots joined with a galvanized steel pipe to ground surface and equipped with steel risers above the ground. See Geosyntec (2011) for additional detail regarding the construction of these piezometers.

Table

Summary of Cartago Well Information

Well Name	Well Owner	Reported Use	Well Depth (ft)	Well Screen Interval (ft bgs)	Reported Depth of Seal (ft bgs)	Reported Depth of Pump (Ft. bgs)	Log Available (Y/N)	Source of Information	Notes
CMW-1	Cartago Mutual	Mutual	250/325	--	--	--	N	Cartago Mutual/AB EIR	Sand in well to 180 feet
CMW-2	Cartago Mutual	Mutual	160	115-150	105	-110	Y	Cartago Mutual	CMW-2 services 43 homes
WIC-1	Chamberlain	?	100/320	--	--	--	N	County/AB EIR	Artesian well?
Pat-1	Troy& Susan Patton	Domestic	155	93.5-153.5	0-50	--	Y	County/HO	
Pal-1	Scott Palamar	Domestic	185	110-185	0-50	--	Y	County/HO	
Coa-1	Cindy Coats	Domestic	100	--	--	--	N	HO	
Mer-1	Kerri Mersch	Domestic	85	--	none	72	N	HO	MER-1/MER-2 supply water to 5 homes
Mer-2	Kerri Mersch	Domestic	105	60-105?	none	80	N	HO	
Lun-1	Magdaleno &Bertha Luna	Domestic	--	--	--	--	N	HO	
Har-1	Dan& Nina Hardwick	Domestic	157	100-157	--	120	Y	HO	
Ril-1	Richard Riley	Domestic	110?	--	--	--	N	HO	
Ril-2	Richard Riley	Domestic	110?	--	--	--	N	HO	
Ril-3	Richard Riley	Domestic	110?	--	--	--	N	HO	
Hue-1	Luis & Rusty Huerta	Domestic	140	--	--	70	N	HO	
Bil-1	--	Domestic	98	--	--	--	N	AB EIR	
Sie-1	--	Domestic	?	--	--	--	N	AB EIR	
Law-1	--	Domestic	120	--	--	--	N	AB EIR	
Han-1	--	Domestic	86	--	--	--	N	AB EIR	
Wal-1	--	Domestic	94	--	--	--	N	AB EIR	

Table
Summary of Cartago Well Information

Well Name	Well Owner	Reported Use	Well Depth (ft)	Well Screen Interval (ft bgs)	Reported Depth of Seal (ft bgs)	Reported Depth of Pump (Ft. bgs)	Log Available (Y/N)	Source of Information	Notes
Wal-2	--	Domestic	90	--	--	--	N	AB EIR	
Wic-1	--	Domestic	320	--	--	--	N	AB EIR	
Die-1	--	Domestic	90	--	--	--	N	AB EIR	
Hug-1	--	Domestic	100	--	--	--	N	AB EIR	
Lun-1	--	Domestic	100	--	--	--	N	AB EIR/HO	
Hat-1	--	Domestic	120-130?	--	--	--	N	AB EIR	
BIY-1	--	Domestic	65	--	--	--	N	AB EIR	
Adk-1	--	Domestic	100	--	--	--	N	AB EIR	

Ft.: feet
Ft. bgs: feet below ground surface
Y/N: Yes/No
HO : Homeowner
AB EIR: Anhesueur Busch Project EIR, 1993

Geosyntec
consultants

APPENDIX C

GROUNDWATER LEVEL DATA AND HYDROGRAPHS

Appendix C
P-5
Groundwater Levels and Hydrographs
CG Roxane - Cabin Bar Ranch
Olancha, California

Well Head Elevation =	3633.1	
Date	DTW (ft btoc)	Elevation (asl)
03/05/96	11.4	3621.7
04/01/96	11.5	3621.6
05/01/96	11.1	3622
06/05/96	10.5	3622.6
07/03/96	10.5	3622.6
08/05/96	11.7	3621.4
09/02/96	12.2	3620.9
10/01/96	12.4	3620.7
11/01/96	12.2	3620.9
11/30/96	12	3621.1
02/01/97	11.4	3621.7
04/01/97	11.2	3621.9
06/01/97	11.6	3621.5
07/01/97	11.8	3621.3
08/01/97	12.1	3621
09/01/97	12.4	3620.7
10/01/97	12	3621.1
11/01/97	12.3	3620.8
12/01/97	12.6	3620.5
01/01/98	11.9	3621.2
02/01/98	11.7	3621.4
03/01/98	11	3622.1
04/01/98	10.8	3622.3
05/01/98	10.5	3622.6
06/01/98	9.8	3623.3
07/01/98	9.4	3623.7
09/01/98	10.1	3623
10/01/98	10.2	3622.9
11/01/98	10.9	3622.2
12/01/98	10.8	3622.3
01/01/99	10.4	3622.7
02/01/99	10.3	3622.8
03/01/99	10.4	3622.7
04/01/99	10.3	3622.8
05/01/99	10.3	3622.8
06/01/99	10.1	3623
07/01/99	10.2	3622.9
08/01/99	10.6	3622.5
09/01/99	12.8	3620.3
10/01/99	11.4	3621.7

Appendix C
P-5
Groundwater Levels and Hydrographs
CG Roxane - Cabin Bar Ranch
Olancha, California

Well Head Elevation =	3633.1	
Date	DTW (ft btoc)	Elevation (asl)
11/01/99	11.5	3621.6
12/01/99	11.7	3621.4
01/01/00	11.2	3621.9
02/01/00	11.2	3621.9
03/01/00	11.4	3621.7
02/08/02	12.3	3620.8
05/22/02	12.5	3620.6
11/04/04	13.8	3619.3
08/29/05	12.3	3620.8
08/05/06	11.8	3621.3
12/23/09	13.8	3619.3
01/06/10	13.7	3619.4
02/09/10		
03/08/10		
07/07/10	13.37	3619.73
10/18/10		
01/01/11	13.3	3619.8
02/01/11	13.28	3619.82
03/01/11	10.1	3623
04/06/11	12.7	3620.4
05/03/11	12.7	3620.4
06/15/11	12.3	3620.8
07/13/11	12.5	3620.6
08/18/11		
09/22/11		
10/29/11		
11/29/11		
12/22/11		
01/13/12	13.65	3619.45
02/17/12	13.55	3619.55
03/22/12	13.5	3619.6
04/20/12	13.1	3620
05/17/12	13.1	3620
06/20/12	13.2	3619.9
07/19/12	13.2	3619.9
08/22/12	13.4	3619.7
09/20/12		
10/17/12		
11/21/12		
12/12/12		

Appendix C
P-5
Groundwater Levels and Hydrographs
CG Roxane - Cabin Bar Ranch
Olancha, California

Well Head Elevation =	3633.1	
Date	DTW (ft btoc)	Elevation (asl)
01/18/13	13.65	3619.45
02/24/13	13.4	3619.7
03/22/13	13.47	3619.63
04/18/13	13.52	3619.58
05/16/13	13.86	3619.24
06/18/13	14.16	3618.94
07/22/13	14.6	3618.5
08/22/13	14.8	3618.3
9/20/2013	14.94	3618.16
09/23/13	14.9	3618.2
10/21/13	15.12	3617.98
11/21/13	15.2	3617.9
12/20/13	15.2	3617.9
01/23/14	15	3618.1
02/21/14	14.9	3618.2
3/20/2014	15	3618.1
04/20/14	14.94	3618.16
05/27/14	14.85	3618.25

Appendix C
P-10
Groundwater Levels and Hydrographs
CG Roxane - Cabin Bar Ranch
Olancha, California

Well Head Elevation =	3640.66	
Date	DTW (ft btoc)	Elevation (asl)
03/05/96	17.4	3623.26
04/01/96	17.5	3623.16
05/01/96	17.1	3623.56
06/05/96	16.6	3624.06
07/03/96	16.9	3623.76
08/05/96	17.3	3623.36
09/02/96	17.1	3623.56
10/01/96	18.3	3622.36
11/01/96	18.4	3622.26
11/30/96	18.2	3622.46
02/01/97	17.3	3623.36
04/01/97	16.8	3623.86
06/01/97	17.3	3623.36
07/01/97	17.8	3622.86
08/01/97	17.7	3622.96
09/01/97	18.4	3622.26
10/01/97	18.5	3622.16
11/01/97	17.9	3622.76
12/01/97	17.9	3622.76
01/01/98	17.7	3622.96
02/01/98	17.4	3623.26
03/01/98	17.6	3623.06
04/01/98	17.3	3623.36
05/01/98	16.5	3624.16
06/01/98	15.5	3625.16
07/01/98	14.6	3626.06
09/01/98	15.7	3624.96
10/01/98	16.1	3624.56
11/01/98	16.1	3624.56
12/01/98	16	3624.66
01/01/99	15.6	3625.06
02/01/99	16	3624.66
03/01/99	15.9	3624.76
04/01/99	15.8	3624.86
05/01/99	15.7	3624.96
06/01/99	15.1	3625.56
07/01/99	15.8	3624.86
08/01/99	16.6	3624.06
09/01/99	17.1	3623.56
10/01/99	17.5	3623.16

Appendix C
P-10
Groundwater Levels and Hydrographs
CG Roxane - Cabin Bar Ranch
Olancha, California

Well Head Elevation =	3640.66	
Date	DTW (ft btoc)	Elevation (asl)
11/01/99	17.2	3623.46
12/01/99	17.5	3623.16
01/01/00	17.9	3622.76
02/01/00	17.8	3622.86
03/01/00	17.4	3623.26
02/08/02	19.7	3620.96
05/22/02	19.9	3620.76
11/04/04	20.9	3619.76
08/29/05	18.8	3621.86
08/05/06	17.9	3622.76
12/23/09	21	3619.66
01/06/10	20.9	3619.76
02/09/10	20.8	3619.86
03/08/10	20.65	3620.01
07/07/10	18.9	3621.76
10/18/10		
01/01/11	20.14	3620.52
02/01/11	20.08	3620.58
03/01/11	19.82	3620.84
04/06/11	19.82	3620.84
05/03/11	19.15	3621.51
06/15/11	18.4	3622.26
07/13/11	18.6	3622.06
08/18/11		
09/22/11		
10/29/11		
11/29/11		
12/22/11		
01/13/12	20.78	3619.88
02/17/12	20.7	3619.96
03/22/12	20.7	3619.96
04/20/12	20	3620.66
05/17/12	19.4	3621.26
06/20/12	19.3	3621.36
07/19/12	19.3	3621.36
08/22/12	19.3	3621.36
09/20/12		
10/17/12		
11/21/12		
12/12/12		

Appendix C
P-10
Groundwater Levels and Hydrographs
CG Roxane - Cabin Bar Ranch
Olancha, California

Well Head Elevation =	**3640.66**	
Date	**DTW (ft btoc)**	**Elevation (asl)**
01/18/13	20.3	3620.36
02/24/13	20.28	3620.38
03/22/13	20.23	3620.43
04/18/13	20.32	3620.34
05/16/13	20.5	3620.16
06/18/13	20.92	3619.74
07/22/13	21.13	3619.53
08/22/13	21.35	3619.31
9/20/2013	21.63	3619.03
09/23/13	21.4	3619.26
10/21/13	21.42	3619.24
11/21/13	21.4	3619.26
12/20/13	21.36	3619.3
01/23/14	21.3	3619.36
02/21/14	21.32	3619.34
03/20/14	21.3	3619.36
04/20/14	21.42	3619.24
05/27/14	21.61	3619.05

Appendix C
P-15
Groundwater Levels and Hydrographs
CG Roxane - Cabin Bar Ranch
Olancha, California

Well Head Elevation =	3606.98	
Date	DTW (ft btoc)	Elevation (asl)
03/05/96	1.10	3605.88
04/01/96	1.00	3605.98
05/01/96	1.00	3605.98
06/05/96	1.20	3605.78
07/03/96	1.50	3605.48
08/05/96	1.30	3605.68
09/02/96	2.00	3604.98
10/01/96	1.00	3605.98
11/01/96	0.80	3606.18
11/30/96	1.00	3605.98
02/01/97	1.00	3605.98
04/01/97	1.00	3605.98
06/01/97	1.00	3605.98
07/01/97	1.00	3605.98
08/01/97	0.80	3606.18
09/01/97	1.20	3605.78
10/01/97	1.30	3605.68
11/01/97	1.20	3605.78
12/01/97	1.20	3605.78
01/01/98	1.00	3605.98
02/01/98	1.30	3605.68
03/01/98	1.00	3605.98
05/01/98	0.40	3606.58
10/01/98	0.30	3606.68
12/01/98	0.40	3606.58
01/01/99	0.60	3606.38
02/01/99	0.40	3606.58
03/01/99	0.20	3606.78
04/01/99	0.20	3606.78
06/01/99	0.40	3606.58
07/01/99	0.50	3606.48
08/01/99	0.30	3606.68
09/01/99	0.40	3606.58
11/01/99	0.30	3606.68
12/01/99	0.50	3606.48
01/01/00	0.80	3606.18
02/01/00	0.60	3606.38
02/08/02	0.40	3606.58
05/22/02	0.40	3606.58
04/06/11	1.30	3605.68

Appendix C
P-15
Groundwater Levels and Hydrographs
CG Roxane - Cabin Bar Ranch
Olancha, California

Well Head Elevation =	3606.98	
Date	DTW (ft btoc)	Elevation (asl)
05/03/11	1.50	3605.48
06/15/11	2.20	3604.78
07/13/11	2.80	3604.18
08/18/11	3.35	3603.63
09/22/11	3.15	3603.83
10/29/11	1.40	3605.58
11/29/11	1.16	3605.82
04/20/12	2.10	3604.88
05/17/12	2.50	3604.48
06/20/12	2.50	3604.48
07/19/12	2.80	3604.18
08/22/12	2.50	3604.48
01/18/13	1.95	3605.03
02/24/13	1.95	3605.03
03/22/13	1.97	3605.01
04/18/13	1.97	3605.01
05/16/13	1.98	3605.00
06/18/13	3.02	3603.96
07/22/13	4.35	3602.63
09/20/13	5.10	3601.88
09/23/13	5.14	3601.84
10/21/13	5.40	3601.58
11/21/13	5.40	3601.58
12/20/13	5.28	3601.70
01/23/14	4.76	3602.22
02/21/14	4.24	3602.74
03/20/14	4.94	3602.04
04/20/14	3.80	3603.18
05/27/14	3.40	3603.58

Appendix C
MW-3
Groundwater Levels and Hydrographs
CG Roxane - Cabin Bar Ranch
Olancha, California

Well Head Elevation =	3679.36	
Date	DTW (ft btoc)	Elevation (asl)
04/01/96	45.4	3633.96
05/01/96	45.6	3633.76
06/05/96	45.2	3634.16
07/03/96	47.8	3631.56
08/05/96	47.9	3631.46
09/02/96	52.5	3626.86
10/01/96	48.6	3630.76
11/01/96	47.8	3631.56
11/30/96	47.4	3631.96
02/01/97	46.7	3632.66
04/01/97	48.2	3631.16
06/01/97	50.1	3629.26
07/01/97	47.3	3632.06
08/01/97	56.9	3622.46
09/01/97	49.4	3629.96
10/01/97	48.9	3630.46
11/01/97	49.6	3629.76
12/01/97	49.6	3629.76
01/01/98	47.2	3632.16
02/01/98	46.8	3632.56
03/01/98	46.6	3632.76
04/01/98	46.5	3632.86
05/01/98	46.4	3632.96
06/01/98	45.7	3633.66
07/01/98	45	3634.36
09/01/98	46.4	3632.96
10/01/98	46.2	3633.16
11/01/98	45.3	3634.06
12/01/98	45	3634.36
01/01/99	44.3	3635.06
02/01/99	44.1	3635.26
03/01/99	44.3	3635.06
04/01/99	44.4	3634.96
05/01/99	44.8	3634.56
06/01/99	45.9	3633.46
07/01/99	45.8	3633.56
08/01/99	47.3	3632.06
09/01/99	45.1	3634.26
10/01/99	48.1	3631.26
11/01/99	47.2	3632.16
12/01/99	46.7	3632.66

Appendix C
MW-3
Groundwater Levels and Hydrographs
CG Roxane - Cabin Bar Ranch
Olancha, California

Well Head Elevation =	3679.36	
Date	DTW (ft btoc)	Elevation (asl)
01/01/00	46.8	3632.56
02/01/00	46.5	3632.86
03/01/00	46.4	3632.96
02/08/02	48.2	3631.16
05/22/02	49.6	3629.76
11/04/04	51.4	3627.96
08/29/05	48.4	3630.96
08/05/06	47.3	3632.06
12/23/09	51.5	3627.86
01/06/10	51.5	3627.86
02/09/10	51.3	3628.06
03/08/10	51.1	3628.26
07/07/10	50.75	3628.61
10/18/10		
01/01/11		
02/01/11		
03/01/11		
04/06/11	49.9	3629.46
05/03/11	49.68	3629.68
06/15/11	49.4	3629.96
07/13/11	49.2	3630.16
08/18/11		
09/22/11		
10/29/11		
11/29/11		
12/22/11		
01/13/12	49.7	3629.66
02/17/12	49.16	3630.2
03/22/12	50.1	3629.26
04/20/12	50.1	3629.26
05/17/12	49.74	3629.62
06/20/12	49.7	3629.66
07/19/12	49.8	3629.56
08/22/12	49.85	3629.51
09/20/12		
10/17/12		
11/21/12		
12/12/12		
01/18/13	49.7	3629.66
02/24/13	50.1	3629.26
03/22/13	50.48	3628.88

Appendix C
MW-3
Groundwater Levels and Hydrographs
CG Roxane - Cabin Bar Ranch
Olancha, California

Well Head Elevation =	**3679.36**	
Date	**DTW (ft btoc)**	**Elevation (asl)**
04/18/13	50.9	3628.46
05/16/13	51	3628.36
06/18/13	51.4	3627.96
07/22/13	52.12	3627.24
08/22/13	53.2	3626.16
9/20/2013	52.8	3626.56
09/23/13	53.5	3625.86
10/21/13	53.24	3626.12
11/21/13	52.88	3626.48
12/20/13	52.62	3626.74
1/23/2014	52.12	3627.24
02/21/14	51.8	3627.56
03/20/14	51.5	3627.86
04/20/14	52.1	3627.26
05/27/14	52.72	3626.64

Appendix C
OW-7U
Groundwater Levels and Hydrographs
CG Roxane - Cabin Bar Ranch
Olancha, California

Well Head Elevation =	3624.70	
Date	DTW (ft btoc)	Elevation (asl)
08/01/96	10.86	3613.84
09/01/96	11.12	3613.58
10/01/96	11.26	3613.44
11/01/96	10.96	3613.74
12/01/96	10.5	3614.2
01/01/97	10.08	3614.62
02/01/97	10.44	3614.26
03/01/97	9.92	3614.78
04/01/97	9.86	3614.84
05/01/97	10.4	3614.3
06/01/97	9.94	3614.76
07/01/97	11.02	3613.68
08/01/97	10.27	3614.43
09/01/97	10.42	3614.28
10/01/97	10.52	3614.18
11/01/97	10.48	3614.22
12/01/97	10.85	3613.85
01/01/98	9.58	3615.12
02/01/98	10.65	3614.05
03/01/98	10.82	3613.88
04/01/98		
05/01/98	10.08	3614.62
06/01/98	9.75	3614.95
07/01/98	10.22	3614.48
08/01/98	10.1	3614.6
09/01/98	10.06	3614.64
10/01/98	9.85	3614.85
11/01/98	10.34	3614.36
12/01/98	9.32	3615.38
01/01/99	9.6	3615.1
02/01/99	9.69	3615.01
03/01/99	9.69	3615.01
04/01/99	9.69	3615.01
05/01/99	9.65	3615.05
06/01/99	10.13	3614.57
07/01/99		
08/01/99	10.67	3614.03
09/01/99	10.65	3614.05
10/01/99	10.76	3613.94
11/01/99		

Appendix C
OW-7U
Groundwater Levels and Hydrographs
CG Roxane - Cabin Bar Ranch
Olancha, California

Well Head Elevation =	3624.70	
Date	DTW (ft btoc)	Elevation (asl)
12/01/99	10.48	3614.22
01/01/00		
02/01/00		
03/01/00	10.25	3614.45
04/01/00		
05/01/00		
06/01/00		
07/01/00		
08/01/00		
09/01/00		
10/01/00		
11/01/00		
12/01/00		
01/01/01	10.41	3614.29
02/01/01	10.3	3614.4
03/01/01	10.19	3614.51
04/01/01	10.13	3614.57
05/01/01	10.09	3614.61
06/01/01	10.35	3614.35
07/01/01		
08/01/01	10.87	3613.83
09/01/01	11.13	3613.57
10/01/01	11.23	3613.47
11/01/01		
12/01/01	10.44	3614.26
01/01/02	10.3	3614.4
02/01/02	10.19	3614.51
03/01/02	10.41	3614.29
04/01/02	10.52	3614.18
05/01/02	10.34	3614.36
06/01/02	10.92	3613.78
07/01/02	11.24	3613.46
08/01/02	11.39	3613.31
09/01/02	11.41	3613.29
10/01/02	11.02	3613.68
11/01/02	10.8	3613.9
12/01/02	10.5	3614.2
01/01/03		
02/01/03		
03/01/03	10.4	3614.3

Appendix C
OW-7U
Groundwater Levels and Hydrographs
CG Roxane - Cabin Bar Ranch
Olancha, California

Well Head Elevation =	3624.70	
Date	DTW (ft btoc)	Elevation (asl)
04/01/03	10.4	3614.3
05/01/03	10.55	3614.15
06/01/03	10.7	3614
07/01/03	10.2	3614.5
08/01/03	11.1	3613.6
09/01/03	11.45	3613.25
10/01/03	11.25	3613.45
11/01/03	11.1	3613.6
12/01/03	10.7	3614
01/01/04	10.5	3614.2
02/01/04	10.5	3614.2
03/01/04	10.5	3614.2
04/01/04	10.5	3614.2
05/01/04		
06/01/04	12.4	3612.3
07/01/04	11.9	3612.8
08/01/04	11.8	3612.9
09/01/04	11.9	3612.8
10/01/04	11.6	3613.1
11/01/04	11.3	3613.4
12/01/04	11.1	3613.6
01/01/05	10.9	3613.8
02/01/05		
03/01/05	10.6	3614.1
04/01/05	10.7	3614
05/01/05		
06/01/05	10.7	3614
07/01/05	10.7	3614
08/01/05		
09/01/05		
10/01/05	10.7	3614
11/01/05		
12/01/05		
01/01/06	10.2	3614.5
02/01/06		
03/01/06	10.05	3614.65
04/01/06	9.9	3614.8
05/01/06	10.1	3614.6
06/01/06		
07/01/06		

Appendix C
OW-7U
Groundwater Levels and Hydrographs
CG Roxane - Cabin Bar Ranch
Olancha, California

Well Head Elevation =	3624.70	
Date	DTW (ft btoc)	Elevation (asl)
08/01/06	10.8	3613.9
09/01/06	10.7	3614
10/01/06	10.8	3613.9
11/01/06		
12/01/06	9.8	3614.9
01/01/07		
02/01/07	10	3614.7
03/01/07	10.3	3614.4
04/01/07	10.6	3614.1
05/01/07		
06/01/07	10.8	3613.9
07/01/07	11	3613.7
08/01/07	11.6	3613.1
09/01/07		
10/01/07	11.2	3613.5
11/01/07	11.4	3613.3
12/01/07	10.9	3613.8
01/01/08	11	3613.7
02/01/08		
03/01/08	10.8	3613.9
04/01/08	11.2	3613.5
05/01/08		
06/01/08	11.9	3612.8
07/01/08		
08/01/08	11.5	3613.2
09/01/08	11.8	3612.9
10/01/08		
11/01/08		
12/01/08	11.6	3613.1
01/01/09	11.5	3613.2
02/01/09	11.6	3613.1
03/01/09	11.2	3613.5
04/01/09	11.1	3613.6
05/01/09	11.4	3613.3
06/01/09	11.6	3613.1
07/01/09	12	3612.7
08/01/09	11.85	3612.85
09/01/09	12.3	3612.4
10/01/09	12.1	3612.6
11/01/09	11.6	3613.1

Appendix C
OW-7U
Groundwater Levels and Hydrographs
CG Roxane - Cabin Bar Ranch
Olancha, California

Well Head Elevation =	3624.70	
Date	DTW (ft btoc)	Elevation (asl)
12/01/09	11.6	3613.1
01/01/10	11.2	3613.5
02/01/10	11	3613.7
03/01/10	11.3	3613.4
04/01/10	11.17	3613.53
05/01/10		
06/01/10		
07/01/10	11.55	3613.15
08/01/10		
09/01/10	11.7	3613
10/01/10	12.2	3612.5
11/01/10		
12/01/10	11.3	3613.4
01/01/11	11.6	3613.1
02/01/11	11.4	3613.3
03/01/11	11.02	3613.68
04/01/11	11.67	3613.03
05/01/11		
06/01/11	11.75	3612.95
07/01/11		
08/01/11	11.9	3612.8
09/01/11	11.82	3612.88
10/01/11	11.25	3613.45
11/01/11		
12/01/11	10.9	3613.8
01/01/12		
02/01/12		
03/01/12		
04/01/12	10.92	3613.78
05/01/12	12	3612.7
06/01/12	12.33	3612.37
07/01/12	12.2	3612.5
08/01/12		
09/01/12	12.8	3611.9
10/01/12	12.5	3612.2
11/01/12	12.4	3612.3
12/01/12	12.15	3612.55
01/01/13	12	3612.7
02/01/13	12	3612.7
03/01/13	12.1	3612.60

Appendix C
OW-7U
Groundwater Levels and Hydrographs
CG Roxane - Cabin Bar Ranch
Olancha, California

Well Head Elevation =	**3624.70**	
Date	**DTW (ft btoc)**	**Elevation (asl)**
09/26/13	13.5	3611.20
09/26/13	13.5	3611.20
10/25/13	13.2	3611.50
11/20/13	12.9	3611.80
12/20/13	12.7	3612.00
01/06/14	12.7	3612.00
02/06/14	12.5	3612.20
03/14/14	12.42	3612.28
04/16/14	12.9	3611.80
05/30/14	13.2	3611.50

Appendix C
OW-7M
Groundwater Levels and Hydrographs
CG Roxane - Cabin Bar Ranch
Olancha, California

Well Head Elevation =	3624.52		
Date	Depth To Water (ft btoc)	Feet of Water Above the Transducer (ft)	Elevation (asl)
06/14/01	-1.76	22.87	3626.28
07/01/01	-2.21	23.32	3626.73
08/01/01	0.67	20.44	3623.85
09/01/01	0.34	20.77	3624.18
10/01/01	-0.54	21.65	3625.06
11/01/01	-1.54	22.65	3626.06
12/01/01	-1.83	22.94	3626.35
01/01/02	-2.05	23.15	3626.57
02/01/02	-2.41	23.52	3626.93
03/01/02	-2.60	23.71	3627.12
04/01/02	-2.38	23.49	3626.90
05/01/02	-1.43	22.54	3625.95
06/01/02	-0.87	21.98	3625.39
07/01/02	-0.30	21.41	3624.82
08/01/02	0.27	20.84	3624.25
09/01/02	0.36	20.75	3624.16
10/01/02	0.53	20.58	3623.99
11/01/02	-0.42	21.53	3624.94
12/01/02	-0.92	22.02	3625.44
01/01/03	-1.21	22.32	3625.73
02/01/03	-1.34	22.45	3625.86
03/01/03	-1.75	22.86	3626.27
04/01/03	-1.69	22.80	3626.21
05/01/03	-1.18	22.29	3625.70
01/05/04	-0.38	21.49	3624.90
02/01/04	-0.61	21.71	3625.13
03/01/04	-0.78	21.89	3625.30
04/01/04	-0.73	21.84	3625.25
05/01/04	0.83	20.28	3623.69
02/22/10	2.50	18.61	3622.02
03/01/10	2.34	18.77	3622.18
04/01/10	2.45	18.66	3622.07
05/01/10	2.64	18.46	3621.88
06/01/10	2.58	18.52	3621.94
07/01/10	3.38	17.73	3621.14
08/01/10	3.63	17.48	3620.89
09/01/10	3.21	17.90	3621.31
10/01/10	2.63	18.48	3621.89
11/01/10	2.37	18.74	3622.15

Appendix C
OW-7M
Groundwater Levels and Hydrographs
CG Roxane - Cabin Bar Ranch
Olancha, California

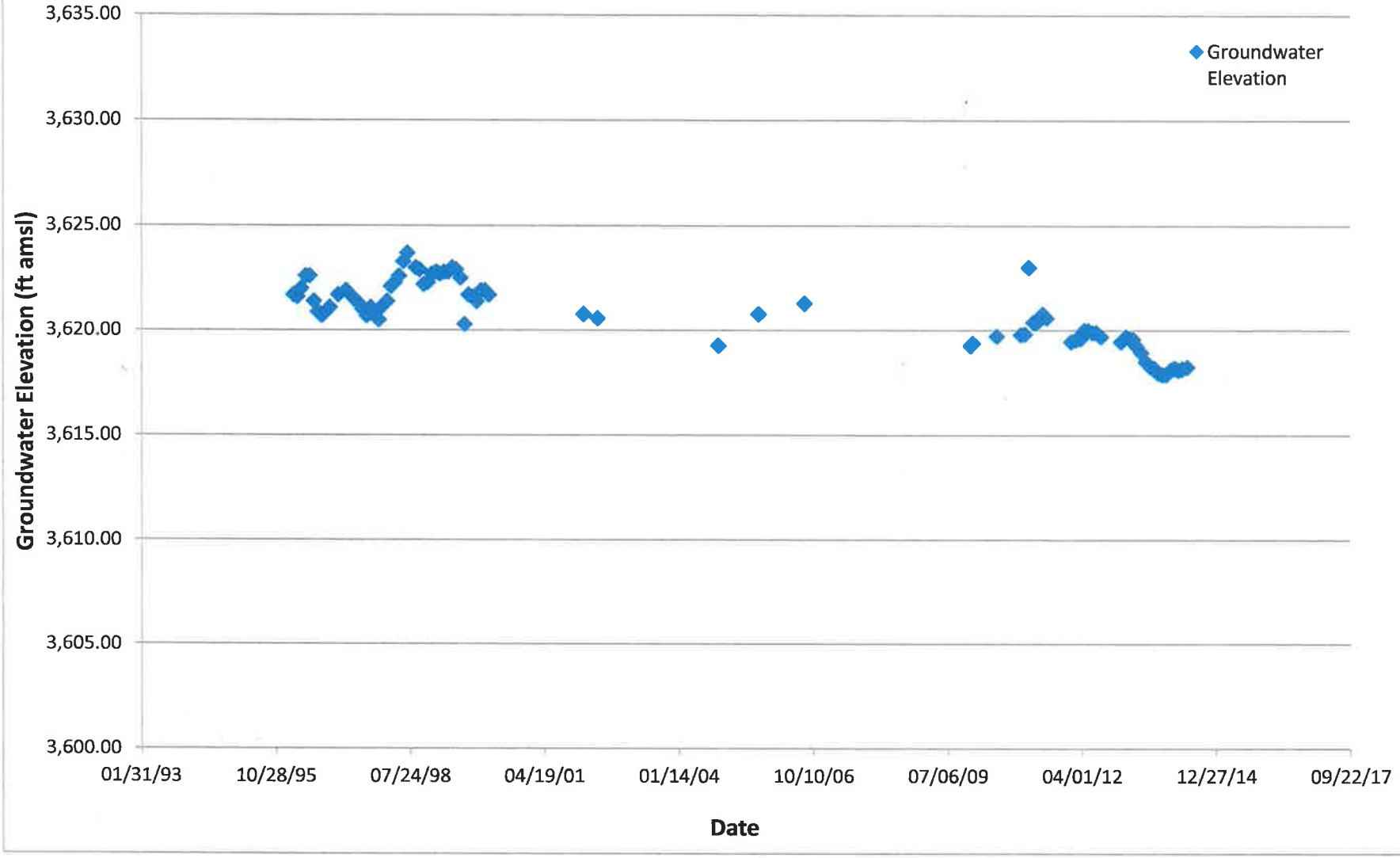
Well Head Elevation =	3624.52		
Date	Depth To Water (ft btoc)	Feet of Water Above the Transducer (ft)	Elevation (asl)
12/01/10	2.05	19.06	3622.47
01/01/11	1.91	19.20	3622.61
02/01/11	1.63	19.48	3622.89
03/01/11	1.47	19.64	3623.05
04/01/11	1.46	19.65	3623.06
05/01/11	1.34	19.77	3623.18
06/01/11	1.07	20.04	3623.45
07/01/11	1.58	19.53	3622.94
08/01/11	2.13	18.98	3622.39
09/01/11	1.87	19.24	3622.65
09/29/11	1.22	19.89	3623.30
11/25/11	0.98	20.13	3623.54
12/01/11	0.86	20.25	3623.66
01/01/12	0.76	20.35	3623.76
02/01/12	0.71	20.40	3623.81
03/01/12	0.96	20.14	3623.56
04/01/12	1.85	19.26	3622.67
05/01/12	2.22	18.89	3622.30
06/01/12	2.72	18.39	3621.80
07/01/12	3.07	18.04	3621.45
08/13/12	3.58	17.53	3620.94
09/01/12	3.22	17.89	3621.30
10/01/12	2.77	18.34	3621.75
11/01/12	2.56	18.55	3621.96
12/01/12	2.38	18.73	3622.14
01/01/13	2.30	18.80	3622.22
02/01/13	2.19	18.92	3622.33
03/01/13	2.33	18.78	3622.19
04/01/13	3.54	17.57	3620.98
05/01/13	3.89	17.22	3620.63
06/01/13	4.27	16.84	3620.25
07/01/13	4.55	16.56	3619.97
08/01/13	4.78	16.33	3619.74
08/25/13	4.94	16.17	3619.58
09/26/13	4.04	17.00	3620.48
10/25/13	3.81	8.79	3620.71
11/20/13	3.81	17.30	3620.71
12/20/13	3.58	17.53	3620.94
01/06/14	3.58	17.53	3620.94

Appendix C
OW-7M
Groundwater Levels and Hydrographs
CG Roxane - Cabin Bar Ranch
Olancha, California

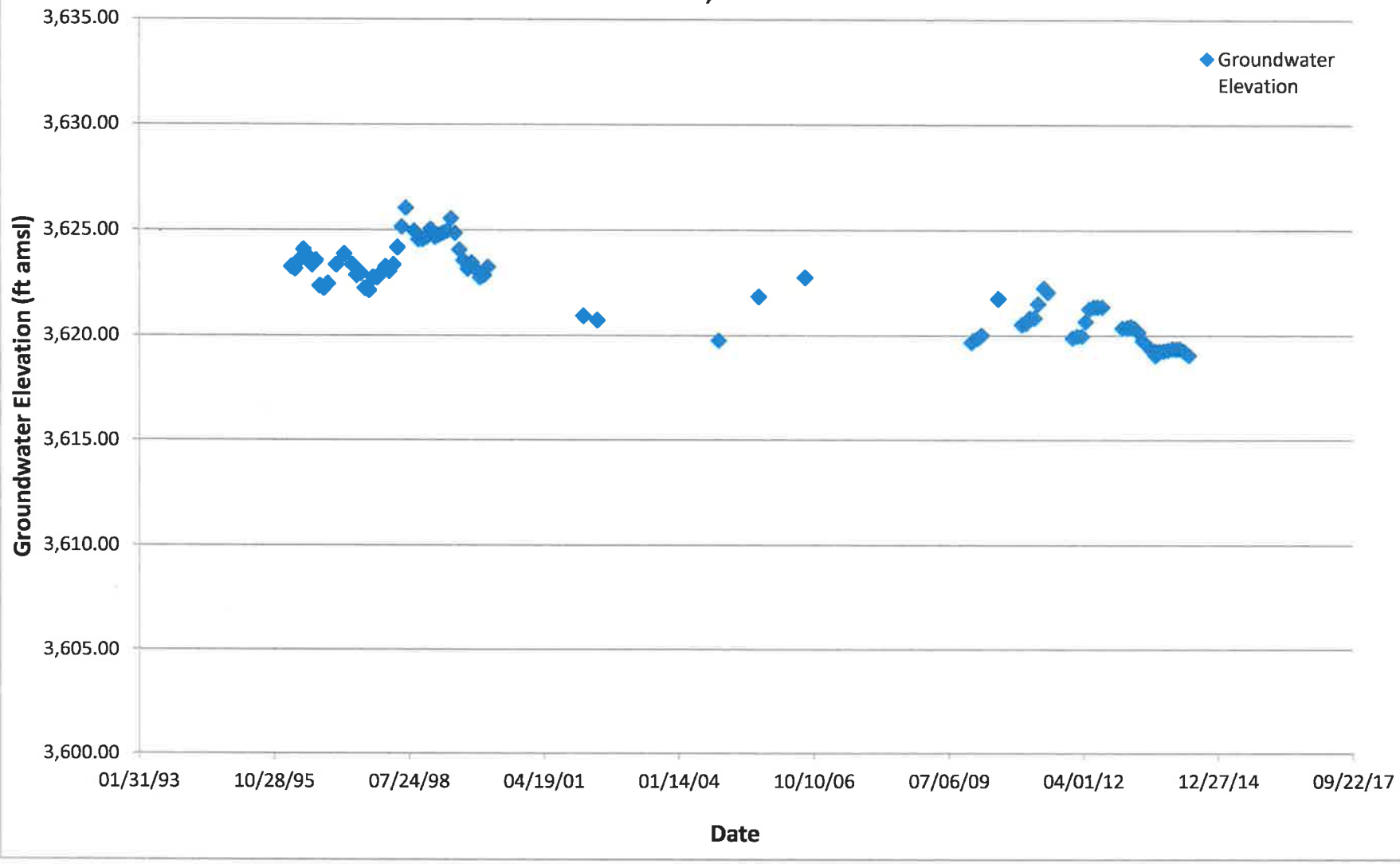
Well Head Elevation =	3624.52		
Date	Depth To Water (ft btoc)	Feet of Water Above the Transducer (ft)	Elevation (asl)
02/06/14	3.35	17.76	3621.17
03/14/14	4.39	16.72	3620.13
04/16/14	4.58	16.53	3619.94
05/30/14	4.96	16.15	3619.56

Note:
A negative depth to water indicates the groundwater potentiometric surface is above the top of well casing.

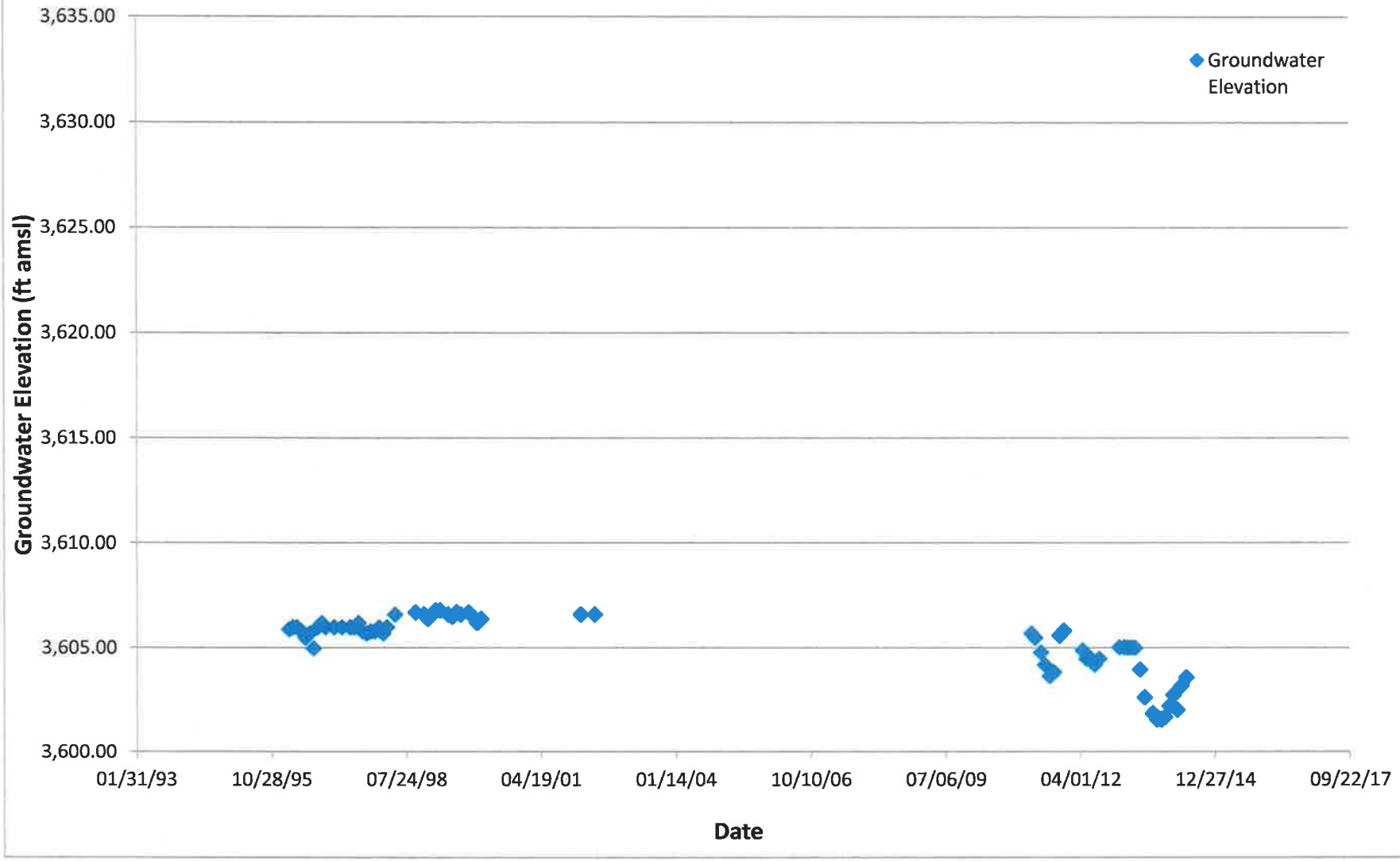
Appendix C
P-5 Groundwater Hydrograph
CG Roxane - Cabin Bar Ranch
Olancha, California



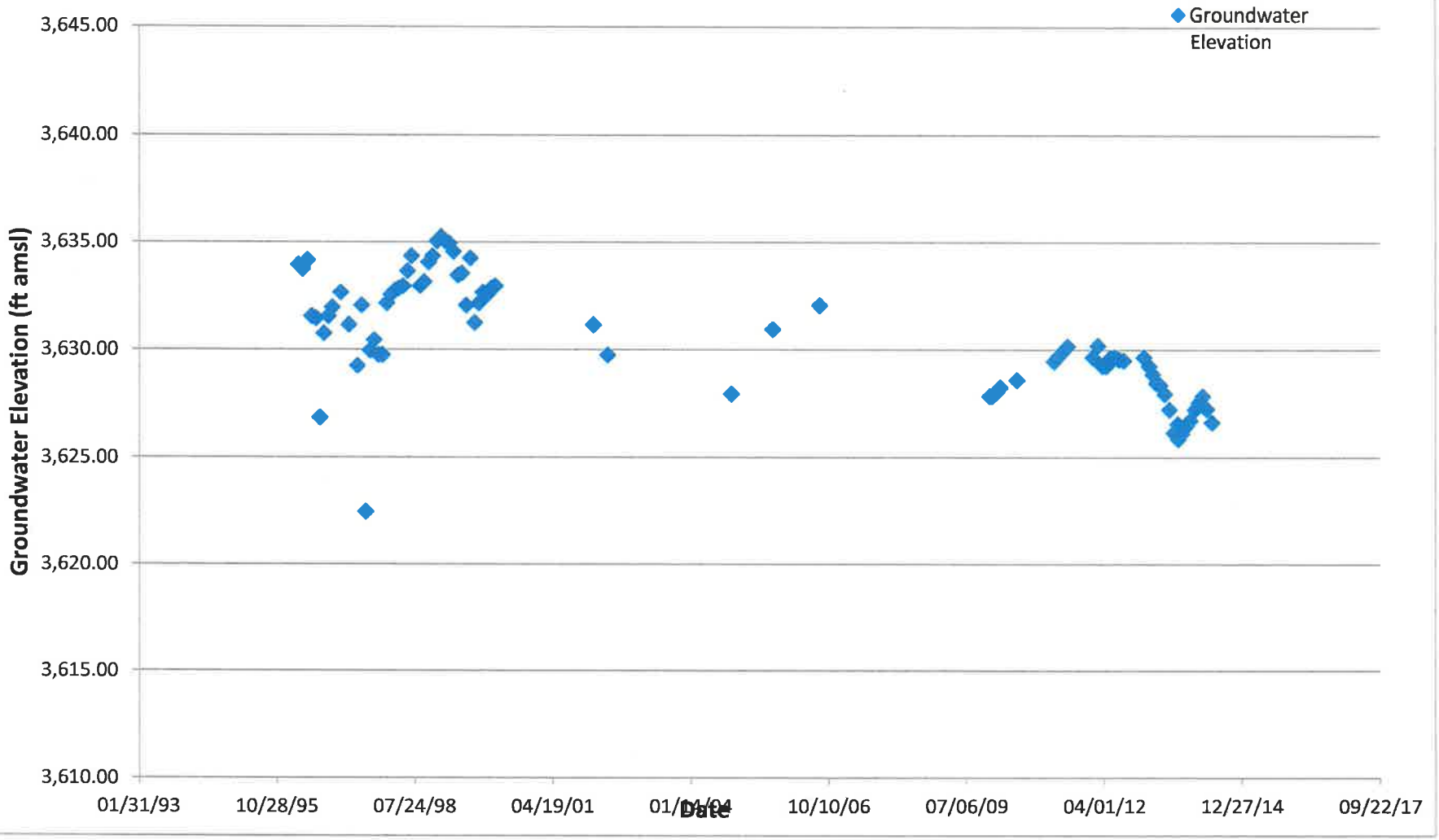
Appendix C
P-10 Groundwater Hydrograph
CG Roxane - Cabin Bar Ranch
Olancha, California



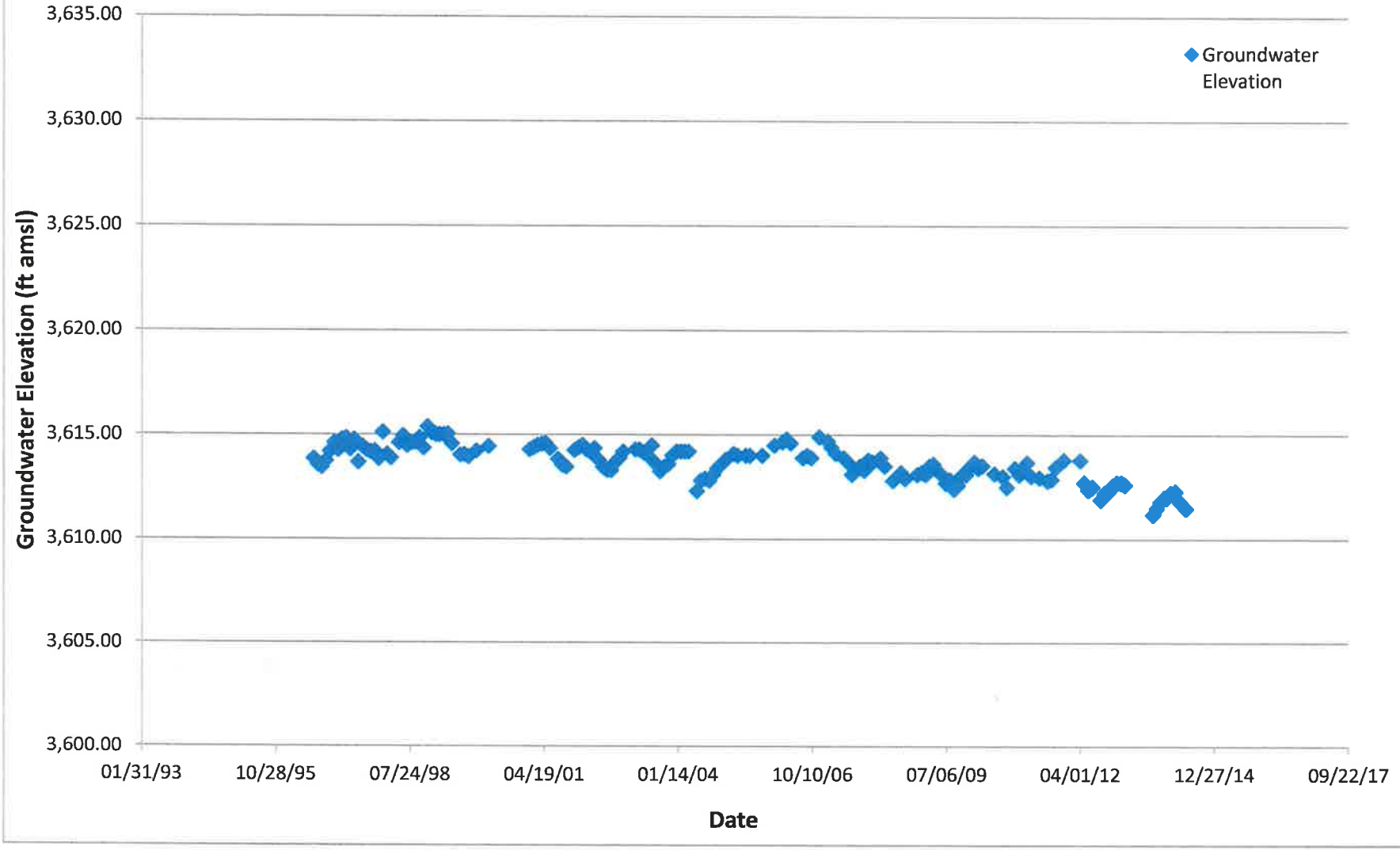
Appendix C
P-15 Groundwater Hydrograph
CG Roxane - Cabin Bar Ranch
Olancha, California



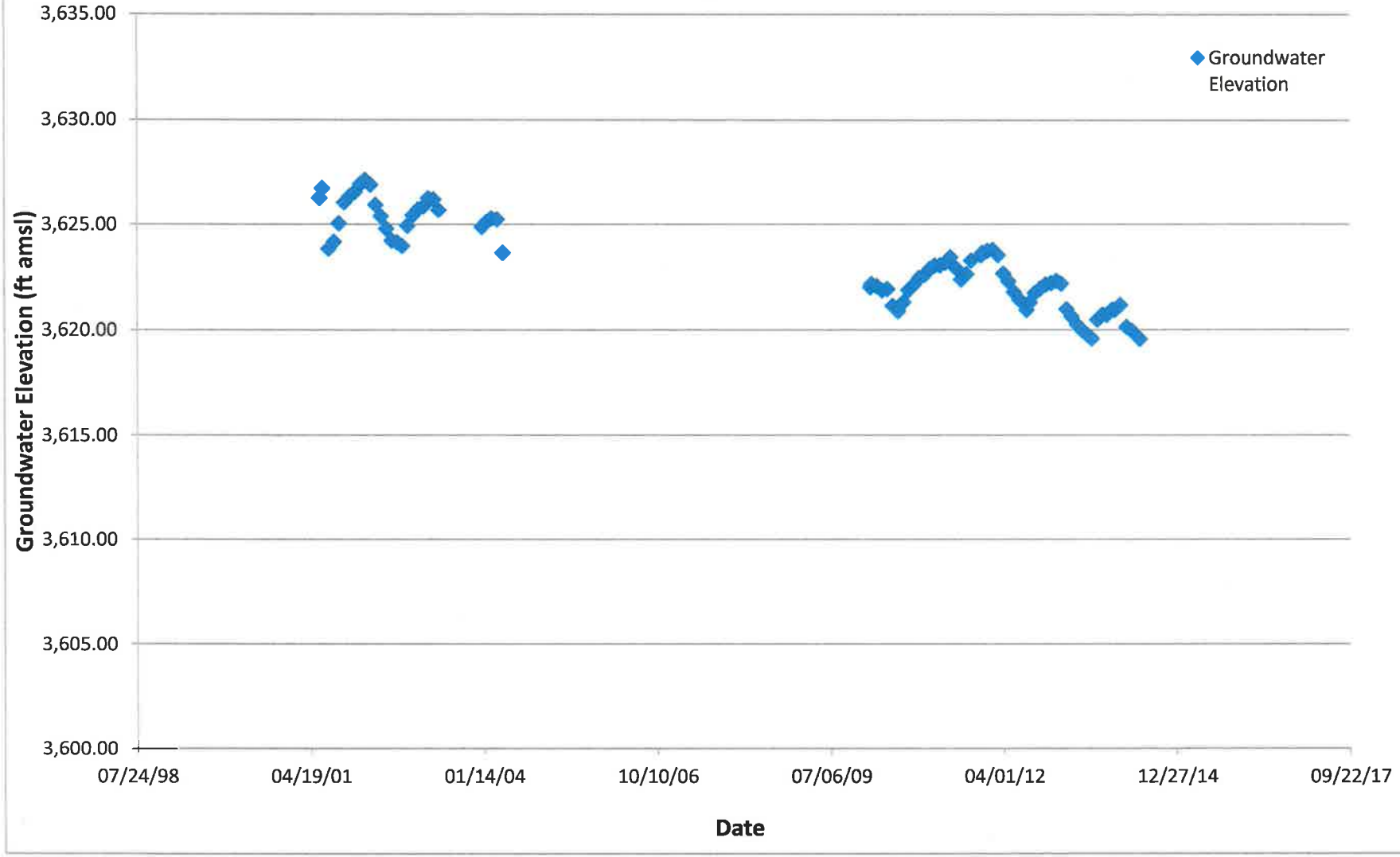
Appendix C
MW-3 Groundwater Hydrograph
CG Roxane - Cabin Bar Ranch
Olancha, California



Appendix C
OW-7U Groundwater Hydrograph
CG Roxane - Cabin Bar Ranch
Olancha, California



Appendix C
OW-7M Groundwater Hydrograph
CG Roxane - Cabin Bar Ranch
Olancha, California



APPENDIX D

GROUNDWATER QUALITY INFORMATION

LABORATORY ANALYSES FOR CGR-8, CGR-9 and CGR-10

CLIENT: Crystal Geyser Roxane
1210 S. State Hwy. #395, PO Drawer 'A'
Olancha, CA 93549

DATE OF REPORT: Quarter 4, 2010
REPORT #: 219-9110
LABORATORY ID#: 3520568, 041024101, 3035762, 3035761, G492-3458, 346733

NOTE:
"*" indicates that maximum levels have been exceeded, or in the case of pH, is either too high or too low
"ND" indicates that none of this analyte has been detected at or above the specified detection level
"MCL" indicates maximum contaminant level as established by EPA and/or FDA or state
"RL" indicates laboratory reporting limit for method
Units results are reported in mg/L unless other wise noted

ANALYSIS PERFORMED	MCL (mg/L)	RL (mg/L)	CGR 8 SOURCE 219-9110 (mg/L)
Primary Inorganics			
Antimony	0.006	0.0010	ND
Arsenic	0.01	0.0035	0.0095
Asbestos	7 MFL	0.20	ND
Barium	2	0.010	0.016
Beryllium	0.004	0.0010	ND
Cadmium	0.005	0.0010	ND
Chromium	0.1	0.0050	ND
Cyanide	0.2	0.010	ND
Fluoride	4	0.050	0.69
Lead	0.015	0.0010	ND
Mercury	0.002	0.00020	ND
Nickel	0.1	0.0050	ND
Nitrogen, Nitrate	10	0.050	ND
Nitrogen, Nitrite	1.0	0.050	ND
Nitrogen - NO3/NO2 (NOX)	10	0.050	ND
Selenium	0.05	0.0010	ND
Thallium	0.002	0.0010	ND
Secondary Inorganics			
Alkalinity	--	5.0	75.3
Aluminum	0.2	0.10	ND
Bicarbonate	--	5.0	75.3
Boron	--	0.050	0.084
Bromide	--	0.10	1.1
Calcium	--	0.50	21.3
Carbonate	--	5.0	ND
Chloride	250	0.50	2.2
Copper	1	0.0050	ND
Corrosivity	--	--	-0.22
Foaming Agents	0.5	0.20	ND
Hardness, Calcium (as CaCO3)	--	1.2	53.2
Hardness, Total (as CaCO3)	--	3.3	59.2
Hydroxide	--	5.0	ND
Iron	0.3	0.040	ND
Magnesium	--	0.50	1.5
Manganese	0.05	0.0050	ND
Orthophosphate	--	0.10	ND
pH	6.5-8.5	0.10	7.9
Phenol	0.001	0.0010	ND
Potassium	--	1.0	2.2
Silver	0.1	0.0050	ND
Sodium	--	1.0	19.8
Specific Conductance	--	1.0	199
Sulfate	250	0.50	18.6
TDS	500	5.0	145
Zinc	5	0.020	ND

ANALYSIS PERFORMED	MCL (mg/L)	RL (mg/L)	CGR 8 SOURCE 219-9110 (mg/L)
Physical			
Color	15 CU	5.0	ND
Odor	3 TON	1.0	ND
Turbidity	1-5 NTU	0.20	ND
Microbiological			
Total Coliform	Absence	Absence	ND
Standard Plate Count	-- cfu/mL	1.0	10.0
E. coli	Absence	Absence	ND
Radiologicals			
Gross Alpha	15 pCi/L	0.673	4.02 (± 0.628)
Gross Beta	50 pCi/L	0.767	0.151 (± 0.468)
Radium 226/228	5 pCi/L	0.838 / 0.794	0.0778 (± 0.404) / 0.794 (± 0.418)
Uranium	30 ug/L	0.420	15.4 (± 0.240)
Radon	-- pCi/L	47.5	259.8 (± 37.9)
Volatile Organic Compounds EPA 524.2:			
Total Trihalomethanes	0.080	0.00050	ND
Benzene	0.001	0.00050	ND
Bromobenzene	--	0.00050	ND
Bromochloromethane	--	0.00050	ND
Bromodichloromethane	--	0.00050	ND
Bromoform	--	0.00050	ND
Bromomethane	--	0.00050	ND
n-Butylbenzene	--	0.00050	ND
sec-Butylbenzene	--	0.00050	ND
tert-Butylbenzene	--	0.00050	ND
Carbon tetrachloride	0.005	0.00050	ND
Chlorobenzene	0.1	0.00050	ND
Chloroethane	--	0.00050	ND
Chloroform	--	0.00050	ND
Chloromethane	--	0.00050	ND
2-Chlorotoluene	--	0.00050	ND
4-Chlorotoluene	--	0.00050	ND
Dibromochloromethane	--	0.00050	ND
Dibromomethane	--	0.00050	ND
1,2-Dichlorobenzene	0.6	0.00050	ND
1,3-Dichlorobenzene	--	0.00050	ND
1,4-Dichlorobenzene	0.075	0.00050	ND
Dichlorodifluoromethane	--	0.00050	ND
1,1-Dichloroethane	--	0.00050	ND
1,2-Dichloroethane	0.005	0.00050	ND
1,1-Dichloroethene	0.007	0.00050	ND
cis-1,2-Dichloroethene	0.07	0.00050	ND
trans-1,2-Dichloroethene	0.1	0.00050	ND
1,2-Dichloropropane	0.005	0.00050	ND
1,3-Dichloropropane	--	0.00050	ND
2,2-Dichloropropane	--	0.00050	ND
1,1-Dichloropropene	--	0.00050	ND
cis-1,3-Dichloropropene	--	0.00050	ND

ANALYSIS PERFORMED	MCL (mg/L)	RL (mg/L)	CGR 8 SOURCE 219-9110 (mg/L)
EPA 524.2 continued:			
trans-1,3-Dichloropropene	--	0.00050	ND
Ethylbenzene	0.7	0.00050	ND
Hexachlorobutadiene	--	0.00050	ND
Isopropylbenzene	--	0.00050	ND
4-Isopropyltoluene	--	0.00050	ND
Methyl tert-Butyl Ether	--	0.00050	ND
Methyl Ethyl Ketone	--	0.020	ND
Methylene Chloride	0.005	0.00050	ND
Naphthalene	--	0.00050	ND
n-Propylbenzene	--	0.00050	ND
Styrene	0.1	0.00050	ND
1,1,1,2-Tetrachloroethane	--	0.00050	ND
1,1,2,2-Tetrachloroethane	--	0.00050	ND
Tetrachloroethene	0.005	0.00050	ND
Toluene	1	0.00050	ND
1,2,3-Trichlorobenzene	--	0.00050	ND
1,2,4-Trichlorobenzene	0.07	0.00050	ND
1,1,1-Trichloroethane	0.2	0.00050	ND
1,1,2-Trichloroethane	0.005	0.00050	ND
Trichloroethene	0.005	0.00050	ND
1,2,3-Trichloropropane	--	0.00050	ND
1,2,3-Trimethylbenzene	--	0.00050	ND
1,2,4-Trimethylbenzene	--	0.00050	ND
1,3,5-Trimethylbenzene	--	0.00050	ND
Vinyl chloride	0.002	0.00050	ND
meta-Xylene \	--	0.00050	ND
ortho-Xylene - (total xylenes)	10	0.00050	ND
para-Xylene /	--	0.00050	ND
Add'l Organics EPA 504.1:			
Dibromochloropropane	0.0002	0.000020	ND
Ethylene Dibromide	0.00002	0.0000098	ND
EPA 508.1:			
Alachlor	0.002	0.00021	ND
Atrazine	0.003	0.00010	ND
Butachlor	--	0.00010	ND
Chlordane (alpha and gamma)	0.002	0.00021	ND
Endrin	0.002	0.000010	ND
Heptachlor	0.0004	0.000041	ND
Heptachlor epoxide	0.0002	0.000021	ND
Hexachlorobenzene	0.001	0.00010	ND
Hexachlorocyclopentadiene	0.05	0.00010	ND
Lindane	0.0002	0.000021	ND
Methoxychlor	0.04	0.00010	ND
Metolachlor	--	0.00010	ND
Metribuzin	--	0.00010	ND
Total PCB's	0.0005	0.00010	ND
PCB 1016	--	0.00010	ND
PCB 1221	--	0.00010	ND
PCB 1232	--	0.00010	ND
PCB 1242	--	0.00010	ND
PCB 1248	--	0.00010	ND
PCB 1254	--	0.00010	ND
PCB 1260	--	0.00010	ND
Simazine	0.004	0.000072	ND
Toxaphene	0.003	0.0010	ND

ANALYSIS PERFORMED	MCL (mg/L)	RL (mg/L)	CGR 8 SOURCE 219-9110 (mg/L)
EPA 515.3:			
Bentazon	0.02	0.00020	ND
2,4-D	0.07	0.00010	ND
Dalapon	0.2	0.0010	ND
Dicamba	--	0.00010	ND
Dinoseb	0.007	0.00020	ND
Pentachlorophenol	0.001	0.000040	ND
Picloram	0.5	0.00010	ND
2,4,5-TP (Silvex)	0.05	0.00020	ND
EPA 525.2:			
Aldrin	--	0.000096	ND
Benzo(a)pyrene	0.0002	0.000096	ND
2-Chlorobiphenyl	--	0.000096	ND
Dieldrin	--	0.00012	ND
Di(2-ethylhexyl)adipate	0.4	0.0015	ND
Di(2-ethylhexyl)phthalate	0.006	0.0019	ND
Dimethyl phthalate	--	0.0015	ND
Fluorene	--	0.00019	ND
Indeno(1,2,3-cd)pyrene	--	0.00019	ND
Molinate	--	0.0019	ND
trans-Nonachlor	--	0.00019	ND
2,2´,3,3´,4,5´,6,6´-Octachlorobiphenyl	--	0.000096	ND
2,2´,3´,4,6-Pentachlorobiphenyl	--	0.000096	ND
Phenanthrene	--	0.00019	ND
Propachlor	--	0.00019	ND
Pyrene	--	0.00019	ND
2,2´,4,4´-Tetrachlorobiphenyl	--	0.000096	ND
Thiobencarb	--	0.0019	ND
EPA 531.1:			
Aldicarb (TEMIK)	0.007	0.0020	ND
Aldicarb sulfone	0.007	0.0020	ND
Aldicarb sulfoxide	0.007	0.0020	ND
Carbaryl	--	0.0020	ND
Carbofuran	0.04	0.0020	ND
3-Hydroxycarbofuran	--	0.0020	ND
Methiocarb	--	0.0020	ND
Methomyl	--	0.0020	ND
Oxamyl (VYDATE)	0.2	0.0020	ND
EPA 547:			
Glyphosate	0.7	0.0060	ND
EPA 548.1:			
Endothall	0.1	0.0090	ND
EPA 549.2:			
Diquat	0.02	0.00010	ND
Paraquat	--	0.00010	ND
EPA 1613:			
2,3,7,8-TCDD (DIOXIN)	3x10-8	0.01x10-9	ND

ANALYSIS PERFORMED	MCL (mg/L)	RL (mg/L)	CGR 8 SOURCE 219-9110 (mg/L)
Disinfection Byproducts			
EPA 524.2:			
Total Trihalomethanes	0.080	0.00050	ND
Bromodichloromethane	--	0.00050	ND
Bromoform	--	0.00050	ND
Chloroform	--	0.00050	ND
Dibromochloromethane	--	0.00050	ND
Residual Disinfectants			
SM4500-CL D:			
Residual Chlorine, Total	4.0	0.10	ND
Miscellaneous			
EPA 314.0:			
Perchlorate	0.0020	0.0005	ND

EPA approved methods were used in all of the analyses and a listing is available upon request. These test results may be used for compliance purposes as required.

CLIENT: Crystal Geyser Roxane
1210 S. State Hwy. #395
Olancha, CA 93549

DATE OF REPORT: Quarter 3, 2010
REPORT #: 219-9111
LABORATORY ID#: 3518288, 041021776, 3034271, 3034272, 346284, G492-3409, 344162

NOTE:
"*" indicates that maximum levels have been exceeded, or in the case of pH, is either too high or too low
"ND" indicates that none of this analyte has been detected at or above the specified detection level
"MCL" indicates maximum contaminant level as established by EPA and/or FDA or state
"RL" indicates laboratory reporting limit for method
Units results are reported in mg/L unless other wise noted

ANALYSIS PERFORMED	MCL (mg/L)	RL (mg/L)	CGR 9 SOURCE 219-9111 (mg/L)
Primary Inorganics			
Antimony	0.006	0.0010	ND
Arsenic	0.01	0.0035	ND
Asbestos	7 MFL	0.20	ND
Barium	2	0.010	0.019
Beryllium	0.004	0.0010	ND
Cadmium	0.005	0.0010	ND
Chromium	0.1	0.0050	ND
Cyanide	0.2	0.010	ND
Fluoride	4	0.050	0.74
Lead	0.015	0.0010	ND
Mercury	0.002	0.00020	ND
Nickel	0.1	0.0050	ND
Nitrogen, Nitrate	10	0.050	0.19
Nitrogen, Nitrite	1.0	0.050	ND
Nitrogen - NO3/NO2 (NOX)	10	0.050	0.19
Selenium	0.05	0.0010	ND
Thallium	0.002	0.0010	ND
Secondary Inorganics			
Alkalinity	--	5.0	68.1
Aluminum	0.2	0.10	ND
Bicarbonate	--	5.0	68.1
Boron	--	0.050	0.056
Bromide	--	0.10	ND
Calcium	--	0.50	16.1
Carbonate	--	5.0	ND
Chloride	250	0.50	1.5
Copper	1	0.0050	ND
Corrosivity	--	--	-0.98
Foaming Agents	0.5	0.20	ND
Hardness, Calcium (as CaCO3)	--	1.2	40.2
Hardness, Total (as CaCO3)	--	3.3	49.6
Hydroxide	--	5.0	ND
Iron	0.3	0.040	ND
Magnesium	--	0.50	2.3
Manganese	0.05	0.0050	ND
Orthophosphate	--	0.10	ND
pH	6.5-8.5	0.10	7.3
Phenol	0.001	0.0010	ND
Potassium	--	1.0	2.0
Silver	0.1	0.0050	ND
Sodium	--	1.0	15.9
Specific Conductance	--	1.0	166
Sulfate	250	0.5	12.8
TDS	500	5.0	135
Zinc	5	0.020	ND

159 South Stark Highway, The Governor Wentworth Building, Weare, New Hampshire 03281
Phone: (603) 529-4977 / Fax: (603) 529-4988

ANALYSIS PERFORMED	MCL (mg/L)	RL (mg/L)	CGR 9 SOURCE 219-9111 (mg/L)
Physical			
Color	15 CU	5.0	ND
Odor	3 TON	1.0	ND
Turbidity	1-5 NTU	0.20	ND
Microbiological			
Total Coliform	Absence	Absence	ND
Standard Plate Count	-- cfu/mL	1.0	ND
E. coli	Absence	Absence	ND
Radiologicals			
Gross Alpha	15 pCi/L	1.62	1.30 (± 0.950)
Gross Beta	50 pCi/L	1.70	0.498 (± 0.785)
Radium 226/228	5 pCi/L	0.477 / 0.753	0.130 (± 0.254) / 1.13 (± 0.420)
Uranium	0.030	0.0010	0.0041
Radon	-- pCi/L	61.7	626 (± 58.1)
Volatile Organic Compounds EPA 524.2:			
Total Trihalomethanes	0.080	0.00050	ND
Benzene	0.001	0.00050	ND
Bromobenzene	--	0.00050	ND
Bromochloromethane	--	0.00050	ND
Bromodichloromethane	--	0.00050	ND
Bromoform	--	0.00050	ND
Bromomethane	--	0.00050	ND
n-Butylbenzene	--	0.00050	ND
sec-Butylbenzene	--	0.00050	ND
tert-Butylbenzene	--	0.00050	ND
Carbon tetrachloride	0.005	0.00050	ND
Chlorobenzene	0.1	0.00050	ND
Chloroethane	--	0.00050	ND
Chloroform	--	0.00050	ND
Chloromethane	--	0.00050	ND
2-Chlorotoluene	--	0.00050	ND
4-Chlorotoluene	--	0.00050	ND
Dibromochloromethane	--	0.00050	ND
Dibromomethane	--	0.00050	ND
1,2-Dichlorobenzene	0.6	0.00050	ND
1,3-Dichlorobenzene	--	0.00050	ND
1,4-Dichlorobenzene	0.075	0.00050	ND
Dichlorodifluoromethane	--	0.00050	ND
1,1-Dichloroethane	--	0.00050	ND
1,2-Dichloroethane	0.005	0.00050	ND
1,1-Dichloroethene	0.007	0.00050	ND
cis-1,2-Dichloroethene	0.07	0.00050	ND
trans-1,2-Dichloroethene	0.1	0.00050	ND
1,2-Dichloropropane	0.005	0.00050	ND
1,3-Dichloropropane	--	0.00050	ND
2,2-Dichloropropane	--	0.00050	ND
1,1-Dichloropropene	--	0.00050	ND
cis-1,3-Dichloropropene	--	0.00050	ND
trans-1,3-Dichloropropene	--	0.00050	ND
Ethylbenzene	0.7	0.00050	ND
Hexachlorobutadiene	--	0.00050	ND
Isopropylbenzene	--	0.00050	ND

ANALYSIS PERFORMED	MCL (mg/L)	RL (mg/L)	CGR 9 SOURCE 219-9111 (mg/L)
EPA 524.2 continued:			
4-Isopropyltoluene	--	0.00050	ND
Methyl tert-Butyl Ether	--	0.00050	ND
Methyl Ethyl Ketone	--	0.020	ND
Methylene Chloride	0.005	0.00050	ND
Naphthalene	--	0.00050	ND
n-Propylbenzene	--	0.00050	ND
Styrene	0.1	0.00050	ND
1,1,1,2-Tetrachloroethane	--	0.00050	ND
1,1,2,2-Tetrachloroethane	--	0.00050	ND
Tetrachloroethene	0.005	0.00050	ND
Toluene	1	0.00050	ND
1,2,3-Trichlorobenzene	--	0.00050	ND
1,2,4-Trichlorobenzene	0.07	0.00050	ND
1,1,1-Trichloroethane	0.2	0.00050	ND
1,1,2-Trichloroethane	0.005	0.00050	ND
Trichloroethene	0.005	0.00050	ND
Trichlorofluoromethane	--	0.00050	ND
Trichlorotrifluoroethane	--	0.00050	ND
1,2,3-Trichloropropane	--	0.00050	ND
1,2,3-Trimethylbenzene	--	0.00050	ND
1,2,4-Trimethylbenzene	--	0.00050	ND
1,3,5-Trimethylbenzene	--	0.00050	ND
Vinyl chloride	0.002	0.00050	ND
meta-Xylene \	--	0.00050	ND
ortho-Xylene - (total xylenes)	10	0.00050	ND
para-Xylene /	--	0.00050	ND
Add'l Organics EPA 504.1:			
Ethylene Dibromide	0.00002	0.000010	ND
Dibromochloropropane	0.0002	0.000020	ND
EPA 508.1:			
Alachlor	0.002	0.00019	ND
Atrazine	0.003	0.000095	ND
Butachlor	--	0.000095	ND
Chlordane (alpha and gamma)	0.002	0.00019	ND
Endrin	0.002	0.0000095	ND
Heptachlor	0.0004	0.000038	ND
Heptachlor epoxide	0.0002	0.000019	ND
Hexachlorobenzene	0.001	0.000095	ND
Hexachlorocyclopentadiene	0.05	0.000095	ND
Lindane	0.0002	0.000019	ND
Methoxychlor	0.04	0.000095	ND
Metolachlor	--	0.000095	ND
Metribuzin	--	0.000095	ND
Total PCBs	0.0005	0.000095	ND
PCB 1016	--	0.000095	ND
PCB 1221	--	0.000095	ND
PCB 1232	--	0.000095	ND
PCB 1242	--	0.000095	ND
PCB 1248	--	0.000095	ND
PCB 1254	--	0.000095	ND
PCB 1260	--	0.000095	ND
Simazine	0.004	0.000067	ND
Toxaphene	0.003	0.00095	ND

ANALYSIS PERFORMED	MCL (mg/L)	RL (mg/L)	CGR 9 SOURCE 219-9111 (mg/L)
EPA 515.3:			
Bentazon	0.02	0.00020	ND
2,4-D	0.07	0.00010	ND
Dalapon	0.2	0.0010	ND
Dicamba	--	0.00010	ND
Dinoseb	0.007	0.00020	ND
Pentachlorophenol	0.001	0.000040	ND
Picloram	0.5	0.00010	ND
2,4,5-TP (Silvex)	0.05	0.00020	ND
EPA 525.2:			
Aldrin	--	0.000095	ND
Benzo(a)pyrene	0.0002	0.000095	ND
2-Chlorobiphenyl	--	0.000095	ND
Dieldrin	--	0.00012	ND
Di(2-ethylhexyl)adipate	0.4	0.0015	ND
Di(2-ethylhexyl)phthalate	0.006	0.0019	ND
Dimethyl phthalate	--	0.0015	ND
Fluorene	--	0.00019	ND
Indeno(1,2,3-cd)pyrene	--	0.00019	ND
Molinate	--	0.0019	ND
trans-Nonachlor	--	0.00019	ND
2,2´,3,3´,4,5´,6,6´-Octachlorobiphenyl	--	0.000095	ND
2,2´,3´,4,6-Pentachlorobiphenyl	--	0.000095	ND
Phenanthrene	--	0.00019	ND
Propachlor	--	0.00019	ND
Pyrene	--	0.00019	ND
2,2´,4,4´-Tetrachlorobiphenyl	--	0.000095	ND
Thiobencarb	--	0.0019	ND
EPA 531.1:			
Aldicarb (TEMIK)	0.007	0.0020	ND
Aldicarb sulfone	0.007	0.0020	ND
Aldicarb sulfoxide	0.007	0.0020	ND
Carbaryl	--	0.0020	ND
Carbofuran	0.04	0.0020	ND
3-Hydroxycarbofuran	--	0.0020	ND
Methiocarb	--	0.0020	ND
Methomyl	--	0.0020	ND
Oxamyl (VYDATE)	0.2	0.0020	ND
EPA 547:			
Glyphosate	0.7	0.0060	ND
EPA 548.1:			
Endothall	0.1	0.0090	ND
EPA 549.2:			
Diquat	0.02	0.00010	ND
Paraquat	--	0.00010	ND
EPA 1613:			
2,3,7,8-TCDD (DIOXIN)	3x10-8	0.01x10-9	ND

ANALYSIS PERFORMED	MCL (mg/L)	RL (mg/L)	CGR 9 SOURCE 219-9111 (mg/L)
Disinfection Byproducts EPA 524.2:			
Total Trihalomethanes	0.080	0.00050	ND
Bromodichloromethane	--	0.00050	ND
Bromoform	--	0.00050	ND
Chloroform	--	0.00050	ND
Dibromochloromethane	--	0.00050	ND
Residual Disinfectants SM4500-CL D:			
Residual Chlorine, Total	4.0	0.10	ND
Miscellaneous EPA 314.0:			
Perchlorate	0.0020	0.0005	ND

EPA approved methods were used in all of the analyses and a listing is available upon request. These test results may be used for compliance purposes as required.

CLIENT: Crystal Geyser Roxane
1210 S. State Hwy. #395, PO Drawer 'A'
Olancha, CA 93549

DATE OF REPORT: Quarter 4, 2010
REPORT #: 219-9318
LABORATORY ID#: 3522177, 041026544, 3037302, 3037303, G492-3487, 348971

NOTE:
"*" indicates that maximum levels have been exceeded, or in the case of pH, is either too high or too low
"ND" indicates that none of this analyte has been detected at or above the specified detection level
"MCL" indicates maximum contaminant level as established by EPA and/or FDA or state
"RL" indicates laboratory reporting limit for method
Units results are reported in mg/L unless other wise noted

ANALYSIS PERFORMED	MCL (mg/L)	RL (mg/L)	CGR 10 219-9318 (mg/L)
Primary Inorganics			
Antimony	0.006	0.0010	ND
Arsenic	0.01	0.0035	ND
Asbestos	7 MFL	0.17	ND
Barium	2	0.010	0.020
Beryllium	0.004	0.0010	ND
Cadmium	0.005	0.0010	ND
Chromium	0.1	0.0050	ND
Cyanide	0.2	0.010	ND
Fluoride	4	0.050	0.73
Lead	0.015	0.0010	ND
Mercury	0.002	0.00020	ND
Nickel	0.1	0.0050	ND
Nitrogen, Nitrate	10	0.050	0.16
Nitrogen, Nitrite	1.0	0.050	ND
Nitrogen - NO3/NO2 (NOX)	10	0.050	0.16
Selenium	0.05	0.0010	ND
Thallium	0.002	0.0010	ND
Secondary Inorganics			
Alkalinity	--	5.0	68.3
Aluminum	0.2	0.10	ND
Bicarbonate	--	5.0	68.3
Boron	--	0.050	0.059
Bromide	--	0.10	ND
Calcium	--	0.50	18.3
Carbonate	--	5.0	ND
Chloride	250	0.50	1.9
Copper	1	0.0050	ND
Corrosivity	--	--	-0.72
Foaming Agents	0.5	0.20	ND
Hardness, Calcium (as CaCO3)	--	1.2	45.7
Hardness, Total (as CaCO3)	--	3.3	54.0
Hydroxide	--	5.0	ND
Iron	0.3	0.040	ND
Magnesium	--	0.50	2.0
Manganese	0.05	0.0050	ND
Orthophosphate	--	0.10	ND
pH	6.5-8.5	0.10	7.5
Phenol	0.001	0.0010	ND
Potassium	--	1.0	2.0
Silver	0.1	0.0050	ND
Sodium	--	1.0	17.5
Specific Conductance	--	1.0	176
Sulfate	250	0.50	14.4
TDS	500	5.0	121
Zinc	5	0.020	ND

ANALYSIS PERFORMED	MCL (mg/L)	RL (mg/L)	CGR 10 219-9318 (mg/L)
Physical			
Color	15 CU	5.0	ND
Odor	3 TON	1.0	ND
Turbidity	1-5 NTU	0.20	ND
Microbiological			
Total Coliform	Absence	Absence	ND
Standard Plate Count	-- cfu/mL	1.0	33.0
E. coli	Absence	Absence	ND
Radiologicals			
Gross Alpha	15 pCi/L	2.21	0.961 (± 1.08)
Gross Beta	50 pCi/L	1.17	1.21 (± 0.624)
Radium 226/228	5 pCi/L	0.388 / 0.922	0.739 (± 0.414) / 0.487 (± 0.439)
Uranium	30 ug/L	0.210	3.97 (± 0.058)
Radon	-- pCi/L	129	265.5 (± 83.5)
Volatile Organic Compounds EPA 524.2:			
Total Trihalomethanes	0.080	0.00050	ND
Benzene	0.001	0.00050	ND
Bromobenzene	--	0.00050	ND
Bromochloromethane	--	0.00050	ND
Bromodichloromethane	--	0.00050	ND
Bromoform	--	0.00050	ND
Bromomethane	--	0.00050	ND
n-Butylbenzene	--	0.00050	ND
sec-Butylbenzene	--	0.00050	ND
tert-Butylbenzene	--	0.00050	ND
Carbon tetrachloride	0.005	0.00050	ND
Chlorobenzene	0.1	0.00050	ND
Chloroethane	--	0.00050	ND
Chloroform	--	0.00050	ND
Chloromethane	--	0.00050	ND
2-Chlorotoluene	--	0.00050	ND
4-Chlorotoluene	--	0.00050	ND
Dibromochloromethane	--	0.00050	ND
Dibromomethane	--	0.00050	ND
1,2-Dichlorobenzene	0.6	0.00050	ND
1,3-Dichlorobenzene	--	0.00050	ND
1,4-Dichlorobenzene	0.075	0.00050	ND
Dichlorodifluoromethane	--	0.00050	ND
1,1-Dichloroethane	--	0.00050	ND
1,2-Dichloroethane	0.005	0.00050	ND
1,1-Dichloroethene	0.007	0.00050	ND
cis-1,2-Dichloroethene	0.07	0.00050	ND
trans-1,2-Dichloroethene	0.1	0.00050	ND
1,2-Dichloropropane	0.005	0.00050	ND
1,3-Dichloropropane	--	0.00050	ND
2,2-Dichloropropane	--	0.00050	ND
1,1-Dichloropropene	--	0.00050	ND
cis-1,3-Dichloropropene	--	0.00050	ND
trans-1,3-Dichloropropene	--	0.00050	ND
Ethylbenzene	0.7	0.00050	ND
Hexachlorobutadiene	--	0.00050	ND

ANALYSIS PERFORMED	MCL (mg/L)	RL (mg/L)	CGR 10 219-9318 (mg/L)
EPA 524.2 continued:			
Isopropylbenzene	--	0.00050	ND
4-Isopropyltoluene	--	0.00050	ND
Methyl tert-Butyl Ether	--	0.00050	ND
Methyl Ethyl Ketone	--	0.020	ND
Methylene Chloride	0.005	0.00050	ND
Naphthalene	--	0.00050	ND
n-Propylbenzene	--	0.00050	ND
Styrene	0.1	0.00050	ND
1,1,1,2-Tetrachloroethane	--	0.00050	ND
1,1,2,2-Tetrachloroethane	--	0.00050	ND
Tetrachloroethene	0.005	0.00050	ND
Toluene	1	0.00050	ND
1,2,3-Trichlorobenzene	--	0.00050	ND
1,2,4-Trichlorobenzene	0.07	0.00050	ND
1,1,1-Trichloroethane	0.2	0.00050	ND
1,1,2-Trichloroethane	0.005	0.00050	ND
Trichloroethene	0.005	0.00050	ND
1,2,3-Trichloropropane	--	0.00050	ND
1,2,3-Trimethylbenzene	--	0.00050	ND
1,2,4-Trimethylbenzene	--	0.00050	ND
1,3,5-Trimethylbenzene	--	0.00050	ND
Vinyl chloride	0.002	0.00050	ND
meta-Xylene \	--	0.00050	ND
ortho-Xylene - (total xylenes)	10	0.00050	ND
para-Xylene /	--	0.00050	ND
Add'l Organics EPA 504.1:			
Dibromochloropropane	0.0002	0.000019	ND
Ethylene Dibromide	0.00002	0.0000097	ND
EPA 508.1:			
Alachlor	0.002	0.00020	ND
Atrazine	0.003	0.00010	ND
Butachlor	--	0.00010	ND
Chlordane (alpha and gamma)	0.002	0.00020	ND
Endrin	0.002	0.000010	ND
Heptachlor	0.0004	0.000041	ND
Heptachlor epoxide	0.0002	0.000020	ND
Hexachlorobenzene	0.001	0.00010	ND
Hexachlorocyclopentadiene	0.05	0.00010	ND
Lindane	0.0002	0.000020	ND
Methoxychlor	0.04	0.00010	ND
Metolachlor	--	0.00010	ND
Metribuzin	--	0.00010	ND
Total PCB's	0.0005	0.00010	ND
PCB 1016	--	0.00010	ND
PCB 1221	--	0.00010	ND
PCB 1232	--	0.00010	ND
PCB 1242	--	0.00010	ND
PCB 1248	--	0.00010	ND
PCB 1254	--	0.00010	ND
PCB 1260	--	0.00010	ND
Simazine	0.004	0.000071	ND
Toxaphene	0.003	0.0010	ND

ANALYSIS PERFORMED	MCL (mg/L)	RL (mg/L)	CGR 10 219-9318 (mg/L)
EPA 515.3:			
Bentazon	0.02	0.00020	ND
2,4-D	0.07	0.00010	ND
Dalapon	0.2	0.0010	ND
Dicamba	--	0.00010	ND
Dinoseb	0.007	0.00020	ND
Pentachlorophenol	0.001	0.000040	ND
Picloram	0.5	0.00010	ND
2,4,5-TP (Silvex)	0.05	0.00020	ND
EPA 525.2:			
Aldrin	--	0.00010	ND
Benzo(a)pyrene	0.0002	0.00010	ND
2-Chlorobiphenyl	--	0.00010	ND
Dieldrin	--	0.00013	ND
Di(2-ethylhexyl)adipate	0.4	0.0016	ND
Di(2-ethylhexyl)phthalate	0.006	0.0020	ND
Dimethyl phthalate	--	0.0016	ND
Fluorene	--	0.00020	ND
Indeno(1,2,3-cd)pyrene	--	0.00020	ND
Molinate	--	0.0020	ND
trans-Nonachlor	--	0.00020	ND
2,2´,3,3´,4,5´,6,6´-Octachlorobiphenyl	--	0.00010	ND
2,2´,3´,4,6-Pentachlorobiphenyl	--	0.00010	ND
Phenanthrene	--	0.00020	ND
Propachlor	--	0.00020	ND
Pyrene	--	0.00020	ND
2,2´,4,4´-Tetrachlorobiphenyl	--	0.00010	ND
Thiobencarb	--	0.0020	ND
EPA 531.1:			
Aldicarb (TEMIK)	0.007	0.0020	ND
Aldicarb sulfone	0.007	0.0020	ND
Aldicarb sulfoxide	0.007	0.0020	ND
Carbaryl	--	0.0020	ND
Carbofuran	0.04	0.0020	ND
3-Hydroxycarbofuran	--	0.0020	ND
Methiocarb	--	0.0020	ND
Methomyl	--	0.0020	ND
Oxamyl (VYDATE)	0.2	0.0020	ND
EPA 547:			
Glyphosate	0.7	0.0060	ND
EPA 548.1:			
Endothall	0.1	0.0090	ND
EPA 549.2:			
Diquat	0.02	0.00012	ND
Paraquat	--	0.00012	ND
EPA 1613:			
2,3,7,8-TCDD (DIOXIN)	3x10-8	0.01x10-9	ND

ANALYSIS PERFORMED	MCL (mg/L)	RL (mg/L)	CGR 10 219-9318 (mg/L)
Disinfection Byproducts EPA 524.2:			
Total Trihalomethanes	0.080	0.00050	ND
Bromodichloromethane	--	0.00050	ND
Bromoform	--	0.00050	ND
Chloroform	--	0.00050	ND
Dibromochloromethane	--	0.00050	ND
Residual Disinfectants SM4500-CL D:			
Residual Chlorine, Total	4.0	0.10	ND
Miscellaneous EPA 314.0:			
Perchlorate	0.0010	0.0005	ND

EPA approved methods were used in all of the analyses and a listing is available upon request. These test results may be used for compliance purposes as required.

LABORATORY ANALYSES FOR PW-1, CBR-1, CBR-2 and CBR-4

CLIENT: Crystal Geyser Roxane
1210 S. State Hwy. #395
Olancha, CA 93549

DATE OF REPORT: Quarter 1, 2010
REPORT #: 219-8316
LABORATORY ID#: 358719, 328413, 3024243, 3024244, 041005894, G49-2979, 328369

NOTE:
- "*" indicates that maximum levels have been exceeded, or in the case of pH, is either too high or too low
- "ND" indicates that none of this analyte has been detected at or above the specified detection level
- "MCL" indicates maximum contaminant level as established by EPA and/or FDA or state
- "RL" indicates laboratory reporting limit for method
- Units results are reported in mg/L unless other wise noted

ANALYSIS PERFORMED	MCL (mg/L)	RL (mg/L)	PW ~~CR~~-1 SOURCE 219-8316 (mg/L)
Primary Inorganics			
Antimony	0.006	0.0010	ND
Arsenic	0.01	0.0010	0.0031
Asbestos	7 MFL	0.19	ND
Barium	2	0.010	ND
Beryllium	0.004	0.0010	ND
Cadmium	0.005	0.0010	ND
Chromium	0.1	0.0050	ND
Cyanide	0.2	0.010	ND
Fluoride	4	0.050	0.75
Lead	0.015	0.0010	ND
Mercury	0.002	0.00020	ND
Nickel	0.1	0.0050	ND
Nitrogen, Nitrate	10	0.050	0.10
Nitrogen, Nitrite	1.0	0.050	ND
Nitrogen - NO3/NO2 (NOX)	10	0.050	0.10
Selenium	0.05	0.0010	ND
Thallium	0.002	0.0010	ND
Secondary Inorganics			
Alkalinity	--	5.0	81.9
Aluminum	0.2	0.10	ND
Bicarbonate	--	5.0	81.9
Boron	--	0.050	0.16
Bromide	--	0.10	ND
Calcium	--	0.50	10.1
Carbonate	--	5.0	ND
Chloride	250	0.50	1.9
Copper	1	0.0050	ND
Corrosivity	--		-0.31
Foaming Agents	0.5	0.20	ND
Hardness, Calcium (as CaCO3)	--	1.2	25.2
Hardness, Total (as CaCO3)	--	3.3	27.9
Hydroxide	--	5.0	ND
Iron	0.3	0.040	0.044
Magnesium	--	0.50	0.64
Manganese	0.05	0.0050	ND
Orthophosphate	--	0.10	ND
pH	6.5-8.5	0.10	8.1
Phenol	0.001	0.0010	ND
Potassium	--	1.0	1.3
Silver	0.1	0.0050	ND
Sodium	--	1.0	32.8
Specific Conductance	--	1.0	182
Sulfate	250	0.50	18.7
TDS	500	5.0	137
Zinc	5	0.020	ND

ANALYSIS PERFORMED	MCL (mg/L)	RL (mg/L)	PW ~~GB~~-1 SOURCE 219-8316 (mg/L)
Physical			
Color	15 CU	5.0	ND
Odor	3 TON	1.0	ND
Turbidity	1-5 NTU	0.20	ND
Microbiological			
Total Coliform	Absence	Absence	ND
Standard Plate Count	-- cfu/mL	1.0	ND
E. coli	Absence	Absence	ND
Radiologicals			
Gross Alpha	15 pCi/L	1.04	1.80 (± 0.688)
Gross Beta	50 pCi/L	0.743	0.824 (± 0.423)
Radium 226/228	5 pCi/L	0.640 / 0.747	0.435 (± 0.451) / 0.976 (± 0.415)
Uranium	30 ug/L	0.210	3.17 (± 0.051)
Radon	-- pCi/L	49.6	1,773 (± 74.3)
Volatile Organic Compounds EPA 524.2:			
Total Trihalomethanes	0.080	0.00050	ND
Benzene	0.001	0.00050	ND
Bromobenzene	--	0.00050	ND
Bromochloromethane	--	0.00050	ND
Bromodichloromethane	--	0.00050	ND
Bromoform	--	0.00050	ND
Bromomethane	--	0.00050	ND
n-Butylbenzene	--	0.00050	ND
sec-Butylbenzene	--	0.00050	ND
tert-Butylbenzene	--	0.00050	ND
Carbon tetrachloride	0.005	0.00050	ND
Chlorobenzene	0.1	0.00050	ND
Chloroethane	--	0.00050	ND
Chloroform	--	0.00050	ND
Chloromethane	--	0.00050	ND
2-Chlorotoluene	--	0.00050	ND
4-Chlorotoluene	--	0.00050	ND
Dibromochloromethane	--	0.00050	ND
Dibromomethane	--	0.00050	ND
1,2-Dichlorobenzene	0.6	0.00050	ND
1,3-Dichlorobenzene	--	0.00050	ND
1,4-Dichlorobenzene	0.075	0.00050	ND
Dichlorodifluoromethane	--	0.00050	ND
1,1-Dichloroethane	--	0.00050	ND
1,2-Dichloroethane	0.005	0.00050	ND
1,1-Dichloroethene	0.007	0.00050	ND
cis-1,2-Dichloroethene	0.07	0.00050	ND
trans-1,2-Dichloroethene	0.1	0.00050	ND
1,2-Dichloropropane	0.005	0.00050	ND
1,3-Dichloropropane	--	0.00050	ND
2,2-Dichloropropane	--	0.00050	ND
1,1-Dichloropropene	--	0.00050	ND
cis-1,3-Dichloropropene	--	0.00050	ND
trans-1,3-Dichloropropene	--	0.00050	ND
Ethylbenzene	0.7	0.00050	ND
Hexachlorobutadiene	--	0.00050	ND
Isopropylbenzene	--	0.00050	ND

ANALYSIS PERFORMED	MCL (mg/L)	RL (mg/L)	PW EB-1 SOURCE 219-8316 (mg/L)
EPA 524.2 continued:			
4-Isopropyltoluene	--	0.00050	ND
Methyl tert-Butyl Ether	--	0.00050	ND
Methyl Ethyl Ketone	--	0.020	ND
Methylene Chloride	0.005	0.00050	ND
Naphthalene	--	0.00050	ND
n-Propylbenzene	--	0.00050	ND
Styrene	0.1	0.00050	ND
1,1,1,2-Tetrachloroethane	--	0.00050	ND
1,1,2,2-Tetrachloroethane	--	0.00050	ND
Tetrachloroethene	0.005	0.00050	ND
Toluene	1	0.00050	ND
1,2,3-Trichlorobenzene	--	0.00050	ND
1,2,4-Trichlorobenzene	0.07	0.00050	ND
1,1,1-Trichloroethane	0.2	0.00050	ND
1,1,2-Trichloroethane	0.005	0.00050	ND
Trichloroethene	0.005	0.00050	ND
Trichlorofluoromethane	--	0.00050	ND
Trichlorotrifluoroethane	--	0.00050	ND
1,2,3-Trichloropropane	--	0.00050	ND
1,2,3-Trimethylbenzene	--	0.00050	ND
1,2,4-Trimethylbenzene	--	0.00050	ND
1,3,5-Trimethylbenzene	--	0.00050	ND
Vinyl chloride	0.002	0.00050	ND
meta-Xylene \	--	0.00050	ND
ortho-Xylene - (total xylenes)	10	0.00050	ND
para-Xylene /	--	0.00050	ND
Add'l Organics EPA 504.1:			
Ethylene Dibromide	0.00002	0.000010	ND
Dibromochloropropane	0.0002	0.000021	ND
EPA 508.1:			
Alachlor	0.002	0.00020	ND
Atrazine	0.003	0.000098	ND
Butachlor	--	0.000098	ND
Chlordane (alpha and gamma)	0.002	0.00020	ND
Endrin	0.002	0.0000098	ND
Heptachlor	0.0004	0.000039	ND
Heptachlor epoxide	0.0002	0.000020	ND
Hexachlorobenzene	0.001	0.000098	ND
Hexachlorocyclopentadiene	0.05	0.000098	ND
Lindane	0.0002	0.000020	ND
Methoxychlor	0.04	0.000098	ND
Metolachlor	--	0.000098	ND
Metribuzin	--	0.000098	ND
Total PCBs	0.0005	0.000098	ND
PCB 1016	--	0.000098	ND
PCB 1221	--	0.000098	ND
PCB 1232	--	0.000098	ND
PCB 1242	--	0.000098	ND
PCB 1248	--	0.000098	ND
PCB 1254	--	0.000098	ND
PCB 1260	--	0.000098	ND
Simazine	0.004	0.000068	ND
Toxaphene	0.003	0.00098	ND

ANALYSIS PERFORMED	MCL (mg/L)	RL (mg/L)	PW ~~GB~~1 SOURCE 219-8316 (mg/L)
EPA 515.3:			
Bentazon	0.02	0.00020	ND
2,4-D	0.07	0.00010	ND
Dalapon	0.2	0.0010	ND
Dicamba	--	0.00010	ND
Dinoseb	0.007	0.00020	ND
Pentachlorophenol	0.001	0.000040	ND
Picloram	0.5	0.00010	ND
2,4,5-TP (Silvex)	0.05	0.00020	ND
EPA 525.2:			
Aldrin	--	0.000096	ND
Benzo(a)pyrene	0.0002	0.000096	ND
2-Chlorobiphenyl	--	0.000096	ND
Dieldrin	--	0.00013	ND
Di(2-ethylhexyl)adipate	0.4	0.0015	ND
Di(2-ethylhexyl)phthalate	0.006	0.0019	ND
Dimethyl phthalate	--	0.0015	ND
Fluorene	--	0.00019	ND
Indeno(1,2,3-cd)pyrene	--	0.00019	ND
Molinate	--	0.0019	ND
trans-Nonachlor	--	0.00019	ND
2,2',3,3',4,5',6,6'-Octachlorobiphenyl	--	0.000096	ND
2,2',3',4,6-Pentachlorobiphenyl	--	0.000096	ND
Phenanthrene	--	0.00019	ND
Propachlor	--	0.00019	ND
Pyrene	--	0.00019	ND
2,2',4,4'-Tetrachlorobiphenyl	--	0.000096	ND
Thiobencarb	--	0.0019	ND
EPA 531.1:			
Aldicarb (TEMIK)	0.007	0.0020	ND
Aldicarb sulfone	0.007	0.0020	ND
Aldicarb sulfoxide	0.007	0.0020	ND
Carbaryl	--	0.0020	ND
Carbofuran	0.04	0.0020	ND
3-Hydroxycarbofuran	--	0.0020	ND
Methiocarb	--	0.0020	ND
Methomyl	--	0.0020	ND
Oxamyl (VYDATE)	0.2	0.0020	ND
EPA 547:			
Glyphosate	0.7	0.0060	ND
EPA 548.1:			
Endothall	0.1	0.0090	ND
EPA 549.2:			
Diquat	0.02	0.00040	ND
Paraquat	--	0.002	ND
EPA 1613:			
2,3,7,8-TCDD (DIOXIN)	3x10-8	0.01x10-9	ND

ANALYSIS PERFORMED	MCL (mg/L)	RL (mg/L)	PW CB-1 SOURCE 219-8316 (mg/L)
Disinfection Byproducts			
EPA 524.2:			
Total Trihalomethanes	0.080	0.00050	ND
Bromodichloromethane	--	0.00050	ND
Bromoform	--	0.00050	ND
Chloroform	--	0.00050	ND
Dibromochloromethane	--	0.00050	ND
Residual Disinfectants			
SM4500-CL D:			
Residual Chlorine, Total	4.0	0.10	ND
Miscellaneous			
EPA 314.0:			
Perchlorate	0.0020	0.0005	ND

EPA approved methods were used in all of the analyses and a listing is available upon request. These test results may be used for compliance purposes as required.

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Laboratory Data
Report: 326417

Crystal Geyser Roxane
Manuel Luna
P.O. Drawer A
Olancha, CA 93549

Samples Received on:
02/18/2010

Prepared	Analyzed	QC Ref #	Method	Analyte	Result	Units	MRL	Dilution
CBR-1 (201002180230)						**Sampled on 02/17/2010 1215**		
			SM 2330B - pH of CaCO3 saturation(60C)					
02/20/2010	01:24		(SM 2330B)	pH of CaCO3 saturation(60C)	7.8	Units	0.1	1
			SM 2330B - Langelier Index - 25 degree					
02/20/2010	01:24		(SM 2330B)	Langelier Index - 25 degree	0.090	None		1
			SM 1030E - Anion Sum - Calculated					
02/22/2010	09:41		(SM 1030E)	Anion Sum - Calculated	2.5	meq/L	0.001	1
			SM 1030E - Cation Sum - Calculated					
02/25/2010	16:09		(SM 1030E)	Cation Sum - Calculated	2.4	meq/L	0.001	1
			SM 2330B - pH of CaCO3 saturation(25C)					
02/21/2010	10:30		(SM 2330B)	pH of CaCO3 saturation(25C)	8.2	Units	0.1	1
			SM 2330 - Agressiveness Index-Calculated					
02/20/2010	01:24		(SM 2330)	Agressiveness Index-Calculated	12	None	0.1	1
			SM 2330B - Langlier Index at 60 degrees C					
02/20/2010	01:24		(SM 2330B)	Langelier Index at 60 degrees C	-0.16	None		1
			SM 1030E - Cation/Anion Difference					
02/20/2010	01:24		(SM 1030E)	Cation/Anion Difference	5.9	%		1
			SM 2340B - Total Hardness as CaCO3 by ICP					
02/25/2010	16:09		(SM 2340B)	Total Hardness as CaCO3 by ICP	41	mg/L	3	1
			EPA 200.8 - ICPMS Metals					
02/25/2010	21:09	543374	(EPA 200.8)	Aluminum Total ICAP/MS	ND	ug/L	40	2
02/25/2010	21:09	543374	(EPA 200.8)	Antimony Total ICAP/MS	ND	ug/L	2	2
03/02/2010	18:54	544162	(EPA 200.8)	Arsenic dissolved ICAP/MS	11	ug/L	1	1
02/26/2010	20:18	543871	(EPA 200.8)	Arsenic Total ICAP/MS	9.5 (D1)	ug/L	5	5
02/25/2010	21:09	543374	(EPA 200.8)	Barium Total ICAP/MS	ND	ug/L	4	2
03/01/2010	14:15	544047	(EPA 200.8)	Beryllium Total ICAP/MS	ND	ug/L	2	2
02/25/2010	21:09	543374	(EPA 200.8)	Cadmium Total ICAP/MS	ND	ug/L	1	2
02/25/2010	21:09	543374	(EPA 200.8)	Chromium Total ICAP/MS	ND	ug/L	2	2
02/25/2010	21:09	543374	(EPA 200.8)	Copper Total ICAP/MS	ND	ug/L	4	2
02/25/2010	21:09	543374	(EPA 200.8)	Lead Total ICAP/MS	ND	ug/L	1	2
02/25/2010	21:09	543374	(EPA 200.8)	Manganese Total ICAP/MS	50	ug/L	4	2
02/25/2010	21:09	543374	(EPA 200.8)	Nickel Total ICAP/MS	ND	ug/L	10	2
02/25/2010	21:09	543374	(EPA 200.8)	Selenium Total ICAP/MS	ND	ug/L	10	2
02/25/2010	21:09	543374	(EPA 200.8)	Silver Total ICAP/MS	ND	ug/L	1	2
02/25/2010	21:09	543374	(EPA 200.8)	Thallium Total ICAP/MS	ND	ug/L	2	2

Rounding on totals after summation.
(c) - indicates calculated results

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Laboratory Data
Report: 326417

Crystal Geyser Roxane
Manuel Luna
P.O. Drawer A
Olancha, CA 93549

Samples Received on:
02/18/2010

Prepared	Analyzed	QC Ref #	Method	Analyte	Result	Units	MRL	Dilution
	02/25/2010 21:09	543374	(EPA 200.8)	Zinc Total ICAP/MS	ND	ug/L	40	2
	EPA 200.7 - ICP Metals							
	02/24/2010 15:45	543313	(EPA 200.7)	Calcium Total ICAP	14	mg/L	1	1
	02/24/2010 15:45	543313	(EPA 200.7)	Iron Total ICAP	0.13	mg/L	0.02	1
	02/24/2010 15:45	543313	(EPA 200.7)	Magnesium Total ICAP	1.5	mg/L	0.1	1
	02/24/2010 15:45	543313	(EPA 200.7)	Potassium Total ICAP	5.7	mg/L	1	1
	02/24/2010 15:45	543313	(EPA 200.7)	Sodium Total ICAP	32	mg/L	1	1
	EPA 245.1 - Mercury							
2/19/2010	02/19/2010 19:38	543091	(EPA 245.1)	Mercury	ND	ug/L	0.2	1
	Default - Freight - Outbound							
	02/19/2010 00:00		(Default)	Freight - Outbound	NA			1
	EPA 300.0 - Nitrate, Nitrite by EPA 300.0							
	02/18/2010 13:44	542603	(EPA 300.0)	Nitrate as Nitrogen by IC	ND	mg/L	0.1	1
	02/18/2010 13:44	542603	(EPA 300.0)	Nitrate as NO3 (calc)	ND	mg/L	0.44	1
	02/18/2010 13:44	542603	(EPA 300.0)	Nitrite Nitrogen by IC	ND	mg/L	0.05	1
	02/18/2010 13:44	542603	(EPA 300.0)	Total Nitrate, Nitrite-N, CALC	ND	mg/L	0.1	1
	EPA 300.1 - Disinfection ByProducts by 300.1							
	03/01/2010 13:45	544213	(EPA 300.1)	Bromide by 300.1	13	ug/L	2	1
	EPA 300.0 - Chloride, Sulfate by EPA 300.0							
	02/18/2010 13:44	542655	(EPA 300.0)	Chloride	2.2	mg/L	1	1
	02/18/2010 13:44	542655	(EPA 300.0)	Sulfate	22	mg/L	0.5	1
	SM2330B - Hydroxide as OH, Calculated							
	02/19/2010 10:16		(SM2330B)	Hydroxide as OH Calculated	ND	mg/L	2	1
	SM4500-CO2-D - Carbon Dioxide,Free(25C)-Calc.							
	02/20/2010 01:24		(SM4500-CO2-D)	Carbon Dioxide,Free(25C)-Calc.	ND	mg/L	2	1
	SM 4500F-C - Fluoride							
	02/19/2010 13:26	542703	(SM 4500F-C)	Fluoride	0.80	mg/L	0.05	1
	SM2330B - Carbonate as CO3, Calculated							
	02/20/2010 01:24		(SM2330B)	Carbonate as CO3, Calculated	ND	mg/L	2	1
	SM 2320B - Alkalinity in CaCO3 units							
	02/21/2010 21:13	542891	(SM 2320B)	Alkalinity in CaCO3 units	96 (B1)	mg/L	2	1
	E160.1/SM2540C - Total Dissolved Solids (TDS)							
	02/19/2010 18:12	542820	(E160.1/SM2540C)	Total Dissolved Solids (TDS)	160	mg/L	10	1
	SM4500-HB - PH (H3=past HT not compliant)							
	02/18/2010 17:54	542622	(SM4500-HB)	PH (H3=past HT not compliant)	8.3	Units	0.1	1
	SM 5540C/EPA 425.1 - Surfactants							

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Laboratory Data
Report: 326417

Crystal Geyser Roxane
Manuel Luna
P.O. Drawer A
Olancha, CA 93549

Samples Received on:
02/18/2010

Prepared	Analyzed	QC Ref #	Method	Analyte	Result	Units	MRL	Dilution
	02/18/2010 12:22	542827	(SM 5540C/EPA 425.1)	Surfactants	ND	mg/L	0.05	1
	SM2330B - Bicarb.Alkalinity as HCO3,calc							
	02/20/2010 01:24		(SM2330B)	Bicarb.Alkalinity as HCO3calc	120	mg/L	2	1
	SM2510B - Specific Conductance							
	02/19/2010 11:38	542774	(SM2510B)	Specific Conductance, 25 C	240	umho/cm	2	1
Default (201002180231)						**Sampled on 02/17/2010 0000**		
	Default -							
	02/19/2010 00:00		(Default)	Sample Kit	NA			1
	Default -							
	02/19/2010 00:00		(Default)	Sample Kit Delivery	NA			1
	Default -							
	02/19/2010 00:00		(Default)	Report - EDD	NA			1
	Default -							
	02/19/2010 00:00		(Default)	QC Level II	NA			1
CBR-2 (201002180232)						**Sampled on 02/17/2010 1200**		
	SM 2330B - pH of CaCO3 saturation(60C)							
	02/20/2010 01:24		(SM 2330B)	pH of CaCO3 saturation(60C)	7.9	Units	0.1	1
	SM 2330B - Langelier Index - 25 degree							
	02/20/2010 01:24		(SM 2330B)	Langelier Index - 25 degree	-0.50	None		1
	SM 1030E - Anion Sum - Calculated							
	02/22/2010 14:36		(SM 1030E)	Anion Sum - Calculated	2.0	meq/L	0.001	1
	SM 1030E - Cation Sum - Calculated							
	02/25/2010 16:09		(SM 1030E)	Cation Sum - Calculated	2.0	meq/L	0.001	1
	SM 2330B - pH of CaCO3 saturation(25C)							
	02/21/2010 10:30		(SM 2330B)	pH of CaCO3 saturation(25C)	8.3	Units	0.1	1
	SM 2330 - Agressiveness Index-Calculated							
	02/20/2010 01:24		(SM 2330)	Agressiveness Index-Calculated	11	None	0.1	1
	SM 2330B - Langlier Index at 60 degrees C							
	02/20/2010 01:24		(SM 2330B)	Langelier Index at 60 degrees C	-0.16	None		1
	SM 1030E - Cation/Anion Difference							
	02/20/2010 01:24		(SM 1030E)	Cation/Anion Difference	5.9	%		1
	SM 2340B - Total Hardness as CaCO3 by ICP							
	02/25/2010 16:09		(SM 2340B)	Total Hardness as CaCO3 by ICP	52	mg/L	3	1
	EPA 200.8 - ICPMS Metals							
	02/25/2010 21:14	543374	(EPA 200.8)	Aluminum Total ICAP/MS	ND	ug/L	20	1

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Report: 326417

Crystal Geyser Roxane
Manuel Luna
P.O. Drawer A
Olancha, CA 93549

Samples Received on:
02/18/2010

Prepared	Analyzed		QC Ref #	Method	Analyte	Result	Units	MRL	Dilution
	02/25/2010	21:14	543374	(EPA 200.8)	Antimony Total ICAP/MS	ND	ug/L	1	1
	03/02/2010	19:09	544162	(EPA 200.8)	Arsenic dissolved ICAP/MS	8.0	ug/L	1	1
	02/26/2010	20:23	543871	(EPA 200.8)	Arsenic Total ICAP/MS	7.7 (D1)	ug/L	5	5
	02/25/2010	21:14	543374	(EPA 200.8)	Barium Total ICAP/MS	ND	ug/L	2	1
	03/01/2010	14:13	544047	(EPA 200.8)	Beryllium Total ICAP/MS	ND	ug/L	1	1
	02/25/2010	21:14	543374	(EPA 200.8)	Cadmium Total ICAP/MS	ND	ug/L	0.5	1
	02/25/2010	21:14	543374	(EPA 200.8)	Chromium Total ICAP/MS	ND	ug/L	1	1
	02/25/2010	21:14	543374	(EPA 200.8)	Copper Total ICAP/MS	ND	ug/L	2	1
	02/25/2010	21:14	543374	(EPA 200.8)	Lead Total ICAP/MS	ND	ug/L	0.5	1
	02/25/2010	21:14	543374	(EPA 200.8)	Manganese Total ICAP/MS	20	ug/L	2	1
	02/25/2010	21:14	543374	(EPA 200.8)	Nickel Total ICAP/MS	ND	ug/L	5	1
	02/25/2010	21:14	543374	(EPA 200.8)	Selenium Total ICAP/MS	ND	ug/L	5	1
	02/25/2010	21:14	543374	(EPA 200.8)	Silver Total ICAP/MS	ND	ug/L	0.5	1
	02/25/2010	21:14	543374	(EPA 200.8)	Thallium Total ICAP/MS	ND	ug/L	1	1
	02/25/2010	21:14	543374	(EPA 200.8)	Zinc Total ICAP/MS	ND	ug/L	20	1
				EPA 200.7 - ICP Metals					
	02/24/2010	15:50	543313	(EPA 200.7)	Calcium Total ICAP	18	mg/L	1	1
	02/24/2010	15:50	543313	(EPA 200.7)	Iron Total ICAP	0.38	mg/L	0.02	1
	02/24/2010	15:50	543313	(EPA 200.7)	Magnesium Total ICAP	1.6	mg/L	0.1	1
	02/24/2010	15:50	543313	(EPA 200.7)	Potassium Total ICAP	4.5	mg/L	1	1
	02/24/2010	15:50	543313	(EPA 200.7)	Sodium Total ICAP	21	mg/L	1	1
				EPA 245.1 - Mercury					
2/19/2010	02/19/2010	19:39	543091	(EPA 245.1)	Mercury	ND	ug/L	0.2	1
				Default - Freight - Outbound					
	02/19/2010	00:00		(Default)	Freight - Outbound	NA			1
				EPA 300.0 - Nitrate, Nitrite by EPA 300.0					
	02/18/2010	13:57	542603	(EPA 300.0)	Nitrate as Nitrogen by IC	ND	mg/L	0.1	1
	02/18/2010	13:57	542603	(EPA 300.0)	Nitrate as NO3 (calc)	ND	mg/L	0.44	1
	02/18/2010	13:57	542603	(EPA 300.0)	Nitrite Nitrogen by IC	ND	mg/L	0.05	1
	02/18/2010	13:57	542603	(EPA 300.0)	Total Nitrate, Nitrite-N, CALC	ND	mg/L	0.1	1
				EPA 300.1 - Disinfection ByProducts by 300.1					
	03/01/2010	14:09	544213	(EPA 300.1)	Bromide by 300.1	16	ug/L	2	1
				EPA 300.0 - Chloride, Sulfate by EPA 300.0					
	02/18/2010	13:57	542655	(EPA 300.0)	Chloride	2.6	mg/L	1	1
	02/18/2010	13:57	542655	(EPA 300.0)	Sulfate	29	mg/L	0.5	1
				SM2330B - Hydroxide as OH, Calculated					

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Laboratory Data
Report: 326417

Crystal Geyser Roxane
Manuel Luna
P.O. Drawer A
Olancha, CA 93549

Samples Received on:
02/18/2010

Prepared	Analyzed	QC Ref #	Method	Analyte	Result	Units	MRL	Dilution
	02/19/2010 10:16		(SM2330B)	Hydroxide as OH Calculated	ND	mg/L	2	1
	SM4500-CO2-D - Carbon Dioxide,Free(25C)-Calc.							
	02/20/2010 01:24		(SM4500-CO2-D)	Carbon Dioxide,Free(25C)-Calc.	2.0	mg/L	2	1
	SM 4500F-C - Fluoride							
	02/22/2010 13:23	542956	(SM 4500F-C)	Fluoride	0.43	mg/L	0.05	1
	SM2330B - Carbonate as CO3, Calculated							
	02/20/2010 01:24		(SM2330B)	Carbonate as CO3, Calculated	ND	mg/L	2	1
	SM 2320B - Alkalinity in CaCO3 units							
	02/21/2010 21:22	542891	(SM 2320B)	Alkalinity in CaCO3 units	64 (B1)	mg/L	2	1
	E160.1/SM2540C - Total Dissolved Solids (TDS)							
	02/19/2010 18:13	542820	(E160.1/SM2540C)	Total Dissolved Solids (TDS)	150	mg/L	10	1
	SM4500-HB - PH (H3=past HT not compliant)							
	02/18/2010 17:58	542622	(SM4500-HB)	PH (H3=past HT not compliant)	7.8	Units	0.1	1
	SM 5540C/EPA 425.1 - Surfactants							
	02/18/2010 12:23	542827	(SM 5540C/EPA 425.1)	Surfactants	ND	mg/L	0.05	1
	SM2330B - Bicarb.Alkalinity as HCO3,calc							
	02/20/2010 01:24		(SM2330B)	Bicarb.Alkalinity as HCO3calc	78	mg/L	2	1
	SM2510B - Specific Conductance							
4	02/19/2010 11:40	542774	(SM2510B)	Specific Conductance, 25 C	210	umho/cm	2	1
CBR-3 (201002180233)						**Sampled on 02/17/2010 1230**		
	SM 2330B - pH of CaCO3 saturation(60C)							
	02/20/2010 01:24		(SM 2330B)	pH of CaCO3 saturation(60C)	7.8	Units	0.1	1
	SM 2330B - Langelier Index - 25 degree							
	02/20/2010 01:24		(SM 2330B)	Langelier Index - 25 degree	-0.37	None		1
	SM 1030E - Anion Sum - Calculated							
	02/25/2010 15:01		(SM 1030E)	Anion Sum - Calculated	1.9	meq/L	0.001	1
	SM 1030E - Cation Sum - Calculated							
	02/25/2010 16:09		(SM 1030E)	Cation Sum - Calculated	2.0	meq/L	0.001	1
	SM 2330B - pH of CaCO3 saturation(25C)							
	02/21/2010 10:30		(SM 2330B)	pH of CaCO3 saturation(25C)	8.2	Units	0.1	1
	SM 2330 - Agressiveness Index-Calculated							
	02/20/2010 01:24		(SM 2330)	Agressiveness Index-Calculated	12	None	0.1	1
	SM 2330B - Langlier Index at 60 degrees C							
	02/20/2010 01:24		(SM 2330B)	Langelier Index at 60 degrees C	-0.16	None		1
	SM 1030E - Cation/Anion Difference							
	02/20/2010 01:24		(SM 1030E)	Cation/Anion Difference	5.9	%		1

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Manuel Luna
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Olancha, CA 93549

Samples Received on:
02/18/2010

Prepared	Analyzed	QC Ref #	Method	Analyte	Result	Units	MRL	Dilution
			SM 2340B - Total Hardness as CaCO3 by ICP					
	02/25/2010 16:09		(SM 2340B)	Total Hardness as CaCO3 by ICP	57	mg/L	3	1
			EPA 200.8 - ICPMS Metals					
	02/25/2010 21:19	543374	(EPA 200.8)	Aluminum Total ICAP/MS	ND	ug/L	20	1
	02/25/2010 21:19	543374	(EPA 200.8)	Antimony Total ICAP/MS	ND	ug/L	1	1
	03/02/2010 19:14	544162	(EPA 200.8)	Arsenic dissolved ICAP/MS	1.1	ug/L	1	1
	02/25/2010 21:19	543374	(EPA 200.8)	Arsenic Total ICAP/MS	1.2	ug/L	1	1
	02/25/2010 21:19	543374	(EPA 200.8)	Barium Total ICAP/MS	27	ug/L	2	1
	02/25/2010 21:19	543374	(EPA 200.8)	Beryllium Total ICAP/MS	ND	ug/L	1	1
	02/25/2010 21:19	543374	(EPA 200.8)	Cadmium Total ICAP/MS	ND	ug/L	0.5	1
	02/25/2010 21:19	543374	(EPA 200.8)	Chromium Total ICAP/MS	ND	ug/L	1	1
	02/25/2010 21:19	543374	(EPA 200.8)	Copper Total ICAP/MS	ND	ug/L	2	1
	02/25/2010 21:19	543374	(EPA 200.8)	Lead Total ICAP/MS	ND	ug/L	0.5	1
	02/25/2010 21:19	543374	(EPA 200.8)	Manganese Total ICAP/MS	ND	ug/L	2	1
	02/25/2010 21:19	543374	(EPA 200.8)	Nickel Total ICAP/MS	ND	ug/L	5	1
	02/25/2010 21:19	543374	(EPA 200.8)	Selenium Total ICAP/MS	ND	ug/L	5	1
	02/25/2010 21:19	543374	(EPA 200.8)	Silver Total ICAP/MS	ND	ug/L	0.5	1
	02/25/2010 21:19	543374	(EPA 200.8)	Thallium Total ICAP/MS	ND	ug/L	1	1
	02/25/2010 21:19	543374	(EPA 200.8)	Zinc Total ICAP/MS	ND	ug/L	20	1
			EPA 200.7 - ICP Metals					
	02/24/2010 15:54	543313	(EPA 200.7)	Calcium Total ICAP	19	mg/L	1	1
	02/24/2010 15:54	543313	(EPA 200.7)	Iron Total ICAP	ND	mg/L	0.02	1
	02/24/2010 15:54	543313	(EPA 200.7)	Magnesium Total ICAP	2.1	mg/L	0.1	1
	02/24/2010 15:54	543313	(EPA 200.7)	Potassium Total ICAP	1.8	mg/L	1	1
	02/24/2010 15:54	543313	(EPA 200.7)	Sodium Total ICAP	19	mg/L	1	1
			EPA 245.1 - Mercury					
2/19/2010	02/19/2010 19:41	543091	(EPA 245.1)	Mercury	ND	ug/L	0.2	1
			Default - Freight - Outbound					
	02/19/2010 00:00		(Default)	Freight - Outbound	NA			1
			EPA 300.0 - Nitrate, Nitrite by EPA 300.0					
	02/18/2010 14:09	542603	(EPA 300.0)	Nitrate as Nitrogen by IC	0.21	mg/L	0.1	1
	02/18/2010 14:09	542603	(EPA 300.0)	Nitrate as NO3 (calc)	0.90	mg/L	0.44	1
	02/18/2010 14:09	542603	(EPA 300.0)	Nitrite Nitrogen by IC	ND	mg/L	0.05	1
	02/18/2010 14:09	542603	(EPA 300.0)	Total Nitrate, Nitrite-N, CALC	0.21	mg/L	0.1	1
			EPA 300.1 - Disinfection ByProducts by 300.1					
	03/01/2010 14:32	544213	(EPA 300.1)	Bromide by 300.1	13	ug/L	2	1

Rounding on totals after summation.
(c) - indicates calculated results

MWH Laboratories
A Division of MWH Americas, Inc.

750 Royal Oak Dr., Suite 100
Monrovia, California, 91016-3629
Tel: 626 386 1100
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1 800 566 LABS (1 800 566 5227)

Laboratory Data
Report: 326417

Crystal Geyser Roxane
Manuel Luna
P.O. Drawer A
Olancha, CA 93549

Samples Received on:
02/18/2010

Prepared	Analyzed	QC Ref #	Method	Analyte	Result	Units	MRL	Dilution
	EPA 300.0 - Chloride, Sulfate by EPA 300.0							
02/18/2010	14:09	542655	(EPA 300.0)	Chloride	1.3	mg/L	1	1
02/18/2010	14:09	542655	(EPA 300.0)	Sulfate	14	mg/L	0.5	1
	SM2330B - Hydroxide as OH, Calculated							
02/19/2010	10:14		(SM2330B)	Hydroxide as OH Calculated	ND	mg/L	2	1
	SM4500-CO2-D - Carbon Dioxide,Free(25C)-Calc.							
02/20/2010	01:24		(SM4500-CO2-D)	Carbon Dioxide,Free(25C)-Calc.	2.2	mg/L	2	1
	SM 4500F-C - Fluoride							
02/22/2010	13:24	542956	(SM 4500F-C)	Fluoride	0.92	mg/L	0.05	1
	SM2330B - Carbonate as CO3, Calculated							
02/20/2010	01:24		(SM2330B)	Carbonate as CO3, Calculated	ND	mg/L	2	1
	SM 2320B - Alkalinity in CaCO3 units							
02/25/2010	11:35	543619	(SM 2320B)	Alkalinity in CaCO3 units	76 (B1)	mg/L	2	1
	E160.1/SM2540C - Total Dissolved Solids (TDS)							
02/19/2010	18:14	542820	(E160.1/SM2540C)	Total Dissolved Solids (TDS)	120	mg/L	10	1
	SM4500-HB - PH (H3=past HT not compliant)							
02/18/2010	18:05	542622	(SM4500-HB)	PH (H3=past HT not compliant)	7.8	Units	0.1	1
	SM 5540C/EPA 425.1 - Surfactants							
02/18/2010	15:20	542827	(SM 5540C/EPA 425.1)	Surfactants	ND	mg/L	0.05	1
	SM2330B - Bicarb.Alkalinity as HCO3,calc							
02/20/2010	01:24		(SM2330B)	Bicarb.Alkalinity as HCO3calc	92	mg/L	2	1
	SM2510B - Specific Conductance							
02/19/2010	11:41	542774	(SM2510B)	Specific Conductance, 25 C	190	umho/cm	2	1

Rounding on totals after summation.
(c) - indicates calculated results

LABORATORY RESULTS FOR OW-7U and OW-7M

OLANCHA MONITORING WELLS

General Mineral Analyses **OW 7-U**

Analyte	Method	3/23/1999	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Alkalinity (as CaCO3)	SM 2320 B	68	68	73	65		73		79		70	
Aluminum (Al)	EPA 200.7	**	ND	ND	ND		ND		ND		**	
Antimony (Sb)	EPA 200.8	**	ND	ND	ND		ND		ND		**	
Arsenic (As)	EPA 200.8	0.036	0.024	0.024	0.025		0.025		0.025		**	
Barium (Ba)	EPA 200.8	**	0.006	0.006	0.006		0.006		0.0063		**	
Beryllium (Be)	EPA 200.8	**	ND	ND	ND		ND		ND		**	
Bicarbonate (as CaCO3)	SM 2320 B	83	68	73	65		73		79		70	
Cadmium (Cd)	EPA 200.8	**	ND	ND	ND		ND		ND		**	
Calcium (Ca)	EPA 200.7	16	20	18	17		18		18		18	
Carbonate (as CaCO3)	SM 2320 B	ND	ND	ND	ND		ND		ND		ND	
Chromium - Total (Cr)	EPA 200.8	**	ND	ND	ND		ND		ND		**	
Chloride (Cl)		**	**	**	**		**		**		2.4	
Conductivity - Specific (EC)	SM 2510 B	210	210	190	200		190		200		180	
Copper (Cu)	EPA 200.8	ND	ND	ND	ND		ND		ND		ND	
Flouride (Fl)		0.47	**	**	**		**		**		**	
Total Hardness (as CaCO3)		100	**	**	**		**		**		50	
Hydroxide (as CaCO3)	SM 2320 B	ND	ND	ND	ND		ND		ND		ND	
Iron (Fe)	EPA 200.7	ND	ND	ND	ND		ND		ND		ND	
Lead (PB)	EPA 200.8	**	ND	ND	ND		ND		ND		**	
Magnesium (Mg)	EPA 200.7	1.7	1.3	1.3	1.2		1.2		1.2		1.2	
Manganese (Mn)	EPA 200.7	ND	ND	ND	ND		ND		ND		ND	
Nickel (Ni)	EPA 200.8	**	ND	ND	ND		ND		ND		**	
Nitrate		**	0.023	**	**		**		**		**	
pH		8.3	**	**	**		**		8.2		8.2	
Potassium (K)	EPA 200.7	2	ND	ND	ND		ND		ND		ND	
Selenium (Se) - Total	EPA 200.8	**	ND	ND	ND		ND		ND		**	
Silica		37	**	**	**		**		**		**	
Silver (Ag)	EPA 200.8	**	ND	ND	ND		ND		ND		ND	
Sodium (Na)		25	**	**	**		**		21		20	
Sulfate (SO4)	EPA 300.0	23	23	23	23		23		17		19	
Thallium (Tl)	EPA 200.8	**	ND	ND	ND		ND		ND		**	
Total Dissolved Solids (TDS)	SM 2540-C	150	140	150	150		140		130		140	
Turbidity	SM 2130 B	**	0.1	ND	ND		ND		0.15		**	
Zinc (Zn)	EPA 200.8	ND	ND	ND	ND		ND		ND		ND	

OLANCHA MONITORING WELLS

General Mineral Analyses — **OW 7-M**

Analyte	Method	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Alkalinity (as CaCO3)	SM 2320 B	76					74		68		76		
Aluminum (Al)	EPA 200.7	ND					ND		ND		ND		
Antimony (Sb)	EPA 200.8	ND					ND		ND		ND		
Arsenic (As)	EPA 200.8	0.02					0.015		0.014		0.013		
Barium (Ba)	EPA 200.8	0.0042					0.03		0.025		0.022		
Beryllium (Be)	EPA 200.8	ND					ND		ND		ND		
Bicarbonate (as CaCO3)	SM 2320 B	92.2					74		68		76		
Cadmium (Cd)	EPA 200.8	ND					ND		ND		ND		
Calcium (Ca)	EPA 200.7	26					27		23		24		
Carbonate (as CaCO3)	SM 2320 B	1.2					ND		ND		ND		
Chromium - Total (Cr)	EPA 200.8	ND					1		ND		ND		
Conductivity - Specific (EC)	SM 2510 B	210					210		200		190		
Copper (Cu)	EPA 200.8	ND					ND		ND		ND		
Hydroxide (as CaCO3)	SM 2320 B	0.034					ND		ND		ND		
Iron (Fe)	EPA 200.7	ND					ND		ND		ND		
Lead (PB)	EPA 200.8	ND					ND		ND		ND		
Magnesium (Mg)	EPA 200.7	2.4					2.2		1.9		1.9		
Manganese (Mn)	EPA 200.7	ND					ND		ND		ND		
Nickel (Ni)	EPA 200.8	ND					ND		ND		ND		
Potassium (K)	EPA 200.7	2.2					ND		ND		ND		
Selenium (Se) - Total	EPA 200.8	ND					ND		ND		ND		
Silver (Ag)	EPA 200.8	ND					ND		ND		ND		
Sulfate (SO4)	EPA 300.0	20					23		22		22		
Thallium (Tl)	EPA 200.8	ND					ND		ND		ND		
Total Dissolved Solids (TDS)	SM 2540-C	130					150		150		140		
Turbidity	SM 2130 B	**					ND		ND		ND		
Zinc (Zn)	EPA 200.8	ND					ND		ND		ND		

LABORATORY ANALYSES FOR CMW-1 and CMW-2

GENERAL MINERAL & PHYSICAL & INORGANIC ANALYSIS (9/99)

Date of Report: 12/07/06 Sample ID No.1211211-01

Laboratory Name: BC LABORATORIES Signature Lab Director: Steven Bennett

Name of Sampler:Aarne Coats/Magdeleno LunaEmployed By:

Date/Time Sample Collected:12/06/18/1745 Date/Time Sample Received @ Lab:12/06/20/1040 Date Analyses Completed:12/07/06

System Name:CARTAGO MUTUAL WATER COMPANY System Number: 1400027

Name or Number of Sample Source:WELL 01 S - STANDBY

* User ID: 14C Station Number: 1400027-001 *

* Date/Time of Sample: |12|06|18|1745| YY MM DD TTTT Laboratory Code: 5806 *

* YY MM DD *

* Date Analysis completed: |12|07|06| *

* Submitted by:_____ Phone #:_____ *

MCL	REPORTING UNITS	CHEMICAL	ENTRY #	ANALYSES RESULTS	DLR
	mg/L	Total Hardness (as CaCO3) (mg/L)	00900		
	mg/L	Calcium (Ca) (mg/L)	00916		
	mg/L	Magnesium (Mg) (mg/L)	00927		
	mg/L	Sodium (NA) (mg/L)	00929		
	mg/L	Potassium (K) (mg/L)	00937		
Total Cations		Meq/L Value: 0.00			
	mg/L	Total Alkalinity (AS CaCO3) (mg/L)	00410		
	mg/L	Hydroxide (OH) (mg/L)	71830		
	mg/L	Carbonate (CO3) (mg/L)	00445		
	mg/L	Bicarbonate (HCO3) (mg/L)	00440		
*	mg/L+	Sulfate (SO4) (mg/L)	00945		.5
*	mg/L+	Chloride (Cl) (mg/L)	00940		
45	mg/L	Nitrate (as NO3) (mg/L)	71850	0.63	2.0
2	mg/L	Fluoride (F) (Natural-Source)	00951	0.73	.1
Total Anions		Meq/L Value: 0.05			
	Std.Units+	PH (Laboratory) (Std.Units)	00403		
***	umho/cm+	Specific Conductance (E.C.) (umhos/cm)	00095		
****	mg/L+	Total Filterable Residue@180C(TDS) (mg/L)	70300		
15	Units	Apparent Color (Unfiltered) (Units)	00081		
3	TON	Odor Threshold at 60 C (TON)	00086		1.
5	NTU	Lab Turbidity (NTU)	82079		
0.5	mg/L+	MBAS (mg/L)	38260		

* 250-500-600 ** 0.6-1.7 *** 900-1600-2200 **** 500-1000-1500

INORGANIC CHEMICALS

1211211-01

MCL	REPORTING UNITS	CHEMICAL	ENTRY #	ANALYSES RESULTS		DLR
1000	ug/L	Aluminum (Al) (ug/L)	01105	<	50	50.0
6	ug/L	Antimony (ug/L)	01097	<	2.0	6.0
10	ug/L	Arsenic (As) (ug/L)	01002		2.9	2.0
1000	ug/L	Barium (Ba) (ug/L)	01007		18	100.0
4	ug/L	Beryllium (ug/L)	01012	<	1.0	1.0
5	ug/L	Cadmium (Cd) (ug/L)	01027	<	1.0	1.0
50	ug/L	Chromium (Total Cr) (ug/L)	01034	<	10	10.0
2	ug/L	Mercury (Hg) (ug/L)	71900	<	0.20	1.0
100	ug/L	Nickel (ug/L)	01067	<	10	10.0
50	ug/L	Selenium (Se) (ug/L)	01147	<	2.0	5.0
2	ug/L	Thallium (ug/L)	01059	<	1.0	1.0
		ADDITIONAL ANALYSES				
1000	ug/L	Nitrite as Nitrogen(N) (ug/L)	00620	<	50	400
6	ug/L	Perchlorate (ug/L)	A-031	<	4.0	4.0

+ Indicates Secondary Drinking Water Standards

Cartago Mutual Water Company
P.O. Box 203
Olancha, CA 93549

Reported: 07/06/2012 14:47
Project: Well 1
Project Number: 1400027-001
Project Manager: Aarne Coats

Water Analysis (General Chemistry)

BCL Sample ID: 1211211-01 | **Client Sample Name:** Well 1, 6/18/2012 5:45:00PM, Aarne Coats/Magdeleno Luna

Constituent	Result	Units	PQL	Method	MB Bias	Lab Quals	Run #
Fluoride	**0.73**	**mg/L**	**0.050**	**EPA-300.0**	ND		1
Nitrate as NO3	**0.63**	**mg/L**	**0.44**	**EPA-300.0**	ND		1
Nitrite as N	<50	ug/L	50	EPA-353.2	ND		2
Perchlorate	<4.0	ug/L	4.0	EPA-314.0	ND		3

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-300.0	06/20/12	06/20/12 16:43	AKB	IC1	1	BVF1406
2	EPA-353.2	06/20/12	06/20/12 15:20	TDC	KONE-1	1	BVF1440
3	EPA-314.0	06/21/12	06/21/12 12:01	LD1	IC6	1	BVF1354

Cartago Mutual Water Company
P.O. Box 203
Olancha, CA 93549

Reported: 07/06/2012 14:47
Project: Well 1
Project Number: 1400027-001
Project Manager: Aarne Coats

Water Analysis (Metals)

BCL Sample ID: 1211211-01 | **Client Sample Name:** Well 1, 6/18/2012 5:45:00PM, Aarne Coats/Magdeleno Luna

Constituent	Result	Units	PQL	Method	MB Bias	Lab Quals	Run #
Total Recoverable Aluminum	<50	ug/L	50	EPA-200.7	ND		1
Total Recoverable Antimony	<2.0	ug/L	2.0	EPA-200.8	ND		2
Total Recoverable Arsenic	**2.9**	**ug/L**	**2.0**	**EPA-200.8**	ND		2
Total Recoverable Barium	**18**	**ug/L**	**10**	**EPA-200.7**	ND		1
Total Recoverable Beryllium	<1.0	ug/L	1.0	EPA-200.8	ND		2
Total Recoverable Cadmium	<1.0	ug/L	1.0	EPA-200.8	ND		2
Total Recoverable Chromium	<10	ug/L	10	EPA-200.7	ND		1
Total Recoverable Mercury	<0.20	ug/L	0.20	EPA-200.8	ND		2
Total Recoverable Nickel	<10	ug/L	10	EPA-200.7	ND		1
Total Recoverable Selenium	<2.0	ug/L	2.0	EPA-200.8	ND		3
Total Recoverable Uranium	**0.92**	**pCi/L**	**0.67**	**EPA-200.8**	ND		2
Total Recoverable Thallium	<1.0	ug/L	1.0	EPA-200.8	ND		2

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	06/21/12	06/21/12 18:00	JRG	PE-OP1	1	BVF1446
2	EPA-200.8	06/25/12	07/02/12 17:06	SRM	PE-EL2	1	BVF1614
3	EPA-200.8	06/25/12	07/03/12 12:29	SRM	PE-EL2	1	BVF1614

BSK Associates

EDT

Date of Report: 12|06|27|0851 **Sample ID No.:** A2F1869-01
Laboratory Name: BSK Analytical Laboratories **Signature Lab Director:**
Name of Sampler: Client

Date/Time Sample Collected: 12|06|18|1745
Date/Time Sample Received @ Lab : 12|06|21|1520
Date Analyses Completed: 12|06|26

System Name: CARTAGO MUTUAL WATER COMPANY **System Number:** 1400027
Name or Number of Sample Source: WELL 01 S - STANDBY

User ID: 14C
Date/Time of Sample: 12|06|18|1745
Submitted by: BSK Associates

Station Number: 1400027-001
Laboratory Code: 5810
Date Analyses Completed: 12|06|26
Phone #: 559-497-2888

MCL	REPORTING UNITS	CHEMICAL	ENTRY #	ANALYSES RESULTS	DLR
		Title 22 California Code of Regulations, Section 64442 (22 CCR 64442)			
15	pCi/L	Gross Alpha	01501	3.65	3.0
	pCi/L	Gross Alpha Counting Error	01502	± 0.311	
	pCi/L	Gross Alpha MDA95	A-072	1.09	

A2F1869 FINAL 06272012 0851

1414 Stanislaus Street Fresno, CA 93706 (559) 497-2888 FAX (559) 485-6935 www.bsklabs.com

RADIOACTIVITY ANALYSIS (9/99)

Date of Report: 12/07/06 Sample ID No.1211211-01

Laboratory Name: BC LABORATORIES Signature Lab Director: Steven Bennett

Name of Sampler:Aarne Coats/Magdeleno Luna Employed By:

Date/Time Sample Collected:12/06/18/1745 Date/Time Sample Received @ Lab:12/06/20/1040 Date Analyses Completed:12/07/06

System Name:CARTAGO MUTUAL WATER COMPANY System Number: 1400027

Name or Number of Sample Source:WELL 01 S - STANDBY

* User ID: 14C Station Number: 1400027-001 *

* Date/Time of Sample: |12|06|18|1745| YY MM DD TTTT Laboratory Code: 5806 *

* YY MM DD *

* Date Analysis completed: |12|07|06| *

* Submitted by:_____ Phone #:_____ *

MCL	REPORT UNITS	CHEMICAL	STORET CODE	ANALYSES RESULTS	DLR
	pCi/L	TITLE 22 CALIFORNIA CODE OF REGULATIONS			
	pCi/L	SECTION 64442 (22 CCR 64442)			
15	pCi/L	Gross Alpha	01501		3.0
	pCi/L	Gross Alpha Counting Error	01502		
	pCi/L	Gross Alpha MDA95 *	A-072		
20	pCi/L	Uranium	28012	0.92	1.0
	pCi/L	Uranium Counting Error	A-028		
	pCi/L	Uranium MDA95	A-073		
	pCi/L	Radium 226	09501		1.0
	pCi/L	Radium 226 Counting Error	09502		
	pCi/L	Radium 226 MDA95	A-074		
	pCi/L	Radium 228	11501		1.0
	pCi/L	Radium 228 Counting Error	11502		
	pCi/L	Radium 228 MDA95	A-075		
5	pCi/L	Ra 226 + Ra 228, Combined	11503		
	pCi/L	Ra 226 + Ra 228 Counting Error, Combined	11504		
	pCi/L	Ra 226 + Ra 229 MDA95, Combined	A-076		
	pCi/L	RADIUM, TOTAL, (FOR NTNC ONLY, BY 903.0)			
	pCi/L	Ra-226 for CWS or Tot RA for NTNC by 903	A-080		
	pCi/L	Ra-226 or Total RA by 903.0 C.E.	A-081		
	pCi/L	Ra-226 or Total RA by 903.0 MDA95	A-082		
	pCi/L	TITLE 22 CALIFORNIA CODE OF REGULATIONS			
	pCi/L	SECTION 64443 (22 CCR 64443)			
50	pCi/L	Gross Beta	03501		4.0
	pCi/L	Gross Beta Counting Error	03502		

	pCi/L	Gross Beta MDA95	A-077		
4	pCi/L	Gross Beta, Calculated Dose Equivalent *	A-071		
8	pCi/L	Strontium 90	13501		2.0
	pCi/L	Strontium 90 Counting Error	13502		
	pCi/L	Strontium 90 MDA95	A-078		
20000	pCi/L	Tritium	07000		1000
	pCi/L	Tritium Counting Error	07001		
	pCi/L	Tritium MDA95	A-079		
	pCi/L	RADON			
	pCi/L	Radon 222	82303		100.0
	pCi/L	Radon 222 Counting Error	82302		
	pCi/L				
	pCi/L	*MDA95 is Minimum Detectable Activity at			
	pCi/L	the 95% confidence level, per			
	pCi/L	22 CCR 64442 and 64443.			
	pCi/L				
	pCi/L	**Gross Beta, Calculated Total Body or			
	pCi/L	Organ Dose Equivalent, Per 22 CCR 64443			
	pCi/L				

ORGANIC CHEMICAL ANALYSIS (9/99)

Date of Report: 12/07/06 Sample ID No.1211211-01

Laboratory Name: BC LABORATORIES Signature Lab Director: Steven Bennett

Name of Sampler:Aarne Coats/Magdeleno Luna Employed By:

Date/Time Sample Collected:12/06/18/1745 Date/Time Sample Received @ Lab:12/06/20/1040 Date Analyses Completed:12/07/06

System Name:CARTAGO MUTUAL WATER COMPANY System Number: 1400027

Name or Number of Sample Source:WELL 01 S - STANDBY

* User ID: 14C Station Number: 1400027-001 *

* Date/Time of Sample: |12|06|18|1745| Laboratory Code: 5806 *

* YY MM DD TTTT YY MM DD *

* Date Analysis completed: |12|07|06| *

* Submitted by:_____ Phone #:_____ *

REGULATED ORGANIC CHEMICALS

TEST METHOD	CHEMICAL ALL CHEMICALS REPORTED ug/L	ENTRY #	ANALYSES RESULTS	MCL ug/L	DLR ug/L
524.2	Total Trihalomethanes (TTHMs)	82080	< 2.0	80	
524.2	Bromodichloromethane	32101	< 0.50		1.0
524.2	Bromoform	32104	< 0.50		1.0
524.2	Chloroform (Trichloromethane)	32106	< 0.50		1.0
524.2	Dibromochloromethane	32105	< 0.50		1.0
524.2	Benzene	34030	< 0.50	1	.50
524.2	Carbon Tetrachloride	32102	< 0.50	.5	.50
524.2	1,2-Dichlorobenzene (o-DCB)	34536	< 0.50	600	.50
524.2	1,4-Dichlorobenzene (p-DCB)	34571	< 0.50	5	.50
524.2	1,1-Dichloroethane (1,1-DCA)	34496	< 0.50	5	.50
524.2	1,2-Dichloroethane (1,2-DCA)	34531	< 0.50	.5	.50
524.2	1,1-Dichloroethylene (1,1-DCE)	34501	< 0.50	6	.50
524.2	cis-1,2-Dichloroethylene (c-1,2-DCE)	77093	< 0.50	6	.50
524.2	trans-1,2-Dichloroethylene (t-1,2-DCE)	34546	< 0.50	10	.50
524.2	Dichloromethane (Methylene Chloride)	34423	< 0.50	5	.50
524.2	1,2-Dichloropropane	34541	< 0.50	5	.50
524.2	Total 1,3-Dichloropropene	34561	< 0.50	.5	.50
524.2	Ethyl Benzene	34371	< 0.50	300	.50
524.2	Methyl tert-Butyl Ether(MTBE)	46491	< 0.50	5	3.00
524.2	Monochlorobenzene (Chlorobenzene)	34301	< 0.50	70	.50
524.2	Styrene	77128	< 0.50	100	.50
524.2	1,1,2,2-Tetrachloroethane	34516	< 0.50	1	.50
524.2	Tetrachloroethylene (PCE)	34475	< 0.50	5	.50
524.2	Toluene	34010	< 0.50	150	.50
524.2	1,2,4-Trichlorobenzene	34551	< 0.50	5	.50
524.2	1,1,1-Trichloroethane (1,1,1-TCA)	34506	< 0.50	200	.50
524.2	1,1,2-Trichloroethane (1,1,2-TCA)	34511	< 0.50	5	.50
524.2	Trichloroethylene (TCE)	39180	< 0.50	5	.50
524.2	Trichlorofluoromethane (FREON 11)	34488	< 0.50	150	5.00

REGULATED ORGANIC CHEMICALS CONTINUED 1211211-01

TEST METHOD	CHEMICAL ALL CHEMICALS REPORTED ug/L	ENTRY #	ANALYSES RESULTS		MCL ug/L	DLR ug/L
524.2	Trichlorotrifluoroethane (FREON 113)	81611	<	0.50	1200	10.00
524.2	Vinyl Chloride (VC)	39175	<	0.50	.5	.50
524.2	m,p-Xylene	A-014	<	0.50		.50
524.2	o-Xylene	77135	<	0.50		.50
524.2	Total Xylenes (m,p, & o)	81551	<	1.0	1750	
524.2	Dibromochloropropane (DBCP)	38761	<	1.0	.2	.01
	UNREGULATED ORGANIC CHEMICALS					
524.2	tert-Amyl Methyl Ether (TAME)	A-034	<	0.50		3.00
524.2	Bromobenzene	81555	<	0.50		.50
524.2	Bromochloromethane	A-012	<	0.50		.50
524.2	Bromomethane (Methyl Bromide)	34413	<	0.50		.50
524.2	tert-Butyl Alcohol (TBA)	77035	<	10		2.00
524.2	n-Butylbenzene	A-010	<	0.50		.50
524.2	sec-Butylbenzene	77350	<	0.50		.50
524.2	tert-Butylbenzene	77353	<	0.50		.50
524.2	Chloroethane	34311	<	0.50		.50
524.2	Chloromethane (Methyl Chloride)	34418	<	0.50		.50
524.2	2-Chlorotoluene	A-008	<	0.50		.50
524.2	4-Chlorotoluene	A-009	<	0.50		.50
524.2	Dibromomethane	77596	<	0.50		.50
524.2	1,3-Dichlorobenzene (m-DCB)	34566	<	0.50		.50
524.2	Dichlorodifluoromethane (Freon 12)	34668	<	0.50		0.50
524.2	1,3-Dichloropropane	77173	<	0.50		.50
524.2	2,2-Dichloropropane	77170	<	0.50		.50
524.2	1,1-Dichloropropene	77168	<	0.50		.50
524.2	Diisopropyl Ether (DIPE)	A-036	<	0.50		3.00
524.2	Ethyl tert-Butyl Ether (ETBE)	A-033	<	0.50		3.00
524.2	Hexachlorobutadiene	34391	<	0.50		.50
524.2	Isopropylbenzene (Cumene)	77223	<	0.50		.50
524.2	p-Isopropyltoluene	A-011	<	0.50		
524.2	Naphthalene	34696	<	0.50		.50
524.2	n-Propylbenzene	77224	<	0.50		.50
524.2	1,1,1,2-Tetrachloroethane	77562	<	0.50		.50
524.2	1,2,3-Trichlorobenzene	77613	<	0.50		.50
524.2	1,2,3-Trichloropropane	77443	<	1.0		.005
524.2	1,2,4-Trimethylbenzene	77222	<	0.50		.50
524.2	1,3,5-Trimethylbenzene	77226	<	0.50		.50

AGRICULTURAL CHEMICAL AND MISCELLANEOUS ORGANIC ANALYSIS (10/97)

Date of Report: 12/07/06 Sample ID No.1211211-01

Laboratory Name: BC LABORATORIES Signature Lab Director: Steven Bennett

Name of Sampler:Aarne Coats/Magdeleno Luna Employed By:

Date/Time Sample Collected:12/06/18/1745 Date/Time Sample Received @ Lab:12/06/20/1040 Date Analyses Completed:12/07/06

System Name:CARTAGO MUTUAL WATER COMPANY System Number: 1400027

Name or Number of Sample Source:WELL 01 S - STANDBY

* User ID: 14C Station Number: 1400027-001 *

* Date/Time of Sample: |12|06|18|1745| Laboratory Code: 5806 *

* YY MM DD TTTT YY MM DD *

* Date Analysis completed: |12|07|06| *

* Submitted by:_____ Phone #:_____ *

Page 1 of 1

TEST METHOD	CHEMICAL ALL CHEMICALS REPORTED ug/L	ENTRY #	ANALYSES RESULTS	MCL ug/L	DLR ug/L
524.2	cis-1,3-Dichloropropene (D-D)	34704	< 0.50	0.5	
524.2	trans-1,3-Dichloropropene	34699	< 0.50	0.5	

Cartago Mutual Water Company
P.O. Box 203
Olancha, CA 93549

Reported: 07/06/2012 14:47
Project: Well 1
Project Number: 1400027-001
Project Manager: Aarne Coats

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID: 1211211-01 | **Client Sample Name:** Well 1, 6/18/2012 5:45:00PM, Aarne Coats/Magdeleno Luna

Constituent	Result	Units	PQL	Method	MB Bias	Lab Quals	Run #
Benzene	<0.50	ug/L	0.50	EPA-524.2	ND		1
Bromobenzene	<0.50	ug/L	0.50	EPA-524.2	ND		1
Bromochloromethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
Bromodichloromethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
Bromoform	<0.50	ug/L	0.50	EPA-524.2	ND		1
Bromomethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
n-Butylbenzene	<0.50	ug/L	0.50	EPA-524.2	ND		1
sec-Butylbenzene	<0.50	ug/L	0.50	EPA-524.2	ND		1
tert-Butylbenzene	<0.50	ug/L	0.50	EPA-524.2	ND		1
Carbon tetrachloride	<0.50	ug/L	0.50	EPA-524.2	ND		1
Chlorobenzene	<0.50	ug/L	0.50	EPA-524.2	ND		1
Chloroethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
Chloroform	<0.50	ug/L	0.50	EPA-524.2	ND		1
Chloromethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
2-Chlorotoluene	<0.50	ug/L	0.50	EPA-524.2	ND		1
4-Chlorotoluene	<0.50	ug/L	0.50	EPA-524.2	ND		1
Dibromochloromethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,2-Dibromo-3-chloropropane	<1.0	ug/L	1.0	EPA-524.2	ND		1
1,2-Dibromoethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
Dibromomethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,2-Dichlorobenzene	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,3-Dichlorobenzene	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,4-Dichlorobenzene	<0.50	ug/L	0.50	EPA-524.2	ND		1
Dichlorodifluoromethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,1-Dichloroethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,2-Dichloroethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,1-Dichloroethene	<0.50	ug/L	0.50	EPA-524.2	ND		1
cis-1,2-Dichloroethene	<0.50	ug/L	0.50	EPA-524.2	ND		1
trans-1,2-Dichloroethene	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,2-Dichloropropane	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,3-Dichloropropane	<0.50	ug/L	0.50	EPA-524.2	ND		1
2,2-Dichloropropane	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,1-Dichloropropene	<0.50	ug/L	0.50	EPA-524.2	ND		1

Cartago Mutual Water Company
P.O. Box 203
Olancha, CA 93549

Reported: 07/06/2012 14:47
Project: Well 1
Project Number: 1400027-001
Project Manager: Aarne Coats

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID: 1211211-01 | **Client Sample Name:** Well 1, 6/18/2012 5:45:00PM, Aarne Coats/Magdeleno Luna

Constituent	Result	Units	PQL	Method	MB Bias	Lab Quals	Run #
cis-1,3-Dichloropropene	<0.50	ug/L	0.50	EPA-524.2	ND		1
trans-1,3-Dichloropropene	<0.50	ug/L	0.50	EPA-524.2	ND		1
Total 1,3-Dichloropropene	<0.50	ug/L	0.50	EPA-524.2	ND		1
Ethylbenzene	<0.50	ug/L	0.50	EPA-524.2	ND		1
Hexachlorobutadiene	<0.50	ug/L	0.50	EPA-524.2	ND		1
Isopropylbenzene	<0.50	ug/L	0.50	EPA-524.2	ND		1
p-Isopropyltoluene	<0.50	ug/L	0.50	EPA-524.2	ND		1
Methylene chloride	<0.50	ug/L	0.50	EPA-524.2	ND		1
Methyl t-butyl ether	<0.50	ug/L	0.50	EPA-524.2	ND		1
Naphthalene	<0.50	ug/L	0.50	EPA-524.2	ND		1
n-Propylbenzene	<0.50	ug/L	0.50	EPA-524.2	ND		1
Styrene	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,1,1,2-Tetrachloroethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,1,2,2-Tetrachloroethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
Tetrachloroethene	<0.50	ug/L	0.50	EPA-524.2	ND		1
Toluene	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,2,3-Trichlorobenzene	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,2,4-Trichlorobenzene	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,1,1-Trichloroethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,1,2-Trichloroethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
Trichloroethene	<0.50	ug/L	0.50	EPA-524.2	ND		1
Trichlorofluoromethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,2,3-Trichloropropane	<1.0	ug/L	1.0	EPA-524.2	ND		1
1,1,2-Trichloro-1,2,2-trifluoroethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,2,4-Trimethylbenzene	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,3,5-Trimethylbenzene	<0.50	ug/L	0.50	EPA-524.2	ND		1
Vinyl chloride	<0.50	ug/L	0.50	EPA-524.2	ND		1
Total Xylenes	<1.0	ug/L	1.0	EPA-524.2	ND		1
Total Trihalomethanes	<2.0	ug/L	2.0	EPA-524.2	ND		1
t-Amyl Methyl ether	<0.50	ug/L	0.50	EPA-524.2	ND		1
t-Butyl alcohol	<10	ug/L	10	EPA-524.2	ND		1
Diisopropyl ether	<0.50	ug/L	0.50	EPA-524.2	ND		1
Ethyl t-butyl ether	<0.50	ug/L	0.50	EPA-524.2	ND		1

Cartago Mutual Water Company
P.O. Box 203
Olancha, CA 93549

Reported: 07/06/2012 14:47
Project: Well 1
Project Number: 1400027-001
Project Manager: Aarne Coats

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID: 1211211-01 | **Client Sample Name:** Well 1, 6/18/2012 5:45:00PM, Aarne Coats/Magdeleno Luna

Constituent	Result	Units	PQL	Method	MB Bias	Lab Quals	Run #
p- & m-Xylenes	<0.50	ug/L	0.50	EPA-524.2	ND		1
o-Xylene	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,2-Dichloroethane-d4 (Surrogate)	87.8	%	75 - 125 (LCL - UCL)	EPA-524.2			1
Toluene-d8 (Surrogate)	94.9	%	80 - 120 (LCL - UCL)	EPA-524.2			1
4-Bromofluorobenzene (Surrogate)	93.2	%	80 - 120 (LCL - UCL)	EPA-524.2			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-524.2	06/25/12	06/25/12 20:21	KEA	HPCHEM	1	BVF1613

BC Laboratories, Inc.

Chain of Custody Form

Page ____ of ____

Report To:
Client: Cartago Mutual Water Co. Project #: well 1
Attn: Aarne Coats Project Name: 1400027-001
Street Address: ~~Box~~ PO Box 203
City, State, Zip: OLANCHA, CA 93549 Sampler(s): Aarne Coats
Phone: 760 920-1978 Fax: Magdaleno Luna
Email Address: aarne_w@yahoo.com
Work Order #: 59637 12-11211

Comments:

Analysis Requested: Please refer to the back of this form for completion instructions and method references.

Sample #	Description	Date Sampled	Time Sampled	Gross Alpha	Inorganic Chemical	(Al, Sb, As, Ba, Be, Cd	Cr, Hg, Ni, Se, Tl)	NO3, NO2, N, F	Perchlorate	Uranium	524 VOC	Soil	Sludge	Drinking Water	Ground Water	Waste Water	Other	Turnaround # of work days*	Notes
-1	well 1	6/18/12	1745	X	X	X	X	X	X	X	X			X					

Are there any tests with holding times less than or equal to 48 hours? ☐ Yes ☐ No

* Standard Turnaround = 10 work days

CHK BY ☒ DISTRIBUTION ☐ SUB-OUT ☒

SHORT HOLDING TIME
pH+6 (NO3) (NO2) OP SS
DO Cl2 BOD MBAS COT

Billing ☐ Same as above
Client: Cartago Water / JoAnne Stoltz
Address: 136 S. Main St. Ste 4
City: Bishop State CA Zip 93514
Attn: Sandy
PO#: 59637

EDF Required? Geotracker ☐ Yes ☐ No
Send Copy to State of CA? (EDT) ☒ Yes ☐ No

Global ID (Needed for EDF)
System # (Needed for EDT)

Relinquished By	Date	Time	Received By	Date	Time
1.			1. [signature]	10/20/12	10:40
2.			2.		
3.			3.		

BC Laboratories, Inc. – 4100 Atlas Ct. – Bakersfield, CA 93308 – 661.327.4911 – Fax: 661.327.1918 – www.bclabs.com

GENERAL MINERAL & PHYSICAL & INORGANIC ANALYSIS (9/99)

Date of Report: 12/07/06 Sample ID No.1211212-01

Laboratory Signature Lab
Name: BC LABORATORIES Director: Steven Bennett

Name of Sampler:Aarne Coats/Magdeleno Luna Employed By:

Date/Time Sample Collected:12/06/18/1800	Date/Time Sample Received @ Lab:12/06/20/1040	Date Analyses Completed:12/07/06

System Name:CARTAGO MUTUAL WATER COMPANY System Number: 1400027

Name or Number of Sample Source:WELL 02 N - ACTIVE

* User ID: 14C Station Number: 1400027-002 *
* Date/Time of Sample: |12|06|18|1800| (YY MM DD TTTT) Laboratory Code: 5806 *
* (YY MM DD) *
* Date Analysis completed: |12|07|06| *
* Submitted by:_____ Phone #:_____ *

MCL	REPORTING UNITS	CHEMICAL	ENTRY #	ANALYSES RESULTS	DLR
	mg/L	Total Hardness (as CaCO3) (mg/L)	00900	78	
	mg/L	Calcium (Ca) (mg/L)	00916	27	
	mg/L	Magnesium (Mg) (mg/L)	00927	2.4	
	mg/L	Sodium (NA) (mg/L)	00929	13	
	mg/L	Potassium (K) (mg/L)	00937	2.1	
Total Cations	Meq/L Value: 2.16				
	mg/L	Total Alkalinity (AS CaCO3) (mg/L)	00410	91	
	mg/L	Hydroxide (OH) (mg/L)	71830	< 1.4	
	mg/L	Carbonate (CO3) (mg/L)	00445	< 2.5	
	mg/L	Bicarbonate (HCO3) (mg/L)	00440	110	
*	mg/L+	Sulfate (SO4) (mg/L)	00945	9.6	.5
*	mg/L+	Chloride (Cl) (mg/L)	00940	1.3	
45	mg/L	Nitrate (as NO3) (mg/L)	71850	0.51	2.0
2 .	mg/L	Fluoride (F) (Natural-Source)	00951	0.55	.1
Total Anions	Meq/L Value: 2.08				
	Std.Units+	PH (Laboratory) (Std.Units)	00403	8.12	
***	umho/cm+	Specific Conductance (E.C.) (umhos/cm)	00095	198	
****	mg/L+	Total Filterable Residue@180C(TDS) (mg/L)	70300	140	
15	Units	Apparent Color (Unfiltered) (Units)	00081	1.0	
3	TON	Odor Threshold at 60 C (TON)	00086	ND	1.
5	NTU	Lab Turbidity (NTU)	82079	0.14	
0.5	mg/L+	MBAS (mg/L)	38260	< 0.10	

* 250-500-600 ** 0.6-1.7 *** 900-1600-2200 **** 500-1000-1500

Cartago Mutual Water Company
P.O. Box 203
Olancha, CA 93549

Reported: 07/06/2012 14:48
Project: Well 2
Project Number: 1400027-002
Project Manager: Aarne Coats

Water Analysis (General Chemistry)

BCL Sample ID: 1211212-01 | **Client Sample Name:** Well 2, 6/18/2012 6:00:00PM, Aarne Coats/Magdeleno Luna

Constituent	Result	Units	PQL	Method	MB Bias	Lab Quals	Run #
Total Recoverable Calcium	27	mg/L	0.10	EPA-200.7	ND		1
Total Recoverable Magnesium	2.4	mg/L	0.050	EPA-200.7	ND		1
Total Recoverable Sodium	13	mg/L	0.50	EPA-200.7	ND		1
Total Recoverable Potassium	2.1	mg/L	1.0	EPA-200.7	ND		1
Bicarbonate	110	mg/L	5.0	SM-2320B	ND		2
Carbonate	<2.5	mg/L	2.5	SM-2320B	ND		2
Hydroxide	<1.4	mg/L	1.4	SM-2320B	ND		2
Alkalinity as CaCO3	91	mg/L	4.1	Calc	ND		3
Chloride	1.3	mg/L	0.50	EPA-300.0	ND		4
Fluoride	0.55	mg/L	0.050	EPA-300.0	ND		4
Nitrate as NO3	0.51	mg/L	0.44	EPA-300.0	ND		4
Sulfate	9.6	mg/L	1.0	EPA-300.0	ND		4
Total Cations	2.2	meq/L	0.10	Calc	ND		3
Total Anions	2.1	meq/L	0.10	Calc	ND		3
Hardness as CaCO3	78	mg/L	0.50	Calc	ND		3
pH	8.12	pH Units	0.05	EPA-150.1		S05	5
Electrical Conductivity @ 25 C	198	umhos/cm	1.00	SM-2510B			6
Total Dissolved Solids @ 180 C	140	mg/L	10	SM-2540C	ND		7
Color	1.0	Color Units	1.0	SM-2120B			8
Odor	No Obs Odor	Odor Units	1.0	SM-2150B	ND		9
Turbidity	0.14	NT Units	0.10	EPA-180.1			10
MBAS	<0.10	mg/L	0.10	SM-5540C	ND		11
Nitrite as N	<50	ug/L	50	EPA-353.2	ND		12

INORGANIC CHEMICALS

1211212-01

MCL	REPORTING UNITS	CHEMICAL	ENTRY #	ANALYSES RESULTS		DLR
1000	ug/L	Aluminum (Al) (ug/L)	01105	<	50	50.0
6	ug/L	Antimony (ug/L)	01097	<	2.0	6.0
10	ug/L	Arsenic (As) (ug/L)	01002		3.2	2.0
1000	ug/L	Barium (Ba) (ug/L)	01007	<	10	100.0
4	ug/L	Beryllium (ug/L)	01012	<	1.0	1.0
5	ug/L	Cadmium (Cd) (ug/L)	01027	<	1.0	1.0
50	ug/L	Chromium (Total Cr) (ug/L)	01034	<	10	10.0
1000	ug/L+	Copper (Cu) (ug/L)	01042	<	10	50.0
300	ug/L+	Iron (Fe) (ug/L)	01045	<	50	100.0
	ug/L	Lead (Pb) (ug/L)	01051	<	1.0	5.0
50	ug/L+	Manganese (Mn) (ug/L)	01055	<	10	20.0
2	ug/L	Mercury (Hg) (ug/L)	71900	<	0.20	1.0
100	ug/L	Nickel (ug/L)	01067	<	10	10.0
50	ug/L	Selenium (Se) (ug/L)	01147	<	2.0	5.0
100	ug/L+	Silver (Ag) (ug/L)	01077	<	10	10.0
2	ug/L	Thallium (ug/L)	01059	<	1.0	1.0
5000	ug/L	Zinc (Zn) (ug/L)	01092	<	50	50.0
		ADDITIONAL ANALYSES				
1000	ug/L	Nitrite as Nitrogen(N) (ug/L)	00620	<	50	400

+ Indicates Secondary Drinking Water Standards

Cartago Mutual Water Company
P.O. Box 203
Olancha, CA 93549

Reported: 07/06/2012 14:48
Project: Well 2
Project Number: 1400027-002
Project Manager: Aarne Coats

Water Analysis (Metals)

BCL Sample ID: 1211212-01 | **Client Sample Name:** Well 2, 6/18/2012 6:00:00PM, Aarne Coats/Magdeleno Luna

Constituent	Result	Units	PQL	Method	MB Bias	Lab Quals	Run #
Total Recoverable Aluminum	<50	ug/L	50	EPA-200.7	ND		1
Total Recoverable Antimony	<2.0	ug/L	2.0	EPA-200.8	ND		2
Total Recoverable Arsenic	**3.2**	**ug/L**	**2.0**	**EPA-200.8**	ND		2
Total Recoverable Barium	<10	ug/L	10	EPA-200.7	ND		1
Total Recoverable Beryllium	<1.0	ug/L	1.0	EPA-200.8	ND		2
Total Recoverable Cadmium	<1.0	ug/L	1.0	EPA-200.8	ND		2
Total Recoverable Chromium	<10	ug/L	10	EPA-200.7	ND		1
Total Recoverable Copper	<10	ug/L	10	EPA-200.7	ND		1
Total Recoverable Iron	<50	ug/L	50	EPA-200.7	ND		1
Total Recoverable Lead	<1.0	ug/L	1.0	EPA-200.8	ND		2
Total Recoverable Manganese	<10	ug/L	10	EPA-200.7	ND		1
Total Recoverable Mercury	<0.20	ug/L	0.20	EPA-200.8	ND		2
Total Recoverable Nickel	<10	ug/L	10	EPA-200.7	ND		1
Total Recoverable Selenium	<2.0	ug/L	2.0	EPA-200.8	ND		3
Total Recoverable Silver	<10	ug/L	10	EPA-200.7	ND		1
Total Recoverable Thallium	<1.0	ug/L	1.0	EPA-200.8	ND		2
Total Recoverable Zinc	<50	ug/L	50	EPA-200.7	ND		1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	06/21/12	06/28/12 21:44	JRG	PE-OP1	1	BVF1438
2	EPA-200.8	06/25/12	07/02/12 17:21	SRM	PE-EL2	1	BVF1614
3	EPA-200.8	06/25/12	07/03/12 12:49	SRM	PE-EL2	1	BVF1614

ORGANIC CHEMICAL ANALYSIS (9/99)

Date of Report: 12/07/06 Sample ID No.1211212-01

Laboratory Name: BC LABORATORIES Signature Lab Director: Steven Bennett

Name of Sampler:Aarne Coats/Magdeleno LunaEmployed By:

Date/Time Sample Collected:12/06/18/1800 Date/Time Sample Received @ Lab:12/06/20/1040 Date Analyses Completed:12/07/06

System Name:CARTAGO MUTUAL WATER COMPANY System Number: 1400027

Name or Number of Sample Source:WELL 02 N - ACTIVE

* User ID: 14C Station Number: 1400027-002 *

* Date/Time of Sample: |12|06|18|1800| YY MM DD TTTT Laboratory Code: 5806 *

* YY MM DD *

* Date Analysis completed: |12|07|06| *

* Submitted by:_____ Phone #:_____ *

REGULATED ORGANIC CHEMICALS

TEST METHOD	CHEMICAL ALL CHEMICALS REPORTED ug/L	ENTRY #	ANALYSES RESULTS	MCL ug/L	DLR ug/L
524.2	Total Trihalomethanes (TTHMs)	82080	< 2.0	80	
524.2	Bromodichloromethane	32101	< 0.50		1.0
524.2	Bromoform	32104	< 0.50		1.0
524.2	Chloroform (Trichloromethane)	32106	< 0.50		1.0
524.2	Dibromochloromethane	32105	< 0.50		1.0
524.2	Benzene	34030	< 0.50	1	.50
524.2	Carbon Tetrachloride	32102	< 0.50	.5	.50
524.2	1,2-Dichlorobenzene (o-DCB)	34536	< 0.50	600	.50
524.2	1,4-Dichlorobenzene (p-DCB)	34571	< 0.50	5	.50
524.2	1,1-Dichloroethane (1,1-DCA)	34496	< 0.50	5	.50
524.2	1,2-Dichloroethane (1,2-DCA)	34531	< 0.50	.5	.50
524.2	1,1-Dichloroethylene (1,1-DCE)	34501	< 0.50	6	.50
524.2	cis-1,2-Dichloroethylene (c-1,2-DCE)	77093	< 0.50	6	.50
524.2	trans-1,2-Dichloroethylene (t-1,2-DCE)	34546	< 0.50	10	.50
524.2	Dichloromethane (Methylene Chloride)	34423	< 0.50	5	.50
524.2	1,2-Dichloropropane	34541	< 0.50	5	.50
524.2	Total 1,3-Dichloropropene	34561	< 0.50	.5	.50
524.2	Ethyl Benzene	34371	< 0.50	300	.50
524.2	Methyl tert-Butyl Ether(MTBE)	46491	< 0.50	5	3.00
524.2	Monochlorobenzene (Chlorobenzene)	34301	< 0.50	70	.50
524.2	Styrene	77128	< 0.50	100	.50
524.2	1,1,2,2-Tetrachloroethane	34516	< 0.50	1	.50
524.2	Tetrachloroethylene (PCE)	34475	< 0.50	5	.50
524.2	Toluene	34010	< 0.50	150	.50
524.2	1,2,4-Trichlorobenzene	34551	< 0.50	5	.50
524.2	1,1,1-Trichloroethane (1,1,1-TCA)	34506	< 0.50	200	.50
524.2	1,1,2-Trichloroethane (1,1,2-TCA)	34511	< 0.50	5	.50
524.2	Trichloroethylene (TCE)	39180	< 0.50	5	.50
524.2	Trichlorofluoromethane (FREON 11)	34488	< 0.50	150	5.00

REGULATED ORGANIC CHEMICALS CONTINUED 1211212-01

TEST METHOD	CHEMICAL ALL CHEMICALS REPORTED ug/L	ENTRY #	ANALYSES RESULTS		MCL ug/L	DLR ug/L
524.2	Trichlorotrifluoroethane (FREON 113)	81611	<	0.50	1200	10.00
524.2	Vinyl Chloride (VC)	39175	<	0.50	.5	.50
524.2	m,p-Xylene	A-014	<	0.50		.50
524.2	o-Xylene	77135	<	0.50		.50
524.2	Total Xylenes (m,p, & o)	81551	<	1.0	1750	
524.2	Dibromochloropropane (DBCP)	38761	<	1.0	.2	.01
	UNREGULATED ORGANIC CHEMICALS					
524.2	tert-Amyl Methyl Ether (TAME)	A-034	<	0.50		3.00
524.2	Bromobenzene	81555	<	0.50		.50
524.2	Bromochloromethane	A-012	<	0.50		.50
524.2	Bromomethane (Methyl Bromide)	34413	<	0.50		.50
524.2	tert-Butyl Alcohol (TBA)	77035	<	10		2.00
524.2	n-Butylbenzene	A-010	<	0.50		.50
524.2	sec-Butylbenzene	77350	<	0.50		.50
524.2	tert-Butylbenzene	77353	<	0.50		.50
524.2	Chloroethane	34311	<	0.50		.50
524.2	Chloromethane (Methyl Chloride)	34418	<	0.50		.50
524.2	2-Chlorotoluene	A-008	<	0.50		.50
524.2	4-Chlorotoluene	A-009	<	0.50		.50
524.2	Dibromomethane	77596	<	0.50		.50
524.2	1,3-Dichlorobenzene (m-DCB)	34566	<	0.50		.50
524.2	Dichlorodifluoromethane (Freon 12)	34668	<	0.50		0.50
524.2	1,3-Dichloropropane	77173	<	0.50		.50
524.2	2,2-Dichloropropane	77170	<	0.50		.50
524.2	1,1-Dichloropropene	77168	<	0.50		.50
524.2	Diisopropyl Ether (DIPE)	A-036	<	0.50		3.00
524.2	Ethyl tert-Butyl Ether (ETBE)	A-033	<	0.50		3.00
524.2	Hexachlorobutadiene	34391	<	0.50		.50
524.2	Isopropylbenzene (Cumene)	77223	<	0.50		.50
524.2	p-Isopropyltoluene	A-011	<	0.50		
524.2	Naphthalene	34696	<	0.50		.50
524.2	n-Propylbenzene	77224	<	0.50		.50
524.2	1,1,1,2-Tetrachloroethane	77562	<	0.50		.50
524.2	1,2,3-Trichlorobenzene	77613	<	0.50		.50
524.2	1,2,3-Trichloropropane	77443	<	1.0		.005
524.2	1,2,4-Trimethylbenzene	77222	<	0.50		.50
524.2	1,3,5-Trimethylbenzene	77226	<	0.50		.50

AGRICULTURAL CHEMICAL AND MISCELLANEOUS ORGANIC ANALYSIS (10/97)

Date of Report: 12/07/06 Sample ID No.1211212-01

Laboratory Signature Lab
Name: BC LABORATORIES Director: Steven Bennett

Name of Sampler:Aarne Coats/Magdeleno LunaEmployed By:

Date/Time Sample Collected:12/06/18/1800 | Date/Time Sample Received @ Lab:12/06/20/1040 | Date Analyses Completed:12/07/06

System Name:CARTAGO MUTUAL WATER COMPANY | System Number: 1400027

Name or Number of Sample Source:WELL 02 N - ACTIVE

* User ID: 14C Station Number: 1400027-002 *
* Date/Time of Sample: |12|06|18|1800| Laboratory Code: 5806 *
* YY MM DD TTTT YY MM DD *
* Date Analysis completed: |12|07|06| *
* Submitted by:_____ Phone #:_____ *

Page 1 of 1

TEST METHOD	CHEMICAL ALL CHEMICALS REPORTED ug/L	ENTRY #	ANALYSES RESULTS	MCL ug/L	DLR ug/L
524.2	cis-1,3-Dichloropropene (D-D)	34704	< 0.50	0.5	
524.2	trans-1,3-Dichloropropene	34699	< 0.50	0.5	

Cartago Mutual Water Company
P.O. Box 203
Olancha, CA 93549

Reported: 07/06/2012 14:48
Project: Well 2
Project Number: 1400027-002
Project Manager: Aarne Coats

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID: 1211212-01 | **Client Sample Name:** Well 2, 6/18/2012 6:00:00PM, Aarne Coats/Magdeleno Luna

Constituent	Result	Units	PQL	Method	MB Bias	Lab Quals	Run #
Benzene	<0.50	ug/L	0.50	EPA-524.2	ND		1
Bromobenzene	<0.50	ug/L	0.50	EPA-524.2	ND		1
Bromochloromethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
Bromodichloromethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
Bromoform	<0.50	ug/L	0.50	EPA-524.2	ND		1
Bromomethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
n-Butylbenzene	<0.50	ug/L	0.50	EPA-524.2	ND		1
sec-Butylbenzene	<0.50	ug/L	0.50	EPA-524.2	ND		1
tert-Butylbenzene	<0.50	ug/L	0.50	EPA-524.2	ND		1
Carbon tetrachloride	<0.50	ug/L	0.50	EPA-524.2	ND		1
Chlorobenzene	<0.50	ug/L	0.50	EPA-524.2	ND		1
Chloroethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
Chloroform	<0.50	ug/L	0.50	EPA-524.2	ND		1
Chloromethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
2-Chlorotoluene	<0.50	ug/L	0.50	EPA-524.2	ND		1
4-Chlorotoluene	<0.50	ug/L	0.50	EPA-524.2	ND		1
Dibromochloromethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,2-Dibromo-3-chloropropane	<1.0	ug/L	1.0	EPA-524.2	ND		1
1,2-Dibromoethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
Dibromomethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,2-Dichlorobenzene	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,3-Dichlorobenzene	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,4-Dichlorobenzene	<0.50	ug/L	0.50	EPA-524.2	ND		1
Dichlorodifluoromethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,1-Dichloroethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,2-Dichloroethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,1-Dichloroethene	<0.50	ug/L	0.50	EPA-524.2	ND		1
cis-1,2-Dichloroethene	<0.50	ug/L	0.50	EPA-524.2	ND		1
trans-1,2-Dichloroethene	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,2-Dichloropropane	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,3-Dichloropropane	<0.50	ug/L	0.50	EPA-524.2	ND		1
2,2-Dichloropropane	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,1-Dichloropropene	<0.50	ug/L	0.50	EPA-524.2	ND		1

Cartago Mutual Water Company
P.O. Box 203
Olancha, CA 93549

Reported: 07/06/2012 14:48
Project: Well 2
Project Number: 1400027-002
Project Manager: Aarne Coats

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID: 1211212-01 | **Client Sample Name:** Well 2, 6/18/2012 6:00:00PM, Aarne Coats/Magdeleno Luna

Constituent	Result	Units	PQL	Method	MB Bias	Lab Quals	Run #
cis-1,3-Dichloropropene	<0.50	ug/L	0.50	EPA-524.2	ND		1
trans-1,3-Dichloropropene	<0.50	ug/L	0.50	EPA-524.2	ND		1
Total 1,3-Dichloropropene	<0.50	ug/L	0.50	EPA-524.2	ND		1
Ethylbenzene	<0.50	ug/L	0.50	EPA-524.2	ND		1
Hexachlorobutadiene	<0.50	ug/L	0.50	EPA-524.2	ND		1
Isopropylbenzene	<0.50	ug/L	0.50	EPA-524.2	ND		1
p-Isopropyltoluene	<0.50	ug/L	0.50	EPA-524.2	ND		1
Methylene chloride	<0.50	ug/L	0.50	EPA-524.2	ND		1
Methyl t-butyl ether	<0.50	ug/L	0.50	EPA-524.2	ND		1
Naphthalene	<0.50	ug/L	0.50	EPA-524.2	ND		1
n-Propylbenzene	<0.50	ug/L	0.50	EPA-524.2	ND		1
Styrene	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,1,1,2-Tetrachloroethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,1,2,2-Tetrachloroethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
Tetrachloroethene	<0.50	ug/L	0.50	EPA-524.2	ND		1
Toluene	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,2,3-Trichlorobenzene	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,2,4-Trichlorobenzene	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,1,1-Trichloroethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,1,2-Trichloroethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
Trichloroethene	<0.50	ug/L	0.50	EPA-524.2	ND		1
Trichlorofluoromethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,2,3-Trichloropropane	<1.0	ug/L	1.0	EPA-524.2	ND		1
1,1,2-Trichloro-1,2,2-trifluoroethane	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,2,4-Trimethylbenzene	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,3,5-Trimethylbenzene	<0.50	ug/L	0.50	EPA-524.2	ND		1
Vinyl chloride	<0.50	ug/L	0.50	EPA-524.2	ND		1
Total Xylenes	<1.0	ug/L	1.0	EPA-524.2	ND		1
Total Trihalomethanes	<2.0	ug/L	2.0	EPA-524.2	ND		1
t-Amyl Methyl ether	<0.50	ug/L	0.50	EPA-524.2	ND		1
t-Butyl alcohol	<10	ug/L	10	EPA-524.2	ND		1
Diisopropyl ether	<0.50	ug/L	0.50	EPA-524.2	ND		1
Ethyl t-butyl ether	<0.50	ug/L	0.50	EPA-524.2	ND		1

Cartago Mutual Water Company
P.O. Box 203
Olancha, CA 93549

Reported: 07/06/2012 14:48
Project: Well 2
Project Number: 1400027-002
Project Manager: Aarne Coats

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID: 1211212-01 | **Client Sample Name:** Well 2, 6/18/2012 6:00:00PM, Aarne Coats/Magdeleno Luna

Constituent	Result	Units	PQL	Method	MB Bias	Lab Quals	Run #
p- & m-Xylenes	<0.50	ug/L	0.50	EPA-524.2	ND		1
o-Xylene	<0.50	ug/L	0.50	EPA-524.2	ND		1
1,2-Dichloroethane-d4 (Surrogate)	97.9	%	75 - 125 (LCL - UCL)	EPA-524.2			1
Toluene-d8 (Surrogate)	100	%	80 - 120 (LCL - UCL)	EPA-524.2			1
4-Bromofluorobenzene (Surrogate)	99.0	%	80 - 120 (LCL - UCL)	EPA-524.2			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-524.2	06/25/12	06/25/12 20:47	KEA	HPCHEM	1	BVF1613

BC Laboratories, Inc.

Chain of Custody Form

Page ____ of ____

Report To: Client: Cartago Mutual Water Co.	Project #: Well 2
Attn: Aarne Coats	Project Name: 1400027-002
Street Address: PO Box 203	
City, State, Zip: OLANCHA, CA 93549	Sampler(s): Aarne Coats
Phone: 760 920 1978 Fax:	Magdaleno Luna
Email Address: aarne_w@yahoo.com	
Work Order #: 59638	12-11212

Analysis Requested

Please refer to the back of this page for completion instructions and method legend.

Sample #	Description	Date Sampled	Time Sampled	524-VOC	GMPT	Sample Matrix: Soil	Sludge	Drinking Water	Ground Water	Waste Water	Other	Turnaround # of work days*
-1	well 2	6/18/12	1800	X	X			X				

Are there any tests with holding times less than or equal to 48 hours? ☐ Yes ☐ No

* Standard Turnaround = 10 work days

Comments:

Notes

CHK BY

DISTRIBUTION
STAT
SUB-OUT

SHORT HOLDING TIME
Cr^{+6} NO_2 NO_3 OP SS
DO Cl_2 BOD MBAS COT

Billing JOANNE Stoltz ☐ Same as above

Client: Cartago Mutual Water Co.

Address: 136 S Main St. Ste 4

City: Bishop State CA Zip 93514

Attn: Sandy

PO#: 59638

EDF Required? Geotracker ☐ Yes ☐ No

Send Copy to State of CA? (EDT) ☒ Yes ☐ No

Global ID (Needed for EDF)

System # (Needed for EDT)

	Relinquished By	Date	Time	Received By	Date	Time
1.					12/20/12	10:40
2.						
3.						

BC Laboratories, Inc. – 4100 Atlas Ct. – Bakersfield, CA 93308 – 661.327.4911 – Fax: 661.327.1918 – www.bclabs.com

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.
All results listed in this report are for the exclusive use of the submitting party BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation

Geosyntec
consultants

APPENDIX E

GROUNDWATER MODEL DESCRIPTION AND RESULTS

Geosyntec consultants

03 June 2014

Groundwater MODFLOW Modeling for Assessment of Pumping Well Impacts –Cabin Bar Ranch Project, Olancha, California

1. INTRODUCTION

Geosyntec Consultants, Inc., (Geosyntec) has prepared this memorandum describing the results of the groundwater flow modeling used for assessing the impacts of the future pumping scenarios for the Cabin Ranch project, in Cartago, California.

Numerical modeling was used to estimate the impacts of future pumping scenarios on groundwater level, spring flow, and other water supply wells in the area. The numerical model used to perform this assessment was based on an existing model developed by Geosyntec (Geosyntec, 2011). The model and the updates are described in this appendix.

1.1 Purpose

The purposes of this memorandum are to: 1) describe the numerical modeling approach used to assess the potential impacts from future pumping scenarios, 2) present the model simulation results including a quantitative estimate of potential impacts on spring flows and groundwater levels, and 3) provide technical support for the selection of monitoring locations.

2. MODEL CONSTRUCTION AND CALIBRATION

2.1 Conceptual Model and Overview

Groundwater beneath the site is mostly derived from precipitation (rainfall) and snowmelt that runs off the Sierra Nevada Mountains to the west and infiltrates into the alluvial fan near the mountain base or enters the alluvial aquifer through fractures in the bedrock. Groundwater in the alluvium flows eastward, away from the Sierra Nevada Mountains and towards the central portion of the Owens Valley basin. In the site vicinity, the alluvium layer is divided into two permeable layers, separated by a fine-grained lacrustine layer that occurs at a depth of approximately 80 feet. The upper aquifer material is referred to as the Shallow Zone, and consists predominately of sand and gravel. The 80-foot deep fine-grained layer is an aquitard that separates the Shallow Zone from deeper sandy and gravely alluvium. This fine-grained layer pinches out towards the west.

The depth to the shallow groundwater table beneath the site gradually decreases towards the east. In the south central portion of the site, shallow groundwater intersects the ground surface along

an approximate line where springs and seeps are observed. These springs and seeps occur along a fault called the Spring-line fault. This fault appears to act as a barrier to groundwater flow in the Shallow Zone, resulting in a rise of the groundwater table, and the observed springs and meadowlands in the central and eastern portions of the site.

2.2 Numerical Model Domain, Grid, and Layers

The three-dimensional model for groundwater flow was developed using MODFLOW, an industry standard finite-difference code. Groundwater flow in the model is assumed to be steady-state.

The model domain is illustrated in Figure E-1. The model domain extends from the foothills of the Sierra Nevada Mountains on the west to the Owens Lakebed on the east. In the north-south direction, the model extends to include the town of Cartago in the north and the Crystal Geyser-Roxanne facility in the south. The trapezoidal model domain is 11,900 feet wide in the north-south direction, 7,200 feet wide in the east-west direction at the north boundary, and 11,800 feet wide in the east-west direction at the south boundary.

The model domain simulates groundwater flow in the Shallow and Deep zones and includes simulation of pumping in active groundwater supply wells at the Crystal Geyser-Roxanne facility, to the south of the Cabin Bar Ranch, and in the town of Cartago, to the north of the Cabin Bar Ranch. The three geological layers at the site, Shallow zone, clay/silt layer and deeper sandy and gravely alluvium, were simulated with three model layers. The top of the model domain was interpolated from a Digital Elevation Model obtained from the USGS National Map Viewer (USGS, 2012)[1]. The top of the middle layer was defined based on well logs and previous hydrogeological investigations (Geosyntec, 2011) and was calculated as the minimum of either 3,550ft msl or the top of the domain minus 75ft. The thickness of the middle layer was 10 feet across the model domain. The bottom of the model domain was fixed at 3,300ft MSL. This corresponds to a total average model thickness of 325 ft in the vicinity of the site. The sequence of alluvium and lacustrine deposits beneath the site is at least 750 feet thick (Geosyntec, 2011). The model domain focuses on the upper portion of the deposits, as it was developed to assess the impacts of pumping in the shallow zone and in the upper deep zone. A cross-section of the model domain is shown in Figure E-2.

[1] The upper model layer is simulated as an unconfined aquifer such that the layer is not fully saturated.

2.3 Groundwater Flow Model

2.3.1 Observation data – Head

Head measurements from 1990 to 2013 are available for several wells located in the area of interest. The well locations and hydrographs for selected wells are shown in Figure E-3.

The measured heads are relatively stable between 2010 and 2013; therefore groundwater flow was simulated under steady state conditions. The average observed heads between May 2011 and April 2013 were used to calibrate the model. Also the vertical gradient between the Shallow and Deep zones observed beneath the site, at monitoring wells OW-7M and OW-7U was used as a calibration target.

2.3.2 Observation data – Spring Flows

Flow rates at selected spring flows were measured in 2010 as part of the hydrogeological investigations (Geosyntec, 2011). Spring flows generally flow eastward into the main collection ditch and the total flow at the ditch was estimated at roughly 350 gpm (Geosyntec, 2011). This total spring flow rate was used to calibrate the model.

2.3.3 Model Boundaries and Stresses

Groundwater flow in the model domain is from east to west. A no-flow boundary was applied at the northern and southern sides of the model. A constant head boundary is applied to the east and west sides of the model. Constant head boundaries were based on the extrapolation of a surface created from averaged head observations in various wells and piezometers over the time period of October 8th through October 15th, 2010. This time period included representative pumping at the existing production wells at the facility. The constant head boundaries resulted in a horizontal regional gradient of approximately 0.009 ft/ft.

The model simulated a maximum ET rate of 0.01 feet per day from the surface which equates to 3.65 feet per year. This ET rate is consistent with an ET rate of 3.2 ft/year estimated by Duell (1988) for meadows in the Owens Valley and is within the range of previously published ET rates for the Owens Valley as presented in JMM (1993) for the site. The ET rates reported by JMM range from 2.6 ft/year (empirical method where groundwater is less than 8 feet bgs) published by Williams (1969) to 4.4 ft/year (open water or mudflats) published by Danskin (1988) (as cited by JMM., 1993). The ET extinction depth was setup to 10 ft bgs.

The springs along the Spring-line fault were simulated with the drain package and the bottom elevation of the drains was defined 2 feet below ground elevation. Springs were defined at

locations ES-1A, ES-3, ES-3A, and CBS-1 to CBS-9. The spring locations are shown in Figure E-4.

The Spring-line fault was simulated as a horizontal flow barrier, in both the shallow and deep sand zones. The modeled and observed spring flow was used to calibrate the hydraulic characteristics of the barrier (hydraulic conductivity divided by fault thickness). Further discussion of groundwater flow calibration results are presented in Section 2.4.

There are several private active pumping wells in the model domain, located in the Cartago area. Average pumping rates of 650 gallons per day (gpd) were used in the model, unless reported otherwise by the owner. There is also one municipal water supply well in Cartago (CMW-2), which provides water to 43 residences. The average pumping rate at this well was estimated based on an estimate rate of 650 gpd per residence (27,950 gpd at the well). The production wells from the Crystal Geyser-Roxanne facility are also included in the model. The location of all pumping wells in the model is shown in Figure E-4. The model inputs of each pumping well (pumping rates, pumping zone) are summarized in Table E-1.

2.3.4 Material Properties

The shallow and deep zones were modeled with uniform hydraulic parameters (i.e., horizontal and vertical hydraulic conductivity). Pumping tests performed in 2010 in wells CGR-8, CGR-9 and CGR-10 resulted in estimates of average hydraulic conductivity of the Shallow Zone between 230 to 550 ft/day (Geosyntec, 2011). These values were used to calibrate groundwater flow simulation. Further discussion of groundwater flow calibration results are presented in Section 2.4. All the parameters used in the model are summarized in Table E-2.

The aquitard-like properties of the clay/silt layer are represented in the model to extend from the eastern domain boundary westward to the western edge of the valley floor/HWY-395 area. The remainder of the middle layer to the west was assigned the same properties as the deep sand layer, simulating a westward pinching out of the aquitard. The aquitard extent is based on well logs, which shows that the clay/silt layer is present at wells PAL-1 and CMW-2 but not at wells PAT-1 and HAR-1.

2.4 Model Calibration

The flow model was calibrated to fit the average observed head at the monitoring wells (Figure E-3), and the total spring flow rate estimated at the ditch (see Section 2.3.2).

The model parameters are summarized in Table E-2. These parameters are further discussed below.

2.4.1 Groundwater Flow Model Parameters

Significant groundwater flow model parameters are as follows:

- The calibrated hydraulic conductivity for the Shallow Zone is 315 ft/day, which is within the range estimated from pumping tests (230 to 550 ft/day, Geosyntec, 2011).
- The calibrated evaporation rate is 3.65 feet per year.
- Figure E-5 presents a plot of observed versus simulated heads, illustrating a good model fit to the observed heads. The root mean squared residual is 2.5 feet, approximately 9% of the observed head difference at the site (27 feet).
- The simulated total spring flow (which is assumed to include water flowing to the main collector ditch) is 410 gpm. This value is consistent with observed discharge (roughly 350 gpm) from the main collection ditch (see section 2.3.2) which is considered a minimum discharge estimate.
- The calibrated head contours are illustrated in Figure E-6.

3. FUTURE SCENARIO SIMULATIONS

The calibrated model was used to assess spring flow changes and groundwater head changes due to additional pumping at Crystal Geyser-Roxanne facility. In addition to a "base case" with no additional pumping, five scenarios were tested with incremental increases in pumping rates from the proposed production wells.

3.1 Description of Future Scenarios

Four additional pumping wells were implemented in the model CGR-8, CGR-9, CGR-10 and an additional domestic well D1 (see Figure E-4). In addition, it is assumed that the water pumped at D1 is discharged into a percolation pond (see Figure E-4). The percolation pond was modeled as an injection well, with the injection rate equals to D1 pumping rate. The pumping rates for the five scenarios are described below and summarized in Table E-1. The scenarios including off-site pumping in CGR's southern facility wells and active wells in the town of Cartago including the Cartago Mutual Water Well (Table E-1). Pumping rates in these off-site wells were based on either reported rates by the owner or estimated rates based on typical average residential use (650 gallons per day). The pumping scenarios simulated are as follows:

- Scenario 1: One operating production line using a total of 90 AFY of groundwater. In the model, wells CGR-8, CGR-9 and CGR-10 were pumped at constant rate of 16.75 gpm and CGR-D was pumped at a constant rate of 6 gpm.
- Scenario 2: Two operating production lines using a total of 180 AFY of groundwater. In the model, wells CGR-8, CGR-9 and CGR-10 were pumped at constant rate of 33.5 gpm and CGR-D was pumped at a constant rate of 12 gpm.
- Scenario 3: Three operating production lines using a total of 270 AFY of groundwater. In the model, wells CGR-8, CGR-9 and CGR-10 were pumped at constant rate of 50.25 gpm and CGR-D was pumped at a constant rate of 19 gpm.
- Scenario 4: Four operating production lines using a total of 360 AFY of groundwater. In the model, wells CGR-8, CGR-9 and CGR-10 were pumped at constant rate of 67 gpm and CGR-D was pumped at a constant rate of 25 gpm.
- Scenario 5: Maximum groundwater use during the summer months, with a total of 200 AF of groundwater over 90 days. In the model, wells CGR-8, CGR-9 and CGR-10 were pumped at constant rate of 150 gpm and CGR-D was pumped at a constant rate of 50 gpm.

The 360 AFY groundwater use (Scenario 4) is the maximum annual amount of water use projected for the project, while Scenario 5 simulates the maximum pumping rate projected for the project (150 gpm per well over 90 days). The model simulated steady state conditions, that is, the pumping was simulated until groundwater levels did not change, therefore Scenario 5 represents a worst case scenario.

3.2 Impacts on Water Levels and Spring Flows

The model scenarios were analyzed to determine the relative changes to: (1) total spring flow discharge; and, (2) water levels in key wells located adjacent to the northern and southern boundaries of the site.

The results for the five pumping scenarios are summarized in Table E-3. Groundwater levels in Scenario 4 are predicted to be approximately 0.14 ft lower in well P-10 located adjacent to the northern boundary of the site, 0.22 ft lower in well P-15 located east of the Spring-Line fault, and 0.33ft lower in well OW-7U located on the southern boundary. Groundwater levels in Scenario 5, the high production scenario, are predicted to be approximately 0.32 ft lower in well P-10, 0.76 ft lower in well P-15, and 0.32ft lower in well OW-7U.

Figure E-7 shows the simulated head contours for Scenario 4 and 5, and Figure E-8 shows the simulated drawdown in the Shallow Zone for scenarios 4 and 5.

The model results predict that the total spring flow will be decreased by 6% for each 90 AFY of pumping. In Scenario 4 (annual pumping rate of 360 AFY), the total spring flow discharge is approximately 23% from the base case. The model predicts a short-term spring flow reduction of 48% for the high production scenario 5.

3.3 Potential for Saline Water Intrusion

The model is used to predict whether the pumping well capture zones for the highest pumping rate (Scenario 5) could cause intrusion of saline water from the east. For this analysis, the capture zones were calculated for the four pumping wells, as shown in Figure E-9. It can be seen that the eastern stagnation points are more than 1,400 feet west from the eastern most monitoring wells (OW-8US and OW-9U). Based on these capture zones, there is no expectation of production wells pulling in saline water from the east.

An extreme scenario was also developed to illustrate the maximum possible extent of the capture zones. This scenario does not represent a realistic pumping scenario. Maximum pumping rates are simulated at the four pumping wells by assigning a constant head boundary 2 feet above the bottom of the Shallow zone, in order to maximize the simulated drawdown. Furthermore the hydraulic flow barrier was removed to maximize the extent of the capture zones towards east. The capture zones for the four pumping wells for this extreme case are shown in Figure E-10. It can be seen that even under this extreme scenario the eastern stagnation points are more than 1,200 feet west from the eastern most monitoring wells (OW-8US and OW-9U). This extreme scenario indicates that there could be approximately 7 feet of drawdown in the OW-9U location without saline intrusion from the east occurring.

4. REFERENCES

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Figure E-9: Simulated Capture Zones for Scenario 5

Figure E-10: Simulated Capture Zones for Extreme Drawdown Case

* * * * *

Table E-1 - Input Parameters for Pumping Wells
Cabin Bar Ranch, Olancha, California

Well	Type	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Percent Pumping		Pumping Rate (gpm)					
				Shallow Zone	Deep Zone	Baseline	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Cartago Active Supply Wells											
CMW-2	Active Well	115	150	0	100	19.4					
BIL-1	Active Well		98	50	50	0.45					
HAN-1	Active Well		86	50	50	0.45					
HAR-1	Active Well	100	157	0	100	0.28					
HUE-1	Active Well		140	50	50	0.45					
LAW-1	Active Well		120	50	50	0.45					
MER-1	Active Well		85	50	50	0.45					
MER-2	Active Well		105	50	50	0.45					
PAL-1	Active Well	100	185	0	100	0.45					
PAT-1	Active Well	93.5	153.5	0	100	0.45					
RIL-1	Active Well			50	50	0.45					
RIL-2	Active Well			50	50	0.45					
RIL-3	Active Well			50	50	0.45					
SIE-1	Active Well			50	50	0.45					
Cartago Non-Active Supply Wells											
ADK-1	Non-Active Well		100			0.0					
BIY-1	Non-Active Well		65			0					
CMW-1	Standby Well					0					
DIE-1	Non-Active Well		90			0					
HAT-1	Non-Active Well					0					
HUG-1	Non-Active Well		100			0					
LUN-1	Non-Active Well		100			0					
WAL-1	Non-Active Well		94			0					
WAL-2	Non-Active Well		90			0					
WIC-1	Non-Active Well		320			0					
Crystal Geyser-Roxanne Active Pumping Wells											
CBR-1	Active Well	60	120	50	50	0.3					
CBR-4	Active Well		60	100	0	0.45					
CGR-2	Active Well	51	65	100	0	130					
CGR-3	Active Well	56	72	100	0	9					
CGR-4	Active Well	52	67	100	0	9					
CGR-7	Active Well	55	70	100	0	37					
Crystal Geyser-Roxanne Non-Active Pumping Wells											
CGR-1	Non-Active Well					0.0					
CBR-2	Non-Active Well	62	166			0					
CBR-3	Non-Active Well					0					
CGR-5	Non-Active Well					0					
CGR-6	Non-Active Well					0					
PW-1	Non-Active Well	200	650			0					
Crystal Geyser-Roxanne Additional Pumping Wells											
CGR-8	Future Well	53	66	100	0	0.00	16.75	33.50	50.25	67.00	150.00
CGR-9	Future Well	53	73	100	0	0.00	16.75	33.50	50.25	67.00	150.00
CGR-10	Future Well	53	73	100	0	0.00	16.75	33.50	50.25	67.00	150.00
D1	Future Well			100	0	0.00	6.00	12.00	19.00	25.00	50.00

Table E-2 - Model Parameters
Cabin Bar Ranch, Olancha, California

Parameter		Unit	Value
Evaporation	Evaporation Rate	ft/year	3.65
	Extinction Depth	ft	10
Horizontal Hydraulic Conductivity	Shallow Zone	ft/day	315
	Deep Zone		10
	Clay/Silt Layer		0.2
Vertical Hydraulic Conductivity	Shallow Zone	ft/day	3.15
	Deep Zone		0.1
	Clay/Silt Layer		0.002
Horizontal Flow Barrier Characteristics	Shallow Zone	1/day	0.225
	Middle/Deep Zone		0.001

Table E-3 - Summary of Model Results
Cabin Bar Ranch, Olancha, California

Well	Zone	Baseline	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Baseline	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Key Monitoring Wells													
		Head (ft msl)						Drawdown (ft)					
OW-7U	Shallow	3614.71	3614.63	3614.55	3614.46	3614.38	3613.94		0.08	0.16	0.25	0.33	0.77
CGR-2	Shallow	3621.78	3621.75	3621.72	3621.70	3621.67	3621.53		0.03	0.05	0.08	0.11	0.25
CGR-7	Shallow	3612.85	3612.81	3612.77	3612.74	3612.70	3612.50		0.04	0.07	0.11	0.15	0.35
P-10	Shallow	3616.76	3616.73	3616.69	3616.66	3616.62	3616.44		0.04	0.07	0.11	0.14	0.32
CMW-2	Deep	3613.00	3612.98	3612.97	3612.96	3612.94	3612.87		0.01	0.03	0.04	0.05	0.12
HAN-1	Shallow	3624.71	3624.68	3624.66	3624.63	3624.60	3624.47		0.03	0.05	0.08	0.11	0.24
P-15	Shallow	3603.51	3603.46	3603.40	3603.35	3603.29	3603.00		0.05	0.11	0.16	0.22	0.51
MW-3	Deep	3628.98	3628.96	3628.93	3628.90	3628.87	3628.73		0.03	0.06	0.08	0.11	0.26
OW-9U	Shallow	3595.49	3595.46	3595.42	3595.39	3595.35	3595.16		0.03	0.07	0.10	0.14	0.33
OW-8US	Shallow	3586.37	3586.35	3586.33	3586.31	3586.29	3586.19		0.02	0.04	0.06	0.08	0.18
Other Monitoring Wells in Shallow Zone													
		Head (ft msl)						Drawdown (ft)					
CGR-3	Shallow	3614.91	3614.89	3614.86	3614.83	3614.80	3614.65		0.03	0.06	0.08	0.11	0.26
CGR-4	Shallow	3613.22	3613.15	3613.08	3613.02	3612.95	3612.58		0.07	0.14	0.20	0.27	0.64
CGR-6	Shallow	3613.83	3613.77	3613.71	3613.65	3613.59	3613.27		0.06	0.12	0.18	0.24	0.55
MW-2	Deep	3627.90	3627.87	3627.84	3627.81	3627.78	3627.62		0.03	0.06	0.09	0.12	0.28
OW-7M	Deep	3623.48	3623.45	3623.42	3623.39	3623.36	3623.21		0.03	0.06	0.09	0.12	0.27
P-1	Shallow	3620.03	3619.94	3619.84	3619.75	3619.66	3619.16		0.09	0.19	0.28	0.37	0.87
P-2	Shallow	3616.90	3616.80	3616.69	3616.58	3616.48	3615.91		0.11	0.21	0.32	0.42	0.99
P-3	Shallow	3618.35	3618.27	3618.19	3618.11	3618.02	3617.59		0.08	0.16	0.25	0.33	0.77
P-4	Shallow	3615.29	3615.17	3615.05	3614.94	3614.82	3614.21		0.11	0.23	0.35	0.46	1.08
P-5	Shallow	3621.03	3620.93	3620.84	3620.74	3620.65	3620.16		0.09	0.19	0.28	0.38	0.87
P-6	Shallow	3618.54	3618.46	3618.38	3618.31	3618.23	3617.82		0.08	0.16	0.24	0.31	0.72
P-7	Shallow	3621.27	3621.20	3621.13	3621.06	3620.99	3620.64		0.07	0.14	0.21	0.28	0.63
P-8	Shallow	3620.07	3620.02	3619.96	3619.91	3619.86	3619.59		0.05	0.11	0.16	0.21	0.48
P-9	Shallow	3607.35	3607.27	3607.19	3607.11	3607.03	3606.65		0.08	0.16	0.25	0.33	0.71
P-11	Shallow	3616.61	3616.50	3616.39	3616.28	3616.17	3615.60		0.11	0.22	0.33	0.44	1.01
P-12	Shallow	3614.25	3614.15	3614.05	3613.95	3613.85	3613.30		0.10	0.20	0.30	0.41	0.95
P-13	Shallow	3612.05	3611.97	3611.89	3611.81	3611.73	3611.28		0.08	0.15	0.23	0.31	0.76
RP-1	Shallow	3611.97	3611.90	3611.82	3611.74	3611.67	3611.22		0.08	0.15	0.23	0.31	0.75
RP-2	Shallow	3611.87	3611.80	3611.73	3611.66	3611.59	3611.19		0.07	0.14	0.21	0.28	0.68
RP-3	Shallow	3613.15	3613.08	3613.00	3612.92	3612.84	3612.35		0.08	0.15	0.23	0.31	0.80
RP-4	Shallow	3614.98	3614.89	3614.80	3614.71	3614.62	3614.15		0.09	0.18	0.27	0.36	0.83
RP-5	Shallow	3611.79	3611.71	3611.63	3611.55	3611.47	3611.03		0.08	0.15	0.23	0.31	0.75
Spring Flow													
		Total Flow (gpm)						% Change					
All Springs		410	387	364	341	318	213		6%	11%	17%	23%	48%

Legend

- Springs
- Active Well
- Non-Active Well
- Additional Pumping Well
- Model Domain

N

0 1,500 3,000 Feet

Model Domain - Plan View

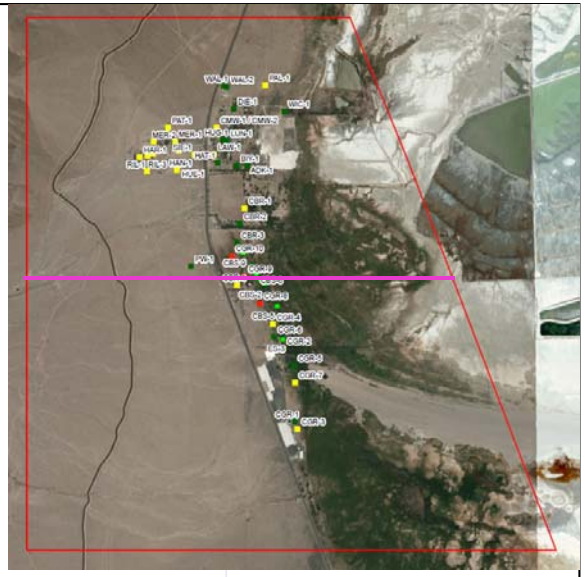
Cabin Bar Ranch, Olancha, California

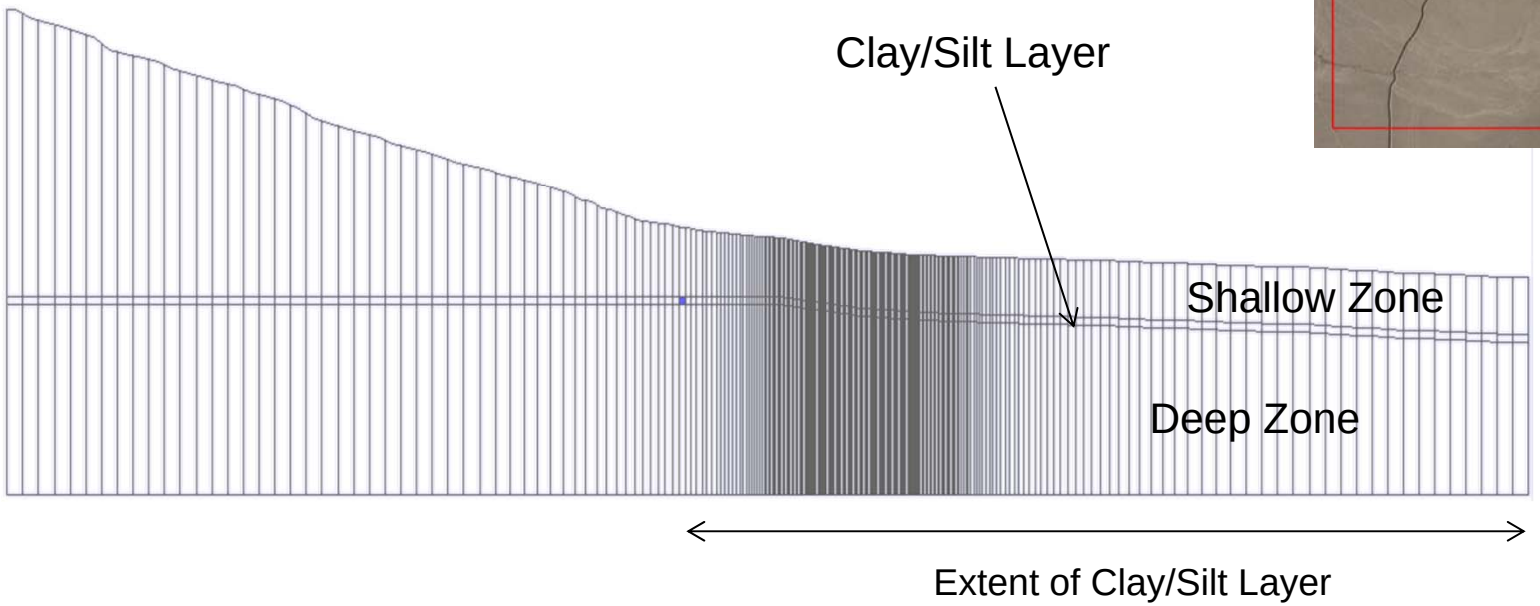
Geosyntec consultants

SB0670 | June 2014

Figure **E-1**

P:\PRJ2003REM\Olancha\GMMRP\GIS\Project\model_domain.mxd





Notes:
Vertical Magnification = 5

200 ft

2,000 ft

Cross-Section

Model Domain

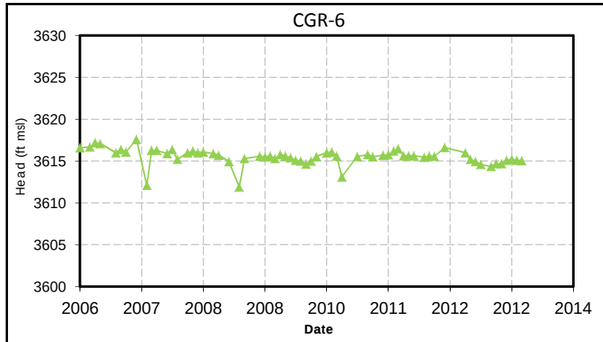
Model Domain – Cross-Section

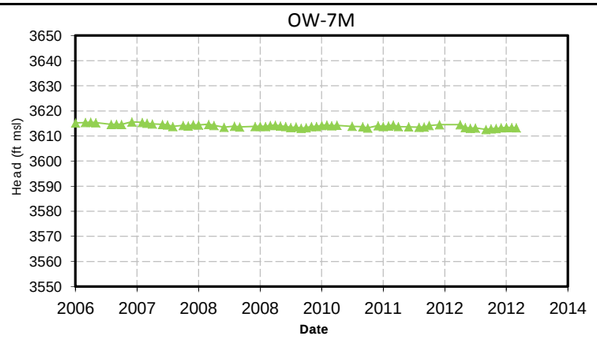
Cabin Bar Ranch
Olancha, California

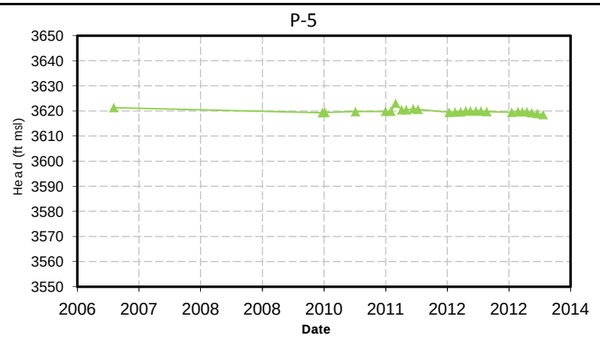
Geosyntec consultants

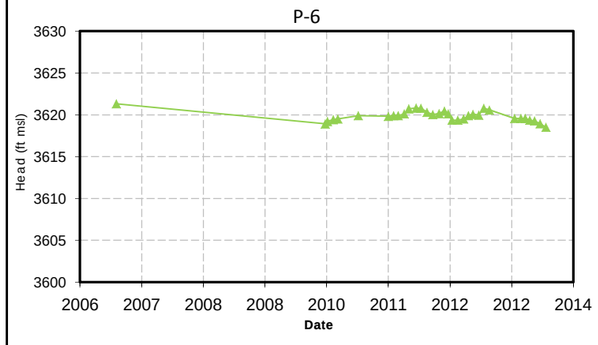
Oakland, CA | June 2014

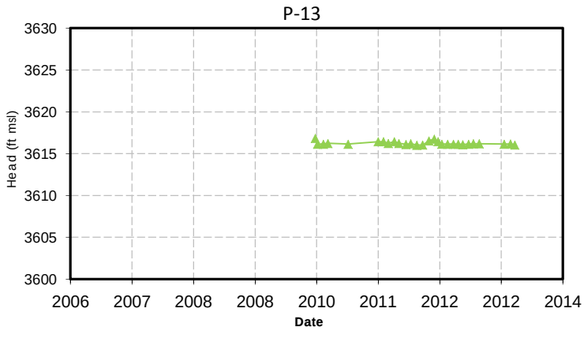
Figure E-2

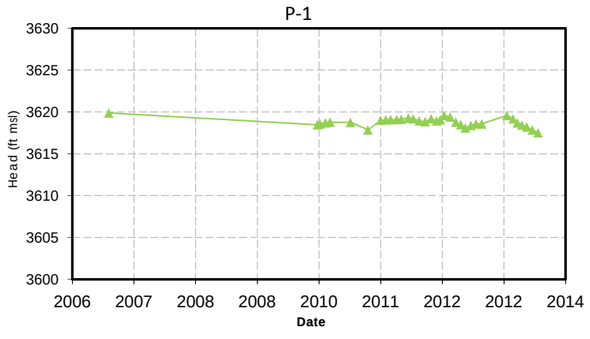


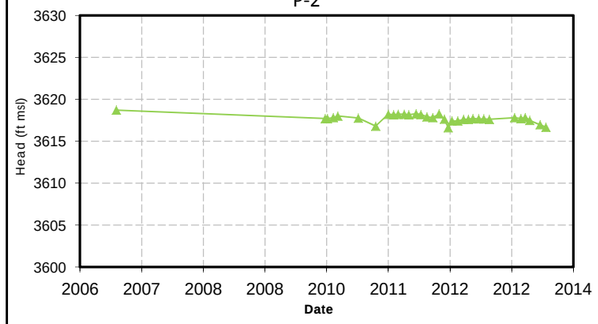


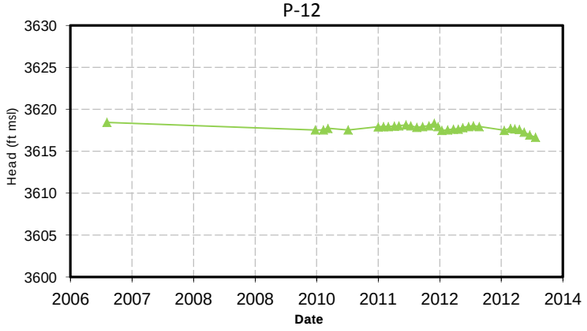


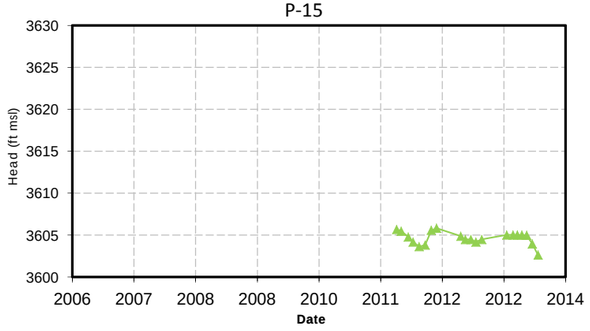


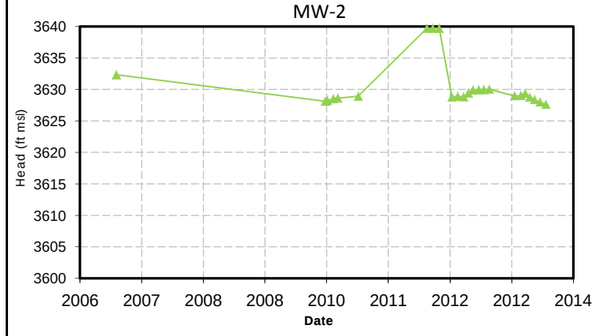


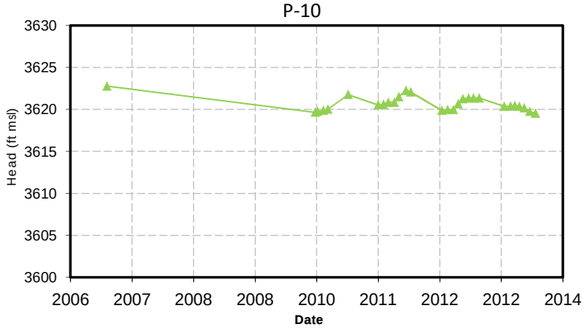


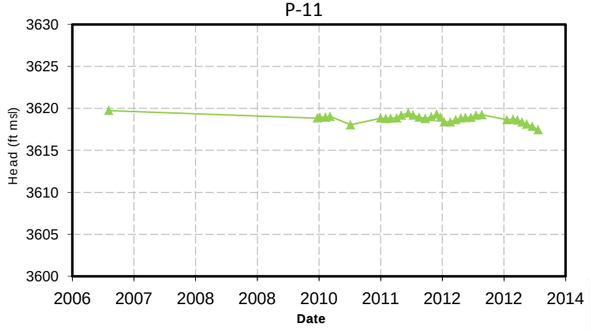


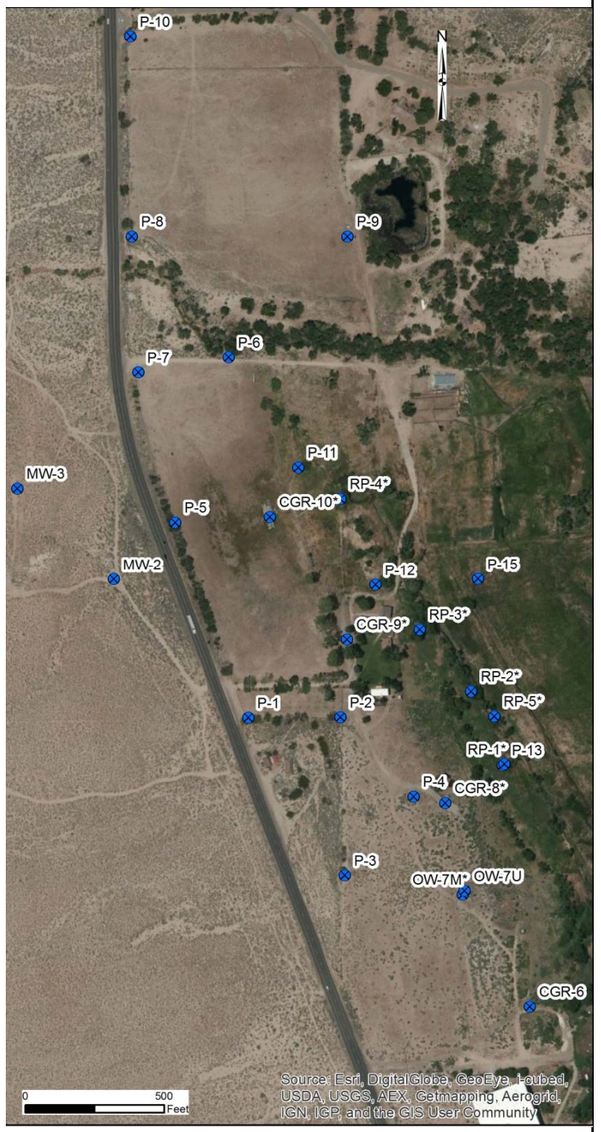












Notes:
* indicates that hydrographs were not available for this well and that the head measured in October 2010 was used for calibration at this well.

OW-7U
Monitoring Well

Hydrographs at Selected Wells

Cabin Bar Ranch
Olancha, California

Geosyntec consultants

Oakland | June 2014

Figure **E-3**

P:\PRJ2003REM\Olancha\GMMRP\Report\Figures\[FigureE3.xlsx]

Legend

- Active Well
- Non-Active Well
- Additional Pumping Well
- Discharge Pond
- HFB (Spring-line Fault)
- Drains (Springs)

N

0 1,500 3,000 Feet

Model Boundaries and Stresses

Cabin Bar Ranch, Olancha, California

Geosyntec consultants

SB0670	June 2014

Figure **E-4**

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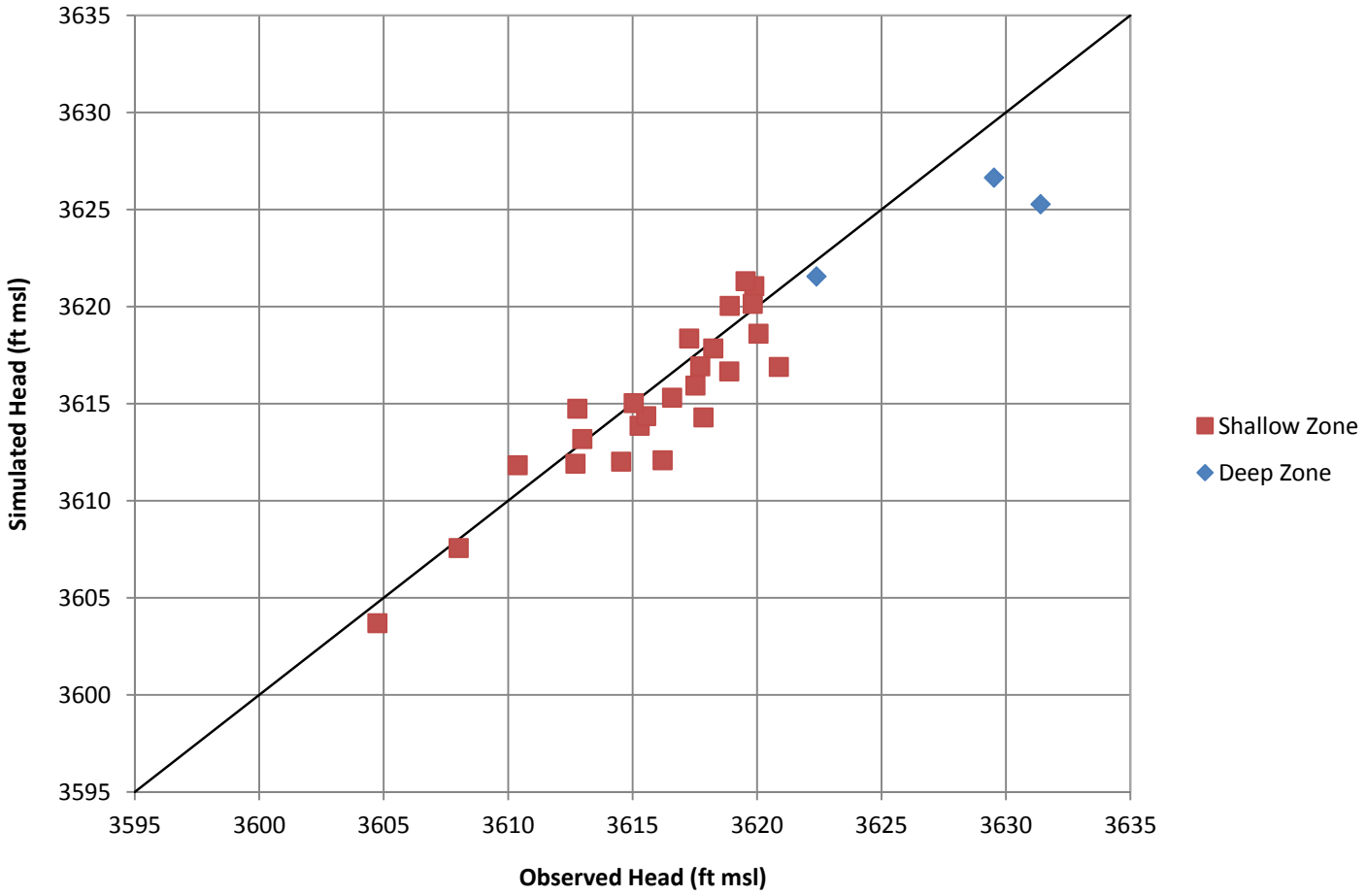

Observed vs. Simulated Heads

Cabin Bar Ranch
Olancha, California

Geosyntec consultants

Oakland, CA | June 2014

Figure E-5

Legend

- Springs
- Calibration Wells
- Calibrated Head Contours (ft msl)

N

0 1,500 3,000 Feet

Calibrated Head Contours in Shallow Zone

Cabin Bar Ranch, Olancha, California

Geosyntec consultants

SB0670 | June 2014

Figure **E-6**

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Legend

- Springs
- Key Monitoring Location
- Key Monitoring Location (to be installed)
- Head Contours Scenario 4 (5 ft)
- Head Contours Scenario 5 (5 ft)

N

0 1,500 3,000 Feet

Simulated Head Contours in Shallow Zone with Scenarios 4 and 5

Cabin Bar Ranch, Olancha, California

Geosyntec consultants

SB0670 | June 2014

Figure E-7

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Legend

- Springs
- Key Monitoring Location
- Key Monitoring Location (to be installed)
- Drawdown Scenario 4 (0.1 ft)
- Drawdown Scenario 5 (0.1 ft)

N

0 1,500 3,000 Feet

Simulated Drawdown in Shallow Zone with Scenarios 4 and 5

Cabin Bar Ranch, Olancha, California

Geosyntec consultants

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Figure **E-8**

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Legend

- Additional Pumping Well
- HFB (Spring-line Fault)
- Springs
- Key Monitoring Location
- Key Monitoring Location (to be installed)
- Simulated Capture Zone

N

0 1,500 3,000 Feet

Simulated Capture Zones for Scenario 5

Cabin Bar Ranch, Olancha, California

Geosyntec consultants

SB0670 | June 2014

Figure **E-9**

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Legend

- Additional Pumping Well
- Simulated Capture Zone
- HFB (Spring-line Fault)
- Springs
- Key Monitoring Location
- Key Monitoring Location (to be installed)

N

0 3,000 Feet

Simulated Capture Zones for Extreme Drawdown Case

Cabin Bar Ranch, Olancha, California

Geosyntec consultants

SB0670	June 2014	Figure E-10

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APPENDIX F

GROUNDWATER GAUGING AND SAMPLING FIELD PLAN

APPENDIX F – FIELD METHODOLOGY
GROUNDWATER LEVEL GAUGING AND SAMPLING

INTRODUCTION

General Information and Objectives

Presented in this appendix is methodology for conducting the groundwater level gauging and sampling work at Cabin Bar Ranch (field plan). The field plan outlines the work to be conducted, field procedures details, and field quality assurance/quality control (QA/QC) methods. The objective of the plan is to insure that the data and samples collected in the field are representative of the site conditions.

The field plan has been divided into five general sections which are as follows:

- Introduction (this section)
- Equipment Cleaning
- Record Keeping
- Groundwater Level Measurement Plan
- Groundwater Sampling Plan

EQUIPMENT CLEANING

Equipment to be used at more than one monitoring point (i.e., non-dedicated) and which will come in contact either with the groundwater directly, or indirectly through contact with other equipment, shall be thoroughly clean prior to use with a non-toxic detergent and then sanitized.

RECORD KEEPING

Maintaining an organized and complete set of records is an integral part of groundwater monitoring procedures. This includes completing field data sheets, maintaining daily field reports, and retaining copies of chain-of-custody forms. Records of past sampling events shall be maintained in a centralized location.

A field data sheet (i.e., groundwater sampling and purge log) shall be filled out completely for each well by the sampling personnel during the course of pre-sampling, sampling, and post-sampling activities. The sampling crew shall also maintain daily field reports. The daily field report sheet shall be used to record general information for each day of sampling. Each daily field report shall contain the following:

- Date;
- Weather and temperature;
- Identification of wells sampled or gauged;
- Names of members of the sampling team;
- Any changes in protocol dictated by field conditions;
- A brief note referring to the field data sheets of wells for which additional information should be noted;
- Calibration and other equipment information; and
- Noteworthy occurrences.

The field data sheets and daily field reports shall be filled out in indelible ink with entry errors crossed out with a single line. Corrections shall be dated and initialed. The field records shall be reviewed for completeness and legibility upon completion of field activities and shall be filed in a reasonably safe location. Chain-of-custody forms will be completed for each shipment of water samples sent to the laboratory.

All sampling logs, daily field reports and chain-of-custody forms will be included in the final report.

GROUNDWATER LEVEL MEASUREMENT PLAN

Groundwater Level Gauging

Continuous groundwater level measurement recorders/instruments (data loggers and transducers) will be installed in accordance with manufacture specifications and downloaded in the field in accordance with the GMMRP. At the time of downloading the data logger systems, depth to groundwater in the monitoring wells (and other GMMRP wells) shall be measured manually using an electric water level indicator.

Groundwater levels in wells without continuous groundwater water level measurement devices shall also be measured with an electric water level indicator.
Groundwater levels in GMMRP monitoring wells shall be determined by measuring the vertical distance from a standard reference point on the well casing to the water level within a groundwater well using the following procedure:

1. Remove the cap from the well.
2. Using a clean electric water level indicator tape, measure the depth to water to the nearest $\pm$0.01 feet (i.e., the meter or water level indicator shall have a sensory accuracy to 0.01 feet).
3. In field logs record the water level depth reading and other pertinent information such as whether any pump in the well is turned on or off.
4. Perform a second water level measurement to verify first measurement (#2). Note verification in field logs.
5. Clean water level indicator tape.

The data logging systems used for the GMMRP will be equipped with vented transducers. The data loggers/transducers shall be installed in the monitoring wells or piezometer so that the transducer is at least 10 feet below the top of groundwater in the well, if possible[1]. A mark on the cords or cables holding the data loggers in the well will be made to indicate the position of the cord/cable relative to the well casing, in order to assure that the loggers (transducers) have not moved in the well.

Depth to groundwater shall be measured in the wells that will be monitored with the data loggers systems at the beginning of the monitoring period in accordance with the procedure outlined above. The initial water level measurements will be used to calculate the groundwater elevation in the monitoring wells. Accurate times and dates will be inputted into the data logging systems before operation and should be synchronized between monitoring locations.

[1] This may not be possible for some piezometers.

GROUNDWATER SAMPLING PLAN

Pre-Sampling Activities

Prior to the start of the sampling event, the following activities shall be performed to prepare for the sampling event:

- The field sampling and laboratory testing program shall be reviewed;
- Field forms will be assembled;
- Sampling and gauging equipment shall be assembled and cleaned.

A description of each of these activities is presented below.

Sampling Equipment and Sampling Forms Organization

Prior to the start of sampling activities, the sampling personnel shall gather the sampling equipment, containers and forms. Equivalent equipment may be used, where applicable. Prior to use, the equipment shall be clean and operational. In summary, the field equipment will include the following:

- A water level meter.
- A submersible pump if dedicated pumps not installed.
- Meter to measure pH, specific conductance (EC), temperature, and turbidity.

.

Purging and Sampling Activities

Monitoring wells will be sampled in accordance with the GMMRP and the following procedures.

- Purging and sampling equipment will be thoroughly cleaned and sanitized prior to and following contact with groundwater.
- Water levels will be measured and purge volumes will be calculated.
- Non-active monitoring wells and piezometers will be purged by pumping out a minimum of 3 well volumes or until stabilization of

water quality parameters (pH, EC, temperature and turbidity). Active water supply wells can be sampled without purging if the well has been pumped within the proceeding 24 hours.

- Water samples will be collected from the discharge hose.
- Samples will be collected in appropriate containers supplied by the laboratory and labeled and transferred to the laboratory under chain-of-custody protocol.

Well Purging

The purpose of well purging is to bring water from the aquifer into the well casing prior to sampling because the water within the well casing may not be representative of the surrounding aquifer. Water purged from the groundwater wells shall be monitored for changes in temperature, pH, specific conductance, and turbidity, with a calibrated field meter.

Prior to commencing purging activities, the depth to water shall be measured and the volume of water to be removed from the well during purging (well depth measurements collected in the initial well gauging task as described below will be used for well volume calculations). Groundwater depth shall be determined by measuring the vertical distance from a standard reference point on the well casing to the nearest $\pm$0.01 ft (0.003 m). If the groundwater conditions at a monitoring point are artesian (i.e., water is under pressure at the top of the well, or flowing from the well) this shall be noted in the field logs.

Once the well depth has been measured, the volume of the water column within the well shall be calculated, using the following equation:

$$V = 0.041 \times d^2 \times H$$

where: V = approximate volume of water in the casing, in gallons;
d = inside diameter of the well casing, in inches;
H = height of the water column in the well, in feet.

Note: $H = TD - D$

where: TD = total well depth from the standard reference point, in feet; and,
D = depth to water level from the standard reference point, in feet.

The minimum purge volume will be calculated by multiplying the volume casing by 3:

Purge Volume = V x 3

During purging water quality parameters shall be measured periodically and recorded in the field during the well purging process to document changes in water quality. Approximately five sets of water quality parameter measurements shall be collected in each well during purging and at regular intervals (approximately every five minutes). Visual observations of the clarity and color of the pump discharge shall also be recorded

Comparison between successive field parameter measurements shall be used to determine when purging is sufficient and sample collection may proceed. In general, purging will continue until all field parameters and visual observations show no significant fluctuations or trends (increasing or decreasing over time). Stabilization of water quality parameters shall be defined as no consistent increasing or decreasing trend among the previous five readings and/or changes among the previous three readings of no more than:

- ±0.2 unit for pH,
- ±5% for specific conductance,
- ±0.5 ^{o}C for temperature,
- ±10% for turbidity, and

The goal of purging will be to show a decrease of turbidity below 5 NTU and stabilization of the water quality parameters. However, this may not be possible in all wells. The total volume purged will not exceed 5 well volumes. The total volume purged and the time will be recorded at the end of each stage of purging.

Groundwater Sampling

The groundwater sample shall be collected immediately following the purging activities. Samples will be collected in accordance with the following guidelines:

- Sample containers shall not be opened until immediately prior to filling;
- The inside of sample containers shall not be touched, including with clean gloves;
- Sampling containers shall be filled slowly;
- Sampling containers shall be filled completely, but not overfilled, as this will result in the loss of preservative;
- Sampling containers shall be filled as expeditiously as possible to minimize the time between filling the first sample container and the last; and,
- Filled sample containers shall be labeled, prepared for transport, and stored in an ice chest or cooler.

Analytical Procedure (EPA Method No.)	**Type of Container**	**Preservative**
Metals (EPA Method 200.7/200.8) or comparable metal suite/methodology	Per recommendation of Laboratory Used	Yes
Physical Constituents		None
General Minerals		None

The general mineral analyses will at a minimum include the major cations (Ca, Mg, Na and K), major anions (Cl, HCO_3, SO_4, nitrate, and alkalinity), EC and Total Dissolved Solids (TDS). Physical constituents shall include odor, turbidity and pH.

Each sample container shall be labeled with a distinct and clearly written label. The field sampling personnel shall complete the information on the sample label at the time of sampling using indelible ink. The information on the sample label shall include:

- Site identification;

- A sample number unique to each well and sampling event;
- Date of sample collection (DD/MM/YY);
- Time of sample collection;
- Sample analytes or test method;
- Type of preservative (generally completed by the laboratory); and,
- Sampler's initials.

A note in the field activity report sheet shall be made to correlate the sample ID number to the well ID number. Labels shall be affixed to a clean and dry surface of the sample bottle and double-checked for completeness. Sampling containers shall be stored properly in an ice chest or cooler to reduce the potential for breakage, spillage, or label deterioration. Sampling containers shall be stored in ice chests immediately following sampling.

The samples shall be maintained in the cooler with ice between the time the samples are collected and the time the samples are analyzed in the laboratory. The presence of solid ice and the temperature of the samples shall be measured and recorded upon receipt by the laboratory. On hot days, the field samplers shall periodically monitor the cooler to remove melted ice water and add ice, as needed, to maintain the acceptable volume of ice.

The coolers containing the groundwater sample containers shall be delivered to the laboratory as soon as possible and within the holding times of the analytical parameters. Each set of samples shall be accompanied by a chain-of-custody form which outlines the contents of the cooler. Information to be included on the chain-of-custody form is described below. The chain-of-custody form shall be completed and signed by the sampler(s) before departing the monitoring point, but after the samples have been packed into the cooler containing ice. The chain-of-custody should be completed with a carrier tracking numbers and/or shipping number. The completed chain-of-custody form shall then be sealed in a Zip-Lock®-type bag and placed in the cooler. Whenever the cooler is exchanged from one person to the other (including couriers and laboratory personnel), the persons relinquishing and receiving the cooler shall sign and date the chain-of-custody form. The laboratory receptionist shall confirm the integrity of the signature upon receipt of the cooler.

Groundwater Sampling QA/QC

A duplicate sample from one well will be collected during each sampling event. The purpose of a duplicate sample is to evaluate the precision of both sampling techniques and laboratory testing. A duplicate sample shall be labeled, packaged, and stored in the same manner as any other sample. A duplicate sample set consists of a complete set of samples of the appropriate volume and in the appropriate containers which is the same as a standard set.

During purging and sampling activities the sampling field data sheets will be completed for each sampling location. The field data sheet will include at a minimum the following information:

- Well identification;
- Condition of well and surface completion;
- Well depth;
- Static water level depth and measurement technique;
- Purge volume and pumping rate;
- Time well purged;
- Water quality parameters and water levels during purging;
- Date and time of collection;
- Well sampling sequence;
- Types of sample bottles used and sample identification numbers;
- Preservatives and pH verification;
- Parameters requested for analysis;
- Field observations of sampling event;
- Name of collector; and
- Climatic conditions, including air temperature.

Completion of chain-of-custody forms is an integral part of record keeping associated with groundwater sampling. For each sample shipment, a new chain-of-custody form shall be filled out to accompany the samples from the wells to the laboratory. The chain-of-custody form shall contain the following information:

- Sample number;
- The name and signature of the sampler;

- Date and time for each sample;
- Sample type;
- Sample point identification;
- Number and types of containers;
- Tests to be performed and/or analytes requested;
- Preservative information;
- Signatures of people involved in the chain of possession with dates and times of possession;
- Tracking and/or shipping number; and
- Other notes or remarks.

APPENDIX G

BASELINE CONDITIONS REPORT – SPRING FAULT LINE AREA

Baseline Conditions of the Spring Fault Area on Cabin Bar Ranch

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March 2014

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Appendix A: Photo-documentation of the Springs along the Spring Fault Line
Appendix B: Fish Survey Memo Report
Appendix C: Benthic Macroinvertebrate Survey Results
Appendix D: Physical Habitat Conditions at the Spring Fault Line Area

Introduction

Garcia and Associates (GANDA) was contracted by CG Roxane to prepare a baseline conditions report for the spring fault area on Cabin Bar Ranch. This report fulfills certain commitments to the Owens Valley Committee and Sierra Club per a settlement agreement reached during 2013 and further serves as a reference point for the Groundwater Monitoring, Mitigation, and Reporting Plan (GMMRP).

In collaboration with the California Department of Fish and Wildlife (CDFW), Dr. Jonathan Baskin of San Marino Environmental Associates ("Marino Associates") and Geosyntec, a baseline survey was conducted of the spring fault area. Surveys for vegetation, fish, benthic macroinvertebrates and spring snails were conducted on July 29 and 30, 2013. Surveys for spring flow rate and physical habitat conditions were conducted on March 18, 2014. The surveys focused on the springs identified as CBS-2, CBS-4, CBS-6 and CBS-9 and the associated 'collector' ditches and channels (Figure 1). Two additional springs, evidencing minimal flow rates, were examined by the survey team due to the fact that they were located within the defined survey area[1]. The purpose of these surveys was to determine baseline conditions for this habitat. Specifically, the surveys had the following objectives:

1. Conduct a focused survey for Owens pupfish (*Cyprinodon radiosus*) and Owens tui chub (*Gila bicolor snyderi*). This effort was led by Steve Parmenter of the CDFW Bishop office and employed 1 night of livetrapping for fish. As part of the survey effort, dissolved oxygen, conductivity and water temperature were recorded.
2. Conduct a focused survey for Wong's springsnail (*Pyrgulopsis wongi*). Snails were sampled by sweeps with a dip net in the vegetation and placed into jars with stream water and kept on ice until returned to the lab. At the lab, the snails were placed in small trays with stream water with menthol crystals added. After several hours the snails were examined to see if they are relaxed. When relaxed, they were preserved in 95% ethanol and sent to Edward Johannes of Deixis Consultants for identification. This effort was be led by Dr. Jonathan Baskin of San Marino Environmental Associates.
3. Conduct aquatic benthic macroinvertebrate sampling focusing on rare invertebrate species. This effort was led by Dr. Jonathan Baskin of San Marino Environmental Associates. At each spring, 20 sweep samples were collected with a 0.5 mm (500 micron) dip net. All samples were elutriated and cleaned in the field, placed in jars, labeled, and preserved in 95% ethanol. Samples were identified by invertebrate taxonomist Robert Wisseman with Aquatic Biology Associates, Inc. in Corvallis, Oregon

[1] Geosyntec identified these two additional springs in its report dated February 7, 2011 entitled *Test Well Installation and Hydrogeology Report, Cabin Bar Ranch, U.S. Highway 395, Olancha, California*.; however, Geosyntec determined that the springs identified as CBS-2, CBS-4, CBS-6 and CBS-9 were representative of the flow and groundwater system along the fault line.

4. Conduct a detailed survey of vegetation arising from, or in the proximity of, the spring fault line habitat. At each of these spring locations a list of plant species was recorded, along with a descriptive summary of the vegetation structure and composition and an estimate of percent vegetation cover. In addition, photographs were taken of each spring. This effort was led by GANDA Botanist Mark Bibbo.
5. Document physical habitat at springs (i.e. depth, width and length of channels and springs and spring flow rate). This effort was led by Geosyntec Hydrologist Brian Franz.

Results of these surveys will serve as baseline conditions to evaluate potential impacts from water extraction. For the vegetation surveys, the number of species and the percent cover data will be the values used to determine if the threshold triggers have been reached. For the faunal survey on benthic macroinvertebrates and Wong's springsnail, the baseline data values documented in this report well serve as a reference for evaluating the health and integrity of the spring fault line. Baseline conditions for these faunal groups will be assessed qualitatively using best professional judgment by a qualified biologist.

Vegetation Survey

GANDA Botanist Mark Bibbo conducted a field survey on July 30, 2013. The focus of this vegetation survey was the 450 meter long by 75 meter wide area (approximately 3.4 hectares or 8.3 acres) around four springs located along the Spring Line Fault on Cabin Bar Ranch property and the main collector ditch (Figure 1). The goal of the survey was to describe the vegetation species composition and structure of plant communities around each spring as well as the main collector ditch. The springs are described in order from northernmost to southernmost, and are referred to using a numbering system instituted by CG Roxane.

Methods

Each spring had a small flume near its origin, installed by CG Roxane to record spring flow. At each spring location, the vegetation was characterized by recording percent cover of individual species within a 28.3 m^2 circular plot (3 meter radius) with the spring flume as the center point. Vegetation cover was recorded as a visual estimate of foliar cover, recorded by species. Cover values were recorded as cover classes using the Daubenmire cover scale (Mueller-Dombois and Ellenberg 1974[2]): 95 to 100% foliar cover equaled cover class 6, 75 to 95% foliar cover equaled cover class 5, etc. The cover class ranges are provided in Tables 1-4. Other species outside of the plot, but still within the riparian zone around the springs were also noted. Descriptions of each spring are provided below. Appendix A provides photo-documentation of the condition at each spring as well as the main collector ditch.

CBS-9

CBS-9 is the northernmost spring. The spring originates from the ground under a cover of red willow (*Salix laevigata*). The spring flume is located at the edge of a red willow thicket (Photo 1 in Appendix A). From the flume, the water flows through a small hand-dug ditch fifteen centimeters wide into the main collector ditch approximately fifteen meters to the east. Vegetation surrounding the hand-dug ditch is dominated by herbaceous species such as American bulrush, water smartweed, and cut-leaved speedwell. A full list of plant species observed around CBS-9 is presented in Table 1 with vegetative cover given for those species within a 28.3 m^2 circular plot around the spring flume.

Table 1: Vegetation at spring, CBS-9

Scientific name	Common name	Cover class within plot*
Tree cover		3
Salix laevigata	red willow	3
Herb cover		4
Schoenoplectus americanus	American bulrush	3

[2] Mueller-Dombois, D. & Ellenberg, H. 1974. Aims and Methods of Vegetation Ecology. New York: Wiley and Sons.

Table 1: Vegetation at spring, CBS-9		
Scientific name	**Common name**	**Cover class within plot***
Persicaria lapathifolium	water smartweed	2
Berula erecta	cut-leaf water parsnip	2
Veronica serpyllifolia var. *humifusa*	thyme-leaved speedwell	2
Mimulus guttatus	seep-spring monkeyflower	2
Nasturium officinale	Watercress	1
Phragmites australis	common reed	1
Typha latifolia	broadleaf cattail	1
Asclepias fascicularis	narrow-leaved milkweed	1
Sonchus asper	prickly sow thistle	1
Cirsium arvense	bull thistle	1
Ludwigia peploides	floating water primrose	1
Anemposis californica	yerba mansa	1
Other species outside of plot		
Rumex crispus	curly dock	-
Apocynum cannabinum	indian hemp	-
Epilobium ciliatum	willow herb	-
Carex praegracilis	slender sedge	-
Juncus balticus	Baltic rush	-
Euthamia occidentalis	Western goldentop	-
Total Vegetation Cover		5

*Foliar cover is recorded as a cover class using Daubenmire cover classes (Mueller-Dombois & Ellenberg 1974).

Cover class	Range of Cover
6	95-100
5	75-95
4	50-75
3	25-50
2	5-25
1	0-5

CBS-6

The spring, CBS-6, originates in a sump pond that is located in the shade of a mature red willow (see Photo 2, in Appendix A). The pond is approximately two and a half meters in diameter and five square meters in area, and approximately 40-50 cm deep with a soft muck bottom. The spring flume is directly adjacent to the pond. From the flume the water flows into the main collector ditch approximately eleven meters to the east through a small hand dug ditch fifteen inches wide. Vegetation surrounding the hand-dug ditch is dominated by herbaceous species such as willow herb, common reed, western goldentop and water smartweed. A full list of plant species around CBS-6 is presented in Table 2, with vegetative cover given for those species within a 28.3 m^2 circular plot around the spring flume.

Table 2: Vegetation at spring, CBS-6		
Scientific name	**Common name**	**Cover class within plot***
Tree cover		3
Salix laevigata	red willow	3
Eleaganus angustifolia	Russian olive	1
Shrub cover		2
Rosa woodsii	Wood rose	2
Herb cover		5
Euthamia occidentalis	Western goldentop	3
Epilobium ciliatum	willow herb	3
Phragmites australis	common reed	2
Persicaria lapathifolium	water smartweed	2
Mentha arvensis	field mint	2
Carex praegracilis	slender sedge	1
Anemposis californica	yerba mansa	1
Equisetum arvense	common horsetail	1
Lotus corniculatus	Bird's foot trefoil	1
Schoenoplectus americanus	American bulrush	1
Mimulus guttatus	seep-spring monkeyflower	1
Other species outside of plot		
Berula erecta	cut-leaf water parsnip	-
Veronica serpyllifolia var. *humifusa*	thyme-leaved speedwell	-
Nasturium officinale	watercress	-
Cirsium arvense	bull thistle	-
Ludwigia peploides	floating water primrose	-
Total Vegetation cover		6

*Foliar cover is recorded as a cover class using Daubenmire cover classes (Mueller-Dombois & Ellenberg 1974).

Cover class	Range of Cover
6	95-100
5	75-95
4	50-75
3	25-50
2	5-25
1	0-5

CBS-2

The spring, CBS-2, originates under a dense stand of common reed. The spring flume is surrounded by cement bags and was installed in a clearing in the reed cover (see Photo 4, in Appendix A). This spring was producing very minimal flow at the time of the July 30, 2013 survey and flows from the flume through a 30 cm wide hand-dug feeder ditch approximately three meters to the main collector ditch. Vegetation surrounding the hand-dug ditch is dominated by herbaceous species such as common reed, water parsnip, water smartweed, and willow herb. A full list of plant species around CBS-2 is presented in Table 3, with vegetative cover given for those species within a 28.3 m^2 circular plot around the spring flume.

Table 3: Vegetation at spring, CBS-2		
Scientific name	**Common name**	**Cover class within plot***
Tree cover		3
Salix laevigata	red willow	3
Eleaganus angustifolia	Russian olive	1
Shrub cover		2
Rosa woodsii	Wood rose	2
Salix exigua	sandbar willow	1
Fraxinus velutina	velvet ash	1
Herb cover		5
Phragmites australis	common reed	3
Berula erecta	cut-leaf water parsnip	3
Epilobium ciliatum	willow herb	2
Persicaria lapathifolium	water smartweed	2
Mentha arvensis	field mint	1
Anemposis californica	yerba mansa	1
Equisetum arvense	common horsetail	1
Schoenoplectus americanus	American bulrush	1
Cirsium arvense	bull thistle	1
Mimulus guttatus	seep-spring monkeyflower	1
Other species outside of plot		
Veronica serpyllifolia var. *humifusa*	thyme-leaved speedwell	-
Nasturium officinale	watercress	-
Total Vegetation cover		5

*Foliar cover is recorded as a cover class using Daubenmire cover classes (Mueller-Dombois & Ellenberg 1974).

Cover class	Range of Cover
6	95-100
5	75-95
4	50-75
3	25-50
2	5-25
1	0-5

CBS-4

The spring, CBS-4, originates under a dense stand of American bulrush behind the spring flume. The spring flume is surrounded by cement bags and was installed in a clearing in the bulrush cover (see Photo 5, in Appendix A). This spring was producing very minimal flow at the time of the July 30, 2013 survey and flows from the flume through a 30 cm wide hand-dug feeder ditch approximately four meters to the main collector ditch. Vegetation surrounding the hand-dug ditch is dominated by herbaceous species such as American bulrush, water parsnip, goldenrod, and willow herb. A full list of plant species around CBS-2 is presented in Table 3, with vegetative

cover given for those species within a 28.3 m^2 circular plot around the spring flume.

Table 4: Vegetation at spring, CBS-4

Scientific name	Common name	Cover class within plot*
Tree cover		3
Salix laevigata	red willow	3
Fraxinus velutina	velvet ash	1
Shrub cover		2
Rosa woodsii	Wood rose	2
Herb cover		5
Schoenoplectus americanus	American bulrush	3
Phragmites australis	common reed	2
Solidago lepida	Western Canada goldenrod	2
Berula erecta	cut-leaf water parsnip	2
Epilobium ciliatum	willow herb	2
Persicaria lapathifolium	water smartweed	1
Mentha arvensis	field mint	1
Equisetum arvense	common horsetail	1
Typha angustifolia	narrowleaf cattail	1
Mimulus guttatus	seep-spring monkeyflower	1
Other species outside of plot		
Anemposis californica	yerba mansa	-
Veronica serpyllifolia var. *humifusa*	thyme-leaved speedwell	-
Total Vegetation cover		5

*Foliar cover is recorded as a cover class using Daubenmire cover classes (Mueller-Dombois & Ellenberg 1974).

Cover class	Range of Cover
6	95-100
5	75-95
4	50-75
3	25-50
2	5-25
1	0-5

Main Collector Ditch

The "Main Collector Ditch" runs in a northwesterly to southeasterly orientation to the east of the springs along the Spring Line Fault. When originally dug (perhaps in the 1980's), the ditch was likely excavated to a width of approximately 2.5 meters wide and 2.5 meters deep. The exact current width of the ditch was difficult to measure as a result of the willow and reed vegetation that had grown over the banks and within the ditch. For most of the length of the ditch within the survey area, the ditch has standing water along its length averaging 1 meter deep. Dense vegetation cover on the banks and tops of the ditch is dominated by common reed, American bulrush, and

cattails, with scattered red willow and Russian olive growing throughout the length of the ditch. The dense vegetation is growing into the ditch and forms a nearly continuous cover over the water surface in the ditch for most of its length. Photo 6 in Appendix A provides an illustration of a typical segment of the main collector ditch.

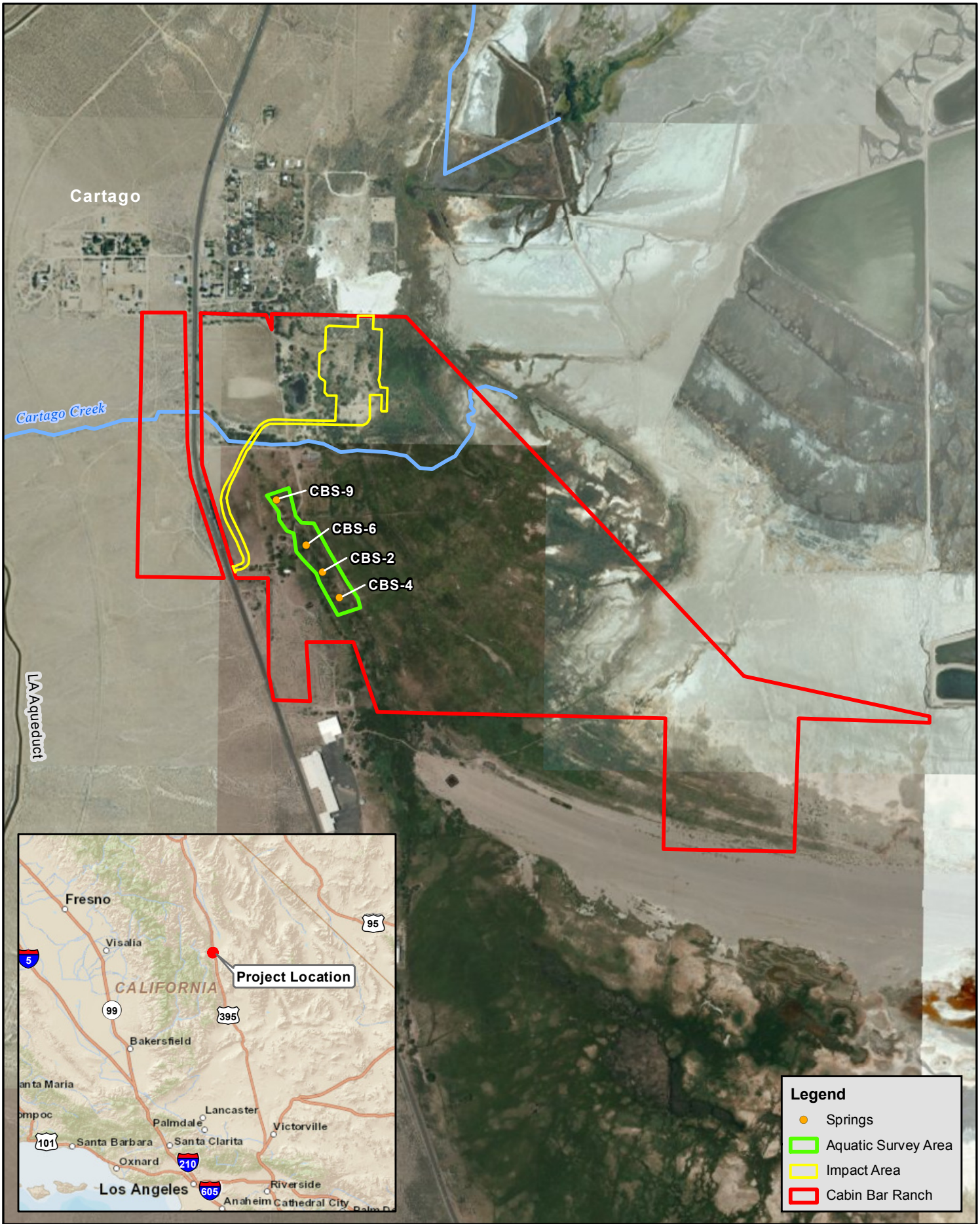

Figure 1.
Aquatic Survey Area

Inyo County, CA

Fish Surveys

On July 29, 2013, the California Department of Fish and Wildlife (CDFW) conducted a focused survey for Owens pupfish (*Cyprinodon radiosus*) and Owens tui chub (*Siphates bicolor snyderi*) in aquatic habitats on Cabin Bar Ranch. The CDFW survey team consisted of Steve Parmenter, Heidi Sickler, Nick Buckmaster, and Veronica Holmes. Aquatic habitats surveyed included Cabin Bar Spring CBS-9, CBS-6, CBS-2, and CBS-4, the main collector ditch for these springs, two additional springs, and three artificial ponds at the north end of the property. The complete memo report from CDFW presenting survey results is provided in Appendix B.

There are no historic records of Owens pupfish in the survey area. Owens tui chubs were discovered on the property in 1987, along with recently introduced game fish species. Twenty-one adult tui chubs were salvaged from ditches and irrigation distributaries on the property in 1989-90 and placed in the northernmost artificial pond near the guest house. Tui chubs were last observed in the pond in 2002. A survey in 2003 found the pond stagnant and devoid of both fish and sufficient oxygen to support such fish due to inadequate provision of water.

All of the springs on Cabin Bar Ranch, as well as the three artificial ponds, were visually inspected for fish. The collector ditch was surveyed using Gee traps. Backpack electrofishing was impractical in all habitats due to shallow water depths and mucky substrate. A total of 12 Gee traps were set overnight on July 29, 2013 at three areas in the main collector ditch chosen non-randomly where water depth was sufficient to submerge the trap entrances. A total of 12 bullfrogs (*Lithobates catesbeianus*), 69 red swamp crayfish (*Procambarus clarki*), and 10 western mosquitofish (*Gambusia affinis*) were caught. Based upon the trap results, nature of the habitat, and the visual impression of the surveyors, Steve Parmenter concluded that neither Owens pupfish nor Owens tui chub were present in the survey area. This conclusion is further supported by a >20 year occupation of the habitat by largemouth bass, which by 1990 appeared to have eliminated tui chubs. It is notable, however, that there was no evidence of introduced game fish remaining in the main collector ditch during the survey.

Benthic Macroinvertebrate Surveys

Dr. Jonathan Baskin of San Marino Environmental Associates was contracted to conduct benthic macroinvertebrate surveys of the spring fault line area on Cabin Bar Ranch. The focus of the survey was to determine the types of species groups with an emphasis on determining if any rare or sensitive species were present. The survey also focused on determining presence of spring snails, and in particular Wong's springsnail (*Pyrgulopsis wongi*), which serve as an indicator species for purposes of determining a baseline condition. Surveys were conducted on July 29, 2013 in conjunction with fish surveys conducted by CDFW. The survey methodology included the sampling of four springs (CBS-2, CBS-4, CBS-6, and CBS-9) using a 500 micron mesh dip net. At each spring a total of 20 sweep samples were collected with the dip net. All samples were elutriated and cleaned in the field, placed in jars, labeled, and preserved in 95% ethanol. Samples were processed by Robert Wisseman, a qualified invertebrate taxonomist with Aquatic Biology Associates, Inc. (Table 1, Appendix C). In addition, all mollusk samples, including spring snails, were processed by Edward Johannes (Deixis Consultants) and identified to the genus level (Table 2, Appendix C). Wong's springsnail was found present in CBS-2, CBS-4, CBS-9, and Additional Spring Site #1 (CBS-1). Results of the survey are presented in Appendix C.

Physical Habitat Conditions

On March 18, 2014, Geosyntec Hydrologist Brian Franz surveyed the Spring Fault Line area on the Cabin Bar Ranch. Springs observations and flow measurements were completed at the four representative spring locations (CBS-2, CBS-4, CBS-6, and CBS-9) where 1-inch Baski cutthroat flumes have been installed. Spring observations included measurement of channel length, width, depth, and flow rate (gauge measurements). These observations are summarized in table 5 below. Channel lengths are generally measured from the base of the spring to the edge of the main collector ditch. Flow rates were measured by reading the front and back gauges installed in the flumes.

Table 5. Physical Habitat Conditions at Cabin Bar Ranch Springs (CBS-2, 4, 6, 9)

Spring/Flume	Front Gauge (ft)	Back Gauge (ft)	Flow rate (gpm)	Channel Length (ft.)	Channel Depth (inches)	Channel Width (inches)
CBS-2	0.02	0.01	0.09	13	½	8
CBS-4	0.04	0.01	0.36	19	1 ½	8
CBS-6	0.2	0.02	9	76	2 ½	12
CBS-9	0.14	0.02	4.4	85	3	16

The following observations were recorded at each spring location:

CBS-2
CBS-2 is located adjacent to the main collector ditch and originates in an area of vegetation. The spring water flows approximately 13 feet before joining with the main collection ditch. The channel width is approximately 8-inches wide by ½-inch deep. The flow rate was measured at approximately 0.09 gpm.

CBS-4
CBS-4 originates in a broad area of vegetation located directly behind the spring flume. The channel is approximately 19 feet long from the edge of the vegetation to the main collection ditch. The channel is 8-inches wide by 1½ - inches deep. The flow rate was measured at approximately 0.36 gpm.

CBS-6
CBS-6 is located adjacent to the horse stables at the caretaker residence. The spring forms an imperfect 12 by 12 foot pond located beneath a large willow tree and spring water flows 76 feet down a 1 foot wide by 2½ -inch deep channel to the collector ditch. The flow rate was measured at 9.0 gpm.

CBS-9
CBS-9 is the northernmost spring on the Cabin Bar Ranch. The spring originates in a broad crescent shaped pool with dimensions of approximately 10 by 16 feet. The spring is located at the base of a red willow. The channel is approximately 85 feet long with a channel width and depth of 16-inches and 3-inches, respectively. The flow rate was measured at 4.4 gpm.

Appendix A: Photo-documentation of the Springs along the Spring Line Fault

Photo 1: CBS–9 – the spring water originates beneath the large red willow in the center of the photo. Water flows through a thirty cm wide hand-dug ditch for a distance of fifteen meters to the main collector ditch.

Photo 2: CBS-6 - the spring daylights into a small pond (2.5 m in diameter, 5 square meters in area) at the base of a large red willow. The water then flows through the flume, then 11 meters along a small hand-dug feeder ditch to the main collector ditch.

Photo 3: CBS-6 – The spring shown in the previous picture is just off to the right. Photo shows the feeder ditch carrying water from the flume (at the stake) 11 meters to the main collector ditch (out of the image frame to the left).

Photo 4: CBS 2 – The spring originates underneath dense common reed just to the right of the flume (surrounded by cement bags) in the center of the photo. This spring was producing very minimal flow at the time of the July 30, 2013 survey and flowed through a 30 cm wide hand-dug feeder ditch three meters to the main collector ditch.

Photo 5: CBS 4 - The spring originates underneath dense American bulrush behind the flume (surrounded by cement bags in the center of the photo). This spring was producing very minimal flow at the time of the July 30, 2013 survey and flowed through a 30 cm wide hand-dug feeder ditch four meters to the main collector ditch (behind and to the left of the photographer).

Photo 6: Main Collector Ditch – The ditch runs in a northwesterly to southeasterly orientation to the east of the springs along the Spring Line Fault. The ditch averages 2.5 meters wide and has standing water along its length averaging 1 meter deep. Average vegetation cover on the banks and tops of the ditch is 90 per cent. Vegetation (predominantly common reed, bulrush, cattails, with scattered red willow and Russian olive) is growing into the water within the ditch and covering the water surface.

Appendix B: Fish Survey Memo Report

State of California
Department of Fish and Wildlife

Memorandum

Date: February 18, 2014

To: Inland Deserts Region Files
Department of Fish and Wildlife

From: Steve Parmenter
Senior Environmental Scientist Specialist

Subject: Fish Survey Cabin Bar Ranch on July 29, 2013

Introduction

On July 29, 2013 the California Department of Fish and Wildlife (CDFW) conducted a focused survey for Owens pupfish (*Cyprinodon radiosus*) and Owens tui chub (*Siphateles bicolor snyderi*), in cooperation with CG Roxane. The work was done as part of more general surveys of the spring fault line. See attached memo (July 26, 2013 from Joseph Drennan/Garcia and Associates) for general objectives and location map. The CDFW crew consisted of Steve Parmenter, Heidi Sickler, Nick Buckmaster, and Veronica Holmes. We were shown the study area by Mr. George Casteñeda from Crystal Geyser, and accompanied by Dr. Jonathan Baskin/San Merino Associates who was there to sample invertebrates. The weather was clear and slightly breezy with a maximum air temperature of 37°C.

No records of Owens pupfish exist for the site. Owens tui chubs were discovered on the property in 1987, along with recently introduced game fishes. Twenty-one adult tui chubs were salvaged from ditches and irrigation distributaries on the property in 1989-90, and placed in the northernmost pond near the guest house. These tui chubs were last observed in 2002. Resurvey of the same site in 2003 found the pond stagnant and devoid of both fish and oxygen due to inadequate provision of water. On a subsequent visit in 2010 I observed one largemouth bass in the southern end of the collector ditch. This 2013 survey was undertaken to investigate if either pupfish or tui chubs still inhabit the property.

Description of Aquatic Habitat

Four springs named Cabin Bar Spring (CBS) 9, CBS 6, CBS 2, and CBS 4 occur in a linear arrangement from north to south, apparently along the fault line. Beginning near CBS-9, a historic collector ditch flows south, closely passing to the east of each spring. The collector ditch captured water from all the springs, did not appear to have any turn-outs in use for irrigation, and appeared unmaintained. Each spring brook flowing from the four springs named above had vegetation mowed along much of the area between spring head and collector ditch. Two unnamed, less "manicured" springs were discovered on the property; one located south of CBS 4 and north of the horse pasture, and the other between CBS 9 and CBS 2. This latter spring appeared to host abundant spring snails (as suggested by size and shell morphology). Each of

the springs and spring brooks were visually inspected, and none appeared to host fish.

A second contouring ditch, roughly parallel to and 50 meters east of the collector ditch and all irrigation distributaries were dry, as was Cartago Creek where is passes across the property.

Three artificial ponds are located in the north of the property, supplied by a well. The two smaller northernmost ponds were full of water and free of cattails. A third, larger pond was over 50% encroached by cattails, and almost completely dry. No fish were seen in the ponds, and they were not trapped.

Water Quality

	CBS 9	CBS 6	CBS 2	CBS 4
time	11:55	12:37	14:24	15:00
Water temperature (°C)	18.1	19.7	21.4	20.6
dissolved O_2 (mg/l)	0.8	1.0	4.7	1.7
conductivity (µS/cm)	70	90	120	140
pH	6 ½	6 ½	6 ½	6 ½
alkalinity (mg/L)	51	34	34	51
clarity and color	Clear	Clear	Clear	Clear
UTM Zone 11S	0408061 E 4019213 N	04018141 E 4019064 N	0408189 E 4019002 N	0408236 E 4018929 N

Fish Sampling

None of the habitats were conducive to backpack electrofishing due to their shallow depth and mucky substrate. A total of twelve Gee® traps were set overnight at three areas in the collector ditch chosen non-randomly where water depth was sufficient to submerge the trap entrances. A total of 12 bullfrogs (*Lithobates catesbeianus*), 69 red swamp crayfish (*Procambarus clarki*) and 10 western mosquitofish (*Gambusia affinis)* were caught. Based upon the trap results, nature of the habitat, and my visual impression, I conclude neither Owens pupfish nor Owens tui chub were present on-site. This conclusion is strengthened by the 20+ year history of occupation by largemouth bass, which by 1990 appeared to have eliminated tui chubs. Of further interest, there was no evidence of introduced game fish remaining in the main collector ditch today.

Appendix C: Benthic Macroinvertebrate Survey Results

Table 1. Benthic Macroinvertebrates collected from Cabin Bar Ranch springs, Owens Valley, CA, July 29, 2013

Qualitative dip-net samples, 500 micron mesh
For San Marino Environmental Associates, Jonathan Baskin, jnbaskin@pacbell.net
Determined by Aquatic Biology Associates, Inc., Corvallis, OR, Robert Wisseman, bob@aquaticbio.com

	Spring name							
Taxon	**CBS-2**	**CBS-4**	**CBS-6**	**CBS-9**	**Common name**	**Higher classification**	**Family**	**Comments**
Turbellaria		1		6	flat worms	Turbellaria		common, generally tolerant
Nemata				1	round worms	Nemata		common, generally tolerant
Oligochaeta	1	4		14	segmented worms	Annelida		common, generally tolerant
Sphaeriidae	2	2	2	259	fingernail clams	Mollusca: Gastropoda	Sphaeriidae	common, generally tolerant
Hydrobiidae		**418**		**1**	**spring snails**	**Mollusca: Gastropoda**	**Hydrobiidae**	**potential T & E taxa; CBS9 had 1 juvenile**
Physa	3			70	pond snails	Mollusca: Gastropoda	Physidae	common, tolerant
Menetus				23	ramshorn snails	Mollusca: Gastropoda	Planorbidae	common, tolerant
Ostracoda		1		8	seed shrimps	Crustacea: Ostracoda		common, generally tolerant
Hyalella				5	scuds	Crustacea: Amphipoda	Talitridae	common, tolerant
Procambarus clarkii			2		crayfish	Custacea: Decapoda	Cambaridae	invasive-introduced species
Acari				1	water mites	Araneae		common
Aeshnidae			1		dragonflies	Insecta: Odonata	Aeshnidae	common, tolerant
Argia			1	2	damselflies	Insecta: Odonata	Coenagrionidae	common, tolerant
Microvelia		2		1	broad shouldered water striders	Insecta: Hemiptera	Veliidae	common, water surface taxa
Hydroptila		1			caddisflies	Insecta: Trichoptera	Hydroptilidae	common, tolerant
Oxyethira				2	caddisflies	Insecta: Trichoptera	Hydroptilidae	common, tolerant
Dytiscidae		117	2	156	predaceous diving beetles	Insecta: Coleoptera	Dytiscidae	common, tolerant
Hydraenidae		1		1	minute moss beetles	Insecta: Coleoptera	Hydraenidae	common
Hydrophilidae		21		5	water scavenger beetles	Insecta: Coleoptera	Hydrophilidae	common, tolerant
Ceratopogoninae	3				no-see-um midges	Insecta: Diptera	Ceratopogonidae	common, tolerant
Dasyhelea				1	no-see-um midges	Insecta: Diptera	Ceratopogonidae	common, tolerant
Chironomidae	1	1	7	13	midges	Insecta: Diptera	Chironomidae	common, generally tolerant
Culicidae			3		mosquitoes	Insecta: Diptera	Culicidae	common, generally tolerant
Dixella	1				dixid midges	Insecta: Diptera	Dixidae	common, tolerant
Ptychoptera	1				phantom crane flies	Insecta: Diptera	Ptychopteridae	common, tolerant
Sciomyzidae				1	marsh flies	Insecta: Diptera	Sciomyzidae	common, tolerant
Caloparyphus		2			soldier flies	Insecta: Diptera	Stratiomyiidae	common, tolerant

Table 2. Mollusks found at spring sites.

	SITES			
TAXON	CBS2	CBS4	CBS9	Extra Spr. Site #1
All UTM Coordinates in Zone 11 NAD 83	0408185E, 4019000N	0408234E, 4018924N	0408063E, 4019219N	0408160E, 4019050N
Pyrgulopsis wongi Hershler, 1989 (Wong's spring snail)	85	4	5	102
Physella sp. (Pond snails; juveniles)			4	
Pisidium sp. (fingernail clams)	1		3	7

Appendix D: Physical Habitat Conditions at the Spring Fault Line Area

Geosyntec consultants

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Technical Memorandum

Date: March 23, 2014

To: Joe Drennan
Garcia & Associates

From: Jeffrey Zukin and Brian Franz - Geosyntec

Subject: March 18, 2014 Spring Observations – Cabin Bar Ranch

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This Technical Memorandum summarizes spring observations collected at the Cabin Bar Ranch on March 18, 2014. The Cabin Bar Ranch is located on South Highway 395 in Cartago California. Springs observations and flow measurements were completed at four spring locations (CBS-2, CBS-4, CBS-6, and CBS-9) where 1-inch Baski cutthroat flumes have been installed. **Photographs 1 through 4** show the surveyed springs and channels.

Spring observations include measurement of channel length, width, depth, and flow rate (gauge measurements). These observations are summarized in the inserted table below. Channel lengths are generally measured from the base of the spring to the edge of the main collector ditch. Flow rates were measured by reading the front and back gauges installed in the flumes.

Spring/Flume	Front Gauge (ft)	Back Gauge (ft)	Flow rate (gpm)	Channel Length (Ft.)	Channel Depth (inches)	Channel Width (inches)
CBS-2	0.02	0.01	0.09	13	½	8
CBS-4	0.04	0.01	0.36	19	1 ½	8
CBS-6	0.2	0.02	9	76	2 ½	12
CBS-9	0.14	0.02	4.4	85	3	16

gpm: gallons per minute
ft.: feet
flow rate (gpm) = $225 * H^2$ where H is the upstream gauge reading in feet

The following are observations made at each of the four spring locations:

CBS-2
CBS-2 is located adjacent to the main collector ditch and originates in an area of vegetation. The spring water flows approximately 13 feet before joining with the main collection ditch. The channel width is approximately 8-inches wide by ½-inch deep. The flow rate was measured at approximately 0.09 gpm.

CBS-4
CBS-4 originates in a broad area of vegetation located directly behind the spring flume. The channel is approximately 19 feet long from the edge of the vegetation to the main collection ditch. The channel is 8-inches wide by 1½ - inches deep. The flow rate was measured at approximately 0.36 gpm.

CBS-6
CBS-6 is located adjacent to the horse stables at the caretaker residence. The spring forms an imperfect 12 by 12 foot pond located beneath a large willow tree and spring water flows 76 feet down a 1 foot wide by 2½ -inch deep channel to the collector ditch. The flow rate was measured at 9.0 gpm.

CBS-9
CBS-9 is the northernmost spring on the Cabin Bar Ranch. The spring originates in a broad crescent shaped pool with dimensions of approximately 10 by 16 feet. The spring is located at the base of a red willow. The channel is approximately 85 feet long with a channel width and depth of 16-inches and 3-inches, respectively. The flow rate was measured at 4.4 gpm.

Photograph 1: Image shows CBS-2 spring channel entering main collection ditch below spring flume.

Photograph 2: Looking east from CBS-4. Flume shown at the bottom of the photograph. A narrow channel drains into the main collection ditch.

Photograph 3: Looking south at Spring CBS-6. Spring originates at the base of a mature willow tree. Flume is located approximately 30 feet east of pool.

Photograph 4: CBS-9 flume shown with spring originating under dense vegetation. Spring area located 19 feet above flume.