Central Valley Dairy Representative Monitoring Program

Year 2 Annual Report (2013)
April 1, 2014
Part III of VI

LUHDORFF & SCALMANINI
CONSULTING ENGINEERS

Attachment B1

Well Installation Reports – Pre-Existing Monitoring Wells

AUK

GROUNDWATER MONITORING PROGRAM
GROUNDWATER MONITORING REPORT
2010

Prepared for

AUKEMAN FARMS

TULARE COUNTY

Site Address:
17297 Road 96
Tulare County, CA

Mailing Address:
Mr. Bob Aukeman
17781 Road 96
Tulare County, CA 93274

June 2011

PROFESSIONAL GEOLOGIST
LINDA
GOMEZ SLOAN
No. 8299
Expires 1-31-12
STATE OF CALIFORNIA

CERTIFIED HYDROGEOLOGIST
LINDA
GOMEZ SLOAN
No. 930
STATE OF CALIFORNIA

Date Signed 6-8-11

EST. 1968
PROVOST& PRITCHARD
CONSULTING GROUP
An Employee Owned Company

Prepared by
Jon Vander Schuur, REHS

Reviewed by
Linda Gomez Sloan, PG, CHG

130 N. Garden Street
Visalia, CA 93291
Phone: (559) 636-1166
Fax: (559) 636-1177
www.ppeng.com

3301-07V1-GMP

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Laboratory Analytical Reports, Chain-of-Custody Documentation, and Monitoring Well Purging and Sampling Records

I. INTRODUCTION

The following is the 2010 Groundwater Monitoring Report for Aukeman Farms located at 17297 Road 96, Tulare County, California. The site is located west of Road 96, between Avenue 160 and Avenue 184, approximately three miles west of California State Highway 99 on Avenue 160 and approximately 3.5 miles northwest of the town of Tipton. The dairy site is within Sections 15 and 16, Township 21 South, Range 24 East, Mount Diablo Baseline and Meridian.

II. GROUNDWATER SAMPLING AND MEASUREMENT DATA

A. Monitoring Well Sampling Procedures

Groundwater monitoring wells MW-1, MW-2, and MW-3 were sampled by Provost & Pritchard Consulting Group personnel on March 15 and October 5, 2010. Static water level measurements were taken from the top of each PVC casing and recorded to the nearest 0.01 foot with respect to the established casing elevation. Each monitoring well was purged a minimum of three well volumes. Purged water was monitored for pH, electrical conductivity (**EC**), and temperature.

Each monitoring well is equipped with a dedicated Waterra inertia pump and Waterra tubing. The use of dedicated sampling equipment prevents cross-contamination between samples and eliminates the need for field decontamination of the equipment. All sample containers were sterilized and transported to the field under conditions to preserve their sterility.

Groundwater samples collected from monitoring wells were placed into laboratory prepared containers, sealed with tight fitting caps, labeled, and stored in a cool ice chest while awaiting delivery to Dellavalle Laboratory, Inc., a California-certified Environmental Laboratory Accreditation Program (**ELAP**) laboratory in Fresno, California. The samples were analyzed for EC, nitrate as nitrogen (**NO_3-N**), and ammonium as nitrogen (**NH_4-N**).

B. Potentiometric Groundwater Surface Map

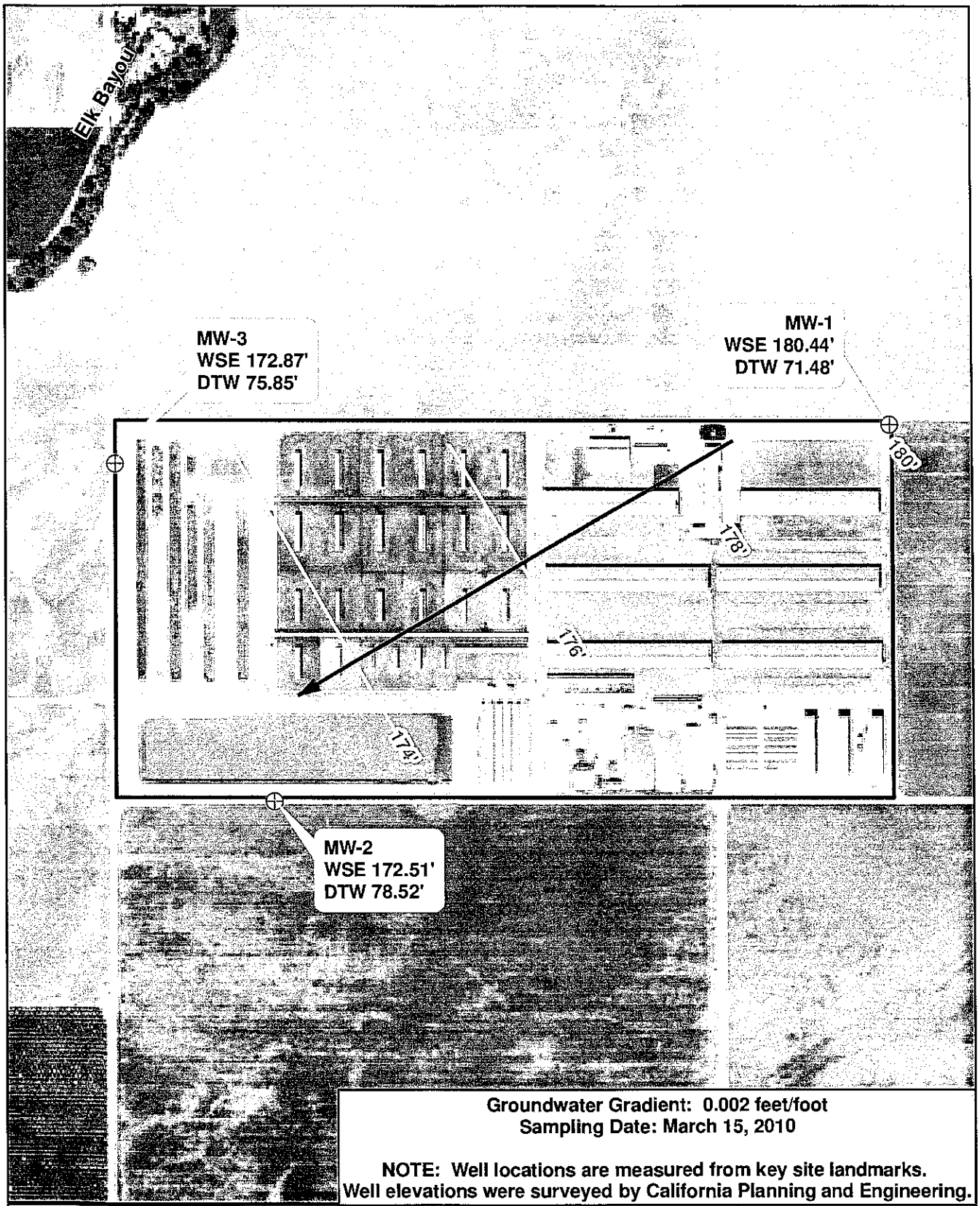
A Potentiometric Groundwater Surface Map, based on available information, was prepared for each sampling event. Well locations, depth to groundwater, groundwater elevations, potentiometric groundwater surface gradient, and groundwater flow direction for each event are illustrated in **Appendix A**: Figures 1 and 2.

III. GROUNDWATER QUALITY SUMMARY

A tabulated historical summary of the monitoring well groundwater measurements and water quality results is presented in **Appendix A**. Laboratory analytical reports, chain-of-custody documentation, and monitoring well purging and sampling records are presented in **Appendix B**.

Appendix A:

Figure 1	Potentiometric Groundwater Surface Map, March 15, 2010
Figure 2	Potentiometric Groundwater Surface Maps, October 5, 2010
Table	Annual Report, Groundwater Reporting Section, Monitoring Wells



Groundwater Gradient: 0.002 feet/foot
Sampling Date: March 15, 2010

NOTE: Well locations are measured from key site landmarks.
Well elevations were surveyed by California Planning and Engineering.

0 300 600 Feet

N

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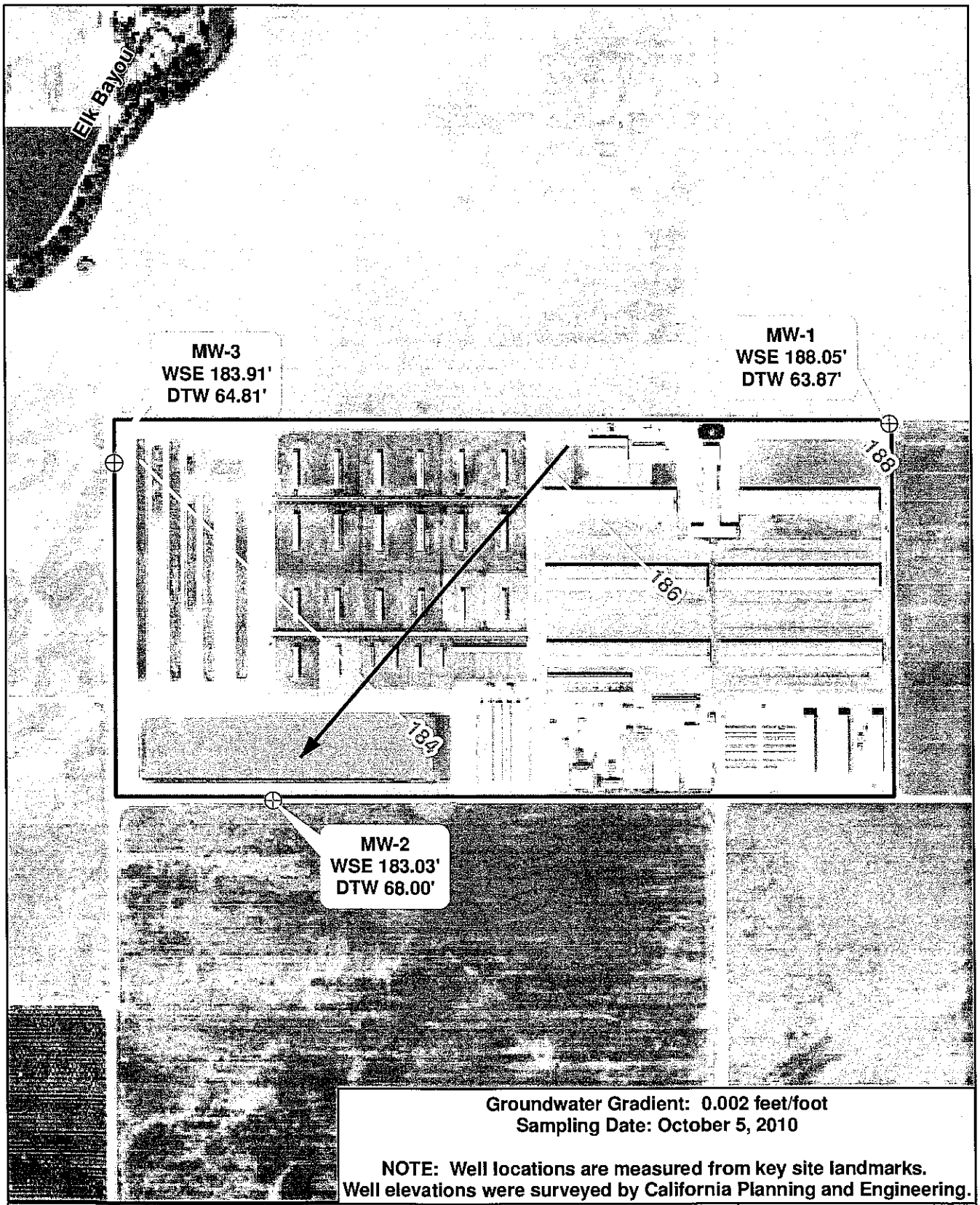
130 N. Garden Street
Visalia, CA 93291
(559) 636-1166

Facility
Monitoring Wells
Flow Direction
Groundwater Elevation Contours

WSE - Water Surface Elevation
DTW - Depth to Water

Aukeman Farms
Figure 1
Potentiometric
Groundwater Surface Map
Job # 3301-07V1-GMP

6/7/2011 \\goose\vsl_clients\Clients\Aukeman_Bob-3301\3301-Aukeman Farms-17297 Rd 96 Tulare_3301-Master\GIS\Map\2010\2010-03-15 Pot GWS.mxd



Groundwater Gradient: 0.002 feet/foot
Sampling Date: October 5, 2010

NOTE: Well locations are measured from key site landmarks.
Well elevations were surveyed by California Planning and Engineering.

0 300 600 Feet

N

Facility
Monitoring Wells
Flow Direction
Groundwater Elevation Contours

WSE - Water Surface Elevation
DTW - Depth to Water

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Visalia, CA 93291
(559) 636-1166

Aukeman Farms
Figure 2
Potentiometric
Groundwater Surface Map
Job # 3301-07V1-GMP

V:\Clients\Aukeman_Bob-3301\3301-Aukeman Farms-17297 Rd 96 Tulare_3301-Master\GIS\Map\2010\2010-1005 Pot GWS basemap

Annual Report
Groundwater Reporting Section
Monitoring Wells

Dairy Name: Aukeman Farms

Dairy Address: 17297 Road 96
Tulare, CA 93274

Report Period: Mar 1, 2007 through Dec 31, 2010

Well ID	Status	Sample Date	Depth to Water (feet)	Groundwater Elevation (ft above MSL)	pH Field (pH units)	Electrical Conductivity (EC) Field (umhos/cm)	Electrical Conductivity (EC) Lab (umhos/cm)	Nitrate as Nitrogen (NO_3-N) (mg/L)	Ammonia as Nitrogen (NH_4-N) (mg/L)
MW-1	Active	10/05/2010	63.87	188.05	7.32	1,434	1,050	49.9	< 0.5
			Wet				10	0.10	0.50
	Active	03/15/2010	71.48	180.44	7.36	1,327	1,220	51.2	< 0.5
			Wet				10	0.10	0.50
	Active	09/23/2009	74.00	177.92	7.27	1,348	1,330	49.7	< 0.5
			Wet				10	0.10	0.50
	Active	03/10/2009	72.62	179.30	7.04	1,459	1,270	51.5	< 0.5
			Wet				10	0.10	0.50
	Active	10/29/2008	71.09	180.83	7.05	1,391	1,310	47.7	< 0.5
			Wet				10	0.10	0.50
	Active	07/24/2008	73.30	178.62	7.02	1,435		43.3	< 0.5
			Wet					0.10	0.50
	Active	12/20/2007	67.87	184.05	7.57	1,056		50.6	1.2
			Wet					0.01	0.50
	Active	06/21/2007	25.30	226.62	7.45	1,030	1,280	50.0	< 0.5
			Wet				10	0.01	0.50

Notes: Laboratory detection limit listed below each result.
NSW = Not Sufficient Water to sample.

Well ID	Status	Sample Date	Depth to Water (feet)	Groundwater Elevation (ft above MSL)	pH Field (pH units)	Electrical Conductivity (EC) Field (umhos/cm)	Electrical Conductivity (EC) Lab (umhos/cm)	Nitrate as Nitrogen (NO_3-N) (mg/L)	Ammonia as Nitrogen (NH_4-N) (mg/L)
MW-2	Active	10/05/2010	68.00	183.03	7.04	1,436	1,040	10.5	< 0.5
			Wet				10	0.10	0.50
	Active	03/15/2010	78.52	172.51	6.91	1,665	1,160	18.0	< 0.5
			Wet				10	0.10	0.50
	Active	09/23/2009	73.38	177.65	7.05	1,234	1,220	33.7	< 0.5
			Wet				10	0.10	0.50
	Active	03/10/2009	78.66	172.37	6.79	1,505	1,360	6.3	< 0.5
			Wet				10	0.10	0.50
	Active	10/29/2008	74.22	176.81	6.84	1,424	1,340	8.8	< 0.5
			Wet				10	0.10	0.50
	Active	07/24/2008	75.03	176.00	6.78	1,463		7.9	< 0.5
			Wet					0.10	0.50
	Active	12/20/2007	71.80	179.23	7.44	915		9.4	1.2
			Wet					0.01	0.50
	Active	06/21/2007	66.05	184.98	7.59	1,003	1,200	26.5	< 0.5
			Wet				10	0.01	0.50
MW-3	Active	10/05/2010	64.81	183.91	7.35	1,940	1,280	62.2	< 0.5
			Wet				10	0.10	0.50
	Active	03/15/2010	75.85	172.87	7.32	1,338	1,230	35.8	< 0.5
			Wet				10	0.10	0.50
	Active	09/23/2009	69.58	179.14	7.08	1,703	1,710	64.8	< 0.5
			Wet				10	0.10	0.50
	Active	03/10/2009	75.03	173.69	7.06	1,605	1,450	40.4	< 0.5
			Wet				10	0.10	0.50

Notes: Laboratory detection limit listed below each result.
NSW = Not Sufficient Water to sample.

Well ID	Status	Sample Date	Depth to Water (feet)	Groundwater Elevation (ft above MSL)	pH Field (pH units)	Electrical Conductivity (EC) Field (umhos/cm)	Electrical Conductivity (EC) Lab (umhos/cm)	Nitrate as Nitrogen (NO_3-N) (mg/L)	Ammonia as Nitrogen (NH_4-N) (mg/L)
	Active	10/29/2008	69.94	178.78	7.10	1,520	1,420	42.4	< 0.5
			Wet				10	0.10	0.50
	Active	07/24/2008	70.64	178.08	7.00	1,542		36.9	< 0.5
			Wet					0.10	0.50
	Active	12/20/2007	68.52	180.20	7.70	1,078		32.8	1.2
			Wet					0.01	0.50
	Active	06/21/2007	62.43	186.29	7.60	1,017	1,320	33.6	< 0.5
			Wet				10	0.01	0.50

Notes: Laboratory detection limit listed below each result.
NSW = Not Sufficient Water to sample.

Appendix B:

Laboratory Analytical Reports, Chain-of-Custody Documentation, and Monitoring Well Purging and Sampling Records

DELLAVALLE® Laboratory, Inc.
Chemists and Consultants

Report of Water Analysis

1910 W. McKinley, Suite 110, Fresno, CA 93728
FAX (559) 268-8174 - (800) 228-9896 - (559) 233-6129

RECEIVED
MAR 30 2010
BY:

Provost & Pritchard Eng - Visalia
130 N Garden St
Visalia CA 93291
14015
08

Material Submitted: Water

Lab No. 140217
Sample Date 3/15/2010
Sample Time
Submitted Date 3/16/2010
Submitted by Linda Gomez
Reported Date 3/26/2010
Location/Project Aukeman Dairy
Copy To
Fax (559) 636-1177
e-mail lgomez@ppeng.com

	EC µmhos/cm	EC dS/m	NO_3-N mg/L	Total NH_4-N mg/L
MCL--->	900-2200	0.90-2.2	10.2	
MDL--->			0.01	0.2
RL--->	10	0.01	0.1	0.5
SM--->	2510 B	2510 B	4500NO3 F	4500NH3 G
EPA--->			300	
Analysis Date:	3/16/2010	3/16/2010	3/16/2010	3/22/2010
001 MW-1 13:15	1220	1.22	51.2	<0.5
002 MW-2 13:45	1160	1.16	18.0	<0.5
003 MW-3 14:10	1230	1.23	35.8	<0.5

*See external laboratory documentation
MCL = Maximum Contaminant Level according to the California Domestic Water Quality and Monitoring Regulations (Title 22)
MDL = Method Detection Limit; RL = Reporting Limit
SM = Standard Methods for the Examination of Water and Wastewater, 19th ed., 1995
EPA = Environmental Protection Agency methods used unless otherwise indicated.
Dissolved metals (bolded) were filtered.
MBAS molecular weight = 340 grams.
QA/QC available upon request.

Approved By: Viola Witt
ELAP Certification #1595

DELLAVALLE® Laboratory, Inc.
Chemists and Consultants

QC Analysis Report

1910 W. McKinley, Suite 110, Fresno, CA 93728
FAX (559) 268-8174 - (800) 228-9896 - (559) 233-6129

Provost & Pritchard Eng - Visalia
130 N Garden St
Visalia CA 93291
14015
08

Material Submitted:

Lab No. 140217
Sample Date 3/15/2010
Sample Time
Submitted Date 3/16/2010
Submitted by Linda Gomez
Reported Date 3/26/2010
Location/Project Aukeman Dairy
Copy To
Fax (559) 636-1177
e-mail lgomez@ppeng.com

Sample ID	Lims ID	QC Code	Analysis Date	Test ID	Lot	Reported Result	Units	% R or RPD	Flag	% RPD for MSD	Flag	Low Limit	High Limit	Amount Added	Dilution
140217	08-017322-001D	D	3/16/2010	F		0.1	mg/L	0							1
140217	08-017322-001D	D	3/16/2010	NO2N;IC		0.1	mg/L	0							1
140217	08-017322-001D	D	3/16/2010	NO3N;IC		7.0	mg/L	3							1
140217	08-017322-001S	S	3/16/2010	F		8.6	mg/L	0							1
140217	08-017322-001S	S	3/16/2010	NO2N;IC		8.5	mg/L	0							1
140217	08-017322-001S	S	3/16/2010	NO3N;IC		15.7	mg/L	0							1
140217	08-017330-002dup	dup	3/22/2010	NH4-N		0.5	mg/L	0							1
140217	08-017330-002S	S	3/22/2010	NH4-N		8.1	mg/L	0							1
140217	08-017330-003D	D	3/16/2010	EC(umhos)		1240	umhos/cm	0							1
140217	08-017341-001D	D	3/16/2010	EC(umhos)		2630	umhos/cm	4							1
140217	Blank33198	B	3/16/2010	EC(umhos)		10.0	umhos/cm	0							1
140217	Blank33202	B	3/16/2010	EC(umhos)		10.0	umhos/cm	0							1
140217	Blank33206	B	3/16/2010	EC(umhos)		10.0	umhos/cm	0							1
140217	Blank33206	B	3/16/2010	pH		6.3	units	0							1
140217	Blank33232	B	3/16/2010	F		0.1	mg/L	0							1
140217	Blank33232	B	3/16/2010	NO2N;IC		0.1	mg/L	0							1
140217	Blank33232	B	3/16/2010	NO3N;IC		0.1	mg/L	0							1
140217	blk33532	blk	3/22/2010	NH4-N		0.5	mg/L	0							1
140217	Calib Check33207	K	3/16/2010	pH		7.1	units	101						7	1
140217	Calib Check33210	K	3/16/2010	pH		7.1	units	101						7	1
140217	Calib Check33233	K	3/16/2010	F		2.6	mg/L	105						2.5	1
140217	Calib Check33233	K	3/16/2010	NO2N;IC		2.6	mg/L	104						2.5	1
140217	Calib Check33233	K	3/16/2010	NO3N;IC		9.9	mg/L	99						10	1
140217	Calib Check33533	K	3/22/2010	NH4-N		9.2	mg/L	93						10	1
140217	Min33200	C	3/16/2010	EC(umhos)	P168-506	318	umhos/cm	100				94.36	105.64	319	1
140217	Min33204	C	3/16/2010	EC(umhos)	P168-506	313	umhos/cm	98				94.36	105.64	319	1

DELLAVALLE® Laboratory, Inc.
Chemists and Consultants

QC Analysis Report

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FAX (559) 268-8174 - (800) 228-9896 - (559) 233-6129

Provost & Pritchard Eng - Visalia
130 N Garden St
Visalia CA 93291
14015
08

Material Submitted:

Lab No. 140217
Sample Date 3/15/2010
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Submitted Date 3/16/2010
Submitted by Linda Gomez
Reported Date 3/26/2010
Location/Project Aukeman Dairy
Copy To
Fax (559) 636-1177
e-mail lgomez@ppeng.com

Sample ID	Lims ID	QC Code	Analysis Date	Test ID	Lot	Reported Result	Units	% R or RPD	Flag	% RPD for MSD	Flag	Low Limit	High Limit	Amount Added	Dilution
140217	Min33208	C	3/16/2010	EC(umhos)	P168-506	316	umhos/cm	99				94.36	105.64	319	1
140217	Min33235	C	3/16/2010	Cl;IC	P168-506	41.8	mg/L	98				90.85	109.49	42.6	1
140217	Min33235	C	3/16/2010	F	P168-506	2.7	mg/L	107				85.77	109.49	2.53	1
140217	Min33235	C	3/16/2010	SO4;IC	P168-506	38.1	mg/L	100				86.32	109.74	38	1
140217	nut s33535	nut s	3/22/2010	NH4-N	P170-505	3.12	mg/L	90				85.22	114.78	3.45	1
140217	NutS33236	C	3/16/2010	NO3N;IC	P170-505	2.7	mg/L	93				88.7	108.9	2.92	1
140217	pH33201	C	3/16/2010	pH	171-977	7.0	Units	102				97.97	102.03	6.89	1
140217	pH33205	C	3/16/2010	pH	171-977	7.0	Units	102				97.97	102.03	6.89	1
140217	pH33209	C	3/16/2010	pH	171-977	7.0	Units	102				97.97	102.03	6.89	1

MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference

140217
3-16-2010 8:6

DELLAVALLE LABORATORY, INC.

1910 W. McKinley Av e, Suite 110 • Fresno, CA 93728
www.dellavallelab.com 559 233-6129 • 800 228-9896 • Fax 559 268-8174

No. of Samples 3 No. of Bottles 6

Logged By _____ Results Needed By _____

Water Type: [ ] Drinking Water [ ] Wastewater
[ ] Ag Water [x] Groundwater [x] Monitoring Well
Other: _____

BILL TO 14015 / 08 (Acct#/Cons.) _____ (Purchase Order No.)

Analysis and Bottles Required:

[x] NO3-N, NH4-N, EC

Name: Provost & Pritchard Engineering, Inc.
Address: 130 N Garden St.
City: Visalia State: Ca Zip: 93291-6362
Telephone: 559-636-1166 Fax: 559-636-1177
Cell/Email: lgomez@ppeng.com

[x] Regulatory [ ] Non Regulatory

REQUESTED BY Linda Gomez

COPIES TO: _____

PROJECT Aukeman Dairy

[ ] Co. Health Dept _____
[ ] RWQCB [x] Copy of Chain
[ ] State Forms [x] QA/QC Documents

CROP _____ INTENDED _____

SAMPLED BY Philip Melcher

	Description of Sample	Date Sampled	Time Sampled	Rec'd Temp °C
1.	MW-1	3-15-10	1:15	5.7
2.	MW-2	3-15-10	1:45	↓
3.	MW-3	3-15-10	2:10	↓
4.				
5.				
6.				
7.				
8.				
9.				
10.				

CHAIN OF CUSTODY

Carrier	Signature	Company	Date/Time Received	Date/Time Relinquished
First	[signature]	Provost and Pritchard	3-15-10/1:15	3-16-10 7:35
Second	[signature]		3/16/10	7:35 am
Third				
Fourth				

I guarantee that as the client, or on behalf of client named, I have the authority to contract the above requested services. Should it be found that I do not have such authority, I agree to be personally liable for all costs and, if there should be action against me for this breach, reasonable attorneys' fees. It is understood that payment is expected to be cash with samples unless terms have been previously arranged. Terms are net 30 days; overdue accounts will be charged a dated damage fee of 2% per month (annually 24%) or $5.00 per month whichever is greater.

If payment is not made when due and a legitimate dispute exists concerning the product or services of Dellavalle Laboratory, Inc., it will be submitted to mediation under the Rules and Procedures of Creative Alternative to Litigation, Inc (*cal*). If the dispute is not resolved in mediation, then the dispute will be submitted to binding arbitration through *cal* under its Rules and Procedures. The parties will equally bear the costs of mediation/arbitration. If, however, the mediator declares that no legitimate dispute exists, then debtor will pay all mediation and arbitration costs, and in the event of arbitration, reasonable attorneys' fees of Dellavalle Laboratory.

Invoicing Information:

Shipping
$_____ In
$_____ Out

Mileage _____ Consulting Hrs _____

Sampling Hrs _____

Signature _____

V:\Support\Forms\Field Services\Original Work Request - Visalia - 10-1-07.doc

EST. 1968
PROVOST& PRITCHARD
CONSULTING GROUP
An Employee Owned Company

Monitoring Well Purging and Sampling Record

Client:	Bob Aukeman		Date: 3/15/10
Project Name:	Aukeman Dairy		County: Tulare
Project Address:	17781 Road 96, Tulare, Ca 93274		
Project Manager:	Linda Gomez Sloan	Job No: 3301-07V1	Phase(s): GMP

Regulatory Contact:	Karen	Telephone:	559-905-6568
Sample Containers:	1 L Neat ; 1 sm	Air Temp (F):	70
Preservatives:	neat / H2SO4	Precipitation:	SUNNY / CLEAR
Instrumentation:	Horiba D-54 multimeter	Wind (dir/speed):	0-5 SE
Date Last Calibrated/By:	3/15/10	Sampler Signature:	

Well Number	MW-1	MW-2	MW-3			
Well Elevation (ft)	251.92	251.03	248.72			
Well Diameter (in)	2	2	2			
Slotted Interval (ft)	65-90	70-95	75-100			
DTW (ft)	71.48	78.52	75.85			
GW Elevation (ft)						
Well Depth (ft)	86.85	91.95	96.20			
Well Volumes (gal)	2.5	2.19	3.32			
Notes:						
Running wells (y/n)	3 wells N/NE	N	N			
Ditch w/water (y/n)	N	N	N			
Well Volume Purged (1st)						
Time	1:06	1:33	2:08			
Temp (C°)	19.6	19.6	19.9			
pH	7.48	7.32	7.51			
EC	1369	1334	1400			
Volume Removed (gal)	>2.5	>2.19	>3.32			
Well Volume Purged (2nd)						
Time	1:09	1:36	2:03			
Temp (C°)	19.4	19.5	19.7			
pH	7.44	7.22	7.46			
EC	1347	1285	1316			
Volume Removed (gal)	>2.5	>2.19	>3.32			
Well Volume Purged (3rd)						
Time	1:11	1:39	2:06			
Temp (C°)	19.3	19.4	19.7			
pH	7.36	6.91	7.32			
EC	1327	1665	1338			
Volume Removed (gal)	>2.5	>2.19	>3.32			
Sample Time	1:15	1:45	2:10			

Equipment used:

Remarks:

2" Well Volume = 0.163 x height of water column 4" Well Volume = 0.653 x height of water column

Report of Water Analysis

DELLAVALLE Laboratory, Inc.
Chemists and Consultants

1910 W. McKinley, Suite 110, Fresno, CA 93728
FAX (559) 268-8174 - (800) 228-9896 - (559) 233-6129

Provost & Pritchard Eng - Visalia
130 N Garden St
Visalia CA 93291
14015
08

Material Submitted: Water

Lab No. 149643
Sample Date 10/5/2010
Sample Time
Submitted Date 10/6/2010
Submitted by Linda Gomez
Reported Date 10/19/2010
Location/Project Aukeman Dairy
Copy To
Fax (559) 636-1177
e-mail lgomez@ppeng.com

	EC µmhos/cm	EC dS/m	NO_3-N mg/L	Total NH_4-N mg/L
MCL--->	900-2200	0.90-2.2	10.2	
MDL--->			0.01	0.2
RL--->	10	0.01	0.1	0.5
SM--->	2510 B	2510 B	Lat. 10.107.05.1.A	4500NH3 G
EPA--->			300	
Analysis Date:	10/6/2010	10/6/2010	10/6/2010	10/13/2010
001 MW-1 Auk @ 09:45	1050	1.05	49.9	<0.5
002 MW-2 Auk @ 10:15	1040	1.04	10.5	<0.5
003 MW-3 Auk @ 10:40	1280	1.28	62.2	<0.5

*See external laboratory documentation
MCL = Maximum Contaminant Level according to the California Domestic Water Quality and Monitoring Regulations (Title 22)
MDL = Method Detection Limit; **RL** = Reporting Limit
SM = Standard Methods for the Examination of Water and Wastewater, 19th ed., 1995
EPA = Environmental Protection Agency methods used unless otherwise indicated.
Dissolved metals (**bolded**) were filtered.
MBAS molecular weight = 340 grams.
QA/QC available upon request.

Approved By: Scott M Fudlend
ELAP Certification #1595

BELLAVALLE® Laboratory, Inc.
Chemists and Consultants

QC Analysis Report

1910 W McKinley, Suite 110, Fresno, CA 93728
FAX (559) 268-8174 - (800) 228-9896 - (559) 233-6129

Provost & Pritchard Eng - Visalia
130 N Garden St
Visalia CA 93291
14015
08

Lab No. 149643
Sample Date 10/5/2010
Sample Time
Submitted Date 10/6/2010
Submitted by Linda Gomez
Reported Date 10/19/2010
Location/Project Aukeman Dairy
Copy To
Fax (559) 636-1177
e-mail lgomez@ppeng.com

Material Submitted:

Sample ID	Lims ID	QC Code	Analysis Date	Test ID	Lot	Reported Result	Units	% R or RPD	Flag	% RPD for MSD	Flag	Low Limit	High Limit	Amount Added	Dilution
149643	08-020503-001dup	dup	10/6/2010	Cl;IC		4.3	mg/L	0							1
149643	08-020503-001dup	dup	10/6/2010	SO4;IC		1.4	mg/L	4							1
149643	08-020503-001S	S	10/6/2010	Cl;IC		12.8	mg/L	0							1
149643	08-020503-001S	S	10/6/2010	SO4;IC		9.1	mg/L	0							1
149643	08-020508-004dup	dup	10/13/2010	NH4-N		0.5	mg/L	0							1
149643	08-020508-004S	S	10/13/2010	NH4-N		8.8	mg/L	0							1
149643	08-020525-001dup	dup	10/6/2010	EC(umhos)		704	umhos/cm	0							1
149643	blk40136	blk	10/6/2010	EC(umhos)		10.0	umhos/cm	0							1
149643	blk40294	blk	10/6/2010	Cl;IC		0.1	mg/L	0							1
149643	blk40294	blk	10/6/2010	SO4;IC		0.2	mg/L	0							1
149643	blk40490	blk	10/13/2010	NH4-N		0.5	mg/L	0							1
149643	Calib Check40295	K	10/6/2010	Cl;IC		24.9	mg/L	100						25	1
149643	Calib Check40295	K	10/6/2010	SO4;IC		24.7	mg/L	99						25	1
149643	Calib Check40491	K	10/13/2010	NH4-N		10.8	mg/L	109						10	1
149643	d5qc40296	d5qc	10/6/2010	Cl;IC	2-MEB303613	12.5	mg/L	100				90	110	12.5	1
149643	d5qc40296	d5qc	10/6/2010	NO2N;IC	2-MEB303613	1.0	mg/L	102				90	110	0.998	1
149643	d5qc40296	d5qc	10/6/2010	NO3N;IC	2-MEB303613	4.8	mg/L	95				90	110	5.009	1
149643	d5qc40296	d5qc	10/6/2010	PO4P	2-MEB303613	9.77	mg/L	98				90	110	10	1
149643	d5qc40296	d5qc	10/6/2010	SO4;IC	2-MEB303613	4.5	mg/L	89	*			90	110	4.99	1
149643	min40138	min	10/6/2010	EC(umhos)	P179-506	451	umhos/cm	100				90	110	451	1
149643	min40298	min	10/6/2010	Cl;IC	P179-506	52.8	mg/L	102				90	110	52	1
149643	min40298	min	10/6/2010	SO4;IC	P179-506	27.6	mg/L	97				90	110	28.5	1
149643	nut s40299	nut s	10/6/2010	NO3N;IC	P176-505	2.8	mg/L	92				88.82	111.18	3.04	1
149643	nut s40299	nut s	10/6/2010	PO4P	P176-505	1.51	mg/L	88	*			90.7	106.98	1.72	1
149643	nut s40493	nut s	10/13/2010	NH4-N	P176-505	5.93	mg/L	103				85.37	114.66	5.73	1
149643	pH40139	pH	10/6/2010	pH	P 184-977	7.6	Units	101				0.982	101.86	7.53	1

MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference

149643
10-6-2010 7:53

DELLAVALLE LABORATORY, INC.

1910 W. McKinley Avenue, Suite 110 • Fresno, CA 93728
www.dellavallelab.com 559 233-6129 • 800 228-9896 • Fax 559 268-8174

No. of Samples 3 No. of Bottles 6

Logged By _____ Results Needed By _____

Water Type: [ ] Drinking Water [ ] Wastewater [ ] Ag Water [ ] Groundwater [x] Monitoring Well

Other: _____

BILL TO 14015 / 08 Acct#/Cons. _____ Purchase Order No.

Analysis and Bottles Required:

[x] NO3-N, NH4-N, EC

Name: Provost & Pritchard Engineering, Inc.

Address: 130 N Garden St.

City: Visalia State: Ca Zip: 93291-6362

Telephone: 559-636-1166 Fax: 559-636-1177

Cell/Email: lgomez@ppeng.com

[x] Regulatory [ ] Non Regulatory

REQUESTED BY Linda Gomez

COPIES TO: _____

PROJECT Aukeman Dairy

CROP _____ INTENDED _____

[ ] Co. Health Dept _____
[ ] RWQCB [x] Copy of Chain
[ ] State Forms [x] QA/QC Documents

SAMPLED BY Philip Melcher

	Description of Sample	Date Sampled	Time Sampled	Rec'd Temp °C
1.	MW-1 Auk	10-5-10	9:45	1.3
2.	MW-2 Auk	10-5-10	10:15	↓
3.	MW-3 Auk	10-5-10	10:40	
4.				
5.				
6.				
7.				
8.				
9.				
10.				

CHAIN OF CUSTODY

Carrier	Signature	Company	Date/Time Received	Date/Time Relinquished
First	[illegible]	Provost and Pritchard	10-5-10 9:45	10-6-10 7:30
Second	Mary Callen MB		10/5/10	7:30pm
Third				
Fourth	Cambria Roberts	DDL	10-6-10 0800	

I guarantee that as the client, or on behalf of client named, I have the authority to contract the above requested services. Should it be found that I do not have such authority, I agree to be personally liable for all costs and, if there should be action against me for this breach, reasonable attorneys' fees. It is understood that payment is expected to be cash with samples unless terms have been previously arranged. Terms are net 30 days; overdue accounts will be charged a dated damage fee of 2% per month (annually 24%) or $5.00 per month whichever is greater.

If payment is not made when due and a legitimate dispute exists concerning the product or services of Dellavalle Laboratory, Inc., it will be submitted to mediation under the Rules and Procedures of Creative Alternative to Litigation, Inc (*cal*). If the dispute is not resolved in mediation, then the dispute will be submitted to binding arbitration through *cal* under its Rules and Procedures. The parties will equally bear the costs of mediation/arbitration. If, however, the mediator declares that no legitimate dispute exists, then debtor will pay all mediation and arbitration costs, and in the event of arbitration, reasonable attorneys' fees of Dellavalle Laboratory.

Invoicing Information:

Shipping
$_____ In
$_____ Out

Mileage _____ Consulting Hrs _____

Sampling Hrs _____

Signature

V:\Support\Forms\Field Services\Original Work Request - Visalia - 10-1-07.doc

EST. 1968
PROVOST& PRITCHARD
CONSULTING GROUP
An Employee Owned Company

Monitoring Well Purging and Sampling Record

Client:	Bob Aukeman		Date: 10-5-10
Project Name:	Aukeman Dairy		County: Tulare
Project Address:	17781 Road 96, Tulare, Ca 93274		
Project Manager:	Linda Gomez Sloan	Job No: 3301-07V1	Phase(s): GMP

Regulatory Contact:	Karen	Telephone:	559-905-6568
Sample Containers:	1L / 1sm	Air Temp (F):	65-70
Preservatives:	neat / H2SO4	Precipitation:	cool / overcast
Instrumentation:	Horiba D-54 multimeter	Wind (dir/speed):	0-5 NE
Date Last Calibrated/By:		Sampler Signature:	[illegible]

Well Number	MW-1	MW-2	MW-3			
Well Elevation (ft)	251.92	251.03	248.72			
Well Diameter (in)	2	2	2			
Slotted Interval (ft)	65-90	70-95	75-100			
DTW (ft)	63.87	68.06	64.81			
GW Elevation (ft)						
Well Depth (ft)	86.89	92.03	96.16			
Well Volumes (gal)	3.75	3.91	5.11			
Notes:	cloudy	cloudy				
Running wells (y/n)	N	N	N			
Ditch w/water (y/n)	N	N	N			
Well Volume Purged (1st)						
Time	9:39	10:06	10:30			
Temp (C°)	19.9	19.8	19.9			
pH	7.50	7.65	7.48			
EC	1496	1441	1930			
Volume Removed (gal)	> 3.75	> 3.91	> 5.11			
Well Volume Purged (2nd)						
Time	9:41	10:09	10:33			
Temp (C°)	19.5	19.7	19.7			
pH	7.49	7.28	7.37			
EC	1466	1435	1940			
Volume Removed (gal)	> 3.75	> 3.91	> 5.11			
Well Volume Purged (3rd)						
Time	9:44	10:12	10:36			
Temp (C°)	19.6	19.6	19.6			
pH	7.32	7.04	7.35			
EC	1434	1436	1940			
Volume Removed (gal)	> 3.75	> 3.91	> 5.11			
Sample Time	9:45	10:15	10:40			

Equipment used:

Remarks: MW-1 zip tie broken

2" Well Volume = 0.163 x height of water column 4" Well Volume = 0.653 x height of water column

DLF

Initial Paragraphs 1 & 2

_____1. I hereby agree to comply with all regulations of Tulare County pertaining to well construction, recondition, deepening and destruction. Within 30 days of work completed, I will furnish Tulare County Environmental Health Services Division a completed well log for well construction, recondition, deepening and destruction.

_____2. I certify that I have read this application and declare under penalty of perjury that the information contained herein is true, correct and complete. I agree to comply with all county ordinances and state laws relating to building, development and construction. I hereby authorize representatives of Tulare County to enter the premises for the purpose of inspecting the work described herein for compliance with county requirements.

WHEN SIGNED BY TULARE COUNTY ENVIRONMENTAL HEALTH SERVICES DIVISION REPRESENTATIVE, this application shall be deemed a permit for the work described. THIS PERMIT SHALL EXPIRE upon completion of the job authorized; in any event shall expire 6 MONTHS from date of issuance. No changes from the approved plan are permitted without prior approval from this Division.

NOTICE: After permit approval an inspection must be scheduled at least 48 hours in advance at (559) 733-6441 for:

1. The sealing of the annular space on a public domestic well or a dairy well.
2. The destruction of all wells.
3. Any other operation stipulated on the permit by the county to deal with special or unusual conditions.

NOTE TO HOMEOWNERS: Contact Tulare County Environmental Health when private well construction and disinfection are complete and water samples can be obtained.

ENVIRONMENTAL HEALTH SERVICES DIVISION USE ONLY

Fee Amount 91.00 Date Rec'd 11-27-06 Rec'd by J.P. Check No 37702 Receipt No 67035

Date Issued 11-27-06 Environmental Health Representative Ken Bowen

Conditions/Comments: Please install as per approved workplan and for Bulletin 74-90.

11/27/06

KDJ

CTL **CONSOLIDATED TESTING LABORATORIES, INC.**

Soils and Materials Testing | Geotechnical and Environmental Drilling | Field Inspection

GROUNDWATER ANALYSIS AND SOIL BORINGS FOR MW-1, MW-2, AND MW-3

RECEIVED
JUN 14 2004
RWQCB-CVR
FRESNO, CALIF

DAIRYLAND FARMS DAIRY
ROAD 152 AND AVENUE 160
WOODVILLE, CALIFORNIA 93257

May 28, 2004

PREPARED BY:

CONSOLIDATED TESTING LABORATORIES, INC.
603 EAST WORTH AVENUE
PORTERVILLE, CALIFORNIA
93257

File No. 5568-04

603 East Worth Avenue • Porterville, CA 93257
Telephone (559) 781-0571
FAX (559) 782-8389

CTL CONSOLIDATED TESTING LABORATORIES, INC.

Soils and Materials Testing | Geotechnical and Environmental Drilling | Field Inspection

May 28, 2004
File No. 5568-04

Mr. Bill Van Beek
Dairyland Farms
Road 152 and Avenue 160
Woodville, California

PROJECT: Dairyland Farms Dairy, Road 152 and Avenue 160, Woodville, California.

SUBJECT: Monitoring Well Installation and Groundwater Analytical Results for monitoring wells MW-1, MW-2, and MW-3.

Dear Mr. Van Beek,

As per the request by Mr. Ken Jones of the California Regional Water Quality Control Board-Central Valley Region (RWQCB) in a letter dated January 15, 2004, we have completed installation and sampling of three groundwater- monitoring wells located at Dairyland Farms near the intersection of Road 152 and Avenue 160.

The groundwater monitoring well installations and sampling activities took place from March 8, 2004 to March 23, 2004. The groundwater samples collected from monitoring wells MW-1, MW-2, and MW-3 were delivered to Dellavalle Laboratories of Fresno, California. The analytical results, testhole boring logs, well installation protocols, monitoring well specifications, field sampling guidelines, and recommendations are enclosed.

Sincerely,

CONSOLIDATED TESTING LABORATORIES, INC.

Fred Mason
Staff Geologist
/fm
Enclosures

pc: Ken Jones (California Regional Water Quality Control Board-Central Valley Region)
Mike Lane (Lane Engineers)

603 East Worth Avenue • Porterville, CA 93257
Telephone (559) 781-0571
FAX (559) 782-8389

GROUNDWATER ANALYSIS AND SOIL BORINGS FOR MW-1, MW-2, AND MW-3

DAIRYLAND FARMS DAIRY
ROAD 152 AND AVENUE 160
WOODVILLE, CALIFORNIA 93257

The material and data in this report were prepared under the supervision and direction of the undersigned.

CONSOLIDATED TESTING LABORATORIES, INC.

REGISTERED PROFESSIONAL ENGINEER
WAYNE F. HARRIS
No. 15342
CIVIL
STATE OF CALIFORNIA

Reviewed by:
George A. Stott,
R.G. 6649, Exp. 12/04

Wayne F. Harris
R.C.E. 15342, Exp. 3/31/05

5/28/04

REGISTERED GEOLOGIST
GEORGE A. STOTT
No. 6649
Exp. 12/04
STATE OF CALIFORNIA

Frederick A. Mason
Staff Geologist

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APPENDIX A

Assessor's Parcel Map

APPENDIX B

Regional Water Quality Control Board Review
Chain of Custody Sheets
Survey Measurements and Map

APPENDIX C

Boring Logs B-1, B-2, and B-3

APPENDIX D

Well Permit Application
Monitoring Well Schematic for MW-1, MW-2, and MW-3

INTRODUCTION

Consolidated Testing Laboratories, Inc. (CTL) was retained in February 2004 by Mr. Bill Van Beek of Dairyland Farms to install three on-site groundwater-monitoring wells. On September 10, 2003, Mr. Van Beek received a written request by the California Regional Water Quality Control Board-Central Valley Region (RWQCB) to install the three monitoring wells. The groundwater-monitoring plan for the installation of these wells was outlined in the *DRAFT EVIRONMENTAL IMPACT REPORT* dated May 2003 as prepared by Quad Knopf, Inc. of Visalia, California.

On March 8, 2004 through March 18, 2004, CTL implemented the above work plan for the installation of three groundwater-monitoring wells at the subject site. This report includes the results of water sample analyses from the three groundwater-monitoring wells in addition to calculation of the groundwater gradient, groundwater flow direction, and flow velocity. The report also includes previous groundwater quality data.

Site Description

The Dairyland Farms dairy is located at the southeast corner of the intersection of Road 152 and Avenue 160 approximately 2 ½-miles southwest of Woodville, Tulare County, California (Figure 1). When in operation, the dairy will house approximately 3,475 mature cows and 1,072 support stock. The facility will utilize a total of approximately 660-acres of cropland. An additional 58-acres includes the main production area located in the northern ½ of the northwest ¼ of Section 25, T. 21 S., R. 25 E., M.D.B.&M. The remaining cropland is situated in Sections 23, 24, and 26, T. 21 S., R. 25 E., M.D.B.&M. The site includes parcel numbers 232-015-002, 232-015-003, 232-15-007, and 232-010-010 (Appendix A).

SITE HISTORY

June 2000 R.L. Schafer and Associates submitted the report entitled *Geological-Hydrological Report for Van Beek Brothers' Dairy*. The report included the hydrology, groundwater quality, and geology of the site.

June 15, 2000 Valley Tech Agricultural Laboratory Services submitted a soil analysis of the three on-site retention ponds. The soil was classified under the United States Department of Agriculture soil classification system. In addition to soil classification, hydrometer analyses were performed on soil samples from all three on-site retention ponds.

October 2000 Kenneth D. Schmidt and Associates of Fresno, California submitted a report titled *Groundwater Conditions for the Van Beek Brothers Dairy Tulare County, California.*

September 10, 2003 The RWQCB reviewed a Report of Waste Discharge (RWD) for Dairyland Farms Dairy. The RWQCB requested additional information in order to determine if the dairy facility could comply with the requirements of Title 27 of the California Code of Regulations and the Water Quality Control Plan for the Tulare lake Basin, Second Edition, 1995 (Basin Plan).

November 12, 2003 Lane Engineers, Inc. submitted documentation containing field percolation testing, lithologic traverse logging, and a topographic report to the RWQCB.

November 24, 2003 Livingston Dairy Consulting, Inc. (LDC) submitted additional information to the RWQCB. The submittal was in regards to additional information requested September 10, 2003 by the RWQCB.

January 15, 2004 The RWQCB reviewed information submitted by LDC dated November 24, 2003 and determined the RWD for Dairyland Farms was incomplete.

The RWQCB stated that two requirements were to be performed before the RWD would be complete (Appendix B). According to the RWQCB, the requirements listed below are to be implemented prior to initial discharge of effluent.

1. Implement a groundwater-monitoring plan as outlined in the previous *DRAFT ENVIRONMENTAL IMPACT REPORT* dated May 2003.
2. Provide a certification that the wastewater retention ponds meet the soil texture requirements of Title 27.

The installation and completion of the three on-site groundwater-monitoring wells, which are discussed below, is in response to item one above.

March 8-17, 2004 CTL completed installation of three on-site groundwater-monitoring wells MW-1, MW-2, and MW-3. In addition, soils within the two smaller retention ponds situated on the east side of the main production area were logged and classified according to the Unified Soil Classification System.

March 18, 2004 CTL met with Ken Jones and Bill Van Beek at the location of the two on-site retention ponds. Ken Jones Examined CTL's soil logs of the two retention ponds and chose 26 locations for sampling and subsequent hydrometer analysis.

March 23, 2004 CTL purged, sounded, and sampled groundwater from each of the three on-site groundwater-monitoring wells as outlined below.

April 2, 2004 CTL submitted findings of hydrometer analyses from the two on-site retention ponds to Bill Van Beek and Ken Jones of the RWQCB.

April 5, 2004 Dellavalle Laboratories of Fresno, California submitted to CTL analytical results of groundwater samples obtained from monitoring wells MW-1, MW-2, and MW-3.

May 4, 2004 Lane Engineering surveyed the top of casing elevations for each of the three monitoring wells (Appendix B). The survey information was used during this investigation to determine depth, direction of flow, and gradient of groundwater below the Dairyland Farms Dairy.

ENVIRONMENTAL SETTING

Geologic and Hydrogeologic Conditions

The site is located in the east-central San Joaquin Valley which is a northwest trending structural trough comprising the southern two-thirds of the Great Central Valley of California. Basin sediments consist primarily of non-marine clay, silt, sand, and gravel, and mixtures thereof. These sediments grade downward into more lithified marine and non-marine strata of similar composition ranging from Pleistocene to Jurassic in age. A deep well drilled approximately 11-miles southeast of the site encountered Upper Jurassic basement complex rocks at an approximate depth of 1,000-feet in the North Deer Creek oil field near Terra Bella, California. The basement complex at this location is overlain by Santa Margarita Formation marine sediments that are Miocene in age.[1]

The body of fresh groundwater in the San Joaquin Valley is contained in principally unconsolidated, continental deposits of Pliocene to Holocene Age (0-7 million years old) that extend to depths ranging from less than 100-feet to more than 3,500-feet. Along the eastern boundary of the valley at shallow depths, the base of fresh groundwater occurs in more consolidated marine and continental sedimentary rocks of Tertiary Age (2-65 million years old).

Groundwater Conditions

Based on the sounding measurements from the recently installed groundwater monitoring wells, groundwater occurs beneath the site at depths ranging from approximately 103.55-feet to 118.05-feet below the top of the well casings. The groundwater flow direction is toward the southeast (Figure 2).

---

[1] California Oil & Gas Fields, California Division of Oil and Gas, 1985

SCOPE OF WORK

The purpose of this investigation was to determine the nature and quality of groundwater located below the Van Beek Dairy as requested by Ken Jones of the RWQCB January 15, 2004. The scope of work involved installing groundwater-monitoring wells MW-1, MW-2 and MW-3. MW-1 was installed off-site from the main production area. MW-2 was installed east of the main production area near the southwest corner of the retention ponds. MW-3 was installed near the southwest corner of the main production area. Soil samples were logged and classified during drilling operations for each well. Groundwater samples were collected and tested for constituents of concern as outlined by the RWQCB. Drilling and sampling procedures, laboratory analyses of groundwater samples collected from the three wells, and groundwater data of surrounding production wells are included in this report.

TESTHOLE SOIL BORING/WELL INSTALLATION

Drilling Preparations

A well drilling permit for the three monitoring wells was applied for and obtained from the Tulare County Environmental Health Department (TCEHD) (Appendix D). Underground utility locations were marked at the site by Underground Services Alert (USA) prior to commencing drilling operations. Each boring was hand augered to a depth of four-feet below ground surface in order to eliminate the possibility of encountering buried utilities.

Drilling Procedures

Installation of borings MW-1, MW-2, and MW-3 was conducted by CTL, a C-57 state licensed drilling contractor, in accordance with American Society of Testing Materials (ASTM) Method D1452-80. A truck mounted Failing F-10 drilling rig with 9-inch outside diameter and 4-3/8-inch inside diameter hollow stem augers, AASHTO

Designation T251-77 was used to drill the testhole borings. The augers were steam cleaned prior to and after drilling at each boring location.

Soil Classification, Location, and Procedure

The soil samples were collected using a 1.5-inch inside diameter by 18-inch long split-spoon-sampler that was driven into the soil formation ahead of the lead auger bit as drilling occurred. Standard penetration blow counts were recorded during soil sampling. The standard penetration test consists of using a 140-pound hammer falling a distance of 30-inches to drive the sampler into the undisturbed soil and recording the number of blow counts required to drive the sampler each 6-inch increment.

Soils encountered in the testhole borings were logged and classified in accordance with the Unified Soil Classification System during drilling operations. Personnel involved in collecting the soil samples and classifying the soils were under the supervision of a Civil Engineer and fully experienced in the field of environmental and geotechnical drilling.

Lithologic descriptions included in the borehole log are: soil type, color, moisture, grain size and shape, compactness or hardness, cohesiveness, grading, and extent of weathering or fracturing if appropriate. The soil samples were logged at five-foot intervals starting at ground surface until the predetermined borehole depths were reached. The soil samples of borehole MW-1 were not collected below first encountered groundwater, from 115-feet to 121-feet 6-inches. Soil samples below first encountered groundwater in boreholes MW-2 and MW-3 were collected and logged to the total depth of the borehole.

MONITORING WELL SPECIFICATIONS

Well Construction

Prior to installing the monitoring wells, CTL requested approval from the property owner and the TCEHD. The total depth of the groundwater-monitoring wells was as follows: MW-1 to 120-feet, MW-2 to 122-feet, and MW-3 to 121-feet. The boreholes were completed as 4-inch PVC groundwater monitoring wells.

The three monitoring wells were completed using approved, flush threaded, schedule 40 4-inch I.D. PVC casing as described on the proposed monitoring well detail (Appendix D). No chemicals, glues or solvents were used in the well construction. In each well, screened well casing with 0.020-inch slots were set approximately 20-feet below and 10-feet above first encountered groundwater. The bottom of the screen was fitted with a threaded cap and lowered into the borehole through the hollow stem augers. Above the screened section the remaining PVC casing blank was threaded on and lowered into the borehole until the casing reached the bottom of the borehole.

The annular space between the well screen and borehole was filled with a #3 sand filter-pack. Approximately 2-feet of filter pack was added above the top of the screened section. Above the filter-pack a minimum three-foot thick section of medium sized bentonite chips were added and hydrated. The remaining annular space above the bentonite seal was filled with a mixture of bentonite slurry and neat cement. A locking PVC well cap was installed on the top of each casing.

The PVC casing extends approximately 34–inches above ground surface in each well. A 6 5/8-inch diameter by 36-inch steel riser pipe was installed around each casing and a locking steel lid was installed on the top of the riser. A minimum six-inch thick by two-foot by two-foot wide concrete pad was poured around the riser. Four, 4-inch diameter by 4-foot tall steel bumper posts were added at each corner of the concrete pad. After

completion, the well was developed and Lane Engineers of Tulare, California surveyed the top of casing elevation at each well location (Appendix B).

Well Development

The monitoring wells were developed within a 24-hour period after completion. A Mobile B-80 drilling rig with a 4-inch outer diameter steel bailer was used to remove accumulated sediment. Bailing continued until it was determined that the majority of sediment and fine-grained soil from the well and substrata adjacent to the well was removed.

FIELD SAMPLING ACTIVITIES

Well Purging and Sampling Protocol

Approximately one-hour prior to sampling, the monitoring wells were opened to the atmosphere and allowed to adjust to the surface barometric pressure. The depth to groundwater was measured from the top of the well casing (north side) with the use of a Solinst® interface probe, which is an electronic water level sounder that has an accuracy to the nearest 0.01-feet. The wells were purged of at least three well casing volumes of water with the use of a Proactive Low Flow Monsoon® water pump. The pump was cleaned with tri-sodium phosphate between each sampling event. Casing volumes for the monitoring wells were calculated based on the well diameter, well depth, and groundwater level measurements obtained before purging. The monitoring wells were purged until field parameters consisting of pH, electrical conductivity (EC), temperature, and turbidity stabilized. After purging, the water pump was cleaned with TSP and groundwater samples were collected.

The collected groundwater samples were placed directly into appropriate sample bottles, which were provided by Dellavalle Laboratories. All sample bottles were labeled with the well number, date, time, job number, depth, sample identification number, and the sampler's name. The samples were then placed in an ice chest cooled with frozen gel packs to maintain the samples at a temperature of approximately 4°-C. Following collection, the samples were delivered under chain-of-custody procedures to Dellavalle Laboratories of Fresno, California and tested for the analytes mentioned below. Copies of the chain-of-custody records are provided in Appendix B.

FINDINGS

Groundwater data acquired from the three groundwater-monitoring wells in addition to previous hydrogeologic studies are included below.

Lithology

Soils encountered in the three boreholes consist predominantly of sand, silty sand, silty clay, clay, and clayey sand. Lithologic logs of the three boreholes are included in Appendix C. Boreholes B-1, B-2 and B-3 were converted to MW-1, MW-2, and MW-3 respectively.

Groundwater Occurrence

Historical data indicate that the average depth to unconfined groundwater in the site vicinity is 87-feeet below ground surface (Table 1). Groundwater depths measured by CTL on March 23 and 24, 2004 ranged from 103.5-feet to 118-feet below top of casing. The groundwater depths were converted to elevations above mean sea level. The elevations were used to determine the groundwater gradient and direction of flow.

In a report prepared by Kenneth D. Schmidt and Associates of Fresno, California, the average direction of groundwater flow 200-feet below ground surface is to the southwest. The direction of groundwater flow calculated by CTL below the Van Beek Dairy on March 23 and March 24, 2004 is approximately S12E with a gradient of 0.017 feet/feet (Figure 2).

ANALYTICAL RESULTS

Groundwater samples were collected by CTL on March 23, 2004, and March 24, 2004, from monitoring wells MW-1, MW-2, and MW-3. The samples were delivered under chain-of-custody to Dellavalle Laboratories, Inc. of Fresno, California and results are

summarized below and tabulated in Table 3. Test methods for each analyte were reported as standard methods (SM).

Previous Analytical Results

Valley Tech Laboratory Services of Tulare, California collected water samples below 200-feet from five irrigation wells surrounding the site in May 2000. The report indicated that nitrates ranged from 3.1 to 7.7-milligrams per liter (mg/L), nitrites range from 0.6 to 1.2-mg/L, total Kjeldhal nitrogen (TKN) ranged from less than 10.0-mg/L to 20.0-mg/L, total dissolved solids ranged from 228-mg/L to 295-mg/L, and total carbons as carbonate and bicarbonate ranged from 973-mg/L to 1,480-mg/L.

Laboratory Analysis

The analytes tested for this report include: nitrites (NO_2), nitrates (NO_3), total Kjeldahl nitrogen (TKN), total dissolved solids (TDS), sulfate (SO_4), calcium, (Ca), magnesium (Mg), sodium (Na), potassium (K), carbonate (CO_3) as calcium carbonate ($CaCO_3$),) bicarbonate (HCO_3) as calcium carbonate ($CaCO_3$), and chloride (Cl). In addition, electrical conductivity, ph, and a cation/anion balance of total dissolved solids were performed. A summary of analytes listed below is tabulated in Table 3.

- **PH**: Reported as moderately alkaline. Monitoring wells MW-1 and MW-2 were reported as having a pH of 7.9. PH levels in MW-3 were slightly lower at 7.7.
- **Electrical Conductivity (EC)**: reported as 550-micromhos per centimeter (μmhos/cm) in MW-1, 519-μmhos/cm in MW-2, and 719-μmhos/cm in MW-3.
- **Nitrate as NO_3**: reported in MW-1 at 7.2-mg/L, MW-2 at 7.8-mg/L, and MW-3 at 20.4-mg/L. The Maximum Contaminant Level (MCL) for Nitrogen is 10-mg/L.
- **Nitrite as NO_2**: reported in MW-1, MW-2, and MW-3 at less than the Practical Quantitation Limit (PQL) also known as the Method Reporting Limit (MRL) of 0.1-mg/L.

- **Ammonia as NH_4**: reported in MW-1 as Not Detected (ND) at or above the Method Detection Limit (MDL) of 0.1-mg/L, MW-2 at 0.2-mg/L, and MW-3 at 0.2-mg/L.
- **Total Kjeldhal Nitrogen (TKN)**: reported in MW-1 at 0.4-mg/L, MW-2 at 1.1-mg/L, and MW-3 at 1.6-mg/L.
- **Sulfate (SO_4)**: reported in MW-1 at 25.7-mg/L, MW-2 at 26.0-mg/L, and MW-3 at 22.0-mg/L.
- **Total Dissolved Solids (TDS):** reported in MW-1 at 360-mg/L, MW-2 at 350-mg/L, and MW-3 at 483-mg/L.
- **Calcium (Ca)**: reported in MW-1 at 70.2-mg/L, MW-2 at 68.8-mg/L, and MW-3 at 100-mg/L.
- **Magnesium (Mg)**: reported in MW-1 at 11.2-mg/L, MW-2 at 9.0-mg/L, and MW3 at 12.1-mg/L.
- **Sodium (Na)**: reported in MW-1 at 28.10-mg/L, MW-2 at 25.5-mg/L, and MW-3 at 33.1-mg/L.
- **Potassium (K)**: reported in MW-1 at 6.9-mg/L, MW-2 at 5.0-mg/L, and MW-3 at 3.7-mg/L.
- **Chloride (Cl)**: reported in MW-1 at 12-mg/L, MW-2 at 19-mg/L, and MW-3 at 32.8-mg/L.
- **Carbonate (Ca) as Calcium Carbonate ($CaCO_3$)**: reported in MW-1, MW-2, and MW-3 at less than the Practical Quantitation Limit (PQL) also known as the Method Reporting Limit (MRL) of 0.1-mg/L.
- **Bicarbonate (HCO_3) as Calcium Carbonate ($CaCO_3$)**: reported in MW-1 at 243-mg/L, MW-2 at 183-mg/L, and MW-3 at 251-mg/L.

Cation/Anion Balance

The analytical laboratory performed a cation/anion balance calculation from the collected groundwater samples to assess the accuracy of major dissolved inorganic constituent values. The ratio between the cations and anions from the collected samples was between 0.9 and 1.0, which is considered within an acceptable range.

CONCLUSIONS AND RECOMMENDATIONS

Nitrate levels in MW-3 were above the MCL of 10-mg/L set by the United States Environmental Protection Agency. In addition, groundwater samples collected by CTL contain nitrate levels higher than those reported from groundwater samples retrieved at greater depths. Total dissolved solids, in addition to carbonate and bicarbonate levels ranged higher than those measured in water samples measured below 200-feet. The pH values are moderately alkaline and total salt concentration (Electrical Conductivity) is within satisfactory ranges. Nitrite, ammonia, and total dissolved solid concentrations are low.

The historical average of depth to groundwater is 87-feet. The average groundwater depth in the three monitoring wells is 110-feet 5-inches. The groundwater flow direction measured on March 23 and March 24, 2004 is estimated to be toward the southeast. The historical groundwater flow direction as reported by Kenneth D. Schmidt and Associates is to the southwest, which is more consistent with regional flow directions. In addition, the groundwater gradient is 0.017 feet/feet.

Based on the above findings, CTL recommends continued sampling and sounding of the three groundwater-monitoring wells as required by the RWQCB. Continued groundwater depth measurements and sampling will provide further information that will more adequately assess the groundwater conditions such as gradient, direction of flow, and quality of groundwater below the Dairyland Farms Dairy.

LIMITATIONS

The services described in this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this report.

The purpose of a geologic/hydrogeologic study is to reasonably characterize existing site conditions based on the geology/hydrogeology of the area. In performing such a study, it is understood that a balance must be struck between a reasonable inquiry into the site conditions and an exhaustive analysis of each conceivable environmental characteristic. The following paragraphs discuss the assumptions and parameters under which such an opinion is rendered.

No investigation is thorough enough to describe all geologic/hydrogeologic conditions of interest at a given site. If conditions have not been identified during the study, such a finding should not therefore be construed as a guarantee of the absence of such conditions at the site, but rather as the result of the services performed within the scope, limitations, and cost of the work performed.

We are unable to report on or accurately predict events that may change the site conditions after the described services are performed, whether occurring naturally or caused by external forces. We assume no responsibility for conditions we were not authorized to evaluate, or conditions not generally recognized as predictable when services were performed.

Geologic/hydrogeologic conditions may exist at the site that cannot be identified solely by visual observation. Where subsurface exploratory work was performed, our professional opinions are based in part on interpretation of data from discrete sampling locations that may not represent actual conditions at unsampled locations.

FIGURES AND TABLES

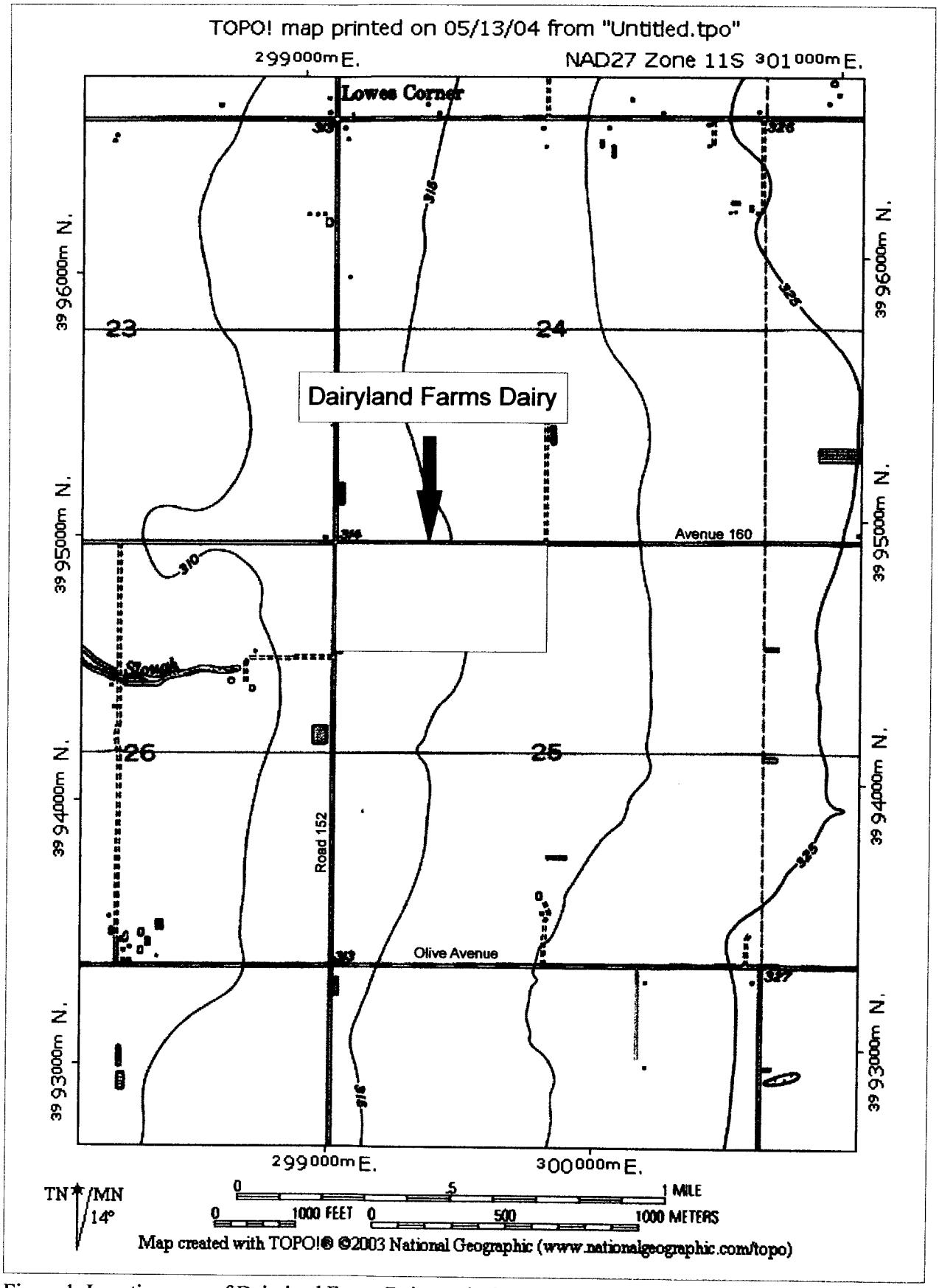


Figure 1. Location map of Dairyland Farms Dairy at the intersection of Avenue 160 and Road 152, Woodville, Tulare County, California.

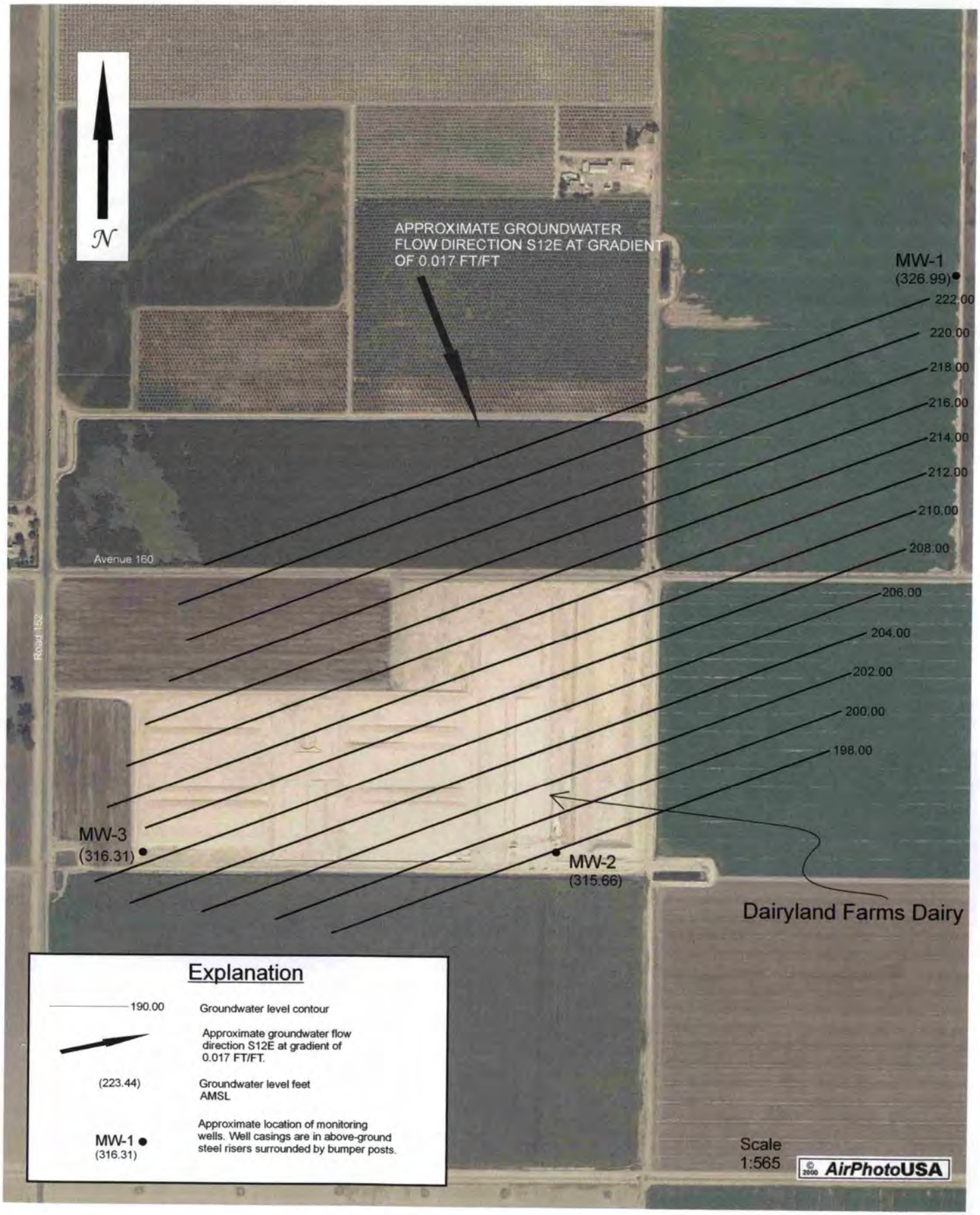


Figure 2. Groundwater level contour map of Dairyland Farms Dairy, Woodville, Tulare County, California.

Table 1
Average Depth to Unconfined Groundwater

Year	Natural Ground Elevation (feet)	Unconfined Groundwater Elevation (feet)	Depth to Unconfined Groundwater (feet)
Fall 1940	315	238	77
Fall 1950	315	188	127
Fall 1960	315	215	100
Fall 1970	315	245	70
Fall 1980	315	245	70
Spring 1990	315	238	77
Spring 1998	315	225	90
Average	315	228	87

Note: Ground elevation from the 1950 USGS Woodville Quadrangle, Tulare County, California. Groundwater elevations obtained from California Department of Water Resources.

Table 2

Monitoring Well Sounding Data
Dairyland Farms Dairy

Well Number	Date Sounded	Depth to Water (Feet)	Top of Casing Elevation (Ft AMSL)	Groundwater Elevation (Ft AMSL)	Groundwater Flow Direction and Gradient Ft/Ft
MW-1	03/23/04	103.55	326.99	223.44	S 12^0 E @ 0.017
MW-2	03/23/04	118.05	315.66	197.61	S 12^0 E @ 0.017
MW-3	03/24/04	110.10	316.31	206.21	S 12^0 E @ 0.017

Table 3
Groundwater Analytical Results[1]
Dairyland Farms Dairy

Monitoring Point	Sampling Date	pH	Electricla Conductivity	Cation/Anion Balance	Nitrate (NO_3-N)	Nitrite (NO_2-N)	Ammonia (NH_4-N)	Total Kjeldhal Nitrogen	Sulfate (SO_4)	Total Dissolved Solids	Calcium	Magnesium	Sodium	Potassium	Carbonate (as $CaCO_3$)	Bicarbonate (as $CaCO_3$)	Chloride
MW-1	3/23/2004	7.9	550.0	0.9	7.2	<0.1	<0.1	0.4	25.7	360.0	70.2	11.2	28.1	6.9	<0.1	243.0	12.0
MW-2	3/23/2004	7.9	519.0	1.0	7.8	<0.1	0.2	1.1	26.0	350.0	68.8	9.0	25.5	5.0	<0.1	183.0	19.0
MW-3	3/24/2004	7.7	719.0	1.0	20.4	<0.1	0.2	1.6	22.0	483.0	100.0	12.1	33.1	3.7	<0.1	251.0	32.8

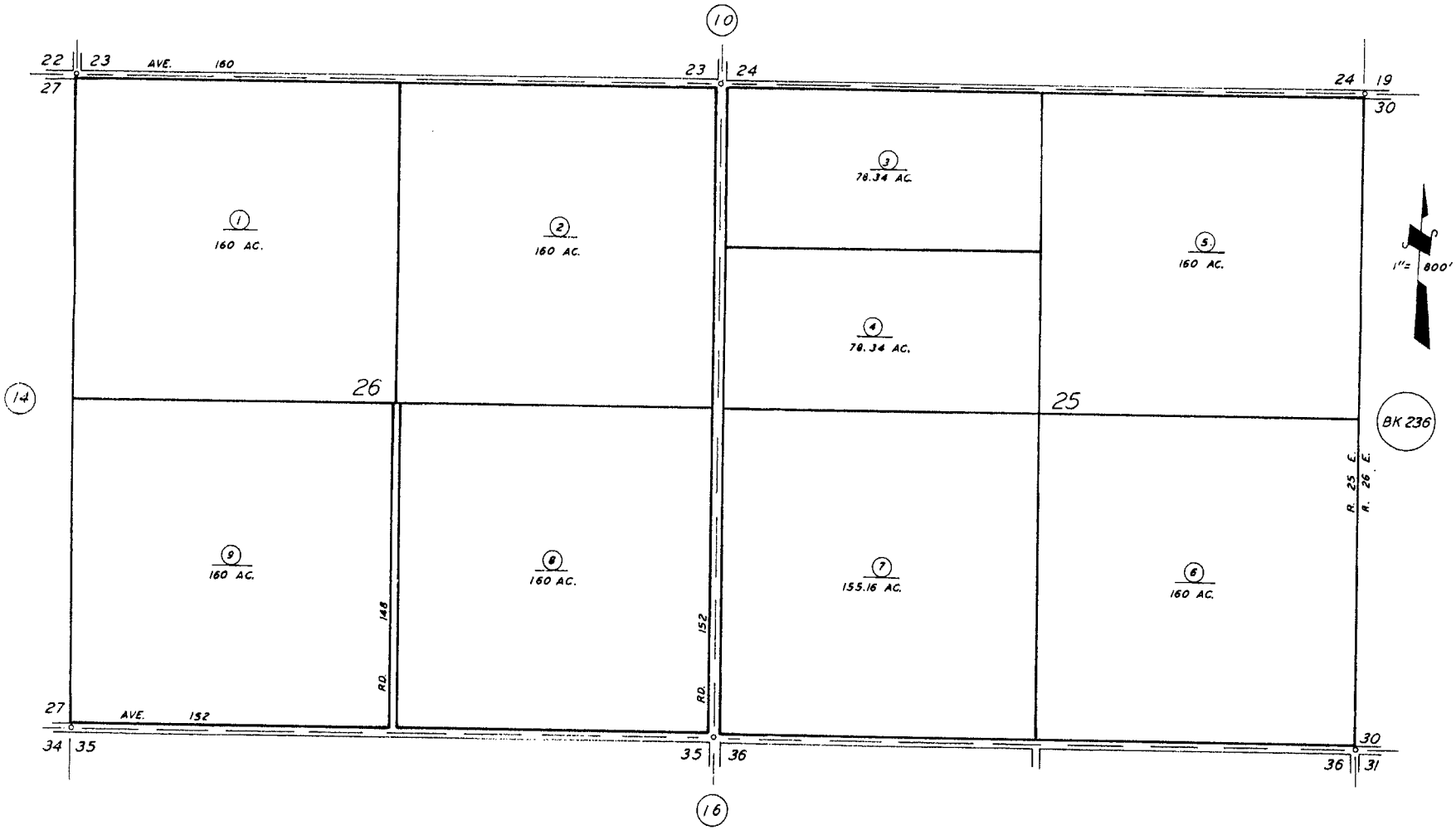
[1]Results are millgrams per liter (mg/L)

APPENDIX A

ASSESSOR'S PARCEL MAPS

SEC'S. 25 & 26, T. 21 S., R. 25 E., M.D.B. & M.

TAX CODE AREA 232-15
147-002

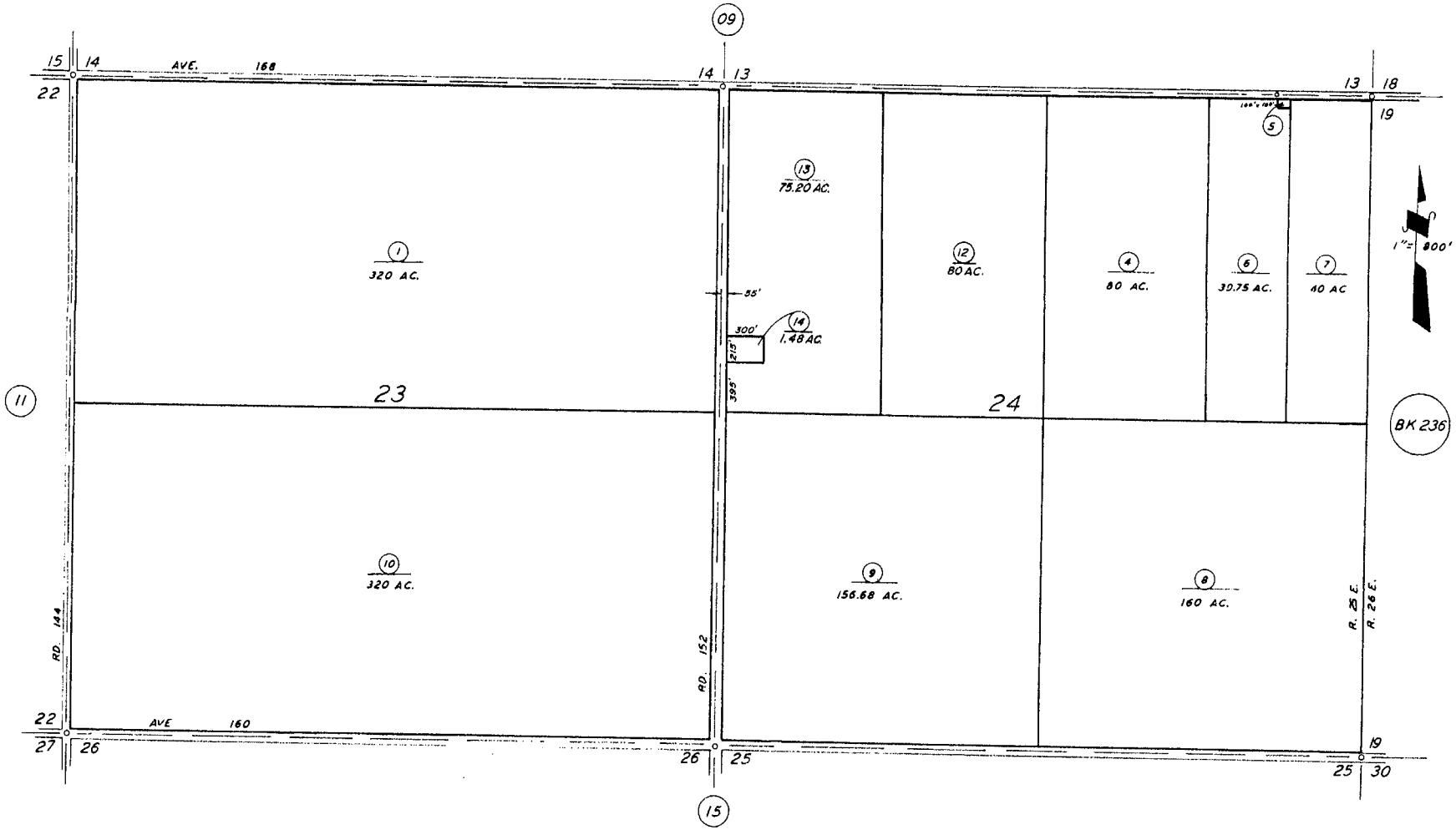


ASSESSOR'S MAPS BK. 232, PG. 15
COUNTY OF TULARE, CALIF.

NOTE — ASSESSOR'S BLOCK NUMBERS SHOWN IN ELLIPSES
ASSESSOR'S PARCEL NUMBERS SHOWN IN CIRCLES

SEC'S. 23 & 24, T. 21 S., R. 25 E., M. D. B. & M.

TAX CODE AREA 232-10
162-001



ASSESSOR'S MAPS BK. 232, PG. 10
COUNTY OF TULARE, CALIF.

NOTE — ASSESSOR'S BLOCK NUMBERS SHOWN IN ELLIPSES
ASSESSOR'S PARCEL NUMBERS SHOWN IN CIRCLES

APPENDIX C

BORING LOGS B-1, B-2, AND B-3

PROJECT: Dairyland Farms
Van Beek Dairy Road 152
and Avenue 160

CONSOLIDATED TESTING LABORATORIES, INC.
603 E. WORTH AVENUE
PORTERVILLE, CA 93257
(559)781-0571 *FAX(559)782-8389

JOB NO.: 5568-04
DATE: 3/08/04
BY: F. Mason

BORING LOG NUMBER B1

DEPTH	%REC	BLOW COUNTS	SAMPLE NO.	SOIL GROUP	SOIL DESCRIPTION	PERCENT MOISTURE	DRY DENSITY
0'			1.5"	SM	0'-1'6", 5'-5'3" Silty Sand; very dark brown, damp, fine to very fine to very coarse, sub-rounded to sub-angular grains, very slight clay binder. Logged from post-hole cuttings. Occasional granules 2-4mm.		
5'		2 3 5	1.5"	SW	5'3"-6'6" Sand; light brown, damp, medium to very coarse, sub-rounded to sub-angular grains. Granules and pebbles 2-6mm. Loose.		
			1.5"	CL	10'-11' Sandy Clay; dark brown, damp, slight to moderate cohesion, medium to coarse sub-rounded sand fraction. Occasional pebbles 6-10mm. Stiff.		
10'		4 9 14	1.5"	CL	11'-11'3" Clay; dark brown, moist, moderate cohesion, minor very fine sand fraction. Stiff.		
			1.5"	SW	11'3"-11'6" Sand; light brown, damp, medium to very coarse sub-rounded grains. Occasional granules 2-3mm. Medium dense.		
15'		3 4 5	1.5"	CL	15'-15'6" Clay; dark brown, moist, moderate cohesion, minor very fine sand fraction.		
			1.5"	CL	15'6"-16'3" Sandy Clay; dark brown, damp, slight to moderate cohesion, medium to coarse sub-rounded sand fraction. Sand lenses of coarse sub-rounded sand approximately 2mm thick are spaced 10-20mm apart.		
20'		3 8 12	1.5"	SW	16'3"-16'6" Sand; light brown, slightly damp, fine to medium sub-rounded to sub-angular grains. Minor rounded pebbles 15-20mm across. Loose.		
			1.5"	SW	20'-21'6" Sand; light brown, slightly damp, medium to very coarse sub-rounded to sub-angular grains. Sub-round to rounded granules and pebbles from 2-30mm across. Silty clay lense at 20'8" is dark yellow brown, moderately cohesive, and approximately 10mm thick. Medium dense.		
25'		4 10 10	1.5"	SM	25'-26'6" Silty Sand; dark yellowish brown, slightly damp, very slight cohesion, very fine to fine sub-rounded grains. Medium dense.		
30'							

LOCATION: Northeast of dairy construction site North of Avenue 160 (See location map)
EQUIPMENT: F-10 drill rig with 10" O.D. hollow stem augers using 1 1/2" I.D. split spoon sampler from 0-111'6"

PROJECT: Dairyland Farms
Van Beek Dairy Road 152
and Avenue 160

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JOB NO.: 5568-04
DATE: 3/08/04
BY: F. Mason

BORING LOG NUMBER B1

DEPTH	%REC	BLOW COUNTS	SAMPLE NO.	SOIL GROUP	SOIL DESCRIPTION	PERCENT MOISTURE	DRY DENSITY
30'		3 5 7	1.5"	ML/ CL	30'-31'6", 35'-3"-36'6" Silty Clay; dark brown, moist, slight to moderate cohesion. Stiff.		
			1.5"	CL	40'-40'3" Clay; dark yellowish brown, moist, moderate cohesion. Stiff.		
35'		4 7 9	1.5"	CL/ ML	40'3"-41'6" Silty Clay; dark yellowish brown, moist, moderate cohesion. Stiff.		
			1.5"	ML	45'-46'6" Sandy Silt; dark yellowish brown, moist, slight to moderate cohesion, very fine to fine sub-rounded sand fraction. Zones 2-3mm of slight reddish-orange mottling. Medium dense.		
40'		3 5 7	1.5"	CL	50'-51' Clay; dark yellowish brown, moist, moderate cohesion, very minor fine to medium sub-rounded sand fraction. Very stiff.		
			1.5"	SM	51'-51'3" Silty Sand; dark olive-brown, damp, slight cohesion, very fine to medium sub-rounded sand fraction. Medium dense.		
45'		3 6 7	1.5"	SW	51'3"-51'6" Sand; light brown, slightly damp, very slight cohesion due to (cementation), very fine to medium sub-rounded to sub-angular grains. Grains are stained reddish-orange in upper 30mm. Medium dense.		
			1.5"	SM	55'-55'4" Silty Sand; dark yellowish brown, damp, slight cohesion, medium to coarse sub-angular grains. Medium dense.		
50'	X	8 13 14	1.5"	SW	55'4"-56'6" Sand; light brown, dry, medium to very coarse sub-angular grains. Sub-rounded to rounded granules 2-4mm and occasional rounded pebbles 10-30mm. Medium dense.		
55'		5 10 13	1.5"	SW	60'-61'6" Sand; light brown, dry, medium to very coarse sub-angular grains. Sub-rounded to rounded granules 2-4mm and occasional rounded pebbles 10-30mm. Medium dense.		
					Note: Driller stated that gravel was encountered at approximately 63' Took approximately 5minutes to clean augers with drill plug. Gravels range from 8-30mm and are rounded.		
60'							

LOCATION: Northeast of dairy construction site North of Avenue 160 (See location map)
EQUIPMENT: F-10 drill rig with 10" O.D. hollow stem augers using 1 1/2" I.D. split spoon sampler from 0-111'6"

PROJECT: Dairyland Farms
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JOB NO.: 5568-04
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BORING LOG NUMBER B1

DEPTH	%REC	BLOW COUNTS	SAMPLE NO.	SOIL GROUP	SOIL DESCRIPTION	PERCENT MOISTURE	DRY DENSITY
60'		5 10 11	1.5"	SM	65'-66'6" Silty Sand; dark yellowish brown, moist, slightly cohesive, very fine to fine sub-rounded grains. Upper 2" is silty sand with grains similar to 60'-61'6". Loose		
			1.5"	SW	70'-70'10" Sand with Clay; olive-brown, moist, slight cohesion, medium to very coarse sub-angular grains, clay binder, occasional pebbles 10mm across. Loose.		
65'		2 4 7	1.5"	SM	70'10"-71'6" Silty Sand; dark yellowish brown, moist, slight to medium cohesion, very fine to fine sub-angular to sub-rounded sand fraction. Loose.		
			1.5"	SC	75'-76'6" Clayey Sand; dark yellowish brown, moist, moderately cohesive, very fine to fine sub-rounded grains, clay binder. Medium dense.		
70'	X	2 3 5	1.5"	ML/CL	80'-81'6" Silty Clay; dark yellowish brown, moist, moderately cohesive, minor very fine sand fraction. Medium stiff.		
			1.5"	SW	85'-86'6" Sand with Clay; dark yellowish brown, moist, slight to moderate cohesion, very fine to medium sub-angular grains. Occasional granules 2-4mm. Moderate clay binder. Medium dense.		
75'		5 9 11	1.5"	CL	90'-91'6" Sandy Clay; dark yellowish brown, moist, moderate cohesion, fine to coarse sub-angular sand fraction. Occasional sub-rounded granules and pebbles 2-15mm. Stiff.		
80'		2 3 4			Note: At about 94', driller states the auger encountered a layer of hardpan 6" thick. Cuttings brought up are tannish-white and the cement reacts to HCL. Hardpan carbonate layer is very well indurated. Sample is in bag "B1-95'-96'6"".		
			1.5"	CL	95'-96'6" Sandy Clay; dark yellowish brown, moist, moderate cohesion, medium to coarse sub-angular sand fraction. Very stiff.		
85'		8 9 11	1.5"	SC	100'-101'6" Silty Clayey Sand; dark yellowish brown, moist, slight cohesion, fine to coarse sub-angular to sub-rounded grains, minor clay binder. Occasional granules and pebbles 2-8mm. Medium dense. Moisture content slightly greater than above sample.		
					Note: Encountered groundwater at 100'.		
90'							

LOCATION: Northeast of dairy construction site North of Avenue 160 (See location map)
EQUIPMENT: F-10 drill rig with 10" O.D. hollow stem augers using 1 1/2" I.D. split spoon sampler from 0-111'6"

PROJECT: Dairyland Farms
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JOB NO.: 5568-04
DATE: 3/08/04
BY: F. Mason

BORING LOG NUMBER B1

DEPTH	%REC	BLOW COUNTS	SAMPLE NO.	SOIL GROUP	SOIL DESCRIPTION	PERCENT MOISTURE	DRY DENSITY
90'		3 5 7	1.5"	SW	105'-106'6" Sand; light brown, wet, fine to very coarse sub-angular to sub-rounded grains. Occasional sub-rounded granules 2-4mm across.		
			1.5"	SW	110'-111'3" Sand; brown, wet, medium to very coarse sub-rounded to sub-angular grains. Occasional granules and pebbles 2-6mm.		
95'		3 5 11	1.5"	ML/CL	111'3"-111'6" Silty Clay; dark yellowish brown, wet, moderately cohesive, slight silt.		
					Terminated drilling at 120'. Groundwater encountered at 100'. Samples not retrievable below water table.		
100'		4 9 11					
105'		7 9 12					
110'		3 4 5					
115'							
120'							

LOCATION: Northeast of dairy construction site North of Avenue 160 (See location map)

EQUIPMENT: F-10 drill rig with 10" O.D. hollow stem augers using 1 1/2" I.D. split spoon sampler for 0-111'6"

PROJECT: Dairyland Farms
Van Beek Dairy Road 152
and Avenue 160

CONSOLIDATED TESTING LABORATORIES, INC.
603 E. WORTH AVENUE
PORTERVILLE, CA 93257
(559)781-0571 *FAX(559)782-8389

JOB NO.: 5568-04
DATE: 3/09/04
BY: F. Mason

BORING LOG NUMBER B2

DEPTH	%REC	BLOW COUNTS	SAMPLE NO.	SOIL GROUP	SOIL DESCRIPTION	PERCENT MOISTURE	DRY DENSITY
0'					Ground surface is loose silty soil with sparse vegetation		
					5' -6'		
			1.5"	CL	Clay; dark yellowish brown, moist, very firm, moderately to heavily cohesive, white carbonate stringers approximately 10%. Very stiff.		
					6'-6'6"		
5'	X	5 12 16	1.5"	SC	Clayey Sand; yellowish brown, moist, very firm, moderately cohesive, very fine to medium sub-angular grains, white carbonate stringers approximately 15%. Medium dense.		
					10'-11'6"		
			1.5"	CL	Silty Clay; dark yellowish brown, moist, moderately cohesive. Stiff.		
					15'-16'		
10'		3 5 8	1.5"	CH	Clay; yellowish brown, moist, moderately to heavily cohesive, occasional carbonate nodules 5-10mm across and stringers 5mm. Medium stiff.		
					16'-16'6"		
			1.5"	CL	Sandy Clay; dark yellowish brown, moist, moderately cohesive, very fine to fine sand fraction. Medium stiff.		
					20'-21'3"		
15'		2 2 5	1.5"	CL	Silty Clay; dark yellowish brown, moist, moderately cohesive. Stiff.		
					21'3"-21'6"		
			1.5"	CL	Sandy Clay; dark yellowish brown, moist, slight to moderate cohesive, friable, very fine sand fraction. Stiff		
					25'-26'6"		
20'			1.5"	CL	Clay; dark yellowish brown, moist, moderately cohesive, very slight reddish-orange mottling. Medium stiff.		
		4 6 7			30'-30'8"		
			1.5"	CL	Clay; brown, moist, moderately cohesive. Medium stiff.		
					30'8"-31'6"		
			1.5"	SM	Silty Sand; dark yellowish brown, damp, slightly cohesive, friable, very fine to fine sub-rounded to sub-angular grains. Medium dense.		
25'					35'-36'		
		2 3 3	1.5"	SC	Clayey Sand; dark yellowish brown, moist, slightly cohesive, friable very fine to fine sub-angular to sub-rounded grains, clay binder. Medium dense.		
					36'-36'6"		
			1.5"	SM	Silty Sand; dark yellowish brown, moist, slightly cohesive, friable, fine to medium sub-angular to sub-rounded grains, moderate reddish-orange stain on grain surfaces. Medium dense.		
30'							

LOCATION: East of dairy site at South end of collection ponds (See location map)
EQUIPMENT: F-10 drill rig with 10" O.D. hollow stem augers using 1 1/2" I.D. split spoon sampler from 0-121'6"

PROJECT: Dairyland Farms
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JOB NO.: 5568-04
DATE: 3/09/04
BY: F. Mason

BORING LOG NUMBER B2

DEPTH	%REC	BLOW COUNTS	SAMPLE NO.	SOIL GROUP	SOIL DESCRIPTION	PERCENT MOISTURE	DRY DENSITY
30'	X	4 6 9	1.5"	SC	40-'40-6" Clayey Sand; brown, moist, slightly cohesive, very friable, fine to medium sub-angular to sub-rounded grains. Dense.		
			1.5"	SW	40'6"-41'6" Sand; light brown, moist, slightly damp, fine to very fine coarse sub-angular to sub-rounded grains, grains are 85% quartz and 10% biotite, 5% feldspar, rounded granules and pebbles 2-22mm. Dense.		
35'	X	6 8 13			Note: Rounded gravels up to 50mm brought up in cuttings between 40' and 45'.		
			1.5"	SW	45'-45'2" Silty sand w/ gravel; dark brown, moist, very friable, medium to very cohesive, sub-angular to sub-rounded grains. Occasional rounded gravel up to 26mm across. Dense.		
40'	X	8 16 20	1.5"	SC	45'2"-46'6" Clayey Sand; olive-brown, moist, slight to moderate cohesive, fine to medium sub-angular to sub-rounded grains. Dense.		
					Note: Rounded gravels up to 65mm were in the cuttings from approximately 45 feet.		
45'		11 19 17			50'-50'8" No recovery.		
			1.5"	SW	50'8"-51'3" Clayey Sand; dark brown, moist, slightly cohesive, fine to very coarse sub-angular to sub-rounded grains. Rounded granules and pebbles 2mm-12mm across, very dense, minor clay binder.		
50'	X X	7 29 31	1.5"	SW	51'3"-51'6" Clayey Sand; olive-brown, damp, slightly cohesive, firm, fine to very coarse sub-angular to sub-rounded grains. Occasional rounded granules 2-3mm, very minor clay binder. Very dense.		
					Note: Driller states moderate to heavy resistance to auger penetration. Auger took approximately 10 minutes to drill from 52'-54'. Driller states that the auger was possibly cutting through a layer of hardpan. Whitish tan cuttings from this layer violently react w/ HCL. Cuttings in sample bag 55'-55'6".		
55'		4 5 8					
			1.5"	SC	55'-55'8" Clayey Sand; dark brown, damp, slightly cohesive, medium to very coarse sub-angular grains. Occasional rounded pebbles up to 15mm. Medium dense.		
60'							

LOCATION: East of dairy site at South end of collection ponds (See location map)
EQUIPMENT: F-10 drill rig with 10" O.D. hollow stem augers using 1 1/2" I.D. split spoon sampler from 0-121'6"

PROJECT: Dairyland Farms
Van Beek Dairy Road 152
and Avenue 160

CONSOLIDATED TESTING LABORATORIES, INC.
603 E. WORTH AVENUE
PORTERVILLE, CA 93257
(559)781-0571 *FAX(559)782-8389

JOB NO.: 5568-04
DATE: 3/09/04
BY: F. Mason

BORING LOG NUMBER B2

DEPTH	%REC	BLOW COUNTS	SAMPLE NO.	SOIL GROUP	SOIL DESCRIPTION	PERCENT MOISTURE	DRY DENSITY
60'		4 5 6	1.5"	CL	55'8"-56'6" Sandy Clay; dark yellowish brown, damp, slight to moderate cohesive, fine to coarse sub-rounded sand fraction with occasional granules 2mm across. Medium stiff.		
			1.5"	ML/CL	60'-61'6" Silty Clay; dark yellowish brown, moist, moderate cohesion. Stiff.		
65'		3 21 25	1.5"	CL	65'-65'3" Silty Clay; dark yellowish brown, moist, moderately cohesive. Medium stiff.		
			1.5"	SW	65'3"-66'6" Sand; light brown, damp, fine to medium sub-angular to sub-rounded grains, very dense, very friable. Medium dense.		
70'		3 8 11	1.5"	ML	70'-71'6" Clayey Silt; dark yellowish brown, damp, slight to moderate cohesion, very stiff, carbonate concretions 4mm-40mm in upper 4". Very Stiff.		
			1.5"	SM	75'-76'6" Silty Sand; dark brown, damp, very slightly cohesive, fine to very coarse sub-angular to sub-rounded grains, round granules 2-6mm. Medium dense.		
75'	X	7 11 19	1.5"	CL	80'-81'6" Silty Clay; dark yellowish brown, moist, moderately cohesive, stiff, carbonate stringers/veinlets 0.5-1mm wide are 5mm to 50mm apart in the upper 5 inches. Stiff to very stiff.		
					Note: At approximately 85', the plug was lost in the hole and the driller drilled to 90' to try and retrieve it. The augers were tripped out and the plug was not retrieved. The plug is in the bottom of the hole between 85' and 90'. Samples from 85' were not collected.		
80'		4 7 8	1.5"	CL	90'-91'6" Silty Clay; dark brown, moist, slight to moderate cohesion, slight very fine sand fraction. Stiff.		
85'			1.5"	CL	95'-96'6" Sandy Silty Clay; dark brown, moist, moderately cohesive, stiff, very fine to fine sand fraction		
			1.5"	CL/ML	100'-101'6" Silty Clay; dark brown, moist, slight to moderately cohesive, stiff, very fine to fine to medium sand fraction.		
90'			1.5"	ML	105'-106'6" Sandy Silt; dark brown, moist, slight cohesion, stiff, very fine to medium sub-angular to sub-rounded grains, very slight clay binder.		

LOCATION: East of dairy site at South end of collection ponds (See location map)
EQUIPMENT: F-10 drill rig with 10" O.D. hollow stem augers using 1 1/2" I.D. split spoon sampler from 0-121'6"

PROJECT: Dairyland Farms
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JOB NO.: 5568-04
DATE: 3/09/04
BY: F. Mason

BORING LOG NUMBER B2

DEPTH	%REC	BLOW COUNTS	SAMPLE NO.	SOIL GROUP	SOIL DESCRIPTION	PERCENT MOISTURE	DRY DENSITY
90'		3 5 7	1.5"	SM	110'-111'6" Silty Sand; dark yellowish brown, moist, slightly cohesive, very fine to medium sub-angular to sub-rounded grains. Medium dense.		
			1.5"	CL	115'-116'6" Silty Clay; dark yellowish brown, moist, moderately cohesive. Occasional interment zones 5-10mm across of sub-angular granules and pebbles 2-5mm. Stiff.		
95'		2 4 6	1.5"	SW	120'-121'6" Sand; dark yellowish brown, moist, very slight cohesion, fine to very coarse sub-angular grains. Slightly silty, minor clay binder. Occasional granules and pebbles 2-5mm.		
					Terminated drilling at 122'. Encountered groundwater at 111'. Auger plug was lost in well at approximately 90'.		
100'		3 5 9					
105'		3 7 11					
110'		7 13 17					
115'		4 7 13					
120'		6 13 15					

LOCATION: East of dairy site at South end of collection ponds (See location map)
EQUIPMENT: F-10 drill rig with 10" O.D. hollow stem augers using 1 1/2" I.D. split spoon sampler from 0-121'6"

PROJECT: Dairyland Farms
Van Beek Dairy Road 152
and Avenue 160

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603 E. WORTH AVENUE
PORTERVILLE, CA 93257
(559)781-0571 *FAX(559)782-8389

JOB NO.: 5568-04
DATE: 3/17/04
BY: F. Mason

BORING LOG NUMBER B3

DEPTH	%REC	BLOW COUNTS	SAMPLE NO.	SOIL GROUP	SOIL DESCRIPTION	PERCENT MOISTURE	DRY DENSITY
0'					5'-6'6", 10'-11'6"		
			1.5"	SC/CL	Clayey Silty Sand; dark yellowish brown, damp, slight to moderate cohesion, very fine to coarse sub-angular grains, moderate clay binder and trace silt. Dense.		
					15'-16'		
			1.5"	SP	Sand; dark yellowish brown, slightly damp, fine sub-angular to sub-rounded grains. Medium dense.		
5'	X	11 16 21					
					16'6"		
			1.5"	SW	Sand; yellowish brown, slightly damp, fine to very coarse sub-angular to sub-rounded grains. Occasional granules 2-4mm. Medium dense.		
					20'-21'6"		
			1.5"	SC/CL	Clayey Silty Sand; dark yellowish brown, damp, slight to moderate cohesion, very fine to coarse sub-angular grains, moderate clay binder and trace silt. Medium dense.		
10'	X	6 11 13					
					25'-26'		
			1.5"	SW	Sand; yellowish brown, slightly damp, medium to very coarse sub-rounded grains. Gradational change in lower strata. Medium dense.		
15'		4 6 8			26'-26'6"		
			1.5"	SM	Silty Sand; olive brown, damp to moist, slightly cohesive, very fine to fine sub-rounded grains, slightly silty.		
					30'-30'8"		
			1.5"	ML/CL	Sandy Clayey Silt; olive brown, slightly cohesive, very fine to fine sand fraction. Clay binder.		
20'		7 10 11			30'8"-31'6"		
			1.5"	ML	Sandy Silt; dark yellowish brown, damp, very slightly cohesive, fine sand fraction, very slightly clayey.		
					35'-36'3"		
			1.5"	CL	Silty Clay; olive brown, damp, moderately cohesive, moderately silty. Very stiff.		
25'		6 11 15			36'3"-36'6"		
			1.5"	SM	Silty Sand; dark yellowish brown, damp, very fine to fine sub-rounded grains, slight to moderate silt. Medium dense.		
30'							

LOCATION: Southwest at Main Dairy site approximately 500 feet East of Road 152 (See location map)
EQUIPMENT: F10 drill rig with 10" O.D. hollow stem augers using a 1.5" SPT from 0-121'

PROJECT: Dairyland Farms
Van Beek Dairy Road 152
and Avenue 160

CONSOLIDATED TESTING LABORATORIES, INC.
603 E. WORTH AVENUE
PORTERVILLE, CA 93257
(559)781-0571 *FAX(559)782-8389

JOB NO.: 5568-04
DATE: 3/17/04
BY: F. Mason

BORING LOG NUMBER B3

DEPTH	%REC	BLOW COUNTS	SAMPLE NO.	SOIL GROUP	SOIL DESCRIPTION	PERCENT MOISTURE	DRY DENSITY
30'		6 11 13	1.5"	CL	40'-40'9" Silty Clay; olive brown, damp, moderately cohesive, slightly silty. Very stiff.		
			1.5"	SM	40'9"-41'6" Silty Sand; dark yellowish brown, damp, very slight cohesion, very fine grains.		
35'		5 6 12	1.5"	SW	45'-46'6" Sand; light olive brown, slightly damp, very fine to medium sub-angular grains. Upper 3" is slightly silty and yellowish-red. From 46'3"-46'4" a 1" layer of coarse sub-angular sand separates the homgenous. Very fine to medium sand. Medium dense.		
			1.5"	SM	50'-50'3" Silty Sand; light yellowish brown, slightly damp, very fine to coarse sub-rounded grains. Slightly silty.		
40'		8 13 16	1.5"	SP	50'3"-51'6" Sand; light olive brown, dry to slightly damp, fine sub-angular to sub-rounded grains, 85% quartz. Medium dense.		
			1.5"	CL	55'-56'6" Silty Clay; olive brown, moist, moderately cohesive, slight trace of silt.		
45'		6 9 14	1.5"	CL	60'-60'3" Sandy Clay; olive brown, moist, moderately cohesive, very fine to fine sub-angular to sub-rounded grains. Very stiff.		
			1.5"	ML	60'3"-61' Clayey Silt; yellowish brown, moist, slight to moderate cohesion, moderate clay binder. Hard.		
50'		6 10 11	1.5"	SM	61'-61'6" Silty Sand; yellowish brown, damp, very fine to medium sub-angular grains, moderately to heavily silty. Slight cohesion. Medium dense.		
55'		2 4 6	1.5"	CL	65'-65'2" Clay; olive brown, moist, moderately cohesive, slight silt. Stiff.		
			1.5"	SM	65'2"-66'6" Silty Sand; olive brown, damp, very fine to medium sub-rounded grains, moderately silty with minor clay binder. Medium dense.		
60'			1.5"	CL	70'-70'3" Sandy Clay; olive brown, moist, very fine to medium sub-rounded sand fraction, moderately cohesive. Stiff.		

LOCATION: Southwest at Main Dairy site approximately 500 feet East of Road 152 (See location map)
EQUIPMENT: F10 drill rig with 10" O.D. hollow stem augers using a 1.5" SPT from 0-121'

PROJECT: Dairyland Farms
Van Beek Dairy Road 152
and Avenue 160

CONSOLIDATED TESTING LABORATORIES, INC.
603 E. WORTH AVENUE
PORTERVILLE, CA 93257
(559)781-0571 *FAX(559)782-8389

JOB NO.: 5568-04
DATE: 3/17/04
BY: F. Mason

BORING LOG NUMBER B3

DEPTH	%REC	BLOW COUNTS	SAMPLE NO.	SOIL GROUP	SOIL DESCRIPTION	PERCENT MOISTURE	DRY DENSITY
60'		5 12 14	1.5"	SC	70'3"-71'6" Clayey Sand; yellowish red, damp, fine to coarse sub-angular grains, moderate clay binder. Loose.		
					Note: The upper soil grades into the lower soil via alternating layers 10-20 mm thick.		
65'	X	5 7 10	1.5"	ML/CL	75'-76'6" Clayey Silt; yellowish brown, moist, slightly cohesive, light to moderate clay binder. Very stiff.		
			1.5"	SC	80'-80'5" Clayey Sand; light olive brown, slightly damp, moderately cohesive, very fine to medium sub-angular to sub-rounded grains. Abundant carbonate stringers throughout. Carbonate matrix strongly reacts to hydrochloric (HCL). Dense.		
70'		1 2 3	1.5"	SM	80'5"-81'6" Silty Sand; olive brown, damp, very fine to fine sub-rounded grains. Slight to moderate silt, moderate intermittent carbonate layers less than 0.5mm thick spaced 15-30mm apart. Dense.		
			1.5"	CL	85'-86'6" Sandy Clay; olive brown, damp, moderately cohesive, very fine sand fraction. The clay matrix in the upper 12" reacts strongly with hydrochloric acid (HCL). Hard. At approximately 85'8" is a ½" layer of well cemented sand. Cement reacts strongly with HCL.		
75'		8 15 16					
			1.5"	CL	90'-91'6" Silty Sand; olive brown, moist, moderately cohesive, slightly silty, very firm. Stiff.		
80'		11 34 12	1.5"	CL	95'-95'8" Clay; light olive brown, moist, moderately to heavily cohesive, lower boundary is abrupt. Very hard and well cemented with carbonate cement. Medium plasticity. Stiff.		
			1.5"	ML/CL	95'8"-96'6" Sandy Clayey Silt; yellowish brown, moist, slight to moderate cohesion, moderate clay binder, very fine to fine sand fraction. Stiff.		
85'		9 14 16	1.5"	SC	100'-101'6" Clayey Silty Sand; dark yellowish brown, moist, slightly cohesive, moderate silt and clay binder, very fine to coarse sub-angular grains. Medium dense.		
90'							

LOCATION: Southwest at Main Dairy site approximately 500 feet East of Road 152 (See location map)
EQUIPMENT: F10 drill rig with 10" O.D. hollow stem augers using a 1.5" SPT from 0-121'

PROJECT: Dairyland Farms
Van Beek Dairy Road 152
and Avenue 160

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JOB NO.: 5568-04
DATE: 3/17/04
BY: F. Mason

BORING LOG NUMBER B3

DEPTH	%REC	BLOW COUNTS	SAMPLE NO.	SOIL GROUP	SOIL DESCRIPTION	PERCENT MOISTURE	DRY DENSITY
90'		4 6 8	1.5"	SW	105'-106'6", 110'-111'6", 115'-116' Silty Sand; olive brown, moist, slight cohesion, very fine to fine angular to sub-rounded grains. Angular to sub-rounded granules and pebbles 2-8mm. Slightly silty, minor clay binder. Very dense.		
			1.5"	CL	116'-116'6" Silty Clay; olive brown, moist, slight to moderate cohesion, moderate silt, very fine sand fraction. Hard.		
95'		4 7 9	1.5"	CL	120'-121'6" Sandy Clay; olive brown, moist, moderately cohesive, fine to coarse sub-angular to sub-rounded grains. Sub-angular grains 2-5mm. Very stiff.		
100'		4 11 16			Terminated drilling @ 121'. Groundwater encountered at 104'.		
105'		15 23 27					
110'		9 13 20					
115'		2 3 4					
120'		9 11 15					

LOCATION: Southwest at Main Dairy site approximately 500 feet East of Road 152 (See location map)
EQUIPMENT: F10 drill rig with 10" O.D. hollow stem augers using a 1.5" SPT from 0-121'6"

APPENDIX D

WELL PERMIT APPLICATION
MONITORING WELL SCHEMTAIC
FOR MW-1, MW-2, AND MW-3

Well Driller:
★ Fill out Well Permit Application
★ Fill out Map Site Attachment
(Please detach from Well Permit when filling out this form)

Tulare County Environmental Health
5957 S. Mooney Blvd.
Visalia, CA 93277
733-6441

#5568-04

WELL PERMIT APPLICATION

Owner Bill Van Beek (WDID #5C54NC00320 DAIRYLAND Farms Dairy) Phone # 559-752-4945

Site Address 15920 Road 152 & AVE 160 City Tipton, CA

Assessor's Parcel No. 232-150-03 (80 Ac.) Parcel Size ~~[illegible]~~ 80 Acre(s)

Township-Range-Section T 21S R 25E S 25

Contractor Consolidated Testing Labs., Inc. Phone # 559-781-0571

Address 603 E. Worth Avenue City Porterville, CA

State License # 544541 License Classification C-57

TYPE OF WORK		METHOD USED		TYPE OF WELL	
Drilling	[x]	Cable Tool	[ ]	Individual	[ ]
Recondition	[ ]	Rotary	[ ]	Public Domestic	[ ]
Deepen	[ ]	Reverse Rotary	[ ]	Agricultural	[ ]
Destroy	[ ]	Air Rotary	[ ]	Industrial	[ ]
		Hollow Stem Auger	[x]	Monitoring	[x]
		Casing Driven	[ ]	Soil Boring	[ ]

CASING INFORMATION
Casing Material 4" PVC
Diameter 4" in.
Gauge Sch. 40
Perforations Yes [✓] No [ ]
Slot Size .050 in.
Perforation Depths 90'-120' ft.

WELL CONSTRUCTION
Depth of Well 120'± ft.
Gravel Packed Yes [✓] No [ ]
Conductor Casing Yes [ ] No [✓]
Depth of Seal 0'-90' ft.
Seal Material NEAT CEMENT

I hereby certify that I have prepared this application and that the work will be done in accordance with the provisions of the Tulare County Well Ordinance.

Date Work to Begin March 2004 Print Name David Harris

Title Contractor Signature [signature]

(Health Department Use Only)

Date Rec'd 3/2/04 Fee Amount 80.00 Receipt # 3851 Check# 5427

In accordance with the provisions of the Tulare County Well Ordinance, permission is granted to perform the work as set forth in this application. This application becomes your valid **WELL PERMIT** upon receipt of all requested information, associated fees, and signed hereupon.

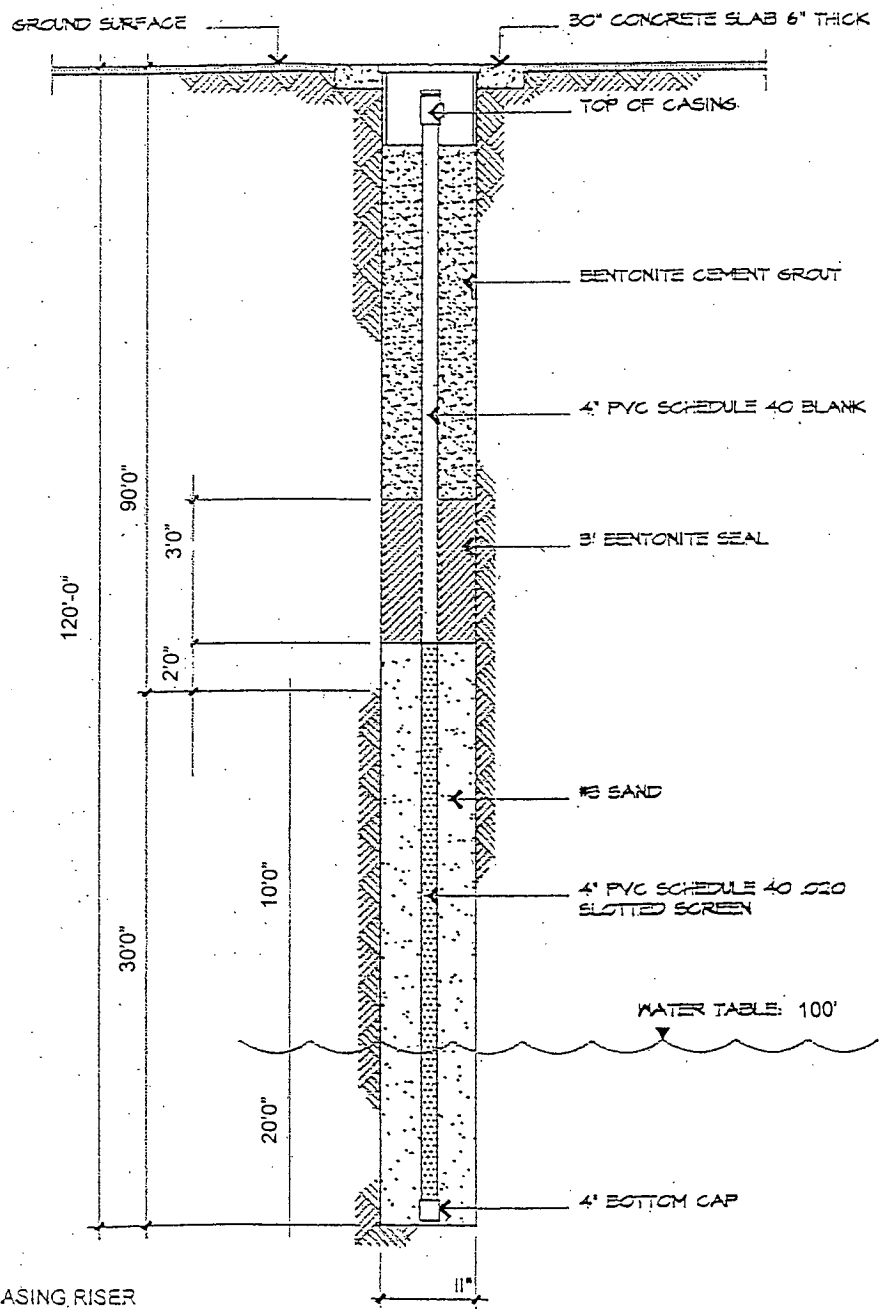
Date Issued 3/4/04 Issued by Salvie T. Geaney, REHS

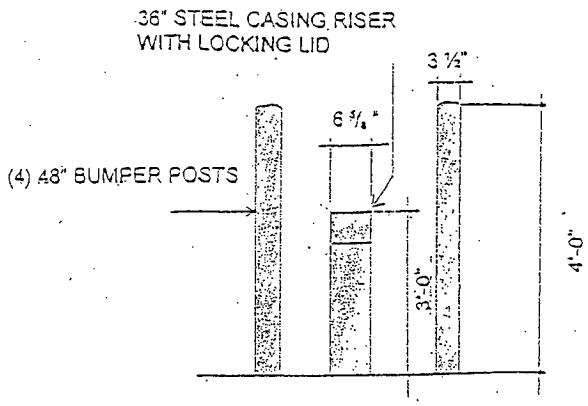
Conditions:

HSD 138 (Rev. 8/01)

MONITORING WELL DETAIL

PROJECT NAME:	Dairyland Farms Dairy	BORING / WELL NO.:	MW-1
		TOP OF CASING ELEVATION:	326.99'
PROJECT NUMBER:	5568-04	-	-
LOCATION:	Ave 160 and Road 152 Woodville, California	-	-
		INSTALLATION DATE:	

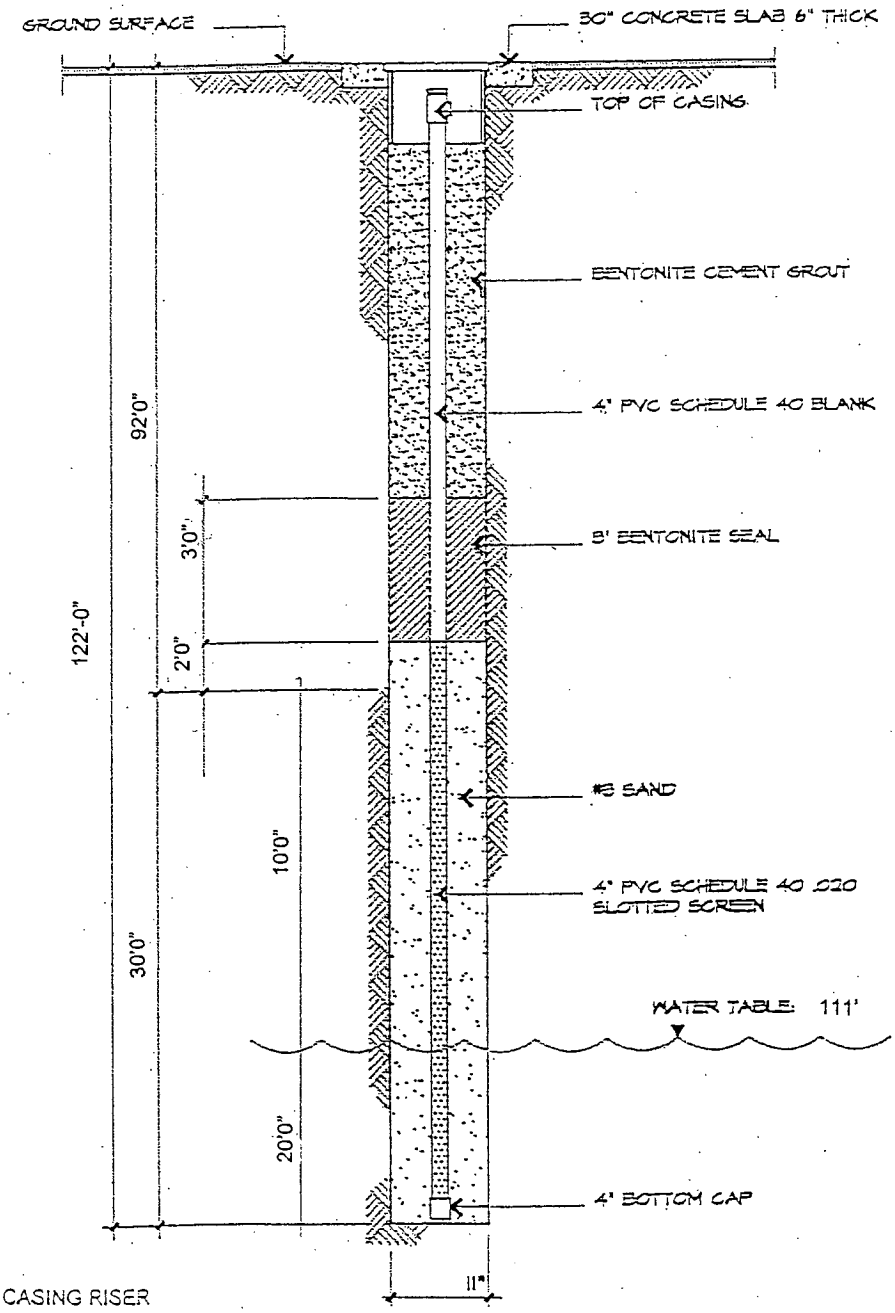


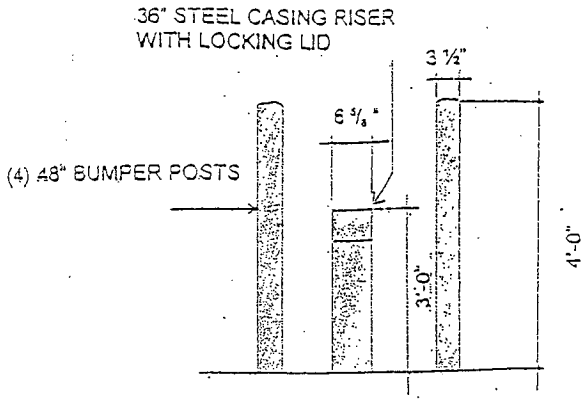


NOTE: DRAWING NOT TO SCALE, SCHEMATIC ONLY

MONITORING WELL DETAIL

PROJECT NAME:	Dairyland Farms Dairy	BORING / WELL NO.:	MW-2
		TOP OF CASING ELEVATION:	315.66'
PROJECT NUMBER:	5568-04	-	-
LOCATION:	Ave 160 and Road 152 Woodville, California	-	-
		INSTALLATION DATE:	

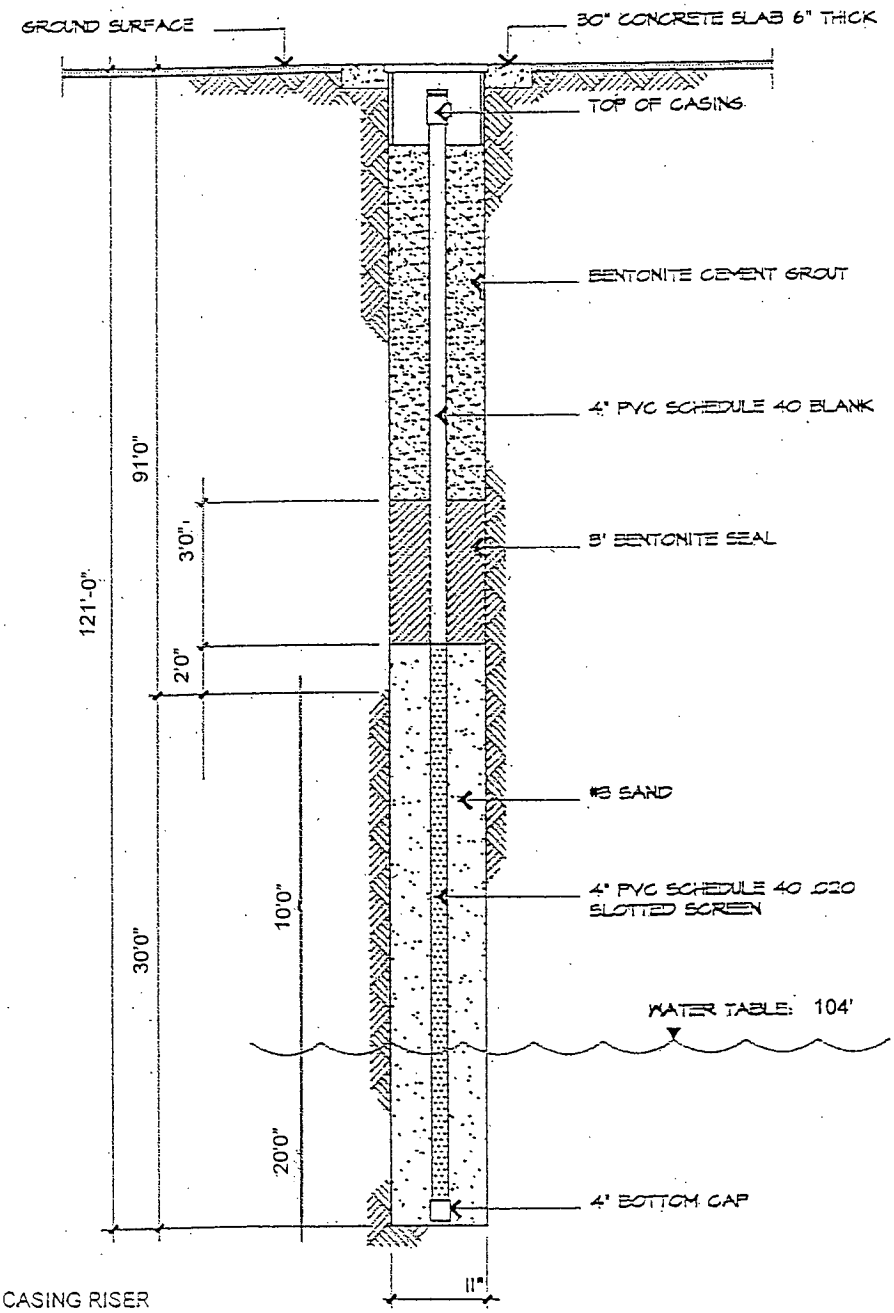


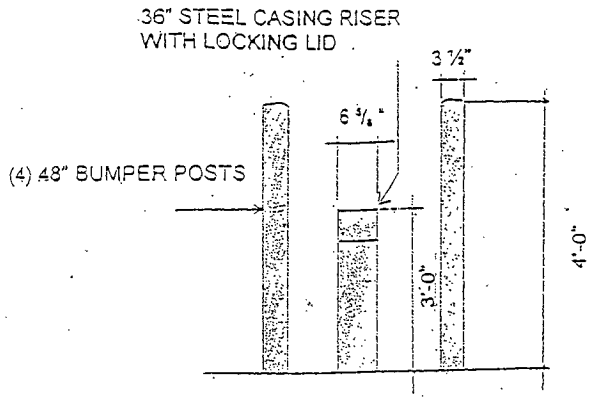


NOTE: DRAWING NOT TO SCALE, SCHEMATIC ONLY

MONITORING WELL DETAIL

PROJECT NAME:	Dairyland Farms Dairy	BORING / WELL NO.:	MW-3
		TOP OF CASING ELEVATION:	316.31'
PROJECT NUMBER:	5568-04	-	-
LOCATION:	Ave 160 and Road 152 Woodville, California	-	-
WELL PERMIT NUMBER:		INSTALLATION DATE:	





NOTE: DRAWING NOT TO SCALE, SCHEMATIC ONLY

ELK

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Owner's Copy

Page ___ of ___
Owner's Well No. SW 1D
Date Work Began 05-21-04 Ended 05-24-04
Local Permit Agency Tulare County
Permit No. 3887 Permit Date 05-07-04

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. 411933

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) X VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DEPTH TO FIRST WATER 60 (Ft.) BELOW SURFACE

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0'	5'	Silty Clay Brown
5'	10'	" "
10'	15'	" "
15'	20'	Clay Dark yellow Brown
20'	25'	" "
25	30'	" "
30'	35'	SANDY silty clay Brown
35'	40'	" " "
40'	45'	silty clay Brown
45'	50'	Clay Brown
50'	55'	" "
55'	60'	" "
60'	65'	SANDY Clay Brown
65'	70'	Silty SANDY Clay Brown
70'	75'	" "
75	80'	silty clay Brown

TOTAL DEPTH OF BORING ___ (Feet)
TOTAL DEPTH OF COMPLETED WELL 80 (Feet)

WELL OWNER
Name Aric DeJong (Elkhorn Dairy)
Mailing Address 2820 So. Shirk Rd
Visalia Ca. 93722
CITY STATE ZIP

WELL LOCATION
Address 10400 AVE 368
City Visalia, Ca
County Tulare County
APN Book 041-050-007 Page ___ Parcel ___
Township 17S Range 24E Section 11
or Latitude ___ NORTH Longitude ___ WEST
DEG. MIN. SEC. DEG. MIN. SEC.

LOCATION SKETCH
NORTH
WEST EAST
Elkhorn Dairy
10400 Ave. 368
SW1D
368
SOUTH
Illustrate or Describe Distance of Well from Landmarks such as Roads, Buildings, Fences, Rivers, etc.
PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)
X NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY *(Describe Procedures and Materials Under "GEOLOGIC LOG")*

PLANNED USE(S)
X (✓) MONITORING
WATER SUPPLY
___ Domestic
___ Public
___ Irrigation
___ Industrial
___ "TEST WELL"
___ CATHODIC PROTECTION
___ OTHER (Specify)

DRILLING METHOD HSA FLUID ___

WATER LEVEL & YIELD OF COMPLETED WELL
DEPTH OF STATIC WATER LEVEL 55 (Ft.) & DATE MEASURED 05-24-04
ESTIMATED YIELD* ___ (GPM) & TEST TYPE ___
TEST LENGTH ___ (Hrs.) TOTAL DRAWDOWN ___ (Ft.)
** May not be representative of a well's long-term yield.*

CASING(S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL/GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0'	55'		X				PVC	2"	Sched 40	
55'	80'			Y			PVC	2"	Sched 40	.020

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE: CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0'	52'	X			
52	55'		X		
55'	80'				#3 SAND

ATTACHMENTS (✓)
___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analyses
___ Other ___
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT
I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME BSK & Associates
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
567 W. Shaw Fresno Ca. 93704
ADDRESS CITY STATE ZIP
Signed [signature] 5-21-04 490942
WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED C-57 LICENSE NUMBER

WR 188 REV. 7-90 IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

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Page ___ of ___

Owner's Well No. SW 2D

Date Work Began 05-25-04 Ended 05-25-04

Local Permit Agency Tulare County

Permit No. 3889 Permit Date 05-07-04

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. 411931

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) X VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)

DEPTH TO FIRST WATER 55 (Ft.) BELOW SURFACE

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0'	5'	Silty clay Yellow Brown
5'	10'	Clay Brown
10'	15'	Clay Silt Brown
15'	20'	Silt Clay Brown
20'	25'	Clay Brown
25'	30'	" "
30'	35'	" "
35'	40'	Silty Clay Brown
40'	45'	Clay Brown
45'	50'	" " "
50'	55'	" " "
55'	60'	" " "
60	65	Silty clay Brown
65'	70'	Clay Brown
70'	75	" "

TOTAL DEPTH OF BORING ___ (Feet)
TOTAL DEPTH OF COMPLETED WELL 75 (Feet)

WELL OWNER

Name Aric DeJong (Elk Horn Dairy)
Mailing Address 2830 So Shirk RD
Visalia CA.
CITY STATE ZIP

WELL LOCATION

Address 10400 AVE 368
City ~~Tulare County~~ Visalia Ca. 93723
County Tulare County
APN Book 047.050.007 Page ___ Parcel ___
or Township ___ Range ___ Section ___
or Latitude ___ DEG. MIN. SEC. NORTH Longitude ___ DEG. MIN. SEC. WEST

LOCATION SKETCH

NORTH
WEST
EAST
SW 2D
ELK HORN DAIRY
10400 AVE 368
AVE 368
SOUTH

Illustrate or Describe Distance of Well from Landmarks such as Roads, Buildings, Fences, Rivers, etc.
PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

X NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY *(Describe Procedures and Materials Under "GEOLOGIC LOG")*

PLANNED USE(S) (✓)

X MONITORING
WATER SUPPLY
___ Domestic
___ Public
___ Irrigation
___ Industrial
___ "TEST WELL"
___ CATHODIC PROTECTION
___ OTHER (Specify)

DRILLING METHOD HSA FLUID ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH OF STATIC WATER LEVEL 55 (Ft.) & DATE MEASURED 05-25-04
ESTIMATED YIELD* ___ (GPM) & TEST TYPE ___
TEST LENGTH ___ (Hrs.) TOTAL DRAWDOWN ___ (Ft.)
** May not be representative of a well's long-term yield.*

CASING(S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL/GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0'	50'		X				PVC	2"	Schd 40	
50'	75'			X			PVC	2"	Schd 40	.020

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE: CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	44'	X			
44	47'		X		
47	75				#3 SAND

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analyses
___ Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME BSK & Associates
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

567 W. Shaw Fresno Ca. 93704
ADDRESS CITY STATE ZIP

Signed ___ DATE SIGNED ___
WELL DRILLER/AUTHORIZED REPRESENTATIVE

490942
C-57 LICENSE NUMBER

DWR 188 REV. 7-90

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy

Page ___ of ___
Owner's Well No. SW 3D
Date Work Began 05-26-04, Ended 05-26-04
Local Permit Agency Tulare County
Permit No. 3889 Permit Date 05-07-04

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. 411932

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) X VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DEPTH TO FIRST WATER 45 (Ft.) BELOW SURFACE

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0'	5	Silty Clay Brown
5'	10'	" "
10'	15'	Clay Dark Brown
15'	20'	" "
20'	25'	Clay silt Brown
25	30	Clay Brown
30'	35'	" "
35	40'	" "
40'	45	Silty Clay Brown
45'	50'	" "
50'	55'	Clay Brown
55'	60	" "
60'	65'	" "

TOTAL DEPTH OF BORING ___ (Feet)
TOTAL DEPTH OF COMPLETED WELL 65 (Feet)

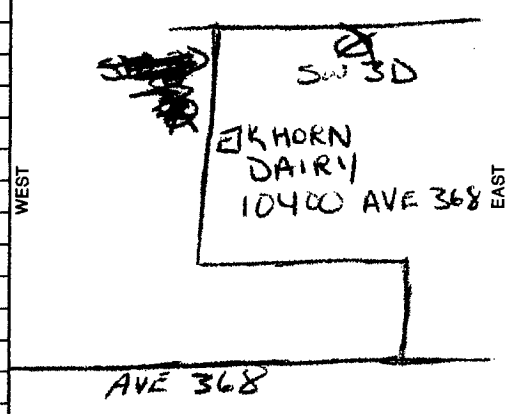
WELL OWNER

Name Aric DeJong (Elk Horn Dairy)
Mailing Address 2820 So. Shirk Rd
Visalia Ca. 93722
CITY STATE ZIP

WELL LOCATION

Address 10400 AVE 368
City ~ Visalia Ca.
County Tulare County
APN Book 047-050-007 Page ___ Parcel ___
Township 17 S Range 24 E Section 11
Latitude ___ DEG. ___ MIN. ___ SEC. NORTH Longitude ___ DEG. ___ MIN. ___ SEC. WEST

LOCATION SKETCH



Illustrate or Describe Distance of Well from Landmarks such as Roads, Buildings, Fences, Rivers, etc.
PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

X NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY *(Describe Procedures and Materials Under "GEOLOGIC LOG")*

PLANNED USE(S) (✓)

X MONITORING
WATER SUPPLY
___ Domestic
___ Public
___ Irrigation
___ Industrial
___ "TEST WELL"
___ CATHODIC PROTECTION
___ OTHER (Specify)

DRILLING METHOD HSA FLUID ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH OF STATIC WATER LEVEL 45 (Ft.) & DATE MEASURED 05-26-04
ESTIMATED YIELD* ___ (GPM) & TEST TYPE ___
TEST LENGTH ___ (Hrs.) TOTAL DRAWDOWN ___ (Ft.)
* *May not be representative of a well's long-term yield.*

CASING(S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL/GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0'	40		X				PVC	2"	Schd 40	
40	65			X			PVC	2"	schd 40	.020

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	34	X			
34	37		X		
37	65				#3 SAND

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analyses
___ Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME BSK & Associates
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
567 W. Shaw Fresno, Ca. 93704
ADDRESS CITY STATE ZIP
Signed ___ WELL DRILLER/AUTHORIZED REPRESENTATIVE
DATE SIGNED ___ C-57 LICENSE NUMBER 490942

DWR 188 REV. 7-90 IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

deJong Elkhorn Dairy

13076 Ave. 368
Visalia Ca

Monitoring Wells
{ #5 - #8 }

HAYNES & SONS
WELL DRILLING
582-WELL
HANFORD CA LIC.# 737156

For Local Requirements

Page 1 of 1

Owner's Well No. _____

Date Work Began 5/18/00, Ended 5/19/00

Local Permit Agency Tulare County

Permit No. DSP 94-092 Permit Date 5/15/00

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. 718302

STATE WELL NO./STATION NO.

LATITUDE LONGITUDE

APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) X VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)

DRILLING METHOD Rotary FLUID Water

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0	3	Top Soil
3	5	Clay
5	6	Hard Pan
6	20	Clay
20	23	Sand
23	28	Clay
28	29	Sand
29	38	Clay

TOTAL DEPTH OF BORING 38 (Feet)

TOTAL DEPTH OF COMPLETED WELL 35 (Feet)

WELL OWNER

Name deJong Elkhorn Dairy

Mailing Address 13076 Ave. 368

Visalia (CITY) Ca (STATE) 93291 (ZIP)

WELL LOCATION

Address 13076 Ave. 368

City Visalia

County Tulare

APN Book 047 Page 050 Parcel 007

Township 17S Range 24E Section 11

Latitude ___ DEG. ___ MIN. ___ SEC. NORTH Longitude ___ DEG. ___ MIN. ___ SEC. WEST

LOCATION SKETCH

NORTH

WEST

See Attachment {Well #5}

EAST

SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. ***PLEASE BE ACCURATE & COMPLETE.***

ACTIVITY (✓)

X NEW WELL

MODIFICATION/REPAIR

___ Deepen

___ Other (Specify)

___ DESTROY *(Describe Procedures and Materials Under "GEOLOGIC LOG")*

PLANNED USES (✓)

WATER SUPPLY

___ Domestic ___ Public

___ Irrigation ___ Industrial

MONITORING X

TEST WELL ___

CATHODIC PROTECTION ___

HEAT EXCHANGE ___

DIRECT PUSH ___

INJECTION ___

VAPOR EXTRACTION ___

SPARGING ___

REMEDIATION ___

OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER ___ (Ft.) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL ___ (Ft.) & DATE MEASURED ___

ESTIMATED YIELD * ___ (GPM) & TEST TYPE ___

TEST LENGTH ___ (Hrs.) TOTAL DRAWDOWN ___ (Ft.)

** May not be representative of a well's long-term yield.*

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	15	6	X				PVC	2	SCH 40	
15	35	6		X			PVC	2	SCH 40	.02

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CE-MENT (✓)	BEN-TONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	15		X		
15	35			X	Sand {#3}

ATTACHMENTS (✓)

___ Geologic Log

___ Well Construction Diagram

___ Geophysical Log(s)

___ Soil/Water Chemical Analyses

___ Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME HAYNES & SONS WELL DRILLING
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

ADDRESS 13827 HOUSTON AVE. CITY HANFORD STATE CA ZIP 93230

Signed _____ (WELL DRILLER/AUTHORIZED REPRESENTATIVE) Date 5/20/00

737156

Attachment H-5

DWR 188 REV. 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

QUADRUPLICATE
For Local Requirements

Page 1 of 1

Owner's Well No. _____

Date Work Began 5/18/00, Ended 5/19/00

Local Permit Agency Tulare County

Permit No. DSP 94-092 Permit Date 5/15/00

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. 718303

DWR USE ONLY — DO NOT FILL IN

STATE WELL NO./STATION NO.

LATITUDE LONGITUDE

APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) X VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)

DRILLING METHOD Rotary FLUID Water

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0	4	Top Siol
4	15	Clay
15	17	Sand
17	24	Clay
24	25	Hard Pan
25	37	Clay

TOTAL DEPTH OF BORING 37 (Feet)

TOTAL DEPTH OF COMPLETED WELL 35 (Feet)

WELL OWNER

Name deJong Elkhorn Dairy

Mailing Address 13076 Ave. 368

Visalia Ca 93291

CITY STATE ZIP

WELL LOCATION

Address 13076 Ave. 368

City Visalia

County Tulare

APN Book 047 Page 050 Parcel 007

Township 17S Range 24E Section 11

Latitude ___ DEG. ___ MIN. ___ SEC. NORTH Longitude ___ DEG. ___ MIN. ___ SEC. WES

LOCATION SKETCH

NORTH

WEST

See Attachment {Well #6}

EAST

SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

X NEW WELL

MODIFICATION/REPAIR

___ Deepen

___ Other (Specify)

___ DESTROY *(Describe Procedures and Materia Under "GEOLOGIC LO*

PLANNED USES (✓

WATER SUPPLY

___ Domestic ___ Public

___ Irrigation ___ Industr

MONITORING X

TEST WELL ___

CATHODIC PROTECTION ___

HEAT EXCHANGE ___

DIRECT PUSH ___

INJECTION ___

VAPOR EXTRACTION ___

SPARGING ___

REMEDIATION ___

OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER ___ (Ft.) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL ___ (Ft.) & DATE MEASURED ___

ESTIMATED YIELD * ___ (GPM) & TEST TYPE ___

TEST LENGTH ___ (Hrs.) TOTAL DRAWDOWN ___ (Ft.)

** May not be representative of a well's long-term yield.*

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	15	6	X				PVC	2	SCH 40	
15	35	6		X			PVC	2	SCH 40	.02

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	15		X		
15	35			X	Sand {#3}

ATTACHMENTS (✓)

___ Geologic Log

___ Well Construction Diagram

___ Geophysical Log(s)

___ Soil/Water Chemical Analyses

___ Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME HAYNES & SONS WELL DRILLING
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

ADDRESS 13827 HOUSTON AVE. CITY HANFORD STATE CA ZIP 93230

Signed [signature] WELL DRILLER/AUTHORIZED REPRESENTATIVE 5/20/00

737156 NUMBER

Attachment H-6

For Local Requirements

Page 1 of 1

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. 718304

Owner's Well No. _____

Date Work Began 5/18/00 Ended 5/19/00

Local Permit Agency Tulare County

Permit No. DSP 94-092 Permit Date 5/15/00

STATE WELL NO./STATION NO.

LATITUDE LONGITUDE

APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) X VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)

DRILLING METHOD Rotary FLUID Water

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0	3	Top Soil
3	16	Clay
16	18	Sand
18	22	Clay
22	25	Hard Pan
25	38	Clay

TOTAL DEPTH OF BORING 38 (Feet)

TOTAL DEPTH OF COMPLETED WELL 35 (Feet)

WELL OWNER

Name deJong Elkhorn Dairy

Mailing Address 13076 Ave. 368

Visalia Ca 93291

CITY STATE ZIP

WELL LOCATION

Address 13076 Ave. 368

City Visalia

County Tulare

APN Book 047 Page 050 Parcel 007

Township 17S Range 24E Section 11

Latitude ___ DEG. ___ MIN. ___ SEC. NORTH Longitude ___ DEG. ___ MIN. ___ SEC. WEST

LOCATION SKETCH

NORTH

WEST

See Attachment {Well #7}

EAST

SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. ***PLEASE BE ACCURATE & COMPLETE.***

ACTIVITY (✓)

X NEW WELL

MODIFICATION/REPAIR

___ Deepen

___ Other (Specify)

___ DESTROY *(Describe Procedures and Materials Under "GEOLOGIC LOG")*

PLANNED USES (✓)

WATER SUPPLY

___ Domestic ___ Public

___ Irrigation ___ Industrial

MONITORING X

TEST WELL ___

CATHODIC PROTECTION ___

HEAT EXCHANGE ___

DIRECT PUSH ___

INJECTION ___

VAPOR EXTRACTION ___

SPARGING ___

REMEDIATION ___

OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER ___ (Ft.) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL ___ (Ft.) & DATE MEASURED ___

ESTIMATED YIELD * ___ (GPM) & TEST TYPE ___

TEST LENGTH ___ (Hrs.) TOTAL DRAWDOWN ___ (Ft.)

** May not be representative of a well's long-term yield.*

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	15	6	X				PVC	2	SCH 40	
15	35	6		X			PVC	2	SCH 40	.02

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE: CE-MENT (✓)	BEN-TONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	15		X		
15	35			X	Sand {#3}

ATTACHMENTS (✓)

___ Geologic Log

___ Well Construction Diagram

___ Geophysical Log(s)

___ Soil/Water Chemical Analyses

___ Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME HAYNES & SONS WELL DRILLING
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

13827 HOUSTON AVE. HANFORD CA 93230
ADDRESS CITY STATE ZIP

Signed _____ DATE 5/20/00
WELL DRILLER/AUTHORIZED REPRESENTATIVE

Attachment H-7

DWR 188 REV. 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

QUADRUPLICATE
For Local Requirements

Page 1 of 1

Owner's Well No. _____

Date Work Began 5/18/00 Ended 5/19/00

Local Permit Agency Tulare County

Permit No. DSP 94-092 Permit Date 5/15/00

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. 718305

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) X VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)

DRILLING METHOD Rotary FLUID Water

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0	4	Top Soil
4	9	Clay
9	18	Sand {C}
18	22	Clay
22	26	Sand
26	40	Clay

TOTAL DEPTH OF BORING 40 (Feet)

TOTAL DEPTH OF COMPLETED WELL 35 (Feet)

WELL OWNER

Name deJong Elkhorn Dairy

Mailing Address 13076 Ave. 368

Visalia Ca 93291
CITY STATE ZIP

WELL LOCATION

Address 13076 Ave. 368

City Visalia

County Tulare

APN Book 047 Page 050 Parcel 007

Township 17S Range 24E Section 11

Latitude ___ DEG. ___ MIN. ___ SEC. NORTH Longitude ___ DEG. ___ MIN. ___ SEC. WEST

LOCATION SKETCH

NORTH

WEST

See Attachment {Well #8}

EAST

SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. ***PLEASE BE ACCURATE & COMPLETE.***

ACTIVITY (✓)

X NEW WELL

MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)

___ DESTROY *(Describe Procedures and Materials Under "GEOLOGIC LOG")*

PLANNED USES (✓)

WATER SUPPLY
___ Domestic ___ Public
___ Irrigation ___ Industrial

MONITORING X
TEST WELL ___
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER _____ (Ft.) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL _____ (Ft.) & DATE MEASURED _____

ESTIMATED YIELD * _____ (GPM) & TEST TYPE _____

TEST LENGTH _____ (Hrs.) TOTAL DRAWDOWN _____ (Ft.)

** May not be representative of a well's long-term yield.*

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	15	6	X				PVC	2	SCH 40	
15	35	6		X			PVC	2	SCH 40	.02

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	15		X		
15	35			X	Sand {#3}

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analyses
___ Other _____

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

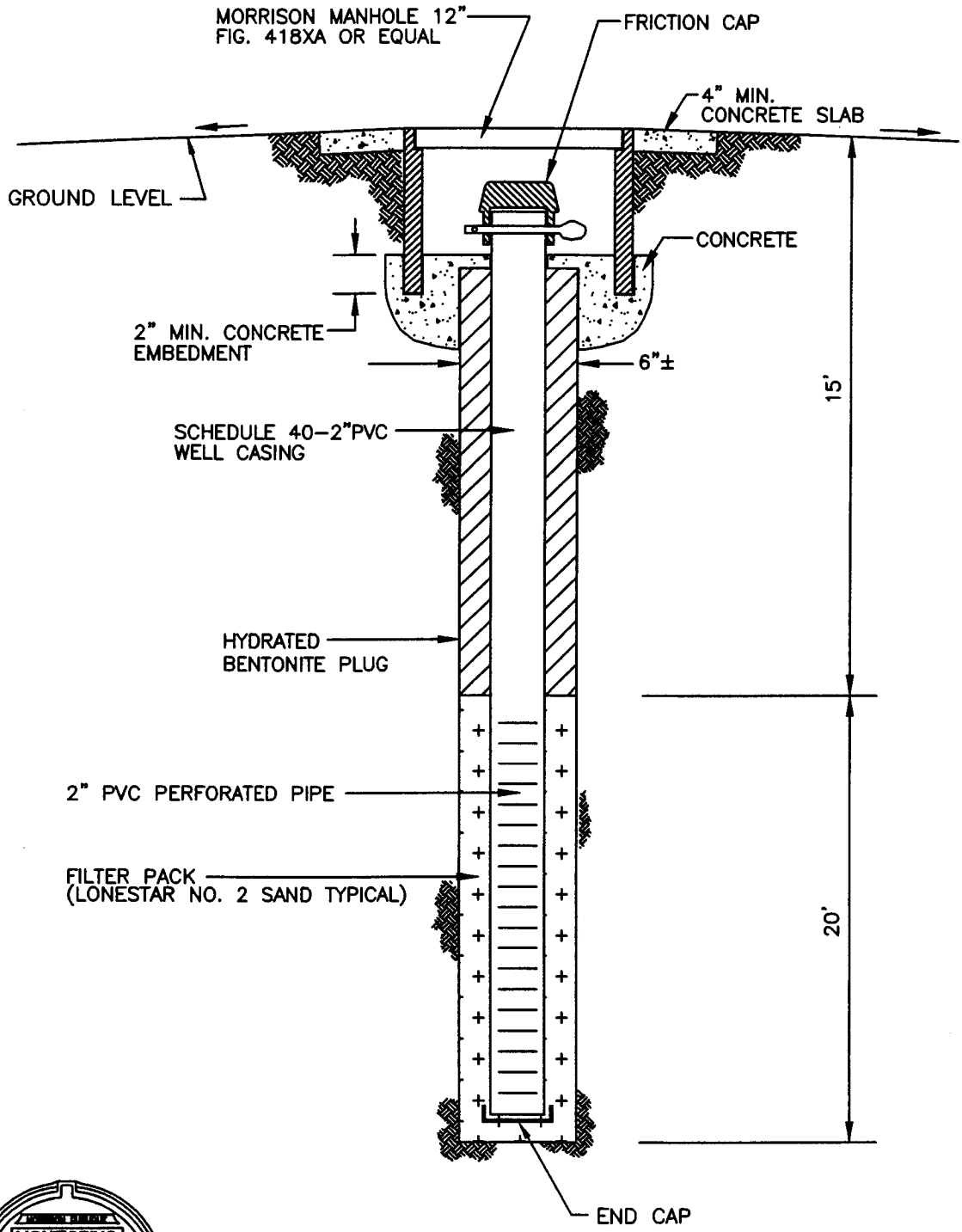
I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

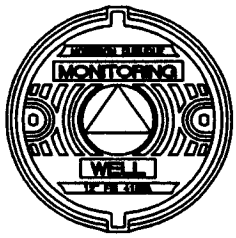
NAME HAYNES & SONS WELL DRILLING
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

13827 HOUSTON AVE. HANFORD CA 93230
ADDRESS CITY STATE ZIP

Signed _____ 5/20/00 737156
WELL DRILLER/AUTHORIZED REPRESENTATIVE

Attachment H-8





MORRISON MANHOLE 12"
FIG. 418XA OR EQUAL

SCHEMATIC
MONITORING WELL DESIGN

NO SCALE

REVISED 12-1-99
REVISED 11-2-99

JAMES F. SORENSEN
CONSULTING ENGINEER
209 SOUTH LOCUST STREET
VISALIA, CALIFORNIA 93291 559-732-7938

ATTACHMENT H-9

J:\JFS_DwJONG\DEC-5 ATT-H-9.DWG

ZZI

Dairy 36-19:
Well Design Justifications,
Well Completion Designs,
Geologic Logs,
and Well Completion Reports

Well Design Justification For Well 36-19-MW1A, B, C, D

The well design is based on professional assessment of the geologic log and the E-log. The depth to water table is 88.0' in MW1B, 88.1' in MW1C, and 88.0' in MW1D. Depending on climate conditions, the water table could drop up to 20 feet in the next 2.5 years of this project. The well design needs to accommodate for sampling first encountered groundwater even if water level drops to 110 ft. As such, we need to design the well with at least 10-20 ft of aquifer depth below 110 ft. to make sure that we are able to collect sufficient sample volume of first encountered groundwater.

In an auger-constructed borehole, used to collect undisturbed soil samples from the land surface to the water table, a well was constructed using non-SWRCB funding (36-19-MW1A). This well will allow for measuring perched water table conditions or first encountered water under future higher water table conditions. The well is screened from 36 ft. to 46 ft. and intersects sand layers that sustained an intermittent perched aquifer at the time of drilling. It is currently dry.

A separate mud-rotary constructed borehole, placed 10 feet from the augered borehole, was used to collect undisturbed core samples from a depth of 80 ft. to the bottom of the borehole. In this borehole, three screened well casings were constructed to allow for sampling first encountered groundwater (aquifer units) even if water levels vary from current conditions:

36-19-MW1B: Screened from 94 - 104 ft
36-19-MW1C: Screened from 116 – 126 ft
36-19-MW1D: Screened from 126 – 136 ft

The borehole is sealed above 86 ft. No seal was constructed between the two lower casing screens as there is no clay layer to seal against (as indicated by the E-log).

The first screen is placed to intersect a sequence of major sand layers near the current water table. The second screen and third screen are placed within the first significant sand unit below 110ft., where 110 ft. is the maximum depth to water for which this well is designed. The borehole is sealed between the two upper screens and above 86 ft. On September 20th, 2007, the depth to water table was 88 .0 ft., 88.1 ft., and 88.0 ft. in the

three wells MW1B, MW1C, and MW1D, respectively, indicating that there is no significant vertical downward gradient.

The three casings are necessary so that we are able to sample first encountered groundwater (FEGW) (Item 2.2.5) recharged from the adjacent upgradient corral (Item 2.2.4) regardless of the depth of the water table.

In order to be able to distinguish FEGW from deeper water when the water table is above 94 ft., separate samples are needed from the sand layers at 94 - 104 ft. and from the sandy layers below 116 ft. to identify the FEGW representing recharge from the upgradient corral. It is unclear from the information we have now whether FEGW sampled from the adjacent corral (Task 2.2.4) is represented by groundwater from 94 to 104 ft. or by groundwater from 94 to 126 ft. or by groundwater from 94 ft to well below 140 ft. if the water level is at 94 ft or above (but below 70 ft.). Based on calculations using typical hydraulic conductivity values, it is most likely that the first option represents FEGW recharged from the adjacent corral for water table depths of above 94 ft, but below 70 ft. To make sure that we can later differentiate FEGW based on depth to the water table and water quality from collected samples, screen lengths are chosen to capture a representative sample of FEGW recharged by the adjacent corral. Screen lengths and depths also accommodate the local geology. All three screens are opposite intermediate yielding sand aquifer units. The calculated length to represent FEGW from the adjacent upgradient field (Item 2.2.4.), given the local geology, is therefore 10 - 20 feet. The upper screen is separated from the lower two screens by a clay layer that is sealed off.

The lower two screens are used when the water table falls to 100 ft. or lower. The 112 – 134 ft. sand layer was screened by two separate ten-foot long screens. This construction was chosen, because it is not clear, whether FEGW sampled from the adjacent field (Task 2.2.4) is represented by 116 - 126 ft. or by 116 to well below 136 ft. if the water level is at 116 ft. or above (but below 100 ft.). To make sure that we can later differentiate FEGW based on depth to the water table and water quality from collected samples, we installed two separate screened well casings rather than a single 20 ft. screen.

The location of all screens also conforms to the elevation of sandy layers identified in the E-log.

Note, that no well screen was constructed to intersect the first sandy unit located above the current water table, a sequence of mostly silty, clayey fine sand between 60 ft. and 70 ft below ground surface. Several reasons lead to the decision not to construct a screen at this level:

- It is unlikely that the water table will rise to above 65 ft. during the project period.
- The sand units are relatively fine textured and may yield limited water.
- The well in the augered hole was completed next to an existing perched aquifer.
- The three selected screen intervals were more significant for monitoring.

Well Design Justification For Well 36-19-MW2A, B, C, D

The well design is based on professional assessment of the geologic log and the E-log. The depth to water table is 73.7' in MW2B, 86.1' in MW2C, and 86.0' in MW2D. Depending on climate conditions, the water table could drop up to 20 feet in the next 2.5 years of this project. The well design needs to accommodate for sampling first encountered groundwater even if water level drops to 110 ft. As such, we need to design the well with at least 10-20 ft of aquifer depth below 110 ft. to make sure that we are able to collect sufficient sample volume of first encountered groundwater.

In an auger-constructed borehole, used to collect undisturbed soil samples from the land surface to the water table, a well was constructed using non-SWRCB funding (36-19-MW2A). This well will allow for measuring perched water table conditions or first encountered water under future higher water table conditions. The well is screened from 35 ft. to 45 ft. below ground surface. It intersects sand layers that sustained an intermittent perched aquifer at the time of drilling. The well is currently dry.

Using the auger-rig, a separate borehole, placed 10 feet from the first augered borehole, was drilled to place another screen immediately above the water table (estimated to be at approximately 80 ft to 90 ft below ground surface). During drilling, a pressured perched water system was encountered at 68 ft. below ground surface. Within a few minutes of drilling into the pressurized, perched aquifer layer, water level in the borehole rose to 37 ft. below ground surface. The auger-drilling was abandoned and a mud-rotary constructed borehole was drilled over the same location.

The mud-rotary constructed borehole was used to collect undisturbed core samples from a depth of 70 ft. to the bottom of the borehole. In this borehole, three screened well casings were constructed to allow for sampling first encountered groundwater (aquifer units) even if water levels vary from current conditions:

36-19-MW2B: Screened from 62 – 72 ft
36-19-MW2C: Screened from 116 – 126 ft
36-19-MW2D: Screened from 130 – 140 ft

The first screen is placed to intersect the pressurized, perched sandy aquifer unit encountered during drilling with the auger rig (see above). The second screen and third screen are placed within the first significant sand unit below the water table and below 110ft., where 110 ft. is the maximum depth to water for which this well is designed. No aquifer sediments were encountered between the current depth to water and 115 ft. below ground surface. The borehole is sealed above 50 ft. and between each of the screens. On August 27th, 2007, the depth to water table was 73.7 ft., 86.1 ft., and 86.0 ft. in the three wells MW2B, MW2C, and MW2D, respectively, indicating that the perched water system in the uppermost well quickly disappeared and was no longer pressurized; and indicating no significant vertical downward gradient between the intermediate and deep screen, which are separated by a four feet thick silty clay unit.

The three casings are necessary so that we are able to sample first encountered groundwater (FEGW) (Item 2.2.5) recharged from the adjacent upgradient corral (Item 2.2.4) regardless of the depth of the water table.

In order to be able to distinguish FEGW from deeper water when the water table is above 116 ft., separate samples are needed from the sand layers at 116 - 126 ft. and from the sandy layers below 130 ft. to identify the FEGW representing recharge from the upgradient corral. It is unclear from the information we have now whether FEGW sampled from the adjacent corral (Task 2.2.4) is represented by groundwater from 116 to 126 ft. or by groundwater from 116 to well below 140 ft. if the water level is at 116 ft or above (but below 70 ft.). Based on calculations using typical hydraulic conductivity values, it is most likely that the second option represents FEGW recharged from the adjacent corral for water table depths of above 116 ft, but below 70 ft. To make sure that we can later differentiate FEGW based on depth to the water table and water quality from collected samples, screen lengths are chosen to capture a representative sample of FEGW recharged by the adjacent corral. Screen lengths and depths also accommodate the local geology. All three screens are opposite intermediate yielding sand aquifer units. The calculated length to represent FEGW from the adjacent upgradient field (Item 2.2.4.), given the local geology, is therefore 10 - 20 feet. Because of the presence of a clay unit at 125 – 129 ft. below ground surface, two separate ten-foot long screens were installed, with a seal between the two levels.

The location of all screens also conforms to the elevation of sandy layers identified in the E-log.

Well Design Justification For Well 36-19-MW3A, 3AA, 3B

The well design is based on professional assessment of the geologic log and the E-log. The depth to water table is 90.6' in MW3B. Depending on climate conditions, the water table could drop up to 20 feet in the next 2.5 years of this project. The well design needs to accommodate for sampling first encountered groundwater even if water level drops to 110 ft. As such, we need to design the well with at least 10-20 ft of aquifer depth below 110 ft. to make sure that we are able to collect sufficient sample volume of first encountered groundwater.

In an auger-constructed borehole, used to collect undisturbed soil samples from the land surface to the water table, a well was constructed using non-SWRCB funding (36-19-MW3A). This well will allow for measuring perched water table conditions or first encountered water under future higher water table conditions. The well is screened from 15 ft. to 25 ft. below ground surface. It intersects sand layers that sustained an intermittent perched aquifer at the time of drilling. The well is currently dry.

In a second auger-constructed borehole, used to collect undisturbed soil samples from the land surface to the water table, a well was constructed using non-SWRCB funding (36-19-MW3AA). This well will allow for measuring perched water table conditions or first encountered water under future higher water table conditions. The well is screened from 70 ft. to 85 ft. below ground surface and intersects several sand layers above the current water table. It is currently dry.

A separate mud-rotary constructed borehole, placed 10 feet from the augered borehole, was used to collect undisturbed core samples from a depth of 88 ft. to the bottom of the borehole. In this borehole, a single screened well casings was constructed to allow for sampling first encountered groundwater (aquifer units) even if water levels vary from current conditions:

36-19-MW3B: Screened from 116 – 131 ft

The borehole is sealed above 108 ft. The screen intersects a single fifteen feet thick sandy aquifer unit, the only water-producing aquifer unit between the current depth of the water table and 140 ft. below ground surface. Coring was terminated at 140 ft. below ground surface. The screen is constructed to capture first encountered groundwater (FEGW) (Item 2.2.5) recharged from the adjacent upgradient lagoon (Item 2.2.4) regardless of the depth of the water table.The location of the screen also conforms to the elevation of sandy layers identified in the E-log.

Well Design Justification For Well 36-19-MW-5A, B, C, D

The well design is based on professional assessment of the geologic log and the E-log. The depth to water table is 87.8' in MW5B, 95.2' in MW5C, and 95.3' in MW5D. Depending on climate conditions, the water table could drop up to 20-25 feet in the next 2.5 years of this project. The well design needs to accommodate for sampling first encountered groundwater even if water level drops to 110 ft. As such, we need to design the well with at least 20 ft. of aquifer depth below 110 ft. to make sure that we are able to collect sufficient sample volume of first encountered groundwater.

In an auger-constructed borehole, used to collect undisturbed soil samples from the land surface to the water table, a well was constructed using non-SWRCB funding (36-19-MW5A). This well will allow for measuring perched water table conditions or first encountered water under future higher water table conditions. The well is screened from 62 ft. to 72 ft. and intersects several sand layers above the current water table that appeared to sustain an intermittent perched aquifer at the time of drilling. The perched aquifer was also pressurized at the time of drilling. It is currently dry.

A separate mud-rotary constructed borehole, placed 10 feet from the augered borehole, was used to collect undisturbed core samples from a depth of 72 ft. to the bottom of the borehole. In this borehole, three screened well casings were constructed to allow for sampling first encountered groundwater (aquifer units) even if water levels vary from current conditions:

36-19-MW5B: Screened from 80 - 90 ft
36-19-MW5C: Screened from 106 – 121 ft
36-19-MW5D: Screened from 121 – 131 ft

The borehole is sealed above 76 ft. and between the two uppermost screens. No seal was constructed between the two lower casing screens as there is no clay layer to seal against (as indicated by the E-log).

The first screen is placed to intersect a sequence of major sand layers near the current water table. The second screen and third screen are placed within the a thirty feet thick sand unit from 99 ft. to 129 ft. below ground surface., where 110 ft. is the maximum depth to water for which this well is designed. On September 26th, 2007, the depth to water table was 86.9 ft., 87.6 ft., and 87.7 ft. in the three wells MW5B, MW5C, and MW5D, respectively, indicating a small vertical downward gradient across the ten feet thick clayey sediments between the uppermost screen and the two lower screens.

The three casings are necessary so that we are able to sample first encountered groundwater (FEGW) (Item 2.2.5) recharged from the adjacent upgradient field (Item 2.2.4) regardless of the depth of the water table.

In order to be able to distinguish FEGW from deeper water when the water table is above 80 ft., separate samples are needed from the sand layers at 80 - 90 ft. and from the sandy

layers below 106 ft. to identify the FEGW representing recharge from the upgradient field. It is unclear from the information we have now whether FEGW sampled from the adjacent field (Task 2.2.4) is represented by groundwater at depths of 80 – 90 ft, or by groundwater from depths of 80 to 121 ft., or by groundwater from depths of 80 to well below 130 ft. if the water level is at 80 ft. or above (but below 70 ft). Based on calculations using typical hydraulic conductivity values, it is most likely that the first option represents FEGW recharged from the adjacent field for water table depths of above 80 ft., but below 70 ft. For water table conditions below 85 ft., it is most likely that the groundwater in the sandy unit below 100 ft. represents FEGW recharged from the adjacent field.

To make sure that we can later differentiate FEGW based on depth to the water table and water quality from collected samples, screen lengths are chosen to capture a representative sample of FEGW recharged by the adjacent field. Screen lengths and depths also accommodate the local geology. All three screens are opposite intermediate yielding sand aquifer units. The calculated length to represent FEGW from the adjacent upgradient field (Item 2.2.4.), given the local geology, is therefore 10 - 20 feet. The upper screen is separated from the lower two screens by a clay layer that is sealed off.

The lower two screens are used when the water table falls to 85 ft. or lower. The 99 – 129 ft. sand layer was screened by two separate fifteen-feet and ten-feet long screens (with the shorter screen intercepting a coarser sand unit than the longer screen). This construction was chosen, because it is not clear, whether FEGW sampled from the adjacent field (Task 2.2.4) is represented by 106 - 121 ft. or by 106 to well below 131 ft. if the water level is at 106 ft. or above (but below 85 ft.). To make sure that we can later differentiate FEGW based on depth to the water table and water quality from collected samples, we installed two separate screened well casings rather than a single 25 ft. screen.

The location of all screens also conforms to the elevation of sandy layers identified in the E-log.

Well Design Justification For Well 36-19-MW-6A, B, C, D

The well design is based on professional assessment of the geologic log and the E-log. The depth to water table is 92.3 ft. in MW6B, 95.0 ft. in MW6C, and 97.3 ft. in MW6D. Depending on climate conditions, the water table could drop up to 20-25 feet in the next 2.5 years of this project. The well design needs to accommodate for sampling first encountered groundwater even if water level drops to 115 ft. As such, we need to design the well with at least 10 - 20 ft. of aquifer depth below 115 ft. to make sure that we are able to collect sufficient sample volume of first encountered groundwater.

In an auger-constructed borehole, used to collect undisturbed soil samples from the land surface to the water table, a well was constructed using non-SWRCB funding (36-19-MW6A). This well will allow for measuring perched water table conditions or first encountered water under future higher water table conditions. The well is screened from 67 ft. to 87 ft. and intersects several sand layers above the current water table. The well is currently dry.

A separate mud-rotary constructed borehole, placed 10 feet from the augered borehole, was used to collect undisturbed core samples from a depth of 85 ft. to the bottom of the borehole. In this borehole, three screened well casings were constructed to allow for sampling first encountered groundwater (aquifer units) even if water levels vary from current conditions:

36-19-MW6B: Screened from 92 – 97 ft
36-19-MW6C: Screened from 105 – 112 ft
36-19-MW6D: Screened from 121 – 136 ft

The borehole is sealed above 90 ft. and between each screen level. Between 90 ft. and 140 ft. below ground surface, the geologic log and the E-log indicate three zones of coarser-textured, sandy sediments, which are screened by three separate short screens. On September 6, 2007, the water table in the three screens was 92.3 ft., 95.0 ft., and 97.3 ft., indicating a strong downward gradient across the sealed fine-textured sediment units between the three screens.

The three casings are necessary so that we are able to sample first encountered groundwater (FEGW) (Item 2.2.5) recharged from the adjacent upgradient field (Item 2.2.4) regardless of the depth of the water table.

In order to be able to distinguish FEGW from deeper water when the water table is above 90 ft., separate samples are needed from the sand layer at 92 - 97 ft., from the sandy layer at 104 ft. to 113 ft. and from the sandy layer below 120 ft. to identify the FEGW representing recharge from the upgradient field. It is unclear from the information we have now whether FEGW sampled from the adjacent field (Task 2.2.4) is represented by groundwater from 92 to 97 ft., or by groundwater from 92 to 112 ft., or by groundwater from 92 to well below 130 ft. if the water level is at 92 ft. or above (but below 80 ft). Based on calculations using typical hydraulic conductivity values, it is most likely that

the second or third option represents FEGW recharged from the adjacent field for water table depths of above 92 ft, but below 80 ft. To make sure that we can later differentiate FEGW based on depth to the water table and water quality from collected samples, screen lengths are chosen to capture a representative sample of FEGW recharged by the adjacent field. Screen lengths and depths also accommodate the local geology. All three screens are opposite intermediate yielding, relatively thin sand aquifer units. The calculated length to represent FEGW from the adjacent upgradient field (Item 2.2.4.), given the local geology, is therefore 15 - 20 feet. However, sandy layers were not sufficiently thick and smaller screen lengths were selected. Coring was terminated at 140 ft. below ground surface. The location of the screens also conforms to the elevation of sandy layers identified in the E-log.

Well Design Justification For Well 36-19-MW-7A, B, C, D

The well design is based on professional assessment of the geologic log and the E-log. The depth to water table is 90.6 ft. in MW7B, 90.8 ft. in MW7C, and 90.7 ft. in MW7D. Depending on climate conditions, the water table could drop up to 20-25 feet in the next 2.5 years of this project. The well design needs to accommodate for sampling first encountered groundwater even if water level drops to 110 ft. As such, we need to design the well with at least 10 - 20 ft. of aquifer depth below 110 ft. to make sure that we are able to collect sufficient sample volume of first encountered groundwater.

In an auger-constructed borehole, used to collect undisturbed soil samples from the land surface to the water table, a well was constructed using non-SWRCB funding (36-19-MW7A). This well will allow for measuring perched water table conditions or first encountered water under future higher water table conditions. The well is screened from 74 ft. to 89 ft. and intersects several sand layers above the current water table. The well is currently dry.

A separate mud-rotary constructed borehole, placed 10 feet from the augered borehole, was used to collect undisturbed core samples from a depth of 89 ft. to the bottom of the borehole. In this borehole, three screened well casings were constructed to allow for sampling first encountered groundwater (aquifer units) even if water levels vary from current conditions:

36-19-MW7B: Screened from 100 – 110 ft
36-19-MW7C: Screened from 121 – 126 ft
36-19-MW7C: Screened from 130 – 140 ft

The borehole is sealed above 96 ft. and between each screen level. Between 96 ft. and 126 ft. below ground surface, the E-log indicates two small zones of intermediate-textured, sandy sediments, which are screened by two separate short screens. Both, the geologic log and the E-log indicate a coarse-textured sand unit from 130 ft. to 140 ft. below ground surface, which is screened separately. On September 6, 2007, the water table in the three screens was 90.6 ft., 90.8 ft., and 90.7 ft., indicating no downward gradient across the sealed fine-textured sediment units between the three screens.

The three casings are necessary so that we are able to sample first encountered groundwater (FEGW) (Item 2.2.5) recharged from the adjacent upgradient corral (Item 2.2.4) regardless of the depth of the water table.

In order to be able to distinguish FEGW from deeper water when the water table is above 100 ft., separate samples are needed from the sandy layer at 100 – 110 ft., from the sandy layer at 121 ft. to 126 ft. and from the sandy layer below 130 ft. to identify the FEGW representing recharge from the upgradient corral. It is unclear from the information we have now whether FEGW sampled from the adjacent corral (Task 2.2.4) is represented by groundwater from 100 to 110 ft., or by groundwater from 100 to 126 ft., or by groundwater from 100 to well below 140 ft. if the water level is at 100 ft. or above (but

below 85 ft). Based on calculations using typical hydraulic conductivity values, it is most likely that the second or third option represents FEGW recharged from the adjacent corral for water table depths of above 100 ft, but below 85 ft. To make sure that we can later differentiate FEGW based on depth to the water table and water quality from collected samples, screen lengths are chosen to capture a representative sample of FEGW recharged by the adjacent corral. Screen lengths and depths also accommodate the local geology. All three screens are opposite intermediate yielding, relatively thin sand aquifer units. The calculated length to represent FEGW from the adjacent upgradient corral (Item 2.2.4.), given the local geology, is therefore 15 - 20 feet. However, sandy layers were not sufficiently thick and smaller screen lengths were selected. Coring was terminated at 140 ft. below ground surface. The location of the screens also conforms to the elevation of sandy layers identified in the E-log.

Well Design Justification For Well 36-19-MW-9A, B, C, D

The well design is based on professional assessment of the geologic log and the E-log. The depth to water table is 82.1 ft. in MW9B, 82.6 ft. in MW9C, and 83.0 ft. in MW9D. Depending on climate conditions, the water table could drop up to 20-25 feet in the next 2.5 years of this project. The well design needs to accommodate for sampling first encountered groundwater even if water level drops to 110 ft. As such, we need to design the well with at least 10 - 20 ft. of aquifer depth below 110 ft. to make sure that we are able to collect sufficient sample volume of first encountered groundwater.

In an auger-constructed borehole, used to collect undisturbed soil samples from the land surface to the water table, a well was constructed using non-SWRCB funding (36-19-MW9A). This well will allow for measuring perched water table conditions or first encountered water under future higher water table conditions. The well is screened from 52 ft. to 67 ft. and intersects several sand layers above the current water table. The well is currently dry.

A separate mud-rotary constructed borehole, placed 10 feet from the augered borehole, was used to collect undisturbed core samples from a depth of 70 ft. to the bottom of the borehole. In this borehole, three screened well casings were constructed to allow for sampling first encountered groundwater (aquifer units) even if water levels vary from current conditions:

36-19-MW7B: Screened from 78 – 88 ft
36-19-MW7C: Screened from 104 – 114 ft
36-19-MW7C: Screened from 124 – 134 ft

The borehole is sealed above 75 ft. and between each screen level. Between 75 ft. and 140 ft. below ground surface, the geologic log and the E-log indicates three significant zones of intermediate-textured, sandy sediments, which are screened by three separate short screens. On September 25, 2007, the water table in the three screens was 82.1 ft., 82.6 ft., and 83.0 ft., indicating a small downward gradient across the sealed fine-textured sediment units between the three screens.

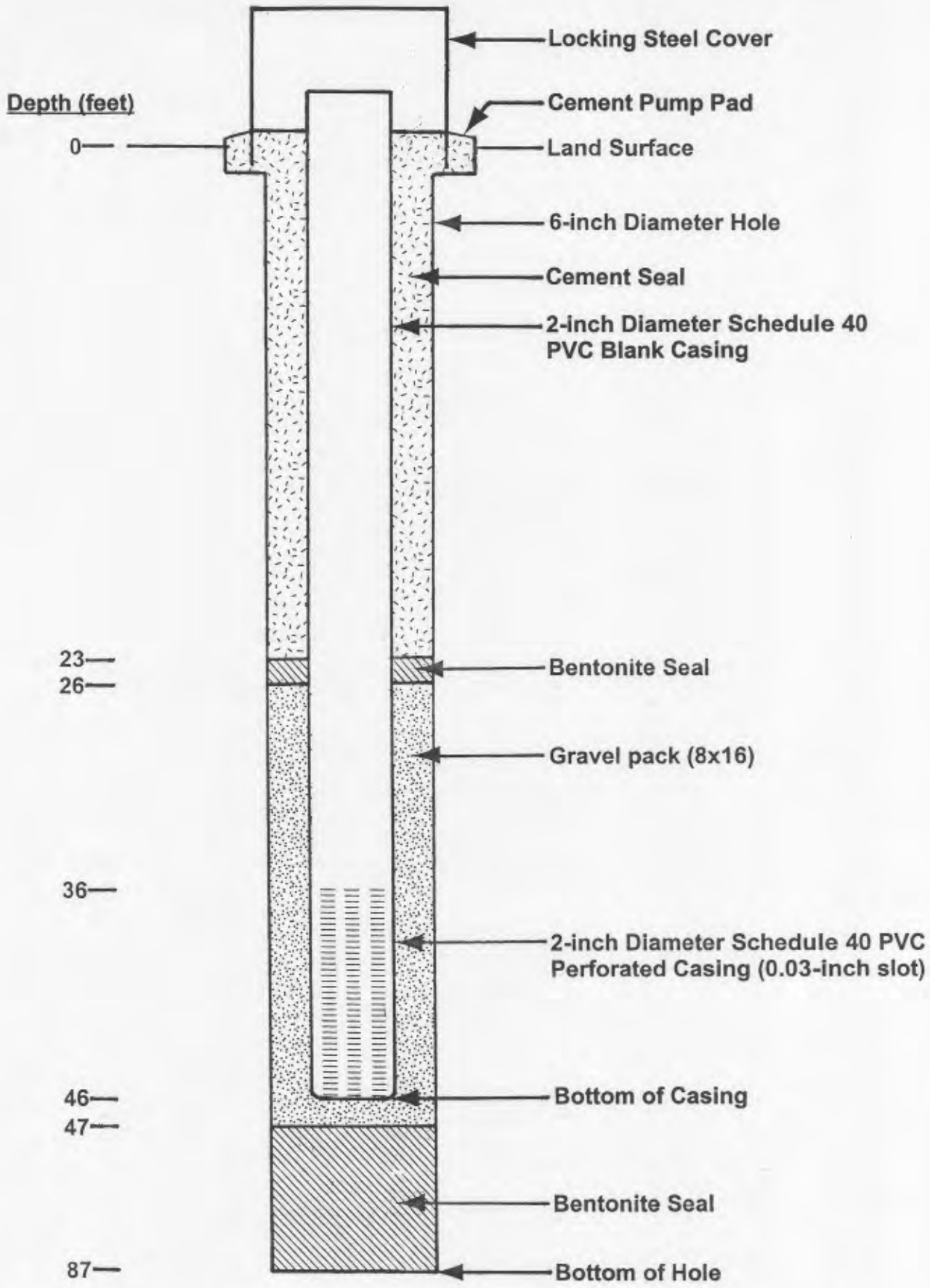
The three casings are necessary so that we are able to sample first encountered groundwater (FEGW) (Item 2.2.5) recharged from the adjacent upgradient corral (Item 2.2.4) regardless of the depth of the water table.

In order to be able to distinguish FEGW from deeper water when the water table is above 78 ft., separate samples are needed from the sandy layer at 78 – 88 ft., from the sandy layer at 104 ft. to 114 ft. and from the sandy layer at 124 – 134 ft. to identify the FEGW representing recharge from the upgradient corral. It is unclear from the information we have now whether FEGW sampled from the adjacent corral (Task 2.2.4) is represented by groundwater from 78 to 88 ft., or by groundwater from 78 to 114 ft., or by groundwater from 78 to well below 134 ft. if the water level is at 80 ft. or above (but below 60 ft). Based on calculations using typical hydraulic conductivity values, it is most likely that

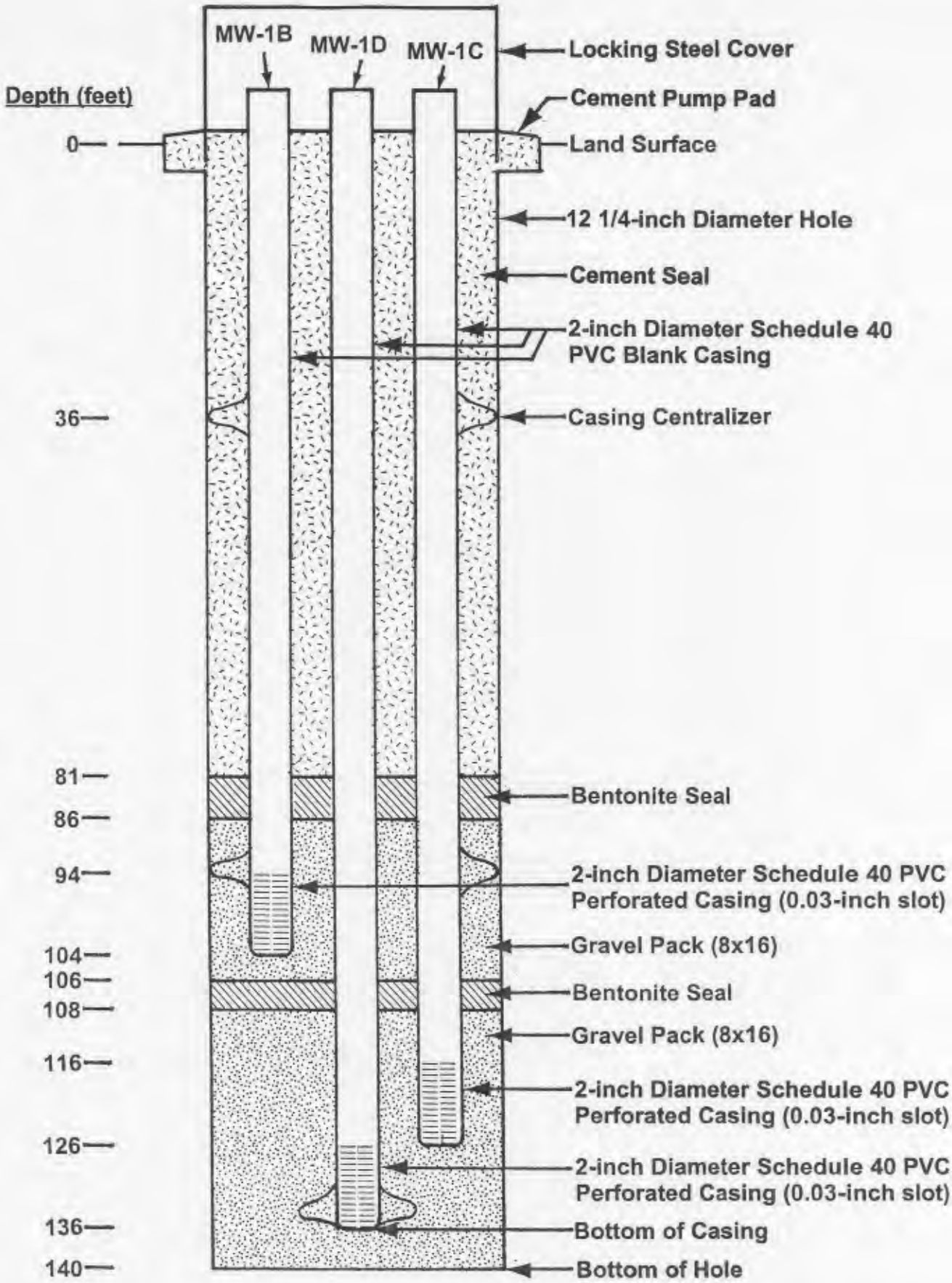
the first or second option represents FEGW recharged from the adjacent corral for water table depths of above 80 ft, but below 60 ft. To make sure that we can later differentiate FEGW based on depth to the water table and water quality from collected samples, screen lengths are chosen to capture a representative sample of FEGW recharged by the adjacent field. Screen lengths and depths also accommodate the local geology. All three screens are opposite intermediate yielding, relatively thin sand aquifer units. The calculated length to represent FEGW from the adjacent upgradient corral (Item 2.2.4.), given the local geology, is therefore 15 - 20 feet. However, sandy layers were not sufficiently thick and smaller screen lengths were selected. Coring was terminated at 140 ft. below ground surface. The location of the screens also conforms to the elevation of sandy layers identified in the E-log.

APPENDIX 1:

Well Completion Designs for Monitoring Wells
36-19-MW1A, -MW1B,C,D
36-19-MW2A, -MW2B,C,D
36-19-MW3A, -3AA, -MW3B
36-19-MW5A, -MW5B,C,D
36-19-MW6A, -MW6B,C,D
36-19-MW7A, -MW7B,C,D
36-19-MW9A, -MW9B,C,D



COMPLETION DIAGRAM FOR GIACOMAZZI DAIRY MW-1A



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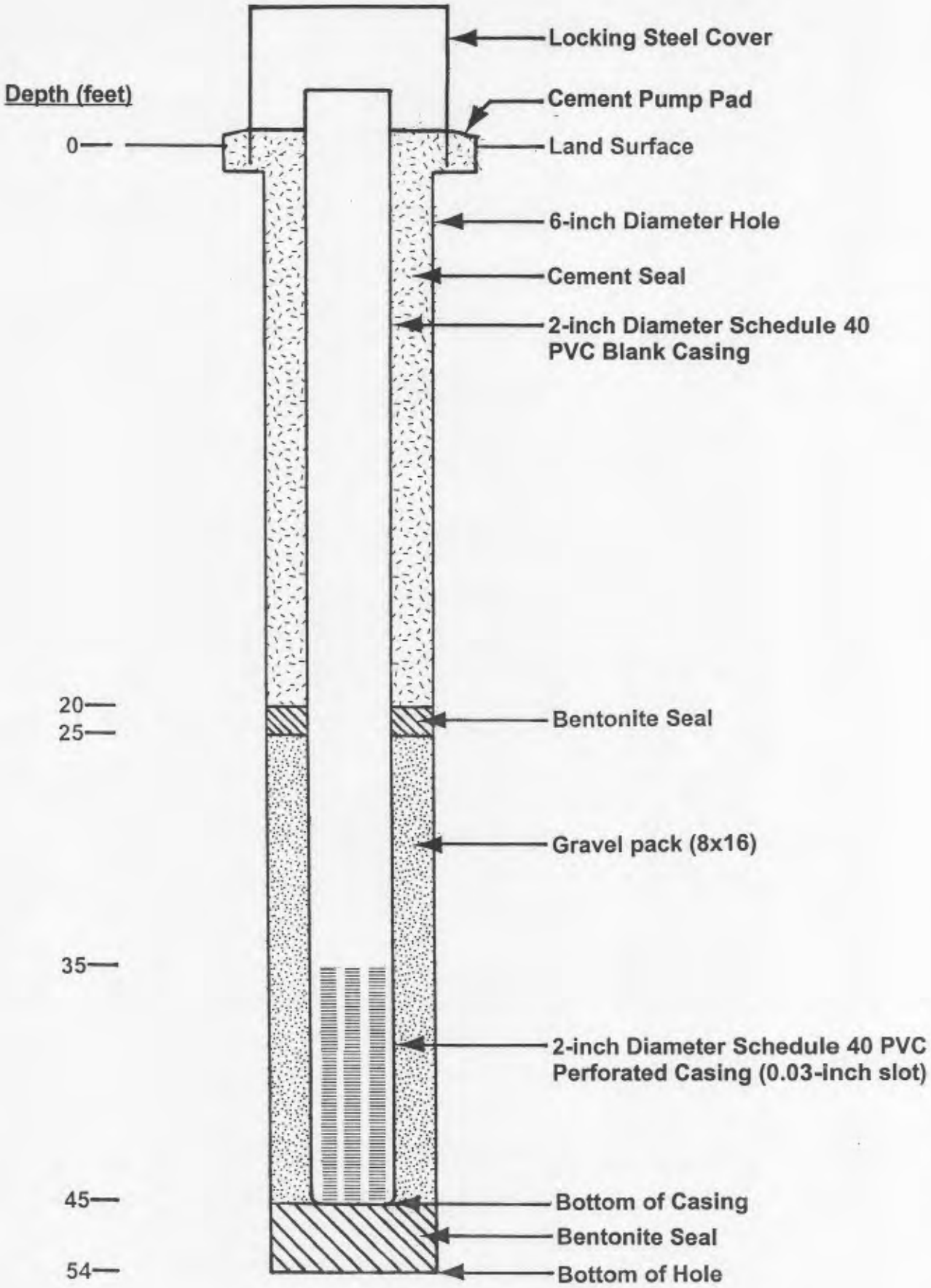

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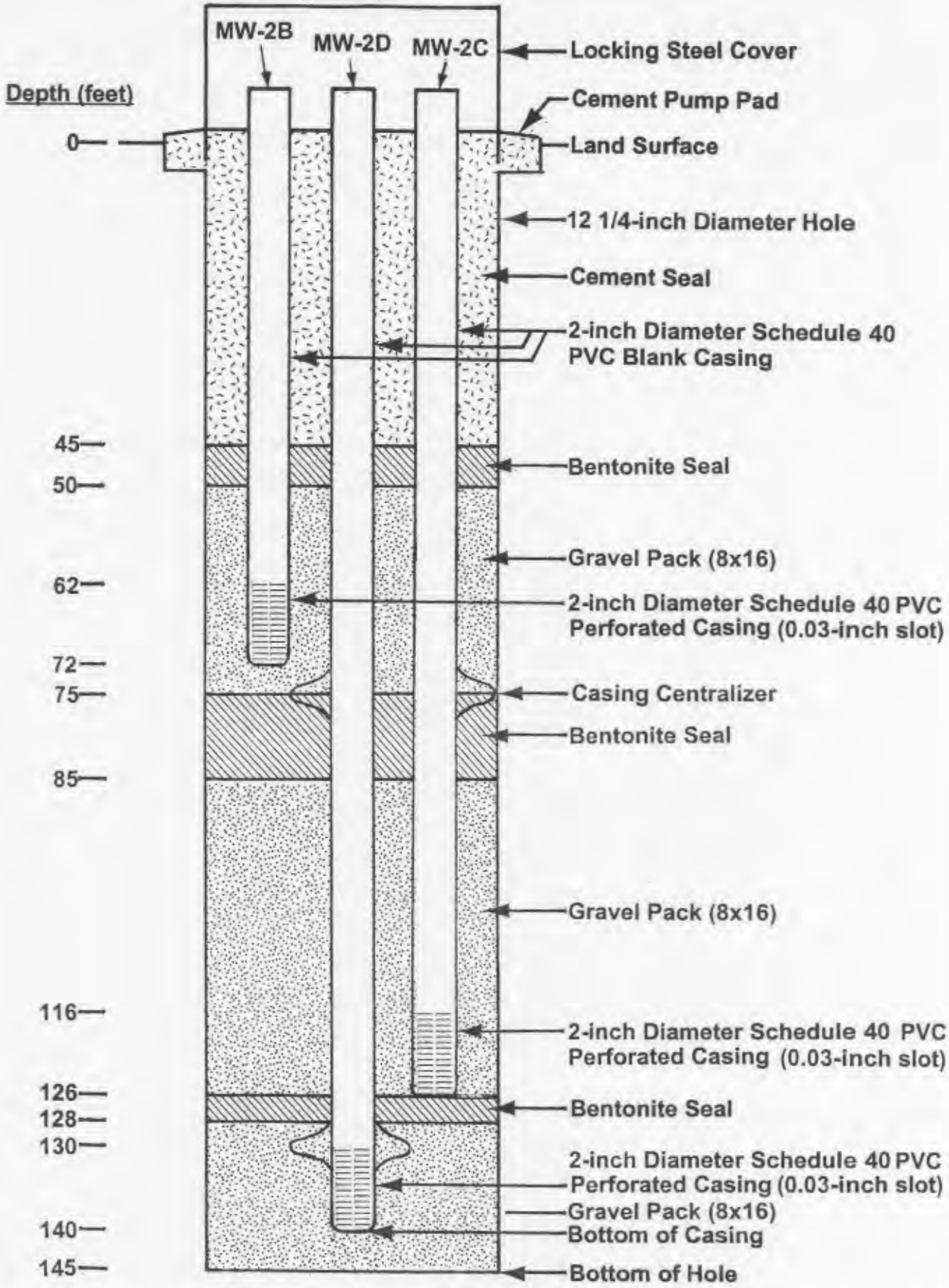
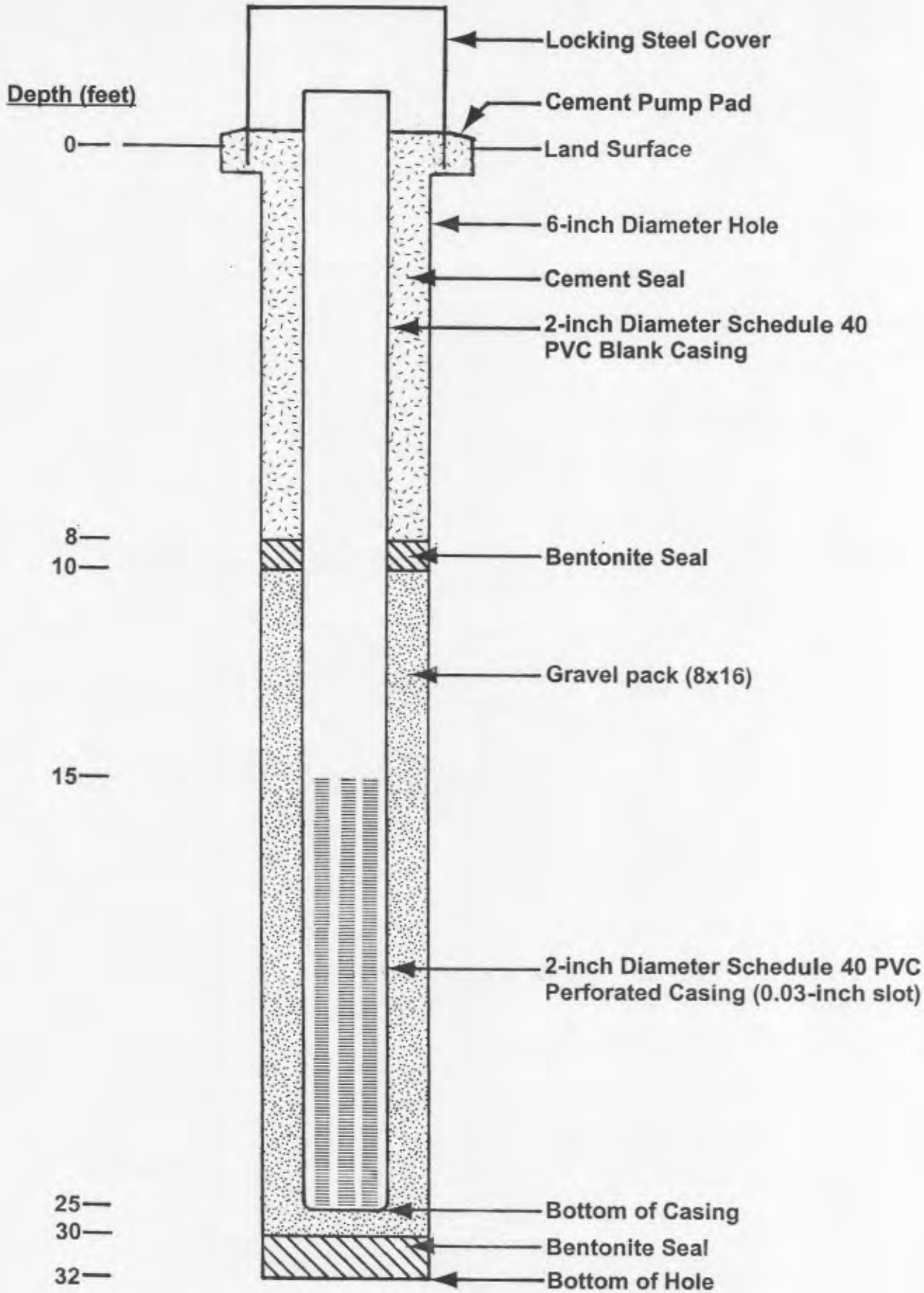
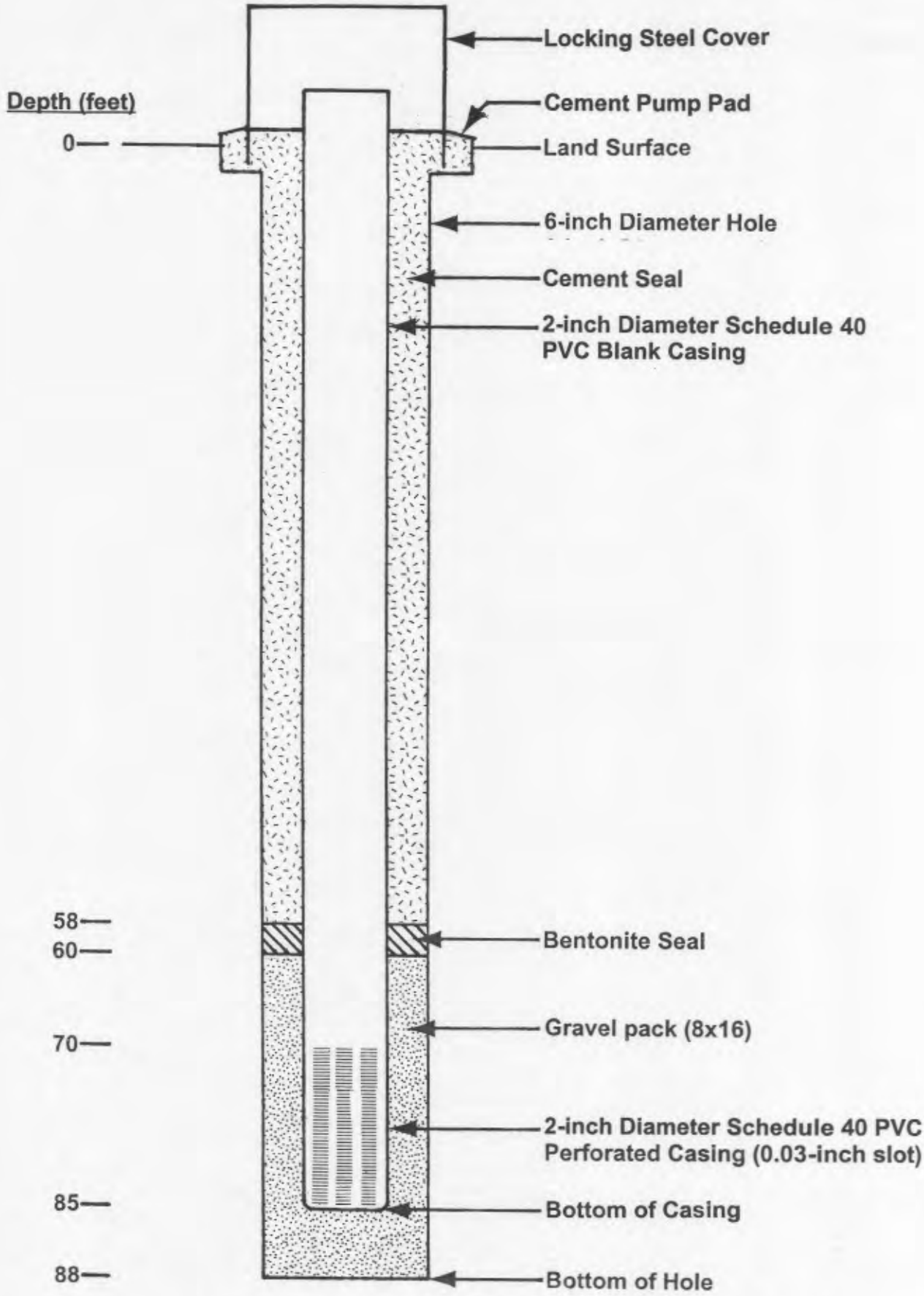


COMPLETION DIAGRAM FOR GIACOMAZZI DAIRY MW-2B, 2C & 2D



COMPLETION DIAGRAM FOR GIACOMAZZI DAIRY MW-3A



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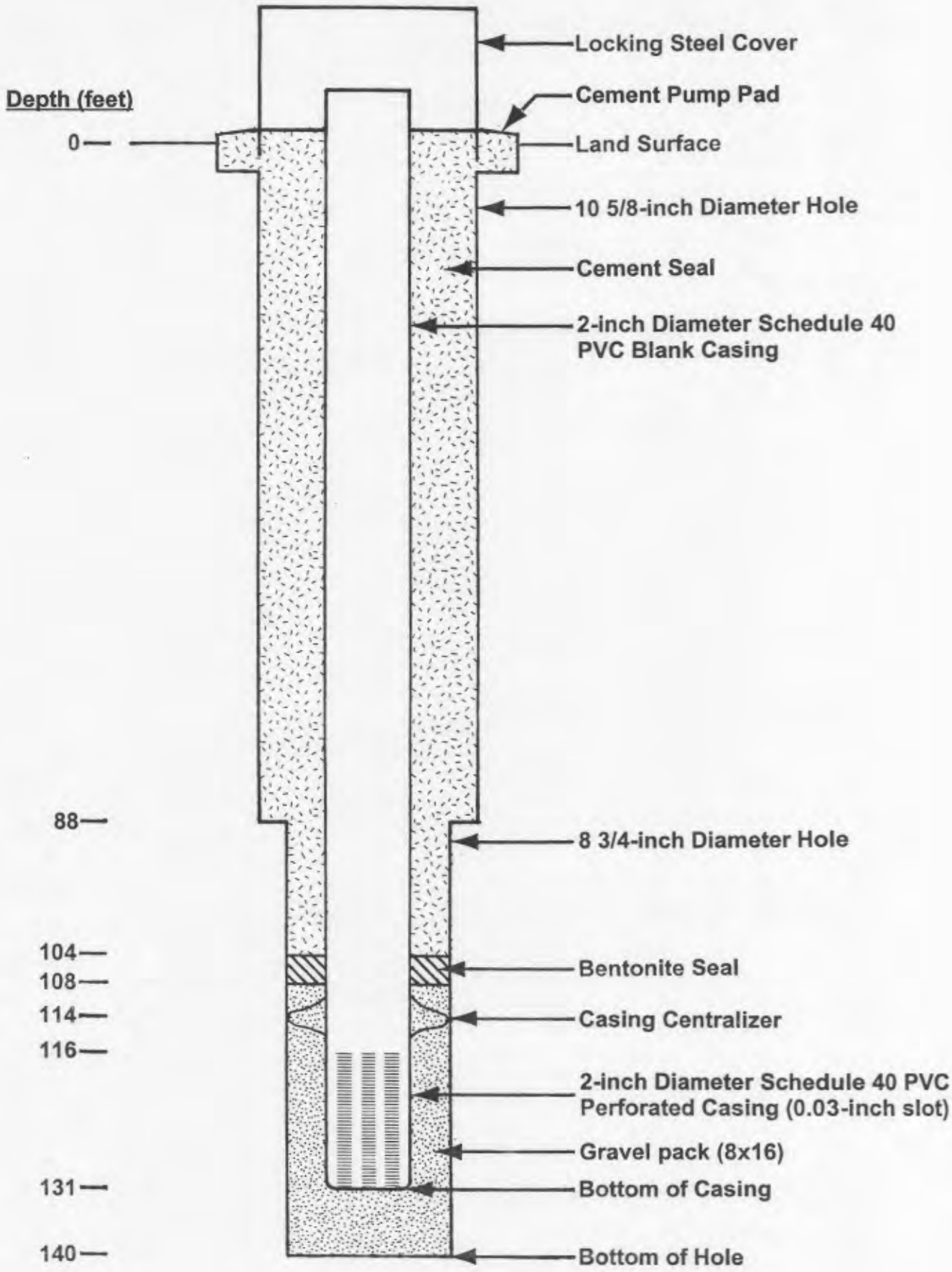
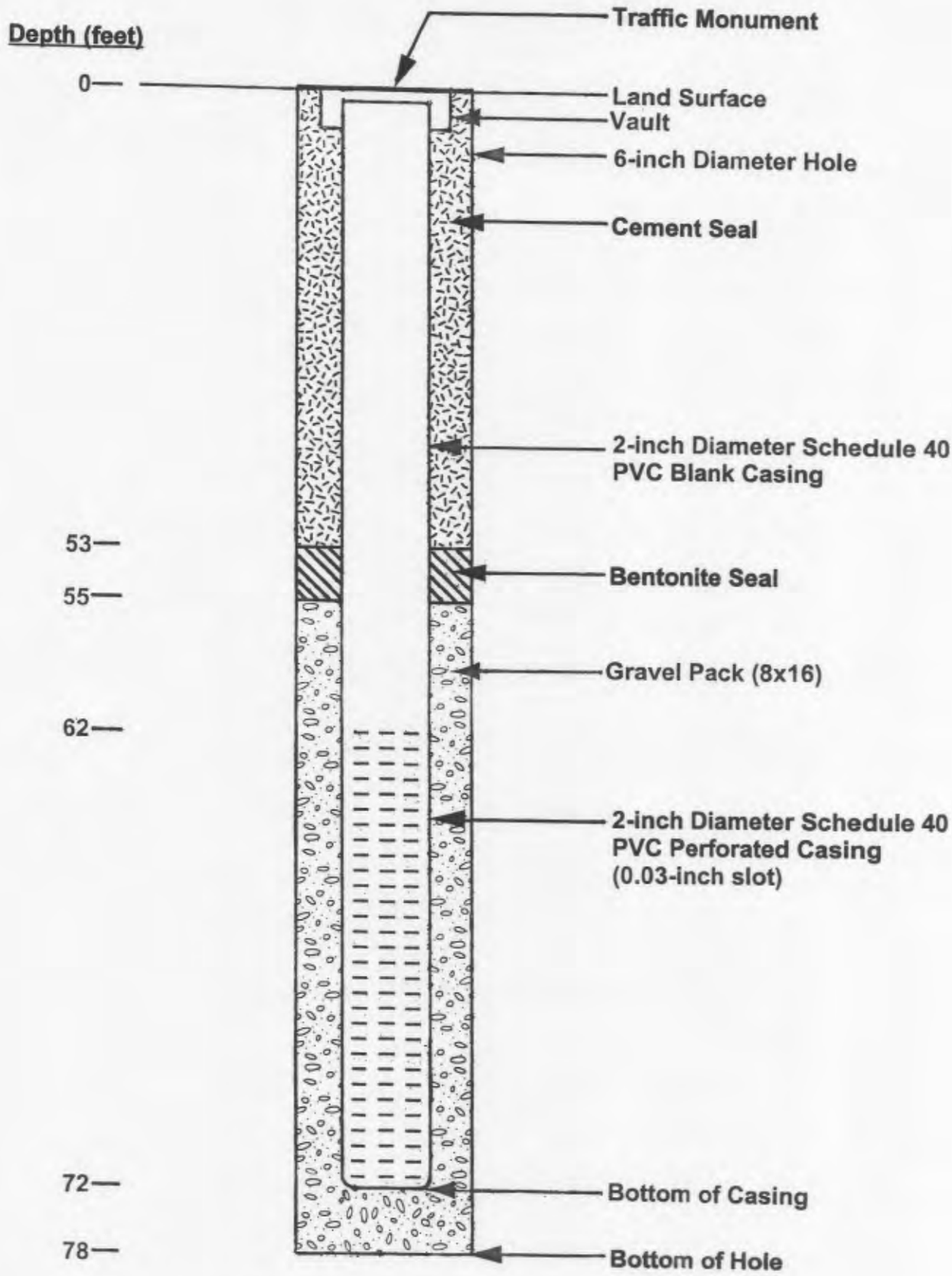
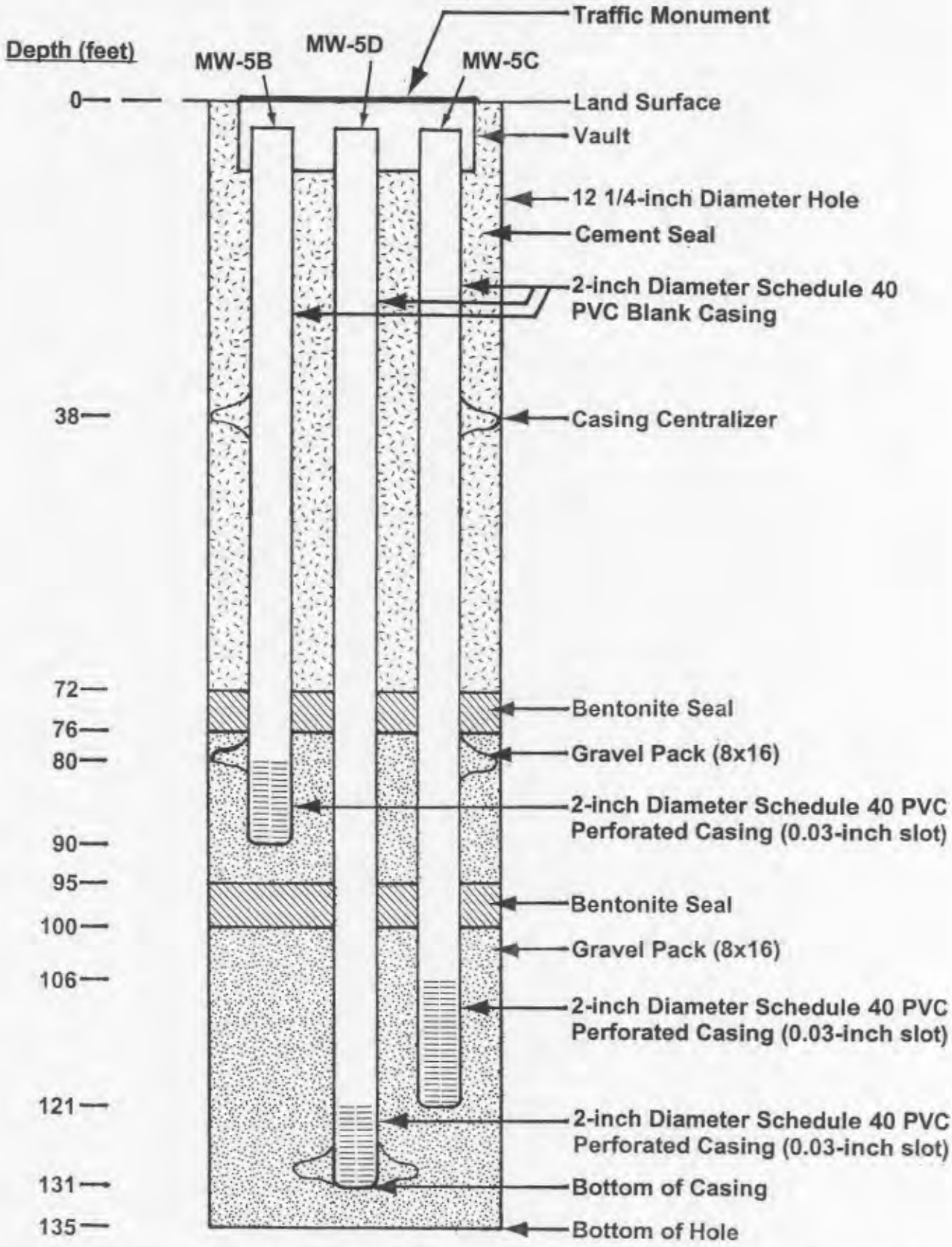


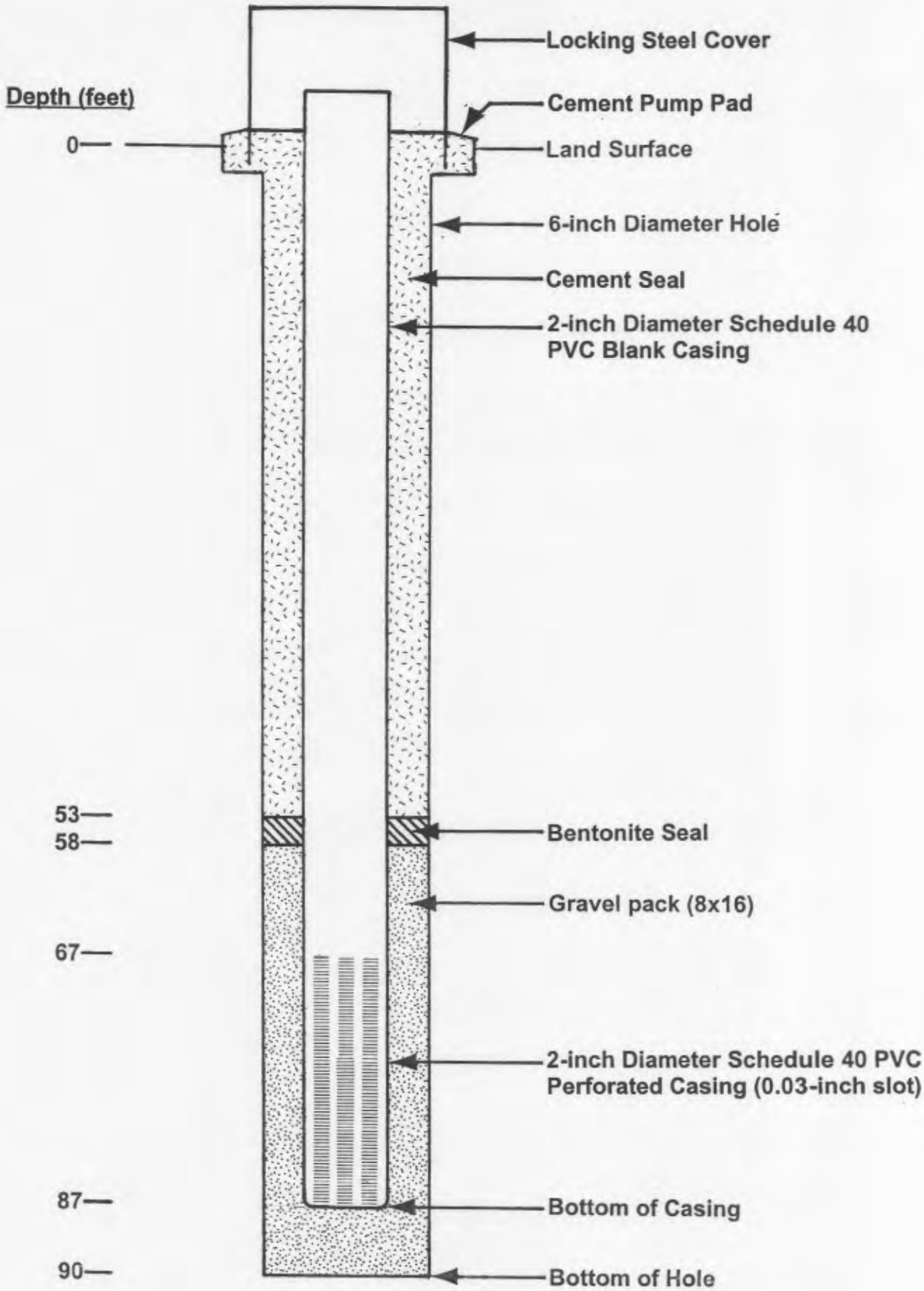
COMPLETION DIAGRAM FOR GIACOMAZZI DAIRY MW-3B



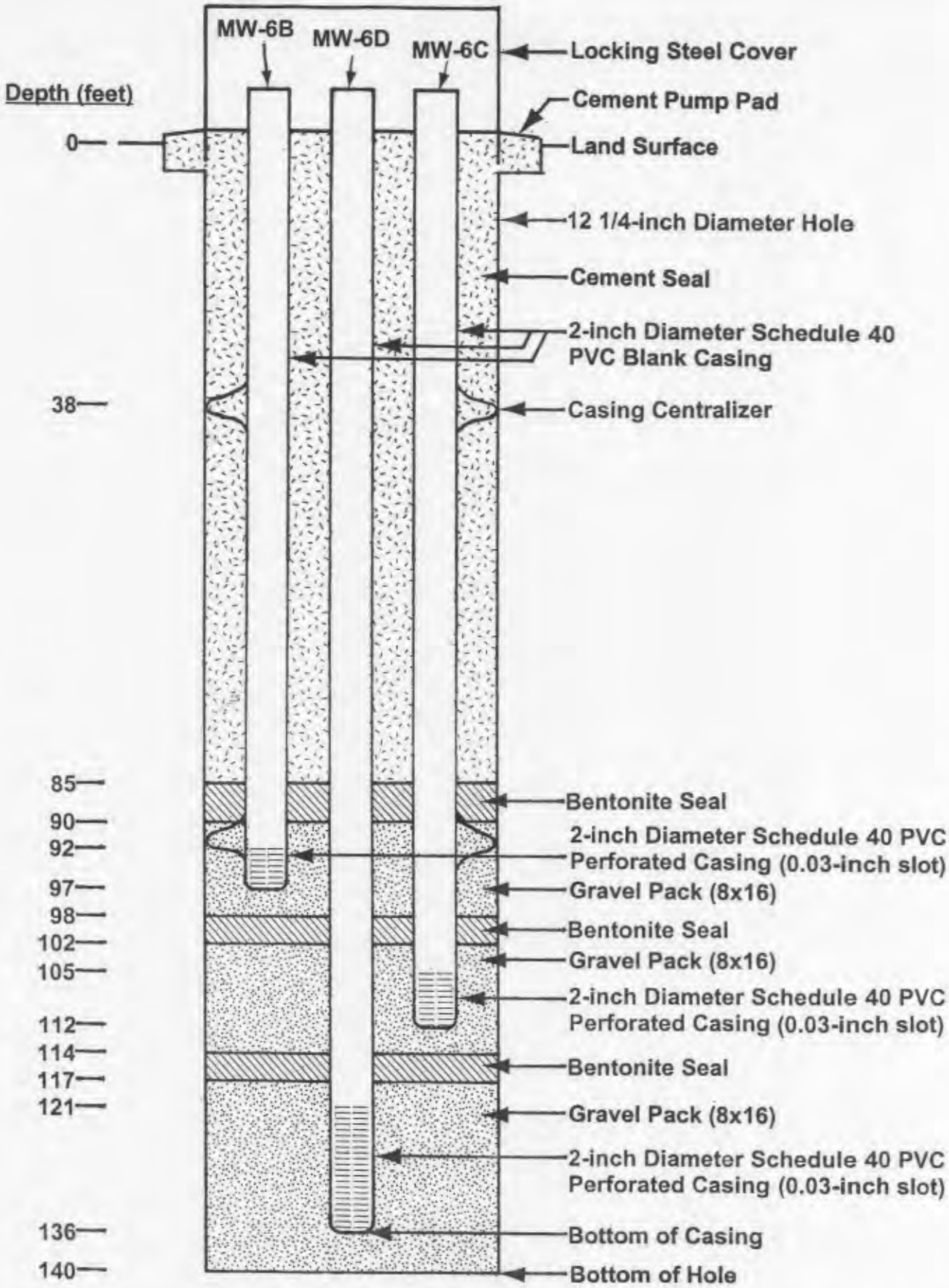
COMPLETION DIAGRAM FOR GIACOMAZZI DAIRY MW-5A



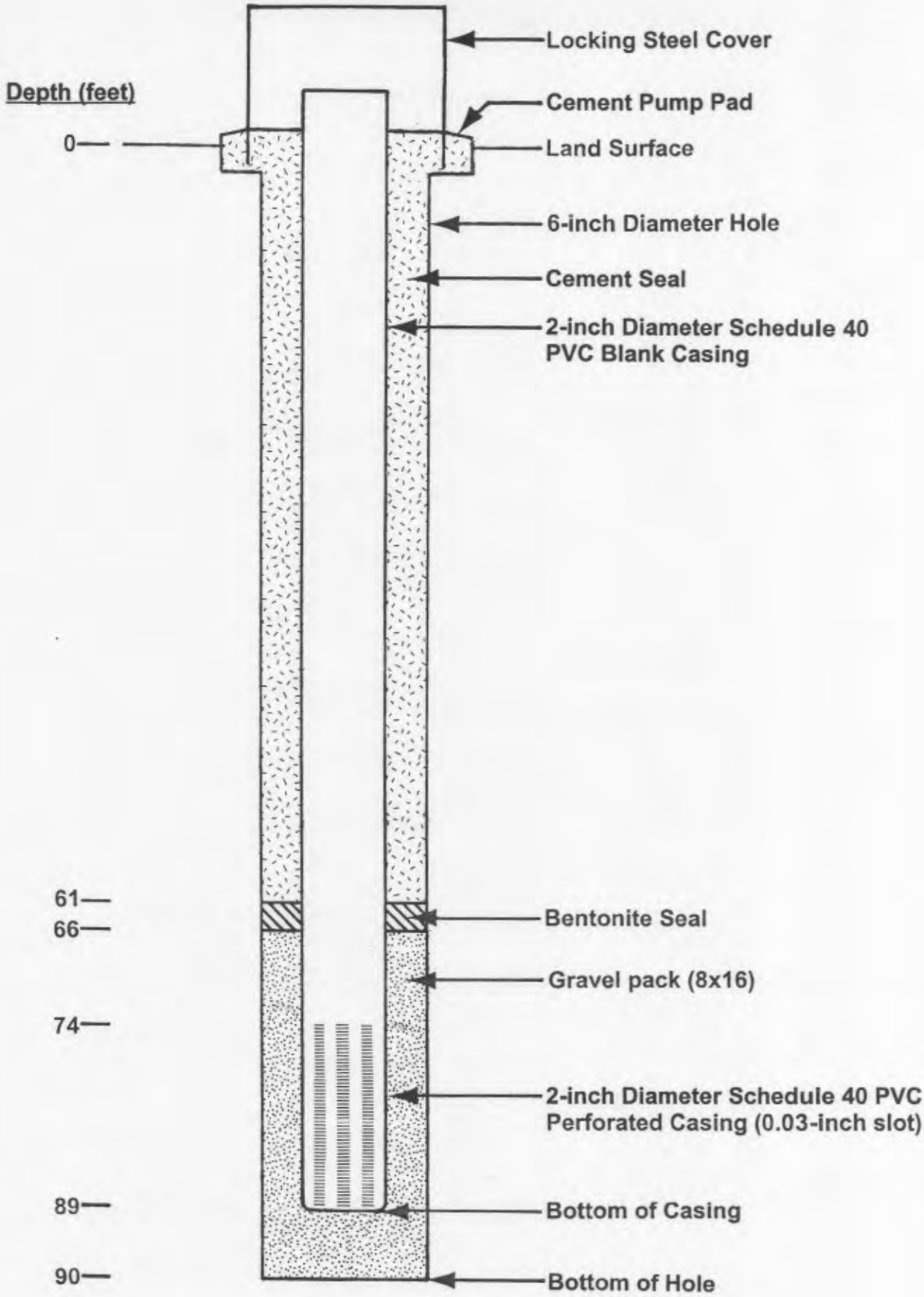
COMPLETION DIAGRAM FOR GIACOMAZZI DAIRY MW-5B, 5C & 5D



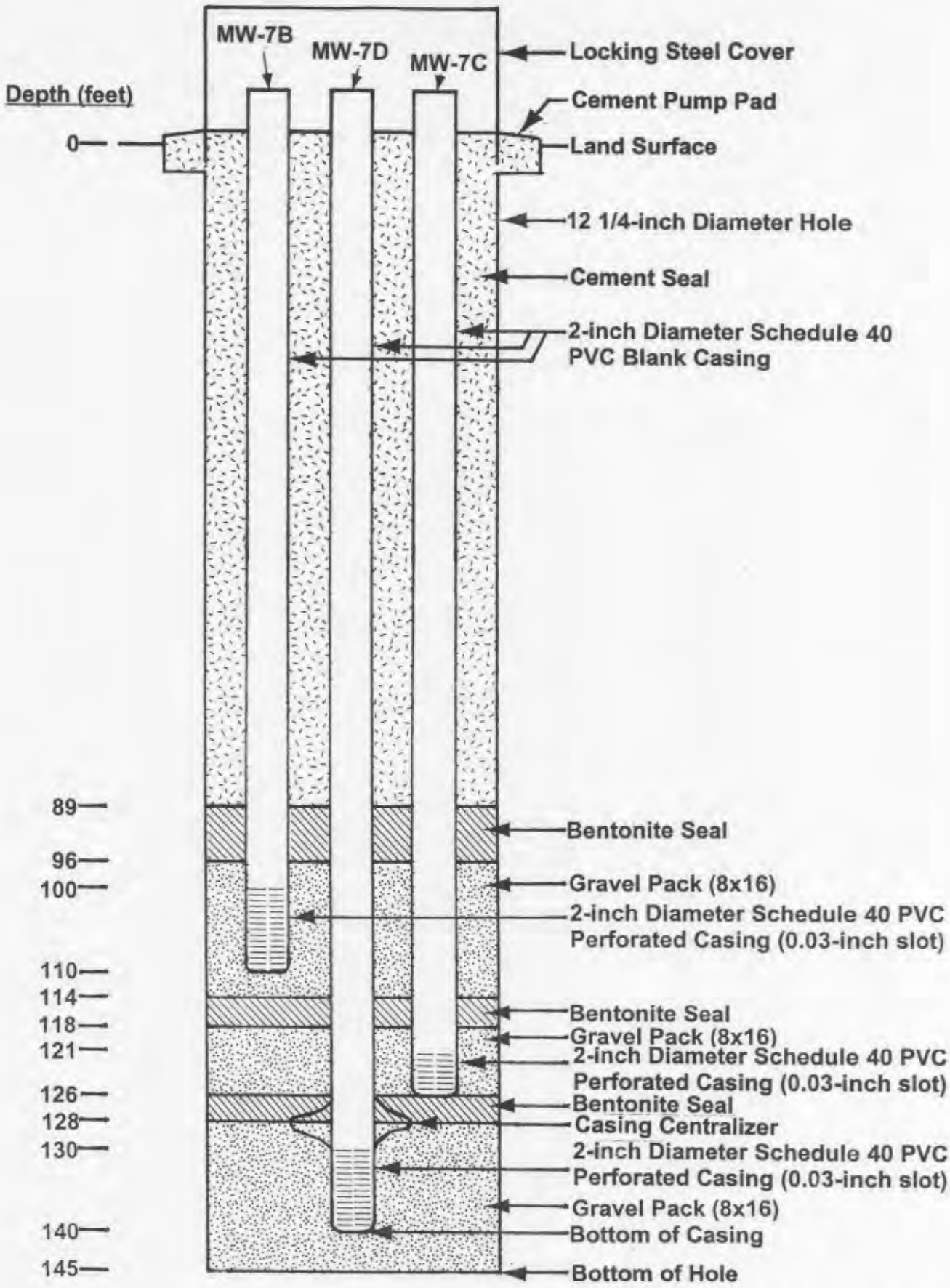
COMPLETION DIAGRAM FOR GIACOMAZZI DAIRY MW-6A



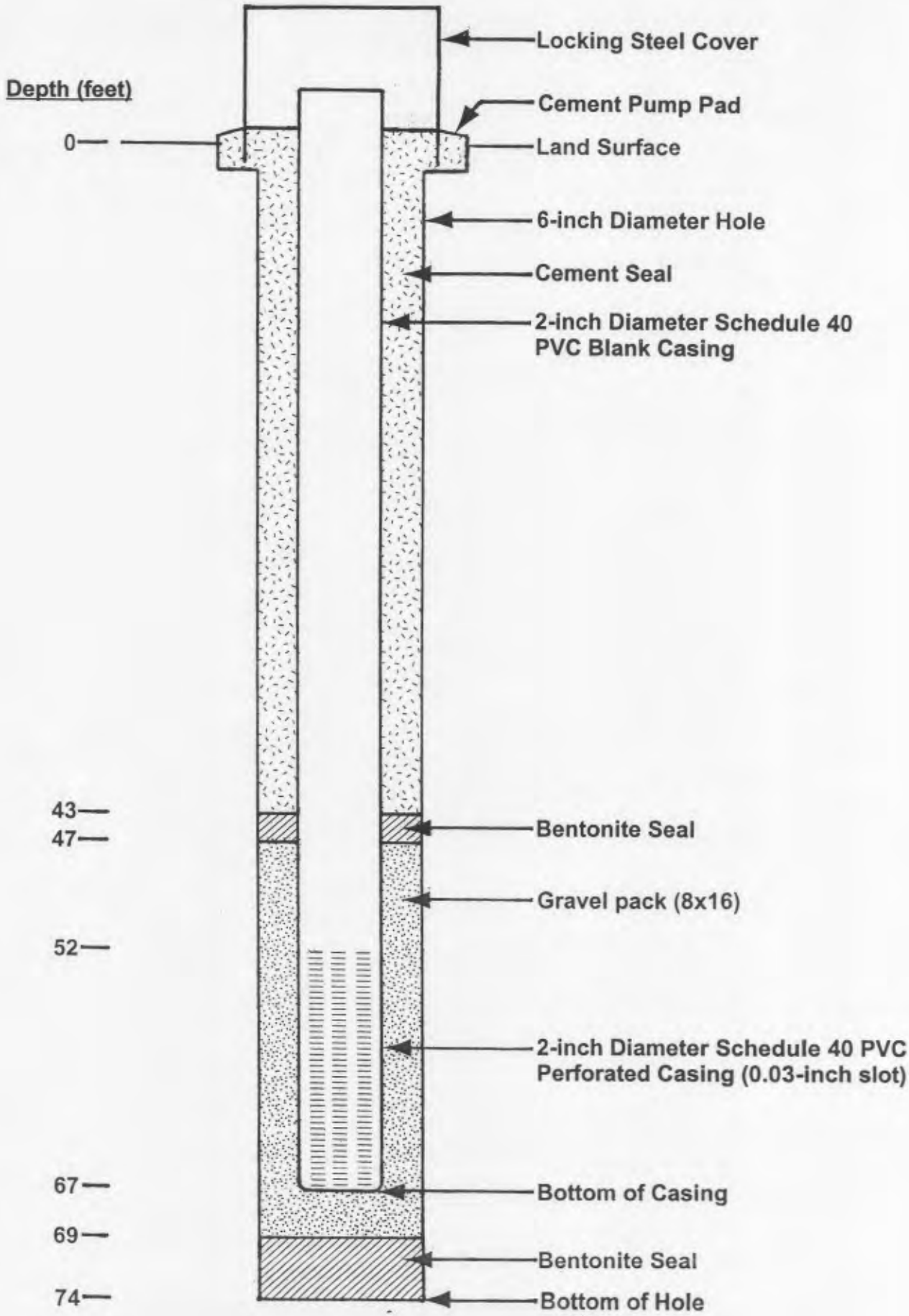
COMPLETION DIAGRAM FOR GIACOMAZZI DAIRY MW-6B, 6C & 6D



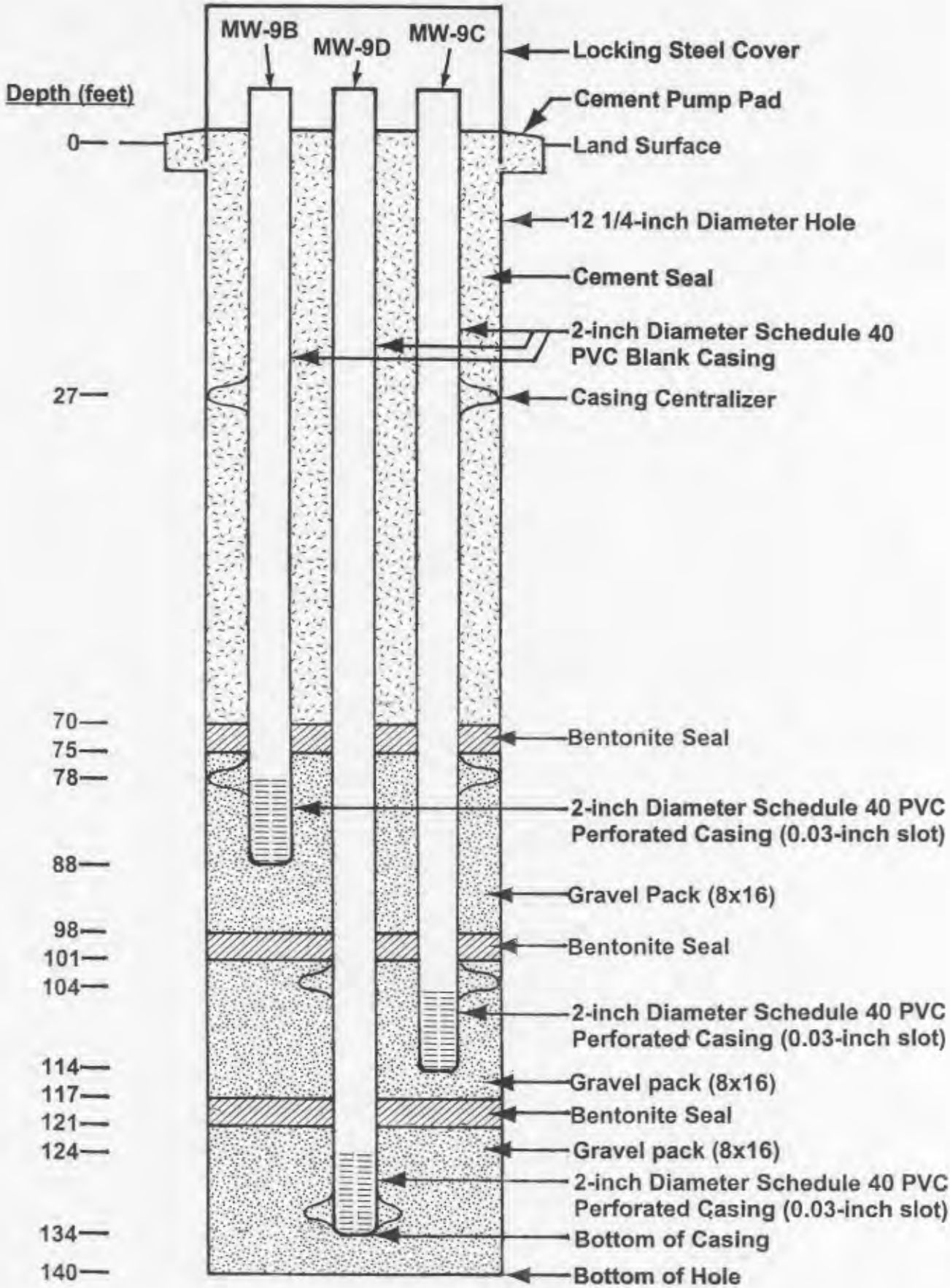
COMPLETION DIAGRAM FOR GIACOMAZZI DAIRY MW-7A



COMPLETION DIAGRAM FOR GIACOMAZZI DAIRY MW-7B, 7C & 7D



COMPLETION DIAGRAM FOR GIACOMAZZI DAIRY MW-9A



COMPLETION DIAGRAM FOR GIACOMAZZI DAIRY MW-9B, 9C & 9D

APPENDIX 2:

Certified Geologic Logs for Monitoring Well Sites
36-19-MW1A, -MW1B,C,D
36-19-MW2A, -MW2B,C,D
36-19-MW3A, -3AA, -MW3B
36-19-MW5A, -MW5B,C,D
36-19-MW6A, -MW6B,C,D
36-19-MW7A, -MW7B,C,D
36-19-MW9A, -MW9B,C,D

GEOLOGIC LOG FOR
GIACOMAZZI DAIRY MW-1A

Depth (feet)	Description	USC
0-4.3	Brown sandy silty, dry	ML
4.3-9.8	Gray-brown clayey silt, moist	ML
9.8-12.0	Brown sandy silt, moist	ML
12.0-18.0	Brown very fine to fine sand, moist	SM
18.0-21.7	Brown fine to medium sand, moist	SP
21.7-28.0	Brown-gray clayey silt and silty clay, moist	ML/CL
28.0-38.0	Gray-green silty clay, wet	CL
38.0-40.0	Gray-green very fine sand, wet	SP
40.0-46.0	Gray-green silty medium to coarse sand, wet	SM
46.0-48.0	Brown-green sandy clay with silt, moist	CL
48.0-50.0	Brown silty very fine sand, moist	SM
50.0-52.0	Brown-gray clayey very fine sand, wet	SC
52.0-58.0	Gray clayey medium sand, wet	SC
58.0-60.0	Brown-orange silty clay, moist	CL
60.0-64.3	Gray-brown very fine sand, dry	SP
64.3-66.0	Gray-brown very fine sand, moist	SP
66.0-67.3	Gray-brown clayey medium sand, moist	SC
67.3-70.0	Gray clayey silt, wet	ML
70.0-72.0	Gray-brown very fine sand, moist	SP
72.0-74.0	Gray-brown very fine sand, moist to dry	SP
74.0-80.0	Gray silty clay, moist	CL

Depth to Water: 28 feet
Date Drilled: July 30, 2007

Cheryl R. Lassotovitch
Cheryl R. Lassotovitch
Geologist No. 7689

August 21, 2007
August 21, 2007

GEOLOGIC LOG FOR
GIAMCOMAZZI DAIRY
MW-1B, 1C, AND 1D

Depth (feet)	Description	USC
80-89	Brown silty clay	CL
89-100	Gray-brown silty fine sand	SM
100-106	Brown fine silty sand	SM
106-112	Gray clay	CL
112-116	Gray-brown fine sand	SP
116-134	Gray-brown medium sand with some gravel	SP/GP
134-140	Gray silty clay	CL

See log for adjacent MW-1A for description of shallower deposits.

Date Drilled: September 20, 2007
Depth to Water: MW-1B 88.0 feet (10/03/07)
MW-1C 88.1 feet (10/03/07)
MW-1D 88.0 feet (10/03/07)

Cheryl R. Lassotovitch
Cheryl R. Lassotovitch
Geologist No. 7689

October 2, 2007
October 2, 2007

GEOLOGIC LOG FOR
GIACOMAZZI DAIRY MW-2A

Depth (feet)	Description	USC
0-2	Brown sandy silt, dry	ML
2-6.8	Brown clayey silt and silty clay, moist	ML/CL
6.8-11.0	Gray-brown clayey fine sand, moist	SC
11.0-16.0	Gray-brown clayey silt and silty clay, moist	ML/CL
16.0-17.0	Gray-red very fine sand with clay, wet	SP
17.0-20.5	Blue-gray clay silt and silty clay, wet to very wet	ML/CL
20.5-22.9	Gray-brown very fine to fine sand, moist to dry	SP
22.9-24.0	Gray-brown silty clay, moist	CL
24.0-27.6	Gray clay fine sand, moist	SC
27.6-30.0	Gray silty clay, moist	CL
30.0-31.9	Gray very fine sand	SP
31.9-35.6	Gray silty clay, moist	CL
35.6-40.0	Gray clayey fine sand, wet	SC
40.0-42.0	Gray-brown sandy clay, wet	CL
42.0-45.0	Gray fine to coarse sand with clay, wet	SP
45.0-46.0	Gray clay, moist	CL
46.0-50.0	Gray-brown sandy clay, moist	CL
50.0-54.0	Gray clayey silt, moist	ML

Depth to Water: 16 feet
Date Drilled: August 22, 2007

Cheryl R. Lassotovitch
Cheryl R. Lassotovitch
Geologist No. 7689

September 18, 2007
September 18, 2007

GEOLOGIC LOG FOR
GIAMCOMAZZI DAIRY
MW-2B, 2C, AND 2D

Depth (feet)	Description	USC
48-53	Brown-gray silty clay	CL
53-57	Brown very fine silty sand	SM
57-62	Brown clay	CL
62-70	Brown fine sand	SP
70-89	Brown clay	CL
89-98	Gray silty clay	CL
98-115	Gray clayey silt	ML
115-125	Gray fine to medium silty sand	SM
125-129	Gray silty clay	CL
129-134	Brown-red very fine to fine silty sand	SM
134-140	Gray clayey silt	ML
140-143	Gray very fine to fine silty sand	SM

See log for adjacent MW-2A and MW-2AA for description of shallower deposits.

Date Drilled: August 27, 2007
Depth to Water: MW-2B 73.7 feet (10/03/07)
MW-2C 86.1 feet (10/03/07)
MW-2D 86.0 feet (10/03/07)

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Geologist No. 7689

October 2, 2007
October 2, 2007

GEOLOGIC LOG FOR
GIACOMAZZI DAIRY MW-3A AND 3AA

Depth (feet)	Description	USC
0-2.0	Brown sandy silt, dry	ML
2.0-7.5	Brown sandy silt, moist	ML
7.5-13.6	Gray-brown clayey silty and silty clay, moist	ML/CL
13.6-20.0	Gray very fine to medium sand, moist	SP
20.0-24.9	Gray fine to medium sand, moist to wet	SP
24.9-33.7	Gray clayey silt and silty clay, moist	ML/CL
33.7-34.6	Gray very fine sand	SP
34.6-45.3	Gray clayey silt, moist	ML
45.3-47.0	Gray medium to coarse sandy silt, moist	ML
47.0-53.5	Gray silty sand, moist	SM
53.5-66.9	Gray clayey silt with sand, moist	ML
66.9-69.5	Gray silty very fine sand, moist	SM
69.5-82.0	Gray-brown very fine to fine sand, moist	SP
82.0-88.0	Gray fine to medium sand, wet	SP

Depth to Water: 82 feet
Date Drilled: August 20, 2007

Cheryl R. Lassotovitch
Cheryl R. Lassotovitch
Geologist No. 7689

September 18, 2007
September 18, 2007

GEOLOGIC LOG FOR
GIAMCOMAZZI DAIRY MW-3B

Depth (feet)	Description	USC
88-97	Gray clayey medium to coarse sand	SC
97-101	Brown-gray clayey silt	ML
101-106	Gray-brown clayey medium to coarse sand	SC
106-115	Brown clayey fine to coarse sand	SC
115-117	Brown very fine silty sand	SM
117-130	Gray fine to coarse silty sand	SM
130-140	Brown silty clay	CL

See log for adjacent MW-3A for description of shallower deposits.

Date Drilled: August 31, 2007
Depth to Water: 90.6 feet (10/03/07)

Cheryl R. Lassotovitch
Cheryl R. Lassotovitch
Geologist No. 7689

October 2, 2007
October 2, 2007

GEOLOGIC LOG FOR
GIACOMAZZI DAIRY MW-5A

Depth (feet)	Description	USC
0-2.9	Brown-gray silty sand, moist	SM
2.9-8.0	Brown clayey silty and silty clay, moist	ML/CL
8.0-11.8	Gray-brown sandy silt with clay, moist	ML
11.8-13.3	Orange medium to coarse sand, moist	SP
13.3-19.3	Gray silty clay, moist	CL
19.3-22.0	Gray-brown very fine sand, moist to dry	SP
22.0-28.0	Brown-gray silty clay, moist	CL
28.0-39.5	White-gray very fine to fine sand, moist to wet	SP
39.5-48.0	Gray medium to coarse sand, moist to wet	SP
48.0-54.9	Gray-brown clayey silt and silty clay, moist to wet	ML/CL
54.9-64.0	Gray-brown clayey silt with sand, moist	ML
64.0-68.0	Gray-brown clayey silty very fine sand, moist	SC
68.0-71.8	Brown silty very fine sand, moist	SM
71.8-78.0	Brown-gray clayey silt, moist	ML

Depth to Water: 33 feet
Date Drilled: August 22, 2007

Cheryl R. Lassotovitch
Cheryl R. Lassotovitch
Geologist No. 7689

September 18, 2007
September 18, 2007

GEOLOGIC LOG FOR
GIAMCOMAZZI DAIRY
MW-5B, 5C, AND 5D

Depth (feet)	Description	USC
72-74	Brown medium to coarse silty sand	SM
74-84	Brown-gray clay silt	ML
84-89	Gray fine to coarse silty sand	SM
89-95	Gray fine sandy clay	CL
95-99	Brown fine sandy clay	CL
99-118	Brown very fine to fine sand	SM
118-129	Gray-brown silty fine sand	SM
129-137	Gray-brown silty clay	CL
137-140	Gray fine to coarse silty sand	SM

See log for adjacent MW-5A for description of shallower deposits.

Date Drilled: September 8, 2007
Depth to Water: MW-5B 87.8 feet (10/03/07)
MW-5C 95.2 feet (10/03/07)
MW-5D 95.3 feet (10/03/07)

Cheryl R. Lassotovitch
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Geologist No. 7689

October 2, 2007
October 2, 2007

GEOLOGIC LOG FOR
GIACOMAZZI DAIRY MW-6A

Depth (feet)	Description	USC
4.0-6.0	Brown sandy silt with clay, moist	ML
6.0-7.7	Brown fine to coarse sand, moist	SP
7.7-9.6	Brown very fine silty sand with clay, moist	SM
9.6-12.0	Brown silty clay, moist	CL
12.0-13.5	Brown very fine sand, moist	SP
13.5-18.0	Brown-orange clayey silt and silty clay, moist	ML/CL
18.0-21.7	Brown very fine sand, moist	SP
21.7-33.0	Brown-gray silty clay with sand, moist	CL
33.0-35.0	Gray very fine sand, moist	SP
35.0-36.0	Gray clay, moist	CL
36.0-40.0	Gray fine sand, moist to wet	SP
40.0-42.0	Gray silty clay, wet	CL
42.0-45.0	Gray fine to medium sand, moist to wet	SP
45.0-54.0	Gray-brown silty clay with fine sand, moist	CL
54.0-57.1	Gray-brown very fine sand, moist	SP
57.1-60.0	Brown clayey silt, moist	ML
60.0-62.0	Brown silty fine sand, moist	SM
62.0-72.0	Gray-brown fine sand, moist	SP
72.0-84.0	Gray-brown fine to medium sand, moist	SP
84.0-88.0	Gray-brown sandy clay, moist to wet	CL
88.0-90.0	Brown clay, wet	CL

Depth to Water: 40 feet
Date Drilled: August 27, 2007

Cheryl R. Lassotovitch
Cheryl R. Lassotovitch
Geologist No. 7689

August 22, 2007
August 22, 2007

GEOLOGIC LOG FOR
GIAMCOMAZZI DAIRY
MW-6B, 6C, AND 6D

Depth (feet)	Description	USC
85-92	Gray-brown fine sandy clay	CL
92-97	Gray fine to medium silty sand	SM
97-104	Brown fine sandy clay	CL
104-113	Gray-brown fine to medium silty sand	SM
113-127	Gray-brown sandy clay	CL
127-136	Gray-brown fine to coarse silty sand	SM
136-140	Gray silty clay	CL

See log for adjacent MW-6A for description of shallower deposits.

Date Drilled: September 6, 2007
Depth to Water: MW-6B 92.3 feet (10/03/07)
MW-6C 95.0 feet (10/03/07)
MW-6D 97.3 feet (10/03/07)

Cheryl R. Lassotovitch
Cheryl R. Lassotovitch
Geologist No. 7689

October 2, 2007
October 2, 2007

GEOLOGIC LOG FOR
GIACOMAZZI DAIRY MW-7A

Depth (feet)	Description	USC
2.0-11.4	Brown sandy silt dry	ML
11.4-16.0	Brown clayey silt and silty clay, moist	ML/CL
16.0-20.9	Brown silty clayey fine sand, moist	SC
20.9-24.0	Brown silty clay, moist	CL
24.0-25.7	Brown very fine sand, moist	SP
25.7-29.6	Gray silty clay, moist	CL
29.6-32.0	Gray very fine to fine sand, dry	SP
32.0-37.9	Gray sandy clay, moist	CL
37.9-39.4	Gray silty fine sand, moist	SM
39.4-41.9	Gray silty clay and clayey silt, moist	ML/CL
41.9-51.0	Gray fine to medium sandy clay with silt, moist	CL
51.0-55.2	Brown very fine to coarse sand, moist	SP
55.2-58.0	Gray-brown silty clay, moist	CL
58.0-66.0	Gray-brown fine to medium sandy clay, moist	CL
66.0-68.0	Gray-brown sandy clay, moist	CL
68.0-70.0	Gray-brown silty clay, moist	CL
70.0-71.9	Brown very fine sand, dry	SP
71.9-74.0	Brown clayey silt, dry	ML
74.0-83.5	Gray-brown fine to medium sand, moist	SP
83.5-87.3	Brown fine sandy clay, moist	CL
87.3-89.4	Brown clayey medium to coarse sand, wet	SC

Depth to Water: 87 feet
Date Drilled: August 24, 2007

Cheryl R. Lassotovitch
Cheryl R. Lassotovitch
Geologist No. 7689

September 11, 2007
September 11, 2007

GEOLOGIC LOG FOR
GIAMCOMAZZI DAIRY
MW-7B, 7C, AND 7D

Depth (feet)	Description	USC
89-129	Brown silty clay with some fine sand	CL/SM
129-138	Brown fine to coarse silty sand	SM
138-140	Brown silty clay	CL

See log for adjacent MW-7A for description of shallower deposits.

Date Drilled: August 29, 2007
Depth to Water: MW-7B 90.6 feet (10/03/07)
MW-7C 90.8 feet (10/03/07)
MW-7D 90.7 feet (10/03/07)

Cheryl R Lassotovitch
Cheryl R. Lassotovitch
Geologist No. 7689

October 2, 2007
October 2, 2007

GEOLOGIC LOG FOR
GIACOMAZZI DAIRY MW-9A

Depth (feet)	Description	USC
0-2.7	Brown clayey silt and silty clay, dry	ML/CL
2.7-10.0	Brown silty fine sand with clay, dry to moist	SM
10.0-14.0	Brown clayey silt, moist	ML
14.0-16.0	Brown fine sandy silt, dry	ML
16.0-24.0	Brown very fine sand, dry	SP
24.0-30.3	Brown clayey silt and silty clay, dry to moist	ML/CL
30.3-36.0	Gray-brown very fine sand with silty clay, moist	SM
36.0-44.0	Gray clayey silt and silty clay, moist	ML/CL
44.0-48.0	Gray-brown clayey silt and silty clay, dry	ML/CL
48.0-54.0	Brown silty fine sand, dry	SM
54.0-62.0	Gray-brown fine sand, dry	SP
62.0-68.0	Brown very fine sand, dry to moist	SP
68.0-74	Brown clayey silt and silty clay, moist to dry	ML/CL

Depth to Water: Dry (10/03/07)
Date Drilled: September 27, 2007

Cheryl R. Lassotovitch October 16, 2007
Cheryl R. Lassotovitch
Geologist No. 7689

GEOLOGIC LOG FOR
GIAMCOMAZZI DAIRY
MW-9B, 9C, AND 9D

Depth (feet)	Description	USC
70-75	Brown clayey sand	SC
75-80	Gray-brown silty clay	CL
80-88	Gray-brown fine to medium silty sand	SM
88-94	Brown clayey sand	SC
94-99	Brown very fine to coarse silty sand	SM
99-103	Gray-brown silty clay	CL
103-114	Gray-brown fine to coarse silty sand	SM
114-123	Gray-brown silty clay	CL
123-133	Gray-brown fine to coarse sand	SP
133-136	Gray-brown silty clay	CL
136-140	Gray-brown very fine to fine silty sand with gravel	SM/GM

See log for adjacent MW-9A for description of shallower deposits.

Date Drilled: September 25, 2007
Depth to Water: MW-9B 82.1 feet (10/04/07)
MW-9C 82.6feet (10/04/07)
MW-9D 83.0 feet (10/04/07)

Cheryl R. Lassotovitch
Cheryl R. Lassotovitch
Geologist No. 7689

October 2, 2007
October 2, 2007

APPENDIX 3:

Well Completion Reports for Monitoring Wells
36-19-MW1A, -MW1B,C,D
36-19-MW2A, -MW2B,C,D
36-19-MW3A, -3AA, -MW3B
36-19-MW5A, -MW5B,C,D
36-19-MW6A, -MW6B,C,D
36-19-MW7A, -MW7B,C,D
36-19-MW9A, -MW9B,C,D

TRIPLICATE
Owner's Copy

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. E064320

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO / STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. MW-1
Date Work Began 7/30/2007, Ended 10/16/2007
Local Permit Agency KINGS COUNTY PLANNING AGENCY
Permit No. W0707-008 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain, size, color, etc.*
0	4.3	BROWN SANDY SILTY, DRY
4.3	9.8	GRAY-BROWN CLAYEY SILT, MOIST
9.8	12.0	BROWN SANDY SILT, MOIST
12.0	18.0	BROWN VERY FINE TO FINE SAND, MOIST
18.0	21.7	BROWN FINE TO MEDIUM SAND, MOIST
21.7	28.0	BROWN-GRAY CLAYEY SILT & SILTY CLAY, MOIST
28.0	38.0	GRAY-GREEN SILTY CLAY, WET
38.0	40.0	GRAY-GREEN VERY FINE SAND, WET
40.0	46.0	GRAY-GREEN SILTY MEDIUM TO COARSE SAND, WET
46.0	48.0	BROWN-GREEN SANDY CLAY WITH SILT, MOIS
48.0	50.0	BROWN SILTY VERY FINE SAND, MOIST
50.0	52.0	BROWN -GRAY CLAYEY VERY FINE SAND, WET
52.0	58.0	RAY CLAYEY MEDIUM SAND, WET
58.0	60.0	BROWN-ORANGE SILTY CLAY, MOIST
60.0	64.3	GRAY-BROWN VERY FINE SAND, DRY
64.3	66.0	GRAY-BROWN VERY FINE SAND, MOIST
66.0	67.3	GRAY-BROWN CLAYEY MEDIUM SAND, MOIST
67.3	70.0	GRAY CLAYEY SILT, WET
70.0	72.0	GRAY-BROWN VERY FINE SAND, MOIST
72.0	74.0	GRAY-BROWN VERY FINE SAND, MOIST TO DRY
74.0	80.0	GRAY SILTY CLAY, MOIST

TOTAL DEPTH OF BORING 80 (Feet)
TOTAL DEPTH OF COMPLETED WELL 80 (Feet)

WELL OWNER

Name LILIA GIACOMAZZI
Mailing Address 9550 6TH AVE.
HANFORD (CITY) CA (STATE) 93230 (ZIP)

WELL LOCATION

Address 9550 6TH AVE
City HANFORD CA 93230
County TULARE
APN Book 014 Page 260 Parcel 068
Township 18 Range 22 Section 27
Latitude DEG. MIN. SEC. DEG. MIN. SEC.

LOCATION SKETCH

NORTH
WEST EAST
SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
Deepen
Other (Specify)
___ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
___ Domestic ___ Public
___ Irrigation ___ Industrial
MONITORING ✓
TEST WELL
CATHODIC PROTECTION
HEAT EXCHANGE
DIRECT PUSH
INJECTION
VAPOR EXTRACTION
SPARGING
REMEDIATION
OTHER (SPECIFY)

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 28 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 28 (Ft.) & DATE MEASURED 7/30/2007
ESTIMATED YIELD * ___ (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN ___ (Ft.)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	36		✓				PVC	2"	SCH 40	
36	46						PVC	2"	SCH 40	0.03"

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
23	26		✓		GRAVEL 8 X16

ATTACHMENTS (✓)

Geologic Log
Well Construction Diagram
Geophysical Log(s)
Soil/Water Chemical Analysis
Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3625 S. HIGHLAND (ADDRESS) DEL REY (CITY) CA (STATE) 93616 (ZIP)
Signed ___ (WELL DRILLER/AUTHORIZED REPRESENTATIVE) 01/16/08 (DATE SIGNED) 414178 (C-57 LICENSE NUMBER)

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy
Page 1 of 2

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. **E067207**

Owner's Well No. MW-1B,1C,1D
Date Work Began 7/30/2007, Ended 9/20/2007
Local Permit Agency KINGS COUNTY PLANNING AGENCY
Permit No. W0707-008 Permit Date 7/9/2007

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO / STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft	to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*
0	4.3	BROWN SANDY SILTY, DRY
4.3	9.8	GRAY-BROWN CLAYEY SILT, MOIST
9.8	12.0	BROWN SANDY SILT, MOIST
12.0	18.0	BROWN VERY FINE TO FINE SAND, MOIST
18.0	21.7	BROWN FINE TO MEDIUM SAND, MOIST
21.7	28.0	BROWN-GRAY CLAYEY SILT & SILTY CLAY, MOIST
28.0	38.0	GRAY-GREEN SILTY CLAY, WET
38.0	40.0	GRAY-GREEN VERY FINE SAND, WET
40.0	46.0	GRAY-GREEN SILTY MEDIUM TO COARSE SAND, WET
46.0	48.0	BROWN-GREEN SANDY CLAY WITH SILT, MOIS
48.0	50.0	BROWN SILTY VERY FINE SAND, MOIST
50.0	52.0	BROWN -GRAY CLAYEY VERY FINE SAND, WET
52.0	58.0	RAY CLAYEY MEDIUM SAND, WET
58.0	60.0	BROWN-ORANGE SILTY CLAY, MOIST
60.0	64.3	GRAY-BROWN VERY FINE SAND, DRY
64.3	66.0	GRAY-BROWN VERY FINE SAND, MOIST
66.0	67.3	GRAY-BROWN CLAYEY MEDIUM SAND, MOIST
67.3	70.0	GRAY CLAYEY SILT, WET
70.0	72.0	GRAY-BROWN VERY FINE SAND, MOIST
72.0	74.0	GRAY-BROWN VERY FINE SAND, MOIST TO DRY
74.0	80.0	GRAY SILTY CLAY, MOIST
80	89	BROWN SILTY CLAY
89	100	GRAY-BROWN SILTY FINE SAND
100	106	BROWN FINE SILTY SAND
106	112	GRAY CLAY
112	116	GRAY-BROWN FINE SAND
116	134	GRAY-BROWN MEDIUM SAND WITH SOME

TOTAL DEPTH OF BORING 80 (Feet)
TOTAL DEPTH OF COMPLETED WELL 80 (Feet)

WELL OWNER

Name LILIA GIACOMAZZI
Mailing Address 9550 6TH AVE.
HANFORD CA 93230
CITY STATE ZIP

WELL LOCATION

Address 9550 6TH AVE
City HANFORD CA 93230
County TULARE
APN Book 014 Page 260 Parcel 068
Township 18 Range 22 Section 27
Latitude DEG. MIN. SEC. DEG. MIN. SEC.

LOCATION SKETCH

NORTH
WEST EAST
SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
— Deepen
— Other (Specify)
— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
— Domestic — Public
— Irrigation — Industrial
MONITORING ✓
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) —

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 88 (Ft) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 88 (Ft) & DATE MEASURED 10/3/2007
ESTIMATED YIELD * — (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs) TOTAL DRAWDOWN — (Ft)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft	to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
80	94		✓				PVC	2"	SCH 40	
94	104						PVC	2"	SCH 40	0.03"
104	116		✓				PVC	2"	SCH40	
116	126						PVC	2"	SCH 40	0.03"
126	136						PVC	2	SCH 40	0.03"

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft	to Ft	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
81	86		✓		GRAVEL 8 X16
106	108		✓		GRAVEL 8 X 1

ATTACHMENTS (✓)

— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3625 S. HIGHLAND DEL REY CA 93616
ADDRESS CITY STATE ZIP
Signed
WELL DRILLER/AUTHORIZED REPRESENTATIVE
01/16/08 DATE SIGNED
414178 C-57 LICENSE NUMBER

DWR 188 REV. 11-97
IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy
Page 2 of 2

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. E067207

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. MW-1B,1C,1D
Date Work Began 7/30/2007, Ended 9/20/2007
Local Permit Agency KINGS COUNTY PLANNING AGENCY
Permit No. W0707-008 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft	to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*
		GRAVEL
134	140	GRAY SILTY CLAY

TOTAL DEPTH OF BORING 80 (Feet)
TOTAL DEPTH OF COMPLETED WELL 80 (Feet)

WELL OWNER

Name LILIA GIACOMAZZI
Mailing Address 9550 6TH AVE.
HANFORD CA 93230
CITY STATE ZIP

WELL LOCATION

Address 9550 6TH AVE
City HANFORD CA 93230
County TULARE
APN Book 014 Page 260 Parcel 068
Township 18 Range 22 Section 27
Latitude DEG. MIN. SEC. DEG. MIN. SEC.

LOCATION SKETCH

NORTH
WEST EAST
SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
___ Domestic ___ Public
___ Irrigation ___ Industrial
MONITORING ✓
TEST WELL ___
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 88 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 88 (Ft.) & DATE MEASURED 10/3/2007
ESTIMATED YIELD * ___ (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN ___ (Ft.)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft	to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
80	94		✓				PVC	2"	SCH 40	
94	104						PVC	2"	SCH 40	0.03"
104	116		✓				PVC	2"	SCH40	
116	126						PVC	2"	SCH 40	0.03"
126	136						PVC	2	SCH 40	0.03"

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft	to Ft	TYPE CE-MENT (✓)	BEN-TONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
81	86		✓		GRAVEL 8 X16
106	108		✓		GRAVEL 8 X 1

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analysis
___ Other
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

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NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3625 S. HIGHLAND DEL REY CA 93616
ADDRESS CITY STATE ZIP
Signed ___ 01/16/08 414178
WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED C-57 LICENSE NUMBER

DWR 188 REV. 11-97
IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

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Owner's Copy
Page 1 of 2

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. E067208

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. MW-2A
Date Work Began 7/30/2007, Ended 8/22/2007
Local Permit Agency KINGS COUNTY PLANNING AGENCY
Permit No. W0707-008 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain, size, color, etc.*
0	2	BROWN SANDY SILTY, DRY
2	6.8	BROWN CLAYEY SILT AND SILTY CLAY, MOIST
6.8	11.0	GRAY/BROWN CLAYEY FINE SAND, MOIST
11.0	16.0	GRAY/BROWN CLAYEY SILT AND SILTY CLAY,
16.0	17.0	GRAY/RED VERY FINE SAND WITH CLAY, WET
17.0	20.5	BLUE/GRAY CLAY SILT & SILTY CLAY,
		WET TO VERY WET
20.5	22.9	GRAY BROWN VERY FINE TO FINE SAND,
		MOIST TO DRY
22.9	24.0	GRAY BROWN SILTY CLAY, MOIST
24.0	27.6	GRAY CLAY FINE SAND, MOIST
27.6	30.0	GRAY SILTY CLAY, MOIST
30.0	31.9	GRAY VERY FINE SAND
31.9	35.6	GRAY SILTY CLAY, MOIST
35.6	40.0	GRAY CLAYEY FINE SAND, WET
40.0	42.0	GRAY BROWN SANDY CLAY, WET
42.0	45.0	GRAY FINE TO COARSE SAND WITH CLAY, WE
45.0	46.0	GRAY CLAY, MOIST
46.0	50.0	GRAY BROWN SANDY CLAY, MOIST
50.0	54.0	GRAY CLAYEY SILT, MOIST

TOTAL DEPTH OF BORING 54 (Feet)
TOTAL DEPTH OF COMPLETED WELL 54 (Feet)

WELL OWNER
Name LILIA GIACOMAZZI
Mailing Address 9550 6TH AVE.
HANFORD CA 93230
CITY STATE ZIP

WELL LOCATION
Address 9550 6TH AVE
City HANFORD CA 93230
County TULARE
APN Book 014 Page 260 Parcel 068
Township 18 Range 22 Section 27
Latitude DEG. MIN. SEC. DEG. MIN. SEC.

LOCATION SKETCH
NORTH
WEST EAST
SOUTH
Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)
✓ NEW WELL
MODIFICATION/REPAIR
— Deepen
— Other (Specify)
— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
— Domestic — Public
— Irrigation — Industrial
MONITORING ✓
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) —

WATER LEVEL & YIELD OF COMPLETED WELL
DEPTH TO FIRST WATER 16 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 16 (Ft.) & DATE MEASURED 8/22/2007
ESTIMATED YIELD * (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN (Ft.)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	35		✓				PVC	2"	SCH 40	
35	45						PVC	2"	SCH 40	0.03"

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
20	25		✓		GRAVEL 8 X16
45	54		✓		GRAVEL 8 X 1

ATTACHMENTS (✓)
— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT
I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3625 S. HIGHLAND DEL REY CA 93616
ADDRESS CITY STATE ZIP
Signed _____ 01/16/08 414178
WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED C-57 LICENSE NUMBER

DWR 188 REV. 11-97
IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

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Owner's Copy
Page 2 of 2

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. E067208

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. MW-2A
Date Work Began 7/30/2007, Ended 8/22/2007
Local Permit Agency KINGS COUNTY PLANNING AGENCY
Permit No. W0707-008 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*

TOTAL DEPTH OF BORING 54 (Feet)
TOTAL DEPTH OF COMPLETED WELL 54 (Feet)

WELL OWNER

Name LILIA GIACOMAZZI
Mailing Address 9550 6TH AVE.
HANFORD CA 93230
CITY STATE ZIP

WELL LOCATION

Address 9550 6TH AVE
City HANFORD CA 93230
County TULARE
APN Book 014 Page 260 Parcel 068
Township 18 Range 22 Section 27
Latitude ___ DEG. ___ MIN. ___ SEC. ___ DEG. ___ MIN. ___ SEC.

LOCATION SKETCH

NORTH
WEST EAST
SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
___ Domestic ___ Public
___ Irrigation ___ Industrial
MONITORING ✓
TEST WELL ___
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 16 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 16 (Ft.) & DATE MEASURED 8/22/2007
ESTIMATED YIELD * ___ (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN ___ (Ft.)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0 to 35		✓				PVC	2"	SCH 40	
35 to 45						PVC	2"	SCH 40	0.03"

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft to Ft	TYPE: CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
20 to 25		✓		GRAVEL 8 X16
45 to 54		✓		GRAVEL 8 X 1

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analysis
___ Other ___
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3625 S. HIGHLAND DEL REY CA 93616
ADDRESS CITY STATE ZIP
Signed ___ 01/16/08 414178
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IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy
Page 1 of 2

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. E067209

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. MW-2B,2C, 2D
Date Work Began 7/30/2007, Ended 8/27/2007
Local Permit Agency KINGS COUNTY PLANNING AGENCY
Permit No. W0707-008 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft	to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*
0	2	BROWN SANDY SILTY, DRY
2	6.8	BROWN CLAYEY SILT AND SILTY CLAY, MOIST
6.8	11.0	GRAY/BROWN CLAYEY FINE SAND, MOIST
11.0	16.0	GRAY/BROWN CLAYEY SILT AND SILTY CLAY,
16.0	17.0	GRAY/RED VERY FINE SAND WITH CLAY, WET
17.0	20.5	BLUE/GRAY CLAY SILT & SILTY CLAY,
		WET TO VERY WET
20.5	22.9	GRAY BROWN VERY FINE TO FINE SAND,
		MOIST TO DRY
22.9	24.0	GRAY BROWN SILTY CLAY, MOIST
24.0	27.6	GRAY CLAY FINE SAND, MOIST
27.6	30.0	GRAY SILTY CLAY, MOIST
30.0	31.9	GRAY VERY FINE SAND
31.9	35.6	GRAY SILTY CLAY, MOIST
35.6	40.0	GRAY CLAYEY FINE SAND, WET
40.0	42.0	GRAY BROWN SANDY CLAY, WET
42.0	45.0	GRAY FINE TO COARSE SAND WITH CLAY, WE
45.0	46.0	GRAY CLAY, MOIST
46.0	50.0	GRAY BROWN SANDY CLAY, MOIST
50.0	54.0	GRAY CLAYEY SILT, MOIST
		MW-2C
48	53	BROWN GRAY SILTY CLAY
53	57	BROWN VERY FINE SILTY SAND
57	62	BROWN CLAY
62	70	BROWN FINE SAND
70	89	BROWN CLAY
89	98	GRAY SILTY CLAY
98	115	GRAY CLAYEY SILT
115	125	GRAY DINE TO MEDIUM SILTY SAND
125	129	GRAY SILTY CLAY

TOTAL DEPTH OF BORING 145 (Feet)
TOTAL DEPTH OF COMPLETED WELL 140 (Feet)

WELL OWNER

Name LILIA GIACOMAZZI
Mailing Address 9550 6TH AVE.
HANFORD CA 93230
CITY STATE ZIP

WELL LOCATION

Address 9550 6TH AVE
City HANFORD CA 93230
County TULARE
APN Book 014 Page 260 Parcel 068
Township 18 Range 22 Section 27
Latitude DEG. MIN. SEC. DEG. MIN. SEC.

LOCATION SKETCH

NORTH
WEST EAST
SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
— Deepen
— Other (Specify)
— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
— Domestic — Public
— Irrigation — Industrial
MONITORING ✓
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) —

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 73.7 (Ft) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 73.7 (Ft) & DATE MEASURED 10/3/2007
ESTIMATED YIELD * (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs) TOTAL DRAWDOWN (Ft)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft	to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	62		✓				PVC	2"	SCH 40	
62	72						PVC	2"	SCH 40	0.03"

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft	to Ft	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
45	50		✓		GRAVEL 8 X16

ATTACHMENTS (✓)

— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
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ADDRESS CITY STATE ZIP
Signed
WELL DRILLER/AUTHORIZED REPRESENTATIVE
01/16/08 DATE SIGNED
414178 C-57 LICENSE NUMBER

DWR 188 REV. 11-97
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TRIPLICATE
Owner's Copy

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. E067209

Owner's Well No. MW-2B,2C, 2D
Date Work Began 7/30/2007, Ended 8/27/2007
Local Permit Agency KINGS COUNTY PLANNING AGENCY
Permit No. W0707-008 Permit Date 7/9/2007

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft	to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*
129	134	BROWN RED VERY FINE TO FINE SILTY SAND
134	140	GRAY CLAYEY SILT
140	143	GRAY VERY FINE TO FINE SILTY SAND

TOTAL DEPTH OF BORING 145 (Feet)
TOTAL DEPTH OF COMPLETED WELL 140 (Feet)

WELL OWNER

Name LILIA GIACOMAZZI
Mailing Address 9550 6TH AVE.
HANFORD CA 93230
CITY STATE ZIP

WELL LOCATION

Address 9550 6TH AVE
City HANFORD CA 93230
County TULARE
APN Book 014 Page 260 Parcel 068
Township 18 Range 22 Section 27
Latitude ___ DEG. ___ MIN. ___ SEC. ___ DEG. ___ MIN. ___ SEC.

LOCATION SKETCH

NORTH
WEST EAST
SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
___ Domestic ___ Public
___ Irrigation ___ Industrial
MONITORING ✓
TEST WELL ___
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 73.7 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 73.7 (Ft.) & DATE MEASURED 10/3/2007
ESTIMATED YIELD * ___ (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN ___ (Ft.)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft	to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	62		✓				PVC	2"	SCH 40	
62	72						PVC	2"	SCH 40	0.03"

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft	to Ft	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
45	50		✓		GRAVEL 8 X16

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analysis
___ Other ___
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3625 S. HIGHLAND DEL REY CA 93616
ADDRESS CITY STATE ZIP
Signed ___ 01/16/08 414178
WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED C-57 LICENSE NUMBER

DWR 188 REV. 11-97
IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. E067210

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO / STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. MW-3A, 3AA, 3B
Date Work Began 7/30/2007, Ended 8/20/2007
Local Permit Agency KINGS COUNTY PLANNING AGENCY
Permit No. W0707-008 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft	to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*
0	2	BROWN SANDY SILTY, DRY
2	7.5	BROWN SANDY SILT, MOIST
7.5	13.6	GRAY-BROWN CLAYEY SILTY AND SILTY CLAY, MOIST
13.6	20.0	GRAY VERY FINE TO MEDIUM SAND, MOIST
20.0	24.9	GRAY FINE TO MEDIUM SAND, MOIST MOIST TO WET
24.9	33.7	GRAY CLAYEY SILT AND SILTY CLAY, MOIST
33.7	34.6	GRAY VERY FINE SAND
34.6	45.3	GRAY CLAYEY SILT, MOIST
45.3	47.0	GRAY MEDIUM TO COARSE SANDY SILT, MOIS
47.0	53.5	GRAY SILTY SAND, MOIST
53.5	66.9	GRAY SLAYEY SILT WITH SAND, MOIST
66.9	69.5	GRAY SILTY VERY FINE SAND, MOIST
69.5	82.0	GRAY-BROWN VERY FINE TO FINE SANDS, MO
82.0	88.0	GRAY FINE TO MEDIUM SAND, WET LOG FOR 3B
88	97	GRAY CLAYEY MEDIUM TO COARSE SAND
97	101	BROWN/GRAY CLAYEY SILT
101	106	GRAY/BROWN CLAYEY MEDIUM TO COARSE SAND
106	115	BROWN CLAYEY FINE TO COARSE SAND
115	117	BROWN VERY FINE SILTY SAND
117	130	GRAY FINE TO COARSE SILTY SAND
130	140	BROWN SILTY CLAY

TOTAL DEPTH OF BORING 140 (Feet)
TOTAL DEPTH OF COMPLETED WELL 140 (Feet)

WELL OWNER
Name LILIA GIACOMAZZI
Mailing Address 9550 6TH AVE.
HANFORD CA 93230
CITY STATE ZIP

WELL LOCATION
Address 9550 6TH AVE
City HANFORD CA 93230
County TULARE
APN Book 014 Page 260 Parcel 068
Township 18 Range 22 Section 27
Latitude DEG MIN SEC DEG MIN SEC

LOCATION SKETCH
NORTH
WEST EAST
SOUTH
Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)
✓ NEW WELL
MODIFICATION/REPAIR
— Deepen
— Other (Specify)
— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
— Domestic — Public
— Irrigation — Industrial
MONITORING ✓
TEST WELL
CATHODIC PROTECTION
HEAT EXCHANGE
DIRECT PUSH
INJECTION
VAPOR EXTRACTION
SPARGING
REMEDIATION
OTHER (SPECIFY)

WATER LEVEL & YIELD OF COMPLETED WELL
DEPTH TO FIRST WATER 82 (Ft) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 82 (Ft.) & DATE MEASURED 8/20/2007
ESTIMATED YIELD * (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN (Ft.)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft	to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	15		✓				PVC	2"	SCH 40	
15	25						PVC	2"	SCH 40	0.03"
0	58		✓				PVC	2"	SCH 40	
70	85						PVC	2"	SCH 40	0.03"

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft	to Ft	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
8	10		✓		GRAVEL 8 X16
58	60		✓		MW-3AA GR
104	108		✓		MW-3B GRAV

ATTACHMENTS (✓)
— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT
I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3625 S. HIGHLAND DEL REY CA 93616
ADDRESS CITY STATE ZIP
Signed _____ 01/17/08 414178
WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED C-57 LICENSE NUMBER

DWR 188 REV. 11-97
IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy
Page 2 of 2

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. E067210

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. MW-3A, 3AA, 3B
Date Work Began 7/30/2007, Ended 8/20/2007
Local Permit Agency KINGS COUNTY PLANNING AGENCY
Permit No. W0707-008 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*

TOTAL DEPTH OF BORING 140 (Feet)
TOTAL DEPTH OF COMPLETED WELL 140 (Feet)

WELL OWNER

Name LILIA GIACOMAZZI
Mailing Address 9550 6TH AVE.
HANFORD CA 93230
CITY STATE ZIP

WELL LOCATION

Address 9550 6TH AVE
City HANFORD CA 93230
County TULARE
APN Book 014 Page 260 Parcel 068
Township 18 Range 22 Section 27
Latitude DEG MIN SEC DEG MIN SEC

LOCATION SKETCH

NORTH
WEST EAST
SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc and attach a map Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
— Deepen
— Other (Specify)
— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)

WATER SUPPLY
— Domestic — Public
— Irrigation — Industrial
MONITORING ✓
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) —

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 82 (Ft) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 82 (Ft) & DATE MEASURED 8/20/2007
ESTIMATED YIELD — (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN — (Ft)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0 104	10 5/8	✓				PVC	2"	SCH 40	
108 116	10 5/8	✓				PVC	2"	SCH 40	
113 131	10 5/8					PVC	2"	SCH 40	0.03"

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft to Ft	TYPE CE-MENT (✓)	BEN-TONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
8 10		✓		GRAVEL 8 X16
58 60		✓		MW-3AA GR
104 108		✓		MW-3B GRAV

ATTACHMENTS (✓)

— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3625 S. HIGHLAND DEL REY CA 93616
ADDRESS CITY STATE ZIP
Signed
WELL DRILLER/AUTHORIZED REPRESENTATIVE
01/17/08 414178
DATE SIGNED C-57 LICENSE NUMBER

DWR 188 REV. 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

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Owner's Copy
Page 1 of 2

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. E067211

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO / STATION NO
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. MW-5A
Date Work Began 7/30/2007, Ended 8/22/2007
Local Permit Agency KINGS COUNTY PLANNING AGENCY
Permit No. W0707-008 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain, size, color, etc.*
0	2.9	BROWN/GRAY SILTY SAND, MOIST
2.9	8.0	BROWN CLAYEY SILTY AND SILTY CLAY, MOIST
8.0	11.8	GRAY/BROWN SANDY SILT WITH CLAY, MOIST
11.8	13.3	ORANGE MEDIUM TO COARSE SAND, MOIST
13.3	19.3	GRAY SILTY CLAY, MOIST
19.3	22.0	GRAY/BROWN VERY FINE SAND, MOIST TO DRY
22.0	28.0	BROWN/GRAY SILTY CLAY, MOST
28.0	39.5	WHITE/GRAY VERY FINE TO FINE SAND, MOIST TO WET
39.5	48.0	GRAY MEDIUM TO COARSE SAND, MOIST TO
48.0	54.9	GRAY/BROWN CLAYEY SILT AND SILTY CLAY, MOIST TO WET
54.9	64.0	GRAY/BROWN CLAYEY SILT WITH SAND, MOIST
64.0	68.0	GRAY/BROWN CLAYEY SILTY VERY FINE SAND MOIST
68.0	71.8	BROWN SILTY VERY FINE SAND, MOIST
71.8	78.0	BROWN/GRAY CLAYEY SILT, MOIST

TOTAL DEPTH OF BORING 78 (Feet)
TOTAL DEPTH OF COMPLETED WELL 78 (Feet)

WELL OWNER
Name LILIA GIACOMAZZI
Mailing Address 9550 6TH AVE.
HANFORD (CITY) CA (STATE) 93230 (ZIP)

WELL LOCATION
Address 9550 6TH AVE
City HANFORD CA 93230
County TULARE
APN Book 014 Page 260 Parcel 068
Township 18 Range 22 Section 27
Latitude DEG. MIN. SEC. DEG. MIN. SEC.

LOCATION SKETCH
NORTH
WEST EAST
SOUTH
Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)
✓ NEW WELL
MODIFICATION/REPAIR
— Deepen
— Other (Specify)
— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
— Domestic — Public
— Irrigation — Industrial
MONITORING ✓
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) —

WATER LEVEL & YIELD OF COMPLETED WELL
DEPTH TO FIRST WATER 33 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 33 (Ft.) & DATE MEASURED 8/22/2007
ESTIMATED YIELD * — (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN — (Ft.)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	15		✓				PVC	2"	SCH 40	
15	25						PVC	2"	SCH 40	0.03"
0	62		✓				PVC	2"	SCH 40	
62	72						PVC	2"	SCH 40	0.03"

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
53	55		✓		GRAVEL 8 X16

ATTACHMENTS (✓)
— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT
I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3625 S. HIGHLAND (ADDRESS) DEL REY (CITY) CA (STATE) 93616 (ZIP)
Signed ____ (WELL DRILLER/AUTHORIZED REPRESENTATIVE) 01/17/08 (DATE SIGNED) 414178 (C-57 LICENSE NUMBER)

DWR 188 REV. 11-97
IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy
Page 2 of 2

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. E067211

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./ STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. MW-5A
Date Work Began 7/30/2007, Ended 8/22/2007
Local Permit Agency KINGS COUNTY PLANNING AGENCY
Permit No. W0707-008 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft. to Ft.	DESCRIPTION *Describe material, grain, size, color, etc.*

TOTAL DEPTH OF BORING 78 (Feet)
TOTAL DEPTH OF COMPLETED WELL 78 (Feet)

WELL OWNER

Name LILIA GIACOMAZZI
Mailing Address 9550 6TH AVE.
HANFORD (CITY) CA (STATE) 93230 (ZIP)

WELL LOCATION

Address 9550 6TH AVE
City HANFORD CA 93230
County TULARE
APN Book 014 Page 260 Parcel 068
Township 18 Range 22 Section 27
Latitude ___ DEG. MIN. SEC. ___ DEG. MIN. SEC.

LOCATION SKETCH

NORTH
WEST EAST
SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
___ Domestic ___ Public
___ Irrigation ___ Industrial
MONITORING ✓
TEST WELL ___
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 33 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 33 (Ft.) & DATE MEASURED 8/22/2007
ESTIMATED YIELD * ___ (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN ___ (Ft.)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft. to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft. to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
53 55		✓		GRAVEL 8 X16

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analysis
___ Other ___
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
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(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3625 S. HIGHLAND (ADDRESS) DEL REY (CITY) CA (STATE) 93616 (ZIP)
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TRIPLICATE
Owner's Copy
Page 1 of 2

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. E067212

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. MW-5B, 5C, 5D
Date Work Began 7/30/2007, Ended 9/8/2007
Local Permit Agency KINGS COUNTY PLANNING AGENCY
Permit No. W0707-008 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft	to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*
0	2.9	BROWN/GRAY SILTY SAND, MOIST
2.9	8.0	BROWN CLAYEY SILTY AND SILTY
		CLAY, MOIST
8.0	11.8	GRAY/BROWN SANDY SILT WITH CLAY, MOIST
11.8	13.3	ORANGE MEDIUM TO COARSE SAND, MOIST
13.3	19.3	GRAY SILTY CLAY, MOIST
19.3	22.0	GRAY/BROWN VERY FINE SAND, MOIST
		TO DRY
22.0	28.0	BROWN/GRAY SILTY CLAY, MOST
28.0	39.5	WHITE/GRAY VERY FINE TO FINE SAND,
		MOIST TO WET
39.5	48.0	GRAY MEDIUM TO COARSE SAND, MOIST TO
48.0	54.9	GRAY/BROWN CLAYEY SILT AND SILTY
		CLAY, MOIST TO WET
54.9	64.0	GRAY/BROWN CLAYEY SILT WITH SAND,
		MOIST
64.0	68.0	GRAY/BROWN CLAYEY SILTY VERY FINE SAND
		MOIST
68.0	71.8	BROWN SILTY VERY FINE SAND, MOIST
71.8	78.0	BROWN/GRAY CLAYEY SILT, MOIST
		MW-5B, 5C AND 5D
72	74	BROWN MEDIUM TO COARSE SILTY SAND
74	84	BROWN/GRAY CLAY SILT
84	89	GRAY FINE TO COARSESILTY SAND
89	95	GRAY FINE SANDY CLAY
95	99	BROWN FINE SANDY CLAY
99	118	BROWN VERY FINE TO FINE SAND
118	129	GRAY/BROWN SILTY FINE SAND
129	137	GRAY/BROWN SILTY CLAY
137	140	GRAY FINE TO COARSE SILTY SAND

TOTAL DEPTH OF BORING 140 (Feet)
TOTAL DEPTH OF COMPLETED WELL 140 (Feet)

WELL OWNER

Name LILIA GIACOMAZZI
Mailing Address 9550 6TH AVE.
HANFORD (CITY) CA (STATE) 93230 (ZIP)

WELL LOCATION

Address 9550 6TH AVE
City HANFORD CA 93230
County TULARE
APN Book 014 Page 260 Parcel 068
Township 18 Range 22 Section 27
Latitude ___ DEG. ___ MIN. ___ SEC. ___ DEG. ___ MIN. ___ SEC.

LOCATION SKETCH

NORTH
WEST EAST
SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
___ Domestic ___ Public
___ Irrigation ___ Industrial
MONITORING ✓
TEST WELL ___
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 87.8 (Ft) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 87.8 (Ft) & DATE MEASURED 10/3/2007
ESTIMATED YIELD * ___ (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN ___ (Ft.)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft	to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	15		✓				PVC	2"	SCH 40	
15	25						PVC	2"	SCH 40	0.03"
	5B									
0	80	12 1/4"	✓				PVC	2"	SCH 40	
80	90	12 1/4"					PVC	2"	SCH 40	0.03

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft	to Ft	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
72	76		✓		GRAVEL 8 X 1
72	76		✓		GRAVEL 8 X 1

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analysis
___ Other ___
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3625 S. HIGHLAND (ADDRESS) DEL REY (CITY) CA (STATE) 93616 (ZIP)
Signed ___ (WELL DRILLER/AUTHORIZED REPRESENTATIVE) 01/17/08 (DATE SIGNED) 414178 (C-57 LICENSE NUMBER)

DWR 188 REV. 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. E067212

Owner's Well No. MW-5B, 5C, 5D
Date Work Began 7/30/2007, Ended 9/8/2007
Local Permit Agency KINGS COUNTY PLANNING AGENCY
Permit No. W0707-008 Permit Date 7/9/2007

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft. to Ft.	DESCRIPTION *Describe material, grain, size, color, etc.*

TOTAL DEPTH OF BORING 140 (Feet)
TOTAL DEPTH OF COMPLETED WELL 140 (Feet)

WELL OWNER

Name LILIA GIACOMAZZI
Mailing Address 9550 6TH AVE.
HANFORD (CITY) CA (STATE) 93230 (ZIP)

WELL LOCATION

Address 9550 6TH AVE
City HANFORD CA 93230
County TULARE
APN Book 014 Page 260 Parcel 068
Township 18 Range 22 Section 27
Latitude ___ DEG. ___ MIN. ___ SEC. ___ DEG. ___ MIN ___ SEC.

LOCATION SKETCH

NORTH
WEST EAST
SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)

WATER SUPPLY
___ Domestic ___ Public
___ Irrigation ___ Industrial
MONITORING ✓
TEST WELL ___
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 87.8 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 87.8 (Ft.) & DATE MEASURED 10/3/2007
ESTIMATED YIELD * ___ (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN ___ (Ft.)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
	5C									
0	106	12 1/4"	✓				PVC	2"	SCH 40	
106	121	12 1/4"					PVC	2"	SCH 40	0.03
	5D									
0	121	12 1/4"	✓				PVC	2"	SCH 40	
121	131	12 1/4"					PVC	2"	SCH 40	0.03

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
	5D				
72	76		✓		GRAVEL 8 X

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analysis
___ Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3625 S. HIGHLAND (ADDRESS) DEL REY (CITY) CA (STATE) 93616 (ZIP)
Signed ___ (WELL DRILLER/AUTHORIZED REPRESENTATIVE) 01/17/08 (DATE SIGNED) 414178 (C-57 LICENSE NUMBER)

DWR 188 REV. 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

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Owner's Copy
Page 1 of 2

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. E067213

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. MW-6A
Date Work Began 7/30/2007, Ended 8/27/2007
Local Permit Agency KINGS COUNTY PLANNING AGENCY
Permit No. W0707-008 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft	to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*
4.0	6.0	BROWN SANDY SILT WITH CLAY, MOIST
6.0	7.7	BROWN FINE TO COARSE SAND, MOIST
7.7	9.6	BROWN VERY FINE SILTY SAND WITH CLAY, MOIST
9.6	12.0	BROWN SILTY CLAY, MOIST
12.0	13.5	BROWN VERY FINE SAND, MOIST
13.5	18.0	BROWN/ORANGE CLAYEY SILT AND SILTY CLAY, MOIST
18.0	21.7	BROWN VERY FINE SAND, MOIST
21.7	33.0	BROWN/GRAY SILTY CLAY WITH SAND, MOIST
33.0	35.0	GRAY VERY FINE SAND, MOIST
35.0	36.0	GRAY CLAY, MOIST
36.0	40.0	GRAY FINE SAND, MOIST TO WET
40.0	42.0	GRAY SILTY CLAY, WET
42.0	45.0	GRAY FINE TO MEDIUM SAND, MOIST TO WET
45.0	54.0	GRAY/BROWN SILTY CLAY WITH FINE SAND, M
54.0	57.1	GRAY/BROWN VERY FINE SAND, MOIST
57.1	60.0	BROWN CLAYEY SILT, MOIST
60.0	62.0	BROWN SILTY FINE SAND, MOIST
62.0	72.0	GRAY/BROWN FINE SAND, MOIST
72.0	84.0	GRAY/BROWN FINE TO MEDIUM SAND, MOIST
84.0	88.0	GRAY/BROWN SANDY CLAY, MOIST TO WET
88.0	90.0	BROWN CLAY, WET

TOTAL DEPTH OF BORING 140 (Feet)
TOTAL DEPTH OF COMPLETED WELL 90 (Feet)

WELL OWNER

Name LILIA GIACOMAZZI
Mailing Address 9550 6TH AVE.
HANFORD (CITY) CA (STATE) 93230 (ZIP)

WELL LOCATION

Address 9550 6TH AVE
City HANFORD CA 93230
County TULARE
APN Book 014 Page 260 Parcel 068
Township 18 Range 22 Section 27
Latitude DEG. MIN. SEC. DEG. MIN. SEC.

LOCATION SKETCH

NORTH
WEST EAST
SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
— Deepen
— Other (Specify)
— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
— Domestic — Public
— Irrigation — Industrial
MONITORING ✓
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) —

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 40 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 40 (Ft.) & DATE MEASURED 10/27/2008
ESTIMATED YIELD * — (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN — (Ft.)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft	to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	67		✓				PVC	2"	SCH 40	
67	87						PVC	2"	SCH 40	0.03"

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft	to Ft	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
53	58		✓		GRAVEL 8 X 1

ATTACHMENTS (✓)

— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3625 S. HIGHLAND (ADDRESS) DEL REY (CITY) CA (STATE) 93616 (ZIP)
Signed _____ (WELL DRILLER/AUTHORIZED REPRESENTATIVE) 01/17/08 (DATE SIGNED) 414178 (C-57 LICENSE NUMBER)

DWR 188 REV. 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy
Page 2 of 2

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. E067213

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. MW-6A
Date Work Began 7/30/2007, Ended 8/27/2007
Local Permit Agency KINGS COUNTY PLANNING AGENCY
Permit No. W0707-008 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*

TOTAL DEPTH OF BORING 140 (Feet)
TOTAL DEPTH OF COMPLETED WELL 90 (Feet)

WELL OWNER

Name LILIA GIACOMAZZI
Mailing Address 9550 6TH AVE.
HANFORD CA 93230
CITY STATE ZIP

WELL LOCATION

Address 9550 6TH AVE
City HANFORD CA 93230
County TULARE
APN Book 014 Page 260 Parcel 068
Township 18 Range 22 Section 27
Latitude ___ DEG. ___ MIN. ___ SEC. ___ DEG. ___ MIN. ___ SEC.

LOCATION SKETCH

NORTH
WEST EAST
SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)

WATER SUPPLY
___ Domestic ___ Public
___ Irrigation ___ Industrial
MONITORING ✓
TEST WELL ___
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 40 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 40 (Ft.) & DATE MEASURED 10/27/2008
ESTIMATED YIELD * ___ (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN ___ (Ft.)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft to Ft	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analysis
___ Other ___
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3625 S. HIGHLAND DEL REY CA 93616
ADDRESS CITY STATE ZIP
Signed ___ 01/17/08 414178
WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED C-57 LICENSE NUMBER

DWR 188 REV. 11-97
IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy
Page 1 of 2

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. **E067214**

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO / STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. MW-6B,6C,6D
Date Work Began 7/30/2007, Ended 9/6/2007
Local Permit Agency KINGS COUNTY PLANNING AGENCY
Permit No. W0707-008 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft	to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*
4.0	6.0	BROWN SANDY SILT WITH CLAY, MOIST
6.0	7.7	BROWN FINE TO COARSE SAND, MOIST
7.7	9.6	BROWN VERY FINE SILTY SAND WITH CLAY, MOIST
9.6	12.0	BROWN SILTY CLAY, MOIST
12.0	13.5	BROWN VERY FINE SAND, MOIST
13.5	18.0	BROWN/ORANGE CLAYEY SILT AND SILTY CLAY, MOIST
18.0	21.7	BROWN VERY FINE SAND, MOIST
21.7	33.0	BROWN/GRAY SILTY CLAY WITH SAND, MOIST
33.0	35.0	GRAY VERY FINE SAND, MOIST
35.0	36.0	GRAY CLAY, MOIST
36.0	40.0	GRAY FINE SAND, MOIST TO WET
40.0	42.0	GRAY SILTY CLAY, WET
42.0	45.0	GRAY FINE TO MEDIUM SAND, MOIST TO WET
45.0	54.0	GRAY/BROWN SILTY CLAY WITH FINE SAND, M
54.0	57.1	GRAY/BROWN VERY FINE SAND, MOIST
57.1	60.0	BROWN CLAYEY SILT, MOIST
60.0	62.0	BROWN SILTY FINE SAND, MOIST
62.0	72.0	GRAY/BROWN FINE SAND, MOIST
72.0	84.0	GRAY/BROWN FINE TO MEDIUM SAND, MOIST
84.0	88.0	GRAY/BROWN SANDY CLAY, MOIST TO WET
88.0	90.0	BROWN CLAY, WET
		MW-6B, 6C, 6D
85	92	GRAY BROWN FINE SANDY CLAY
92	97	GRAY FINE TO MEDIUM SILTY SAND
97	104	BROWN FINE SANDY CLAY
104	113	GRAY BROWN FINE TO MEDIUM SILTY SAND
113	127	GRAY BROWN SANDY CLAY

TOTAL DEPTH OF BORING 140 (Feet)
TOTAL DEPTH OF COMPLETED WELL 140 (Feet)

WELL OWNER

Name LILIA GIACOMAZZI
Mailing Address 9550 6TH AVE.
HANFORD CA 93230
CITY STATE ZIP

WELL LOCATION

Address 9550 6TH AVE
City HANFORD CA 93230
County TULARE
APN Book 014 Page 260 Parcel 068
Township 18 Range 22 Section 27
Latitude DEG MIN SEC DEG MIN SEC

LOCATION SKETCH

NORTH
WEST EAST
SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
— Deepen
— Other (Specify)
— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
— Domestic — Public
— Irrigation — Industrial
MONITORING ✓
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) —

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 95.0 (Ft) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 95.0 (Ft) & DATE MEASURED 10/3/2007
ESTIMATED YIELD * (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN (Ft)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft	to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	67		✓				PVC	2"	SCH 40	
67	87						PVC	2"	SCH 40	0.03"
0	92	12 1/4	✓				PVC	2"	SCH 40	
92	97	12 1/4					PVC	2"	SCH 40	0.03

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft	to Ft	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
53	58		✓		GRAVEL 8 X 1
85	89		✓		GRAVEL 8 X 1
85	89		✓		GRAVEL 8 X 1

ATTACHMENTS (✓)

— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3625 S. HIGHLAND DEL REY CA 93616
ADDRESS CITY STATE ZIP
Signed
WELL DRILLER/AUTHORIZED REPRESENTATIVE
01/17/08 DATE SIGNED
414178 C-57 LICENSE NUMBER

DWR 188 REV. 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

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Page 2 of 2

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. E067214

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./ STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. MW-6B,6C,6D
Date Work Began 7/30/2007, Ended 9/6/2007
Local Permit Agency KINGS COUNTY PLANNING AGENCY
Permit No. W0707-008 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain, size, color, etc.*
127	136	GRAY BROWN FINE TO COARSE SILTY SAND
136	140	GRAY SILTY CLAY

TOTAL DEPTH OF BORING 140 (Feet)
TOTAL DEPTH OF COMPLETED WELL 140 (Feet)

WELL OWNER

Name LILIA GIACOMAZZI
Mailing Address 9550 6TH AVE.
HANFORD CA 93230
CITY STATE ZIP

WELL LOCATION

Address 9550 6TH AVE
City HANFORD CA 93230
County TULARE
APN Book 014 Page 260 Parcel 068
Township 18 Range 22 Section 27
Latitude DEG. MIN. SEC. DEG. MIN. SEC.

LOCATION SKETCH

NORTH
WEST EAST
SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
— Deepen
— Other (Specify)
— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
— Domestic — Public
— Irrigation — Industrial
MONITORING ✓
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) —

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 95.0 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 95.0 (Ft.) & DATE MEASURED 10/3/2007
ESTIMATED YIELD * — (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN — (Ft.)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	105	12 1/4	✓				PVC	2"	SCH 40	
105	112	12 1/4					PVC	2"	SCH 40	0.03
0	121	12 1/4	✓				PVC	2"	SCH 40	
121	126	12 1/4					PVC	2"	SCH 40	0.03

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
85	89		✓		GRAVEL 8 X 1

ATTACHMENTS (✓)

— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

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(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3625 S. HIGHLAND DEL REY CA 93616
ADDRESS CITY STATE ZIP
Signed
WELL DRILLER/AUTHORIZED REPRESENTATIVE
01/17/08 414178
DATE SIGNED C-57 LICENSE NUMBER

DWR 188 REV. 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

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Owner's Copy
Page 1 of 1

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. E067216

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO / STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. MW-7B, 7C, 7D
Date Work Began 7/9/2007, Ended 8/29/2007
Local Permit Agency KINGS CTY PLANNING
Permit No. WO707-008 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft	to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*
2.0	11.4	BROWN SANDY SILT DRY
11.4	16.0	BROWN CLAYEY SILT AND SILTY CLAY
		MOIST
16.0	20.9	BROWN SILTY CLAYEY FINE SAND, MOIST
20.9	24.0	BROWN SILTY CLAY, MOIST
24.0	25.7	BROWN VERY FINE SAND, MOIST
25.7	29.6	GRAY SILTY CLAY, MOIST
29.6	32.0	GRAY VERY FINE TO FINE SAND, DRY
32.0	37.9	GRAY SANDY CLAY, MOIST
37.9	39.4	GRAY SILTY FINE SAND, MOIST
39.4	41.9	GRAY SILTY CLAY AND CLAYEY SILT, MOIST
41.9	51.0	GRAY FINE TO MEDIUM SANDY CLAY WITH
		SILT, MOIST
51.0	55.2	BROWN VERY FINE TO COARSE SAND, MOIST
55.2	58.0	GRAY/BROWN SILTY CLAY, MOIST
58.0	66.0	GRAY/BROWN FINE TO MEDIUM SANDY CLAY,
		MOIST
66.0	68.0	GRAY/BROWN SANDY CLAY, MOIST
68.0	70.0	GRAY/BROWN SILTY CLAY, MOIST
70.0	71.9	BROWN VERY FINE SAND, DRY
71.9	74.0	BROWN CLAYEY SILT, DRY
74.0	83.5	GRAY/BROWN FINE TO MEDIUM SAND, MOIST
83.5	87.3	BROWN FINE SANDY CLAY, MOIST
87.3	89.4	BROWN CLAYEY MEDIUM TO COARSE SAND,
		WET
MW	7B,7C	7D
89	129	BROWN SILTY CLAY WITH SOME FINE SAND
129	138	BROWN FINE TO COARSE SILTY SAND
138	140	BROWN SILTY CLAY

TOTAL DEPTH OF BORING 140 (Feet)
TOTAL DEPTH OF COMPLETED WELL 140 (Feet)

WELL OWNER
Name LILIA GIACOMAZZI
Mailing Address 9550 6TH AVE.
HANFORD (CITY) CA (STATE) 93230 (ZIP)

WELL LOCATION
Address 9550 6TH AVE
City HANFORD CA 93230
County TULARE
APN Book 014 Page 260 Parcel 068
Township 18 Range 22 Section 27
Latitude ___ DEG. ___ MIN. ___ SEC. ___ DEG. ___ MIN. ___ SEC.

LOCATION SKETCH
NORTH
WEST EAST
SOUTH
Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)
___ NEW WELL
MODIFICATION/REPAIR
___ Deepen
✓ Other (Specify)
___ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
___ Domestic ___ Public
___ Irrigation ___ Industrial
MONITORING ✓
TEST WELL ___
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL
DEPTH TO FIRST WATER 90.8 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 90.8 (Ft.) & DATE MEASURED 10/3/2007
ESTIMATED YIELD * ___ (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN ___ (Ft.)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft	to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	74	6"	✓				PVC	2"	SCH 40	
74	89	6"					PVC	2"	SCH 40	0.03
0	100	12 1/4"	✓				PVC	2"	SCH 40	
100	110	12 1/4"					PVC	2"	SCH 40	0.03

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft	to Ft	TYPE CE-MENT (✓)	BEN-TONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
61	66		✓		GRAVEL 8 X 1
89	96		✓		GRAVEL 8 X 1

ATTACHMENTS (✓)
___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analysis
___ Other
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT
I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3625 S. HIGHLAND (ADDRESS) DEL REY (CITY) CA (STATE) 93616 (ZIP)
Signed ___ (WELL DRILLER/AUTHORIZED REPRESENTATIVE) 01/17/08 (DATE SIGNED) 414178 (C-57 LICENSE NUMBER)

DWR 188 REV. 11-97
IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy
Page 1 of 1

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. E067217

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. MW-9A
Date Work Began 7/1/2007, Ended 9/27/2007
Local Permit Agency KINGS CTY PLANNING AGENCY
Permit No. WO07-008 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft	to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*
0	2.7	BROWN CLAYEY SILT AND SILTY CLAY, DRY
2.7	10.0	BROWN SILTY FINE SAND WITH CLAY, DRY TO MOIST
10.0	14.0	BROWN CLAYEY SILT, MOIST
14.0	16.0	BROW FINE SANDY SILT, DRY
16.0	24.0	BROWN VERY FINE SAND, DRY
24.0	30.3	BROWN CLAYEY SILT & SILTY CLAY, DRY TO MOIST
30.3	36.0	GRAY/BROWN VERY FINE SAND WITH CLAY, MOIST
36.0	44.0	GRAY CLAYEY SILT AND SILTY CLAY, MOIST
44.0	48.0	GRAY/BROWN CLAYEY SILT AND SILTY CLAY, DRY
48.0	54.0	BROWN SILTY FINE SAND, DRY
54.0	62.0	GRAY/BROWN FINE SAND, DRY
62.0	68.0	BROWN VERY FINE SAND, DRY TO MOIST
68.0	74	BROWN CLAYEY SILT AND SILTY CLAY, MOIST TO DRY.

TOTAL DEPTH OF BORING 74 (Feet)
TOTAL DEPTH OF COMPLETED WELL 140 (Feet)

WELL OWNER
Name LILIA GIACOMAZZI
Mailing Address 9550 6TH AVE.
HANFORD (CITY) CA (STATE) 93230 (ZIP)

WELL LOCATION
Address 9550 6TH AVE
City HANFORD CA 93230
County TULARE
APN Book 014 Page 260 Parcel 068
Township 18 Range 22 Section 27
Latitude DEG. MIN. SEC. DEG. MIN. SEC.

LOCATION SKETCH
NORTH
WEST EAST
SOUTH
Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)
— NEW WELL
MODIFICATION/REPAIR
— Deepen
✓ Other (Specify)
— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
— Domestic — Public
— Irrigation — Industrial
MONITORING ✓
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) —

WATER LEVEL & YIELD OF COMPLETED WELL
DEPTH TO FIRST WATER DRY (Ft) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL DRY (Ft) & DATE MEASURED 10/3/2007
ESTIMATED YIELD * — (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs) TOTAL DRAWDOWN — (Ft)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft	to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	52	6"	✓				PVC	2"	SCH 40	
52	67	6"					PVC	2"	SCH 40	0.03

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft	to Ft	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
43	47		✓		GRAVEL 8 X 1

ATTACHMENTS (✓)
— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS

CERTIFICATION STATEMENT
I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3625 S. HIGHLAND (ADDRESS) DEL REY (CITY) CA (STATE) 93616 (ZIP)
Signed — WELL DRILLER/AUTHORIZED REPRESENTATIVE
01/18/08 DATE SIGNED
414178 C-57 LICENSE NUMBER

DWR 188 REV 11-97
IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy
Page 1 of 2

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. E067218

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO / STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. MW-9B, 9C, 9D
Date Work Began 7/1/2007, Ended 9/25/2007
Local Permit Agency KINGS CTY PLANNING AGENCY
Permit No. WO07-008 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft	to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*
0	2.7	BROWN CLAYEY SILT AND SILTY CLAY, DRY
2.7	10.0	BROWN SILTY FINE SAND WITH CLAY, DRY TO MOIST
10.0	14.0	BROWN CLAYEY SILT, MOIST
14.0	16.0	BROW FINE SANDY SILT, DRY
16.0	24.0	BROWN VERY FINE SAND, DRY
24.0	30.3	BROWN CLAYEY SILT & SILTY CLAY, DRY TO MOIST
30.3	36.0	GRAY/BROWN VERY FINE SAND WITH CLAY, MOIST
36.0	44.0	GRAY CLAYEY SILT AND SILTY CLAY, MOIST
44.0	48.0	GRAY/BROWN CLAYEY SILT AND SILTY CLAY, DRY
48.0	54.0	BROWN SILTY FINE SAND, DRY
54.0	62.0	GRAY/BROWN FINE SAND, DRY
62.0	68.0	BROWN VERY FINE SAND, DRY TO MOIST
68.0	74	BROWN CLAYEY SILT AND SILTY CLAY, MOIST TO DRY. MW-9B, 9C AND 9D
70	75	BROWN CLAYEY SAND
75	80	GRAY/BROWN SILTY CLAY
80	88	GRAY/BROWN FINE TO MEDIUM SILTY SAND
88	94	BROWN CLAYEY SAND
94	99	BROWN VERY FINE TO COARSE SILTY SAND
99	103	GRAY/BROWN SILTY CLAY
103	114	GRAY/BROWN FINE TO COARSE SILTY SAND
114	123	GRAY/BROWN SILTY CLAY
123	133	GRAY/BROWN FINE TO COARSE SAND
133	136	GRAY/BROWN SILTY CLAY
136	140	GRAY/BROWN VERY FINE TO FINE SILTY

TOTAL DEPTH OF BORING 140 (Feet)
TOTAL DEPTH OF COMPLETED WELL 140 (Feet)

WELL OWNER
Name LILIA GIACOMAZZI
Mailing Address 9550 6TH AVE.
HANFORD CA 93230
CITY STATE ZIP

WELL LOCATION
Address 9550 6TH AVE
City HANFORD CA 93230
County TULARE
APN Book 014 Page 260 Parcel 068
Township 18 Range 22 Section 27
Latitude DEG. MIN. SEC. DEG MIN. SEC.

LOCATION SKETCH
NORTH
WEST EAST
SOUTH
Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)
— NEW WELL
MODIFICATION/REPAIR
— Deepen
✓ Other (Specify)
— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
— Domestic — Public
— Irrigation — Industrial
MONITORING ✓
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) —

WATER LEVEL & YIELD OF COMPLETED WELL
DEPTH TO FIRST WATER 82.1 (Ft) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 83.0 (Ft) & DATE MEASURED 10/4/2007
ESTIMATED YIELD * (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN (Ft)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft	to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	52	6"	✓				PVC	2"	SCH 40	
52	67	6"					PVC	2"	SCH 40	0.03
0	78	12 1/4"	✓				PVC	2"	SCH 40	
78	88	12 1/4"					PVC	2"	SCH 40	0.03

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft	to Ft	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
78	88		✓		GRAVEL 8 X 1
70	75		✓		GRAVEL 8 X 1
70	75		✓		GRAVEL 8 X 1
70	75		✓		GRAVEL 8 X 1

ATTACHMENTS (✓)
— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT
I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3625 S. HIGHLAND DEL REY CA 93616
ADDRESS CITY STATE ZIP
Signed
WELL DRILLER/AUTHORIZED REPRESENTATIVE
01/18/08 DATE SIGNED
414178 C-57 LICENSE NUMBER

DWR 188 REV. 11-97
IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. **E067218**

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO / STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. MW-9B, 9C, 9D
Date Work Began 7/1/2007, Ended 9/25/2007
Local Permit Agency KINGS CTY PLANNING AGENCY
Permit No. WO07-008 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*
	SAND WITH GRAVEL

TOTAL DEPTH OF BORING 140 (Feet)
TOTAL DEPTH OF COMPLETED WELL 140 (Feet)

WELL OWNER

Name LILIA GIACOMAZZI
Mailing Address 9550 6TH AVE.
HANFORD CA 93230
CITY STATE ZIP

WELL LOCATION

Address 9550 6TH AVE
City HANFORD CA 93230
County TULARE
APN Book 014 Page 260 Parcel 068
Township 18 Range 22 Section 27
Latitude DEG. MIN. SEC. DEG. MIN. SEC.

LOCATION SKETCH

NORTH
WEST EAST
SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

— NEW WELL
MODIFICATION/REPAIR
— Deepen
✓ Other (Specify)
— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
— Domestic — Public
— Irrigation — Industrial
MONITORING ✓
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) —

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 82.1 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 83.0 (Ft.) & DATE MEASURED 10/4/2007
ESTIMATED YIELD * — (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN — (Ft.)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0 104	12 1/4"	✓				PVC	2"	SCH 40	
104 114	12 1/4"					PVC	2"	SCH 40	0.03
0 124	12 1/4"	✓				PVC	2"	SCH 40	
124 134	12 1/4"					PVC	2"	SCH 40	0.03

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft to Ft	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
78 88		✓		GRAVEL 8 X 1
70 75		✓		GRAVEL 8 X 1
70 75		✓		GRAVEL 8 X 1
70 75		✓		GRAVEL 8 X 1

ATTACHMENTS (✓)

— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3625 S. HIGHLAND DEL REY CA 93616
ADDRESS CITY STATE ZIP
Signed
WELL DRILLER/AUTHORIZED REPRESENTATIVE
01/18/08 414178
DATE SIGNED C-57 LICENSE NUMBER

DWR 188 REV. 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

KINGS COUNTY PLANNING AGENCY

BUILDING DIVISION

1400 W. LACEY BLVD, BUILDING 6, HANFORD, CA 93230
TELEPHONE (559)582-3211 Ext. 2670 Fax (559)584-8989

WELL PERMIT

Permit Number: **W0707-008**
Permit Date Issued **7/9/2007**

Contractor
Name: **BRADLEY & SONS**
Address: **3625 S HIGHLAND AVE**
City, State Zip: **DEL RAY, CA 93616-**
Phone: **(559) 441-1401**

Description of Well
Monitoring
6 MONITORING WELLS/VARYING DEPTHS

Property Owner
Name: **GIACOMAZZI, LILIA REV TRUST 25%**
Address: **9550 6TH AVE**
City, State Zip **HANFORD CA 93230**
Telephone:

Location of Well
Site Address: **9550 6TH AVE**
Parcel #: **014-260-068**
Township: **18** Range: **22** Section: **27**

All work shall be done in conformance with the California Well Standards and the Kings County Water Well Ordinance. In case of conflict between laws or regulations, the more restrictive laws or regulations shall apply. The owner or contractor shall notify the Kings County Planning Department within forty-eight (48) hours of the placement of the annular seal for the purpose of inspection. The annular seal shall not be tremied or placed unless the Building Official or his designated officer is present and/or notice has been given to proceed. If the Building Official or his designated officer is not present at the time the annular seal is to be tremied or placed, the contractor shall seal the well in accordance with the standards prescribed above. The owner or contractor shall notify the Kings County Planning Department within seven (7) days from the completion of the well for final inspection of the proposed work.

The owner and contractor agree to defend and save harmless Kings County from all losses or damages resulting from injury or death of any person and/or damage to property, and any fine which occasioned by or arises out of any breach of applicable laws, ordinances, regulations or conditions of approval governing the construction and inspection of water wells. Said losses or damages shall include, but not be limited to, the cost of any required or necessary repair, cleanup, or detoxification and the preparation of any closure or cleanup plans attributable, directly or indirectly, to the work under this permit.

Additional permits (electrical, plumbing, building, etc.) for the development of the property associated with this permit may be required. This permit does not waive any requirements for other permits which may be needed from this office.

A permit for a dairy well shall not be valid unless the applicant has a letter from the Tulare County Health Department approving the location of the well.

Domestic wells serving five (5) or more service connections or serving twenty-five (25) or more people at least sixty (60) days out of the year require a permit from the Kings County Health Department.

The permittee shall be responsible for the safe and appropriate handling and disposal of drilling fluids and other drilling materials used in connection with the work specified under this permit.

As a condition of a construction or reconstruction permit, any abandoned wells located on the subject property shall be destroyed in accordance with the California Well Standards and the Kings County Water Well Ordinance.

It shall be the responsibility of the permittee to maintain a copy of this permit on the drilling site during all phases of the well construction or destruction.

This permit is not valid within the limits of any city.

This permit is valid for 180 days from the date of issuance and shall expire if the work is not completed within that time period.

BUILDING DEPARTMENT APPROVAL

7/9/07
DATE

W0707-008

HOL

BSK

567 W. Shaw Ave., Ste. B
Fresno, CA 93704
(559) 497-2880
FAX (559) 497-2886

September 19, 2005

BSK D05.009.10F

Mr. Barbara Brandl
Provost & Pritchard
3500 West Orchard Court
Visalia, California 93277

SUBJECT: Monitoring Well Lithologic Logs, Construction Details, and Analytical Results
Seven L Holstein Farms
Tipton, Tulare County, California

Dear Ms. Brandl:

BSK Associates has prepared these monitoring well lithologic logs, construction diagrams, and analytical results to summarize the installation of groundwater monitoring wells in soil and groundwater below Seven L Holstein Farms (Site), located at 4639 Avenue 176, Tulare County, California.

From May 19 through May 26, 2005, BSK advanced three on-site exploratory soil borings to approximately 140 feet below ground surface (bgs), and subsequently converted them to groundwater monitoring wells. Soils beneath the Site consist of sand, clayey sand, sandy clay, and clay with silt. The clay is variably plastic and stiff. Groundwater was encountered at depths ranging from 111 to 115 feet bgs. The three monitoring wells are constructed of 2-inch diameter, schedule 40 PVC, with 30 feet of 0.020-inch, machine-slotted screen. BSK placed # 3 Monterey sand around and approximately two feet above the screened interval as a filter pack. Approximately three feet of hydrated bentonite was placed above the sand as a transitional seal. Neat cement with 10% bentonite was tremmied above the bentonite to ground surface. The monitoring wells were completed with pressure caps and above-ground steel well monuments encased in concrete pads.

BSK appreciates the opportunity to be of service to you. Please call Evan Studley at (559) 497-2880, extension 138, if you have any questions or comments.

Sincerely,
BSK Associates

Evan G. Studley
Staff Geologist

Amer A. Hussain, P. E.
Regional Manager

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BSK
567 W. Shaw Ave.
Fresno, CA 93704
(559) 497-2880
(559) 497-2886 FAX

LOG OF BORING MW-1

Seven L Holstein Farms Dairy
Tulare, California

Job Number: D05.008.10F

Elevation:

Driller: BSK Associates

Start Date: 05/19/05

Drill Method: HSA

Finish Date: 05/20/05

Sample Method: SPT

Logged By: EGS

Borehole Diameter: 8.25"

Water Level: ~114' bgs

Reviewed By: JHK

Depth (feet)	Sample Type	Blow Count (blows/ft.)	Dry Density (pcf)	PID Reading	Graphic Log	Materials Description	Elevation (feet)	Remarks
0			0			**Clayey Sand (SC)** Dark yellow/brown, fine-grained sand, damp (dry @ surface), medium-plastic.		Above ground steel vault
2			2					
4			4					
6		20	6			**Sandy Clay (CL)** Gray/brown, fine-grained sand, low-plastic, medium-stiff, 20% mottled white inclusions, damp.		Six-sack sand/cement slurry grout.
8			8					
10		35	10			**Clayey Sandy Silt (ML)** Gray/brown, medium-grained sand, non-plastic, medium-stiff, damp.		
12			12			**Sand (SP)** Gray/brown, fine- to medium-grained sand, loose, clean, damp, micaceous.		Sched 40, 2" blank PVC casing.
14			14			**Silty Sand (SM)** Dark brown, fine- to medium-grained sand, medium-dense, damp.		
16		34	16			**Sand (SP)** Gray/brown, fine- to medium-grained sand, medium-dense, damp.		
18			18					
20		42	20			**Sand (SW)** Brown, well-graded sand, medium-dense, damp, micaceous.		
22			22					
24			24					

BSK
567 W. Shaw Ave.
Fresno, CA 93704
(559) 497-2880
(559) 497-2886 FAX

Log of Well MW-1

7 L Holstein Farms Dairy
Tulare, California

Job Number: D05.008.10F

Elevation

Depth (feet)	Sample Type	Blow Count (blows/ft.)	Dry Density (pcf)	Methane Reading (%)	Graphic Log	Materials Description	Probe Completion	Remarks
		31				**Sandy Clay (CL)** Very dark brown, fine-grained sand, micaceous, plastic, stiff, damp.		
27						**Clayey Sand (SC)** Dark gray, fine-grained sand, low-plastic, medium-dense, trace silt, damp.		
29								
31		25				**Sandy Clayey Silt (ML)** Gray/brown, fine-grained sand, micaceous, medium-soft, damp.		Six-sack sand/cement slurry grout.
						Sandy Clay (CL) Fine-grained, medium-plastic, medium-soft, damp.		
33								
35								
		34				**Sandy Silt (ML)** Light olive/brown, fine-grained sand, micaceous, medium-dense, damp.		
37								
39						**Sandy Clay (CL)** Dark gray/brown, fine-grained sand, high-plastic, stiff, damp.		
41		36				**Clayey Sand (SC)** Dark gray/brown, fine- to medium-grained sand, micaceous, low-plastic, medium-dense, damp.		
43						**Sand (SP)** Olive/brown, fine- to medium-grained sand, micaceous, trace clay, non-plastic, damp.		
45		51				**Clayey Sandy Silt (ML)** Dark gray/brown, fine-grained sand, low-plastic, micaceous, damp.		
47						**Sand (SP)** Gray, fine- to medium-grained, medium-dense, micaceous, damp.		
49								

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Log of Well MW-1

7 L Holstein Farms Dairy
Tulare, California

Job Number: D05.008.10F

Elevation

Depth (feet)	Sample Type	Blow Count (blows/ft.)	Dry Density (pcf)	Methane Reading (%)	Graphic Log	Materials Description	Probe Completion	Remarks
		29				**Sandy Clay (CL)** Brown, fine-grained sand, low-plastic, micaceous, medium-soft, damp.		
52						**Clay (CL)** Olive/brown, medium-plastic, stiff, trace fine-grained sand, micaceous, damp.		
54								Six-sack sand/cement slurry grout.
56		24				**Clayey Silt (ML)** Light olive brown, low-plastic, soft, damp.		
58						**Silty Sand (SM)** Light olive brown, fine-grained sand, micaceous, medium-dense, damp.		
60		26				**Sandy Silt (ML)** Olive brown, fine-grained sand, soft, damp.		
62						**Sand (SP)** Light gray, medium-grained sand, medium-dense, damp.		
64						**Sandy Clay (CL)** Dark yellow/brown, fine-grained, micaceous, trace silt, low-plastic, damp.		
66		40				**Sand (SW)** Light gray, well-graded sand, medium-dense, damp.		
68						**Sandy Silt (ML)** Olive brown, fine-grained sand, micaceous, trace clay, low-plastic, stiff, damp.		
70		39						
72								
74								

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Log of Well MW-1

7 L Holstein Farms Dairy
Tulare, California

Job Number: D05.008.10F

Elevation

Depth (feet)	Sample Type	Blow Count (blows/ft.)	Dry Density (pcf)	Methane Reading (%)	Graphic Log	Materials Description	Probe Completion	Remarks
		42				**Sandy Silt (ML)** Olive brown, fine-grained sand, micaceous, trace clay, low-plastic, stiff, damp.		
77						**Sand (SW)** Gray, well-graded sand, medium-dense, damp.		
79								
81		50						Six-sack sand/cement slurry grout.
83						**Sandy Clay (CL)** Light olive brown, fine-grained sand, micaceous, medium-plastic, soft, damp.		
85								
		21						
87								
89								
91		24				**Sandy Clayey Silt (ML)** Light olive brown, fine-grained sand, micaceous, low-plastic, soft, damp.		
						Clayey Sand (SC) Light olive brown, fine-grained, micaceous, low-plastic, medium-dense, damp.		
93								
95								
		21				**Sandy Clay (CL)** Light olive brown, fine-grained sand, medium-plastic, micaceous, soft, damp.		
97								
99								

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Log of Well MW-1

7 L Holstein Farms Dairy
Tulare, California

Job Number: D05.008.10F

Elevation

Depth (feet)	Sample Type	Blow Count (blows/ft.)	Dry Density (pcf)	Methane Reading (%)	Graphic Log	Materials Description	Probe Completion	Remarks
		22				**Sandy Clay (CL)** Light olive brown, fine-grained sand, medium-plastic, micaceous, soft, damp.		
102						**Clayey Sand (SC)** Light olive brown, fine- to medium-grained sand, loose, trace silt, damp.		Bentonite seal
104								
106		26				**Sandy Clay (CL)** Dark olive brown, fine-grained sand, medium-plastic, stiff, damp.		
108								
110		26						
112						**Sand (SP)** Light yellow/brown, fine- to medium-grained, loose, damp.		
114						**Sandy Silt (ML)** Light olive brown, fine-grained sand, micaceous, medium-soft, non-plastic, damp.		Groundwater static @ 114' 2".
116		24				**Sandy Clay (CL)** Light olive brown, fine-grained sand, medium-plastic, stiff, damp.		Groundwater encountered @ 117'.
118								
120						**Sand (SW)** Light yellow/brown, well-graded sand, wet.		#3 Monterey sand
		42				**Sandy Clay (SC)** Light olive brown, fine-grained sand, medium-plastic, soft to stiff, wet.		
122						Trace silt, very stiff.		2" x 0.02" slotted screen.
124								

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Log of Well MW-1

7 L Holstein Farms Dairy
Tulare, California

Job Number: D05.008.10F

Elevation

Depth (feet)	Sample Type	Blow Count (blows/ft.)	Dry Density (pcf)	Methane Reading (%)	Graphic Log	Materials Description	Probe Completion	Remarks
						Sandy Clay (SC) Light olive brown, fine-grained sand, medium-plastic, soft to stiff, wet.		No samples collected below groundwater.
127								#3 Monterey sand
129								
131						Interbedded sands, sandy clays, and silty clays.		2" x 0.02" slotted screen.
133								
135								
137								
139								
141						Bottom of Boring at 140' bgs.		
143								
145								
147								
149								

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LOG OF BORING MW-2

Seven L Holstein Farms Dairy
Tulare, California

Job Number: D05.008.10F

Elevation:

Driller: BSK Associates

Start Date: 05/23/05

Drill Method: HSA

Finish Date: 05/24/05

Sample Method: SPT

Logged By: EGS

Borehole Diameter: 8.25"

Water Level: ~115' bgs

Reviewed By: JHK

Depth(feet)	Sample Type	Blow Count (blows/ft.)	Dry Density (pcf)	PID Reading	Graphic Log	Materials Description	Elevation (feet)	Remarks
0			0			**Sandy Clay (CL)** Dark gray, fine-grained sand, high-plastic, damp (dry @ surface + 2").		Above ground steel vault
2			2					
4			4					
6		20	6			**Silty Clay (OH)** Brown, high-plastic, soft, 15% mottled white inclusions, damp.		Six-sack sand/cement slurry grout.
8			8					
10		35	10					
12			12			**Sand (SP)** Gray/brown, fine- to medium-grained sand, loose, damp.		Sched 40, 2" blank PVC casing.
14			14			**Silty Clay (CL)** Light olive brown, trace fine-grained sand, medium-plastic, soft, damp.		
16		34	16			**Sand (SW)** Light gray/brown, well-graded sand, micaceous, loose, damp.		
18			18					
20		42	20			**Silty Clay (CL)** Brown, trace fine-grained sand, medium-plastic, mottled light brown silt, micaceous, damp.		
22			22			**Sand (SP)** Gray, fine- to medium-grained sand, medium-dense, micaceous, damp.		
24			24					

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Log of Well MW-2

7 L Holstein Farms Dairy
Tulare, California

Job Number: D05.008.10F

Elevation

Depth (feet)	Sample Type	Blow Count (blows/ft.)	Dry Density (pcf)	Methane Reading (%)	Graphic Log	Materials Description	Probe Completion	Remarks
		31				**Silty Sand (SM)** Dark green/gray, fine- to medium-grained sand, loose, wet, slight decomposed hay odor.		Discoloration due to hay stockpile begins.
27								
29						**Sand (SW)** Greenish/gray, well-graded sand, strong odor of decomposed hay, loose, wet.		Six-sack sand/cement slurry grout.
31		25						
33								
35		34						
37								
39								
41		36				**Sand (SW)** Pale brown, well-graded sand, micaceous, slight odor of decomposed hay, medium-dense, damp.		Discoloration due to hay stockpile absent.
43								
45		51						
47								
49								

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Log of Well MW-2

7 L Holstein Farms Dairy
Tulare, California

Job Number: D05.008.10F

Elevation

Depth (feet)	Sample Type	Blow Count (blows/ft.)	Dry Density (pcf)	Methane Reading (%)	Graphic Log	Materials Description	Probe Completion	Remarks
		29				**Sand (SW)** Pale brown, well-graded sand, micaceous, slight odor of decomposed hay, medium-dense, damp.		
52						**Sandy Clay (CL)** Olive brown, fine-grained sand, medium-plastic, trace silt, stiff, slight odor of decomposed hay, damp.		
54								
56		24						Six-sack sand/cement slurry grout.
58								
60								
		26				**Sandy Silty Clay (SM)** Light olive brown, fine-grained sand, non-plastic, micaceous, dense, damp.		
62								
64						**Sandy Clay (CL)** Light olive gray, fine-grained sand, low-plastic, soft, damp.		
66		40				**Sand (SP)** Light gray, medium- to coarse-grained sand, medium-dense, damp.		
68								
70						**Sandy Silt (ML)** Light olive brown, fine-grained sand, trace clay, low-plastic, micaceous, medium stiff.		
		39				**Silty Sand (SM)** Light olive brown, fine-grained sand, micaceous, non-plastic, medium-dense, damp.		
72								
74						**Sandy Clayey Silt (ML)** Light olive brown, fine-grained sand, micaceous, low-plastic, soft, damp.		

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Log of Well MW-2

7 L Holstein Farms Dairy
Tulare, California

Job Number: D05.008.10F

Elevation

Depth (feet)	Sample Type	Blow Count (blows/ft.)	Dry Density (pcf)	Methane Reading (%)	Graphic Log	Materials Description	Probe Completion	Remarks
		42				**Sandy Clayey Silt (ML)** Light olive brown, fine-grained sand, micaceous, low-plastic, soft, damp.		
77								
79								
81		50				**Silty Sand (SM)** Gray/brown, fine-grained sand, micaceous, loose, damp.		Six-sack sand/cement slurry grout.
						Sand (SW) Light brown/gray, well-graded sand, loose, micaceous, damp.		
83						**Clayey Silt (ML)** Light olive brown, trace fine-grained sand, micaceous, non-plastic, stiff, damp.		
85								
		21				**Silty Clay (CL)** Dark gray/brown, trace fine-grained sand, micaceous, low-plastic, medium-soft, damp.		
87						**Silty Sand (SM)** Gray/brown, fine-grained sand, medium-dense, damp.		
89						**Sandy Clay (CL)** Light olive brown, fine-grained sand, low-plastic, very stiff, damp.		
91		24				**Sand (SP)** Light olive brown, fine- to medium-grained sand, micaceous, dense, damp.		
93						**Sandy Silt (ML)** Light olive brown, fine-grained sand, micaceous, damp.		
95								
		21				**Silty Sand (SM)** Light olive brown, fine-grained sand, micaceous, medium-dense, damp.		
97						**Clayey Sand (SC)** Light olive brown, fine-grained sand, micaceous, low-plastic, stiff, trace silt, damp.		
99								

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Log of Well MW-2

7 L Holstein Farms Dairy
Tulare, California

Job Number: D05.008.10F

Elevation

Depth (feet)	Sample Type	Blow Count (blows/ft.)	Dry Density (pcf)	Methane Reading (%)	Graphic Log	Materials Description	Probe Completion	Remarks
		22				**Sandy Clay (SC)** Olive brown, fine-grained sand, micaceous, medium-plastic, medium-stiff, trace silt, damp.		Six-sack sand/cement slurry grout.
102						**Silty Sand (SM)** Light olive brown, fine-grained sand, micaceous, medium-dense, non-plastic, trace clay, damp.		
104								Bentonite seal
106		26				**Clayey Sand (SC)** Light olive brown, fine-grained sand, micaceous, medium-dense, medium-plastic, trace silt, damp.		
108								
110						**Sandy Clay (CL)** Light olive brown, fine-grained sand, micaceous, soft, low-plastic, trace silt, damp.		
		26				**Clayey Sand (SC)** Light olive brown, fine-grained sand, micaceous, low-plastic, soft, trace silt, damp.		
112						**Silty Clay (CL)** Light olive brown, trace fine-grained sand, micaceous, medium-plastic, medium soft, damp.		
114								
								Groundwater static @ 115' 1".
116		24				**Sandy Clay (SM)** Light yellow/brown, fine- to medium-grained sand, medium-dense, non-plastic, soft to stiff, micaceous, damp.		
118								
						Silty Clay (CH) Pale olive, high-plastic, soft, damp.		
120								#3 Monterey sand
		42				**Sandy Clay (CL)** Light olive brown, fine-grained sand, micaceous, medium-plastic, soft, damp.		
122						**Clayey Sand (SC)** Light olive brown, fine-grained sand, micaceous, medium-plastic, medium dense, damp.		2" x 0.02" slotted screen.
								Groundwater encountered @ 123'.
124						**Sandy Clay (CL)** Light olive brown, fine-grained sand, micaceous, low-plastic, soft , wet.		

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Log of Well MW-2

7 L Holstein Farms Dairy
Tulare, California

Job Number: D05.008.10F

Elevation

Depth (feet)	Sample Type	Blow Count (blows/ft.)	Dry Density (pcf)	Methane Reading (%)	Graphic Log	Materials Description	Probe Completion	Remarks
						Clayey Sand (SC) Light yellow/brown, fine-grained sand, micaceous, low-plastic, loose, wet.		
127						**Silty Sandy Clay (CL)** Light olive brown, fine-grained sand, micaceous, soft, medium-plastic, wet.		#3 Monterey sand
129								No samples collected below groundwater.
131								2" x 0.02" slotted screen.
133						**Sandy Clay (CL)** Light olive brown, fine- to medium-grained sand, high plastic, wet.		
135								
137								
139								
141						Bottom of Boring at 140' bgs.		
143								
145								
147								
149								

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Log of Well MW-3

7 L Holstein Farms Dairy
Tulare, California

Job Number: D05.008.10F

Elevation:

Driller: BSK Associates	**Start Date:** 05/24/05
Drill Method: BK-81, Hollow Stem Auger	**Finish Date:** 05/26/05
Sample Method: SPT	**Logged By:** EGS
Borehole Diameter: 8.25" / **Water Level:** 111'	**Reviewed By:** CMM

Depth (feet)	Sample Type	Blow Count (blows/ft.)	Dry Density (pcf)	Methane Readings (%)	Graphic Log	Materials Description	Probe Completion	Remarks
0						**Silty Sand (SM)** Gray, fine- to medium-grained sand, trace clay, non-plastic, damp (dry @ surface + 3").		Above ground steel vault
2								
4						**Silty Clay (CL)** Dark gray/brown, medium-plastic, medium-stiff, trace fine-grained sand, damp.		Six-sack sand/cement slurry grout.
6		27						
8						**Sandy Silt (ML)** Dark gray/brown, fine-grained sand, medium-soft, trace clay, low-plastic, damp.		
10		20				**Clay (CL)** Black, medium-soft, high-plastic, damp.		
12						**Silty Clayey Sand (SC)** Light olive brown, fine-grained sand, micaceous, medium-plastic, loose, damp.		Sched 40, 2" blank PVC casing.
14								
16		15				**Clay (CL)** Black, high-plastic, soft, damp.		
18						**Silty Sand (SM)** Light olive brown, fine- to medium-grained, micaceous, loose, damp.		
20		20				**Clay (CL)** Black, high-plastic, soft, damp.		
22						**Sandy Clay (CL)** Olive brown, fine- to medium-grained sand, micaceous, high-plastic, medium-soft, damp.		
24						**Sand (SP)** Light yellow/brown, fine- to medium-grained sand, loose damp.		

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Log of Well MW-3

7 L Holstein Farms Dairy
Tulare, California

Job Number: D05.008.10F

Elevation

Depth (feet)	Sample Type	Blow Count (blows/ft.)	Dry Density (pcf)	Methane Reading (%)	Graphic Log	Materials Description	Probe Completion	Remarks
		20				**Sand (SP)** Light yellow/brown, fine- to medium-grained sand, loose damp.		
27								
29								
31		42				**Sand (SW)** Light olive brown, well-graded (coarse), loose, damp.		Six-sack sand/cement slurry grout.
33								
35						**Silty Sand (SM)** Light olive brown, fine-grained sand, micaceous, non-plastic, loose, orange mottling, damp.		
		25						
37								
39								
41		28						
43								
45								
		40				**Sand (SP)** Light brown/gray, medium-grained sand, micaceous, medium-dense to dense at base, damp.		
47								
49						**Sand (SW)** Light gray, well-graded sand, medium-dense, micaceous, damp.		

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Log of Well MW-3

7 L Holstein Farms Dairy
Tulare, California

Job Number: D05.008.10F

Elevation

Depth (feet)	Sample Type	Blow Count (blows/ft.)	Dry Density (pcf)	Methane Reading (%)	Graphic Log	Materials Description	Probe Completion	Remarks
		35				**Sand (SW)** Light gray, well-graded sand, medium-dense, micaceous, damp.		
52								
54						**Sand (SP)** Gray/brown, fine- to medium-grained sand, micaceous, medium-dense, damp.		Six-sack sand/cement slurry grout.
56		31						
58								
60						**Sandy Silt (ML)** Gray/brown, fine-grained sand, micaceous, non-plastic, stiff, damp.		
		36				**Silty Sand (SM)** Olive brown, fine-grained sand, micaceous, medium-dense, damp.		
62								
64								
66		31						
68								
70						**Sandy Clayey Silt (ML)** Gray/brown, fine-grained sand, micaceous, loose, low-plastic, damp.		
		38						
72						**Sandy Silt (ML)** Light olive/brown, fine-grained, micaceous, medium-stiff, damp.		
74								

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Log of Well MW-3

7 L Holstein Farms Dairy
Tulare, California

Job Number: D05.008.10F

Elevation

Depth (feet)	Sample Type	Blow Count (blows/ft.)	Dry Density (pcf)	Methane Reading (%)	Graphic Log	Materials Description	Probe Completion	Remarks
		29				**Silty Clay (CL)** Light olive brown, low-plastic, medium-stiff, damp.		
77						**Sand (SP)** Gray/brown sand, medium-grained, loose, damp.		
79						**Sandy Silty Clay (CL)** Light olive brown, medium stiff, fine- to medium-grained sand, low-plastic, damp.		Six-sack sand/cement slurry grout.
81		30				**Sandy Silt (ML)** Light olive brown, fine-grained sand, micaceous, stiff, damp.		
83						**Sandy Silty Clay (CL)** Light olive brown, low-plastic, fine-grained sand, micaceous, stiff, damp.		
85		52				**Sandy Silt (ML)** Light olive brown, fine-grained sand, micaceous, medium-stiff, non-plastic, damp.		
87						**Silty Sand (SM)** Light olive brown, fine-grained sand, micaceous, medium-dense, damp.		
89								
91		NA						
93						**Clay (OH)** Dark gray/brown, high-plastic, medium-stiff, damp.		
95		25						
97						**Silty Sand (SM)** Light olive brown, fine-grained, micaceous, medium-dense, damp.		
99						**Clay (OH)** Light olive brown, high-plastic, medium-stiff, trace silt, damp.		

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Log of Well MW-3

7 L Holstein Farms Dairy
Tulare, California

Job Number: D05.008.10F

Elevation

Depth (feet)	Sample Type	Blow Count (blows/ft.)	Dry Density (pcf)	Methane Reading (%)	Graphic Log	Materials Description	Probe Completion	Remarks
		33				**Clay (OH)** Light olive brown, high-plastic, medium-stiff, trace silt, damp.		Six-sack sand/cement slurry grout.
102						**Sandy Clay (CL)** Fine-grained sand, medium-plastic, micaceous, medium-stiff, trace clay, damp.		
104								Bentonite seal
106		26				**Silty Sandy Clay (CL)** Brown, fine-grained sand, micaceous, medium-plastic, medium-stiff, damp.		
108								
110								
		35						Groundwater static @ 111' 2".
112								
114								
116		34				**Clay (CL)** Dark gray/brown, medium-plastic, stiff, damp.		
118								#3 Monterey sand
120								Groundwater encountered @ 120'.
		36				**Silty Sand (SM)** Gray/brown, fine- to medium-grained, medium-dense to dense, wet.		
122								2" x 0.02" slotted screen.
124								

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Log of Well MW-3

7 L Holstein Farms Dairy
Tulare, California

Job Number: D05.008.10F

Elevation

Depth (feet)	Sample Type	Blow Count (blows/ft.)	Dry Density (pcf)	Methane Reading (%)	Graphic Log	Materials Description	Probe Completion	Remarks
						Silty Sand (SM) Gray/brown, fine- to medium-grained, medium-dense to dense, wet.		
127								#3 Monterey sand
129								No samples collected below groundwater.
131								2" x 0.02" slotted screen.
133								
135								
137						Bottom of Boring at 136' bgs.		
139								
141								
143								
145								
147								
149								

Appendix C

Monitoring Well Survey

EST. 1968
PROVOST & PRITCHARD INC
ENGINEERING GROUP
An Employee Owned Company

WATER & WASTEWATER
MUNICIPAL INFRASTRUCTURE
LAND DEVELOPMENT
AGRICULTURAL SERVICES
DAIRY SERVICES
LAND SURVEYING & GIS
PLANNING & ENVIRONMENTAL
DISTRICT MANAGEMENT

FRESNO • VISALIA • BAKERSFIELD

3500 W. Orchard Court
Visalia, CA 93277-7055
559 636-1166
FAX 559 636-1177

Survey Report of Monitoring Well Survey at Seven L Holstein Dairy

Point	Northing	Easting	Casing Elevation	Concrete Elevation	Corner of Concrete
MW#1	11551.56	10617.93	200.00	199.30	NW
MW#2	9359.83	8317.50	197.65	197.45	NW
MW#3	10219.64	5388.95	197.73	195.62	NW

Readings for monitoring wells are on an assumed datum and were taken at the north side of the PVC well casing and on the northwest corner of the concrete base.

Site benchmark is a chiseled box on the southwest corner of the concrete irrigation well base on the road bounding the south side of the western half of the dairy site.

Elevation = 196.32

1/23/2006

John S. Dutton, P.E.

REGISTERED PROFESSIONAL ENGINEER
JOHN SHERIDAN DUTTON
No. 24673
Exp 12-31-07
CIVIL
STATE OF CALIFORNIA

Appendix D

Laboratory Analysis, Chain-of-Custody and Field Sampling Records

BSK ANALYTICAL LABORATORIES

BSK Submission Number: 2005072097

08/18/2005

Mark Pomaville
BSK and Associates - Geotechnical
567 W Shaw, Suite B
Fresno, CA 93704

Dear Mark Pomaville,

Thank you for selecting BSK Analytical Laboratories for your analytical testing needs. We have prepared this report in response to your request for analytical services. Please find enclosed the following sections for your complete laboratory report, each uniquely paginated:

CASE NARRATIVE: An overview of the work performed.
CERTIFICATE OF ANALYSIS: Analytical results.
REPORT OF SAMPLE INTEGRITY
CHAIN OF CUSTODY FORM

Certification: I certify that this data package is in compliance with NELAC Standards for applicable analyses under NELAP Certificate #04227CA, and is in compliance with ELAP Standards for applicable certified analyses under ELAP Certificate #1180, except for the conditions listed.

If additional clarification of any information is required, please contact your Client Services Representative, Glen Brown, at (800) 877-8310 or (559) 497-2888.

BSK ANALYTICAL LABORATORIES

Glen Brown
Client Services Representative

Cynthia Hamilton
Quality Assurance Specialist

Case Narrative

BSK Submission Number: 2005072097

SAMPLE AND RECEIPT INFORMATION

The sample(s) was received, prepared, and analyzed within the method specified holding times unless otherwise noted on the Certificate of Analysis. Samples, when shipped, arrived within acceptable temperature requirements of 0° to 6° Celsius unless otherwise noted on the Report of Sample Integrity. Samples collected by BSK Analytical Laboratories were collected in accordance with the BSK Sampling and Collection Standard Operating Procedures.

QUALITY CONTROL

All analytical quality controls are within established method criteria except when noted in the Quality Control section or on the Certificate of Analysis. All positive results for EPA Methods 504.1, 502.2, and 524.2 require the analysis of a Field Reagent Blank (FRB) to confirm that the results are not a contamination error from field sampling steps. If Field Reagent Blanks were not submitted with the samples, this method requirement has not been performed. QC samples may include analytes not requested in this submission.

RUN	ORDER	TEST	ANALYTE	COMMENT
97367	620388	EPA 351.2	Nitrogen - Total Kjeldahl (TKN)	MS and MSD recoveries were affected by the matrix.
97367	620390	EPA 351.2	Nitrogen - Total Kjeldahl (TKN)	MS and MSD recoveries were affected by the matrix.

SAMPLE RESULT INFORMATION

Samples are analyzed as received (wet weight basis) unless noted here. The results relate only to the items tested. Any exceptions to be considered when evaluating these results are also listed here, if applicable. Results contained in this package shall not be reproduced, except in full, without written approval of BSK Analytical Laboratories.

ORDER	TEST	ANALYTE	COMMENT

FINAL

BSK and Associates - Geotechni 08/18/2005

Project ID/Desc: D0500910F

BSK Submission #: 2005072097

Laboratory Order #: 613279

Sample Desc: MW-2

MASS BALANCE REPORT

Analyte	Concentration (mg/L)	Mult		
Alkalinity	160			
TDS	460			
Conductivity	700			
pH	8.2			
				Anion Meq
Bicarbonate	160	0.0200		3.200
Carbonate	ND	0.0200		
Chloride	60	0.0282		1.690
Sulfate	88	0.0208		1.830
Nitrate	5.9	0.0161		0.420
			Cation Meq	
Calcium	25	0.0500	1.270	
Magnesium	2.9	0.0822	0.240	
Sodium	130	0.0435	5.700	
Potassium	ND	0.0255		

Ion Totals/ Deviation:	**7.210**	**7.140**	**0.070**

% Difference:	**0.5**
Sodium Absorption Ratio (SAR):	**6.6**
% Sodium:	**79.1**
TDS/EC:	**0.660**
Alkalinity:	**265**
Hardness (mg/L):	**75.4**

ACCREDITED IN ACCORDANCE WITH nelac

BSK ANALYTICAL LABORATORIES

FINAL

BSK and Associates - Geotechni

08/18/2005

Project ID/Desc: D0500910F

BSK Submission #: 2005072097

Laboratory Order #: 613280

Sample Desc: MW-3

MASS BALANCE REPORT

Analyte	Concentration (mg/L)	Mult		
Alkalinity	140			
TDS	430			
Conductivity	660			
pH	8.1			
				Anion Meq
Bicarbonate	140	0.0200		2.920
Carbonate	ND	0.0200		
Chloride	77	0.0282		2.170
Sulfate	62	0.0208		1.290
Nitrate	4.7	0.0161		0.340
			Cation Meq	
Calcium	39	0.0500	1.930	
Magnesium	4.1	0.0822	0.340	
Sodium	110	0.0435	4.970	
Potassium	ND	0.0255		

Ion Totals/ Deviation:	**7.240**	**6.710**	**0.520**

% Difference:	**3.7**
Sodium Absorption Ratio (SAR):	**4.7**
% Sodium:	**68.6**
TDS/EC:	**0.650**
Alkalinity:	**121**
Hardness (mg/L):	**113.4**

BSK ANALYTICAL LABORATORIES

QC Summary Report 08/23/2005

BSK Submission : **2005072097**
Client : **BSK and Associates - Geotechni**
Date Submitted : **07/28/2005**
Project ID : **D0500910F**

Project Desc : **Seven L Hostein**

NELAP Certificate #04227CA
ELAP Certificate #1180

BSK StarLims Run #: 96628
Analyst Initials: **MARIAM**
Method Number: **ALK**

Analyte Results

Analyte	QC Type	Matrix Spike ID	Result	Units	% Rec or RPD	Spike RPD	Spk Conc	Matrix Conc	UCL	LCL	Date	
Alkalinity (as CaCO3)	LCS	N/A	106	mg/L	106		100	ND	120	80	07/29/05	*Acceptable*
Alkalinity (as CaCO3)	LCSD	N/A	101	mg/L	101	4.9	100	ND	120	80	07/29/05	*Acceptable*
Alkalinity (as CaCO3)	LDUP	613291	193	mg/L	1			200	10	N/A	07/29/05	*Acceptable*
Bicarbonate (as CaCO3)	LDUP	613291	193	mg/L	1			200	10	N/A	07/29/05	*Acceptable*
Carbonate (as CaCO3)	LDUP	613291	0	mg/L	N/A			ND	10	N/A	07/29/05	*Acceptable*
Conductivity - Specific (EC)	LDUP	613291	444	µmho/c	1			450	20	N/A	07/29/05	*Acceptable*
Hydroxide (as CaCO3)	LDUP	613291	0	mg/L	N/A			ND	10	N/A	07/29/05	*Acceptable*
pH	LDUP	613291	7.78	Std. Unit	0			7.8	20	N/A	07/29/05	*Acceptable*
Alkalinity (as CaCO3)	RBLK	N/A	0	mg/L	< 1				1	N/A	07/29/05	*Acceptable*
Bicarbonate (as CaCO3)	RBLK	N/A	0	mg/L	< 1				1	N/A	07/29/05	*Acceptable*
Carbonate (as CaCO3)	RBLK	N/A	0	mg/L	< 1				1	N/A	07/29/05	*Acceptable*
Conductivity - Specific (EC)	RBLK	N/A	0	µmho/c	< 1				1	N/A	07/29/05	*Acceptable*
Hydroxide (as CaCO3)	RBLK	N/A	0	mg/L	< 1				1	N/A	07/29/05	*Acceptable*

StarLims Run 96628 includes the following BSK Sample ID# :

613064 613067 613069 613110 613113 613120 613233 613252 613264 613278 613279 613280 613291 613292 613293 613337
613338 613455 613456 613457 614051 614052 614053 614054

BSK StarLims Run #: 96636
Analyst Initials: **PARAMJITK**
Method Number: **CL_IC**

Analyte Results

Analyte	QC Type	Matrix Spike ID	Result	Units	% Rec or RPD	Spike RPD	Spk Conc	Matrix Conc	UCL	LCL	Date	
Chloride (Cl)	LCS	N/A	50.5	mg/L	101		50	ND	110	90	07/29/05	*Acceptable*
Fluoride	LCS	N/A	0.51	mg/L	102		.5	ND	110	90	07/29/05	*Acceptable*
Nitrate (NO3)	LCS	N/A	49.9	mg/L	99		50	ND	110	90	07/29/05	*Acceptable*
Nitrate (NO3-N)	LCS	N/A	11.2641	mg/L	99		11.3	ND	110	90	07/29/05	*Acceptable*
Nitrite (NO2-N)	LCS	N/A	0.49	mg/L	98		.5	ND	110	90	07/29/05	*Acceptable*
o-Phosphate (o-PO4-P)	LCS	N/A	2.56	mg/L	102		2.5	ND	110	90	07/29/05	*Acceptable*
Sulfate (SO4)	LCS	N/A	50.2	mg/L	100		50	ND	110	90	07/29/05	*Acceptable*
Chloride (Cl)	LCSD	N/A	50.7	mg/L	101	N/A	50	ND	110	90	07/29/05	*Acceptable*
Fluoride	LCSD	N/A	0.51	mg/L	102	N/A	.5	ND	110	90	07/29/05	*Acceptable*
Nitrate (NO3)	LCSD	N/A	49.9	mg/L	99	N/A	50	ND	110	90	07/29/05	*Acceptable*
Nitrate (NO3-N)	LCSD	N/A	11.2641	mg/L	99	0.0	11.3	ND	110	90	07/29/05	*Acceptable*
Nitrite (NO2-N)	LCSD	N/A	0.49	mg/L	98	N/A	.5	ND	110	90	07/29/05	*Acceptable*
o-Phosphate (o-PO4-P)	LCSD	N/A	2.54	mg/L	101	N/A	2.5	ND	110	90	07/29/05	*Acceptable*

%Rec: Percent Recovered
RPD: Relative Percent Difference
UCL: Upper Control Limit
LCL: Lower Control Limit
LCS: Laboratory Control Sample
LCSD: Laboratory Control Sample Duplicate

Parent Sample: Sample used as background matrix for MS/MSD
OOS-High: QC Result Above UCL
OOS-Low: QC Result Below LCL
MS: Matrix Spike
MSD: Matrix Spike Duplicate
RBLK: Reagent (Method) Blank
Surrogate results for QC standards are not evaluated for acceptability (due to definition of a surrogate standard)

BSK ANALYTICAL LABORATORIES

QC Summary Report 08/23/2005

BSK Submission : **2005072097**
Client : **BSK and Associates - Geotechni**
Date Submitted : **07/28/2005**
Project ID : **D0500910F**

Project Desc : **Seven L Hostein**

NELAP Certificate #04227CA
ELAP Certificate #1180

BSK StarLims Run #: 96636

Analyst Initials: **PARAMJITK** Method Number: **SO4_IC**

Analyte Results

Analyte	QC Type	Matrix Spike ID	Result	Units	% Rec or RPD	Spike RPD	Spk Conc	Matrix Conc	UCL	LCL	Date	
Sulfate (SO4)	LCSD	N/A	50.3	mg/L	100	N/A	50	ND	110	90	07/29/05	*Acceptable*
Chloride (Cl)	MS	613352	126.4	mg/L	102		100	24	120	80	07/29/05	*Acceptable*
Fluoride	MS	613352	1.16	mg/L	107		1.0	ND	120	80	07/29/05	*Acceptable*
Nitrate (NO3)	MS	613352	139.6	mg/L	100		100	39	120	80	07/29/05	*Acceptable*
Nitrate (NO3-N)	MS	613024	26.0948	mg/L	102		22.6	2.9	120	80	07/29/05	*Acceptable*
Nitrite (NO2-N)	MS	613352	0.96	mg/L	96		1.0	ND	120	80	07/29/05	*Acceptable*
Sulfate (SO4)	MS	613352	134.4	mg/L	102		100	32	120	80	07/29/05	*Acceptable*
Chloride (Cl)	MSD	613352	126.8	mg/L	102	N/A	100	24	120	80	07/29/05	*Acceptable*
Fluoride	MSD	613352	1.16	mg/L	107	N/A	1.0	ND	120	80	07/29/05	*Acceptable*
Nitrate (NO3)	MSD	613352	139.8	mg/L	100	N/A	100	39	120	80	07/29/05	*Acceptable*
Nitrate (NO3-N)	MSD	613024	26.0497	mg/L	102	0.17	22.6	2.9	120	80	07/29/05	*Acceptable*
Nitrite (NO2-N)	MSD	613352	0.96	mg/L	96	N/A	1.0	ND	120	80	07/29/05	*Acceptable*
Sulfate (SO4)	MSD	613352	134.2	mg/L	102	N/A	100	32	120	80	07/29/05	*Acceptable*
Chloride (Cl)	RBLK	N/A	0	mg/L	< 1				1	N/A	07/29/05	*Acceptable*
Fluoride	RBLK	N/A	0	mg/L	< 0.1				0.1	N/A	07/29/05	*Acceptable*
Nitrate (NO3)	RBLK	N/A	0	mg/L	< 1				1	N/A	07/29/05	*Acceptable*
Nitrate (NO3-N)	RBLK	N/A	0	mg/L	< 0.2				0.2	N/A	07/29/05	*Acceptable*
Nitrite (NO2-N)	RBLK	N/A	0	mg/L	< 0.05				0.05	N/A	07/29/05	*Acceptable*
o-Phosphate (o-PO4-P)	RBLK	N/A	0	mg/L	< 0.2				0.2	N/A	07/29/05	*Acceptable*
Sulfate (SO4)	RBLK	N/A	0	mg/L	< 2				2	N/A	07/29/05	*Acceptable*

StarLims Run 96636 includes the following BSK Sample ID# :

607984 607999 613001 613024 613026 613064 613071 613196 613247 613252 613264 613278 613279 613280 613291 613292
613293 613337 613338 613352 613985 613986 613987 613988 613989 613990 613991

BSK StarLims Run #: 96663

Analyst Initials: **LUEV** Method Number: **TDS**

Analyte Results

Analyte	QC Type	Matrix Spike ID	Result	Units	% Rec or RPD	Spike RPD	Spk Conc	Matrix Conc	UCL	LCL	Date	
Total Dissolved Solids (TDS)	LDUP	612683	700	mg/L	0			700	20	N/A	08/02/05	*Acceptable*
Total Dissolved Solids (TDS)	RBLK	N/A	0	mg/L	< 5				5	N/A	08/02/05	*Acceptable*

%Rec: Percent Recovered
RPD: Relative Percent Difference
UCL: Upper Control Limit
LCL: Lower Control Limit
LCS: Laboratory Control Sample
LCSD: Laboratory Control Sample Duplicate

Parent Sample: Sample used as background matrix for MS/MSD
OOS-High: QC Result Above UCL
OOS-Low: QC Result Below LCL
MS: Matrix Spike
MSD: Matrix Spike Duplicate
RBLK: Reagent (Method) Blank
Surrogate results for QC standards are not evaluated for acceptability (due to definition of a surrogate standard)

BSK ANALYTICAL LABORATORIES

QC Summary Report 08/23/2005

BSK Submission : **2005072097**
Client : **BSK and Associates - Geotechni**
Date Submitted : **07/28/2005**
Project ID : **D0500910F**

Project Desc : **Seven L Hostein**

NELAP Certificate #04227CA
ELAP Certificate #1180

StarLims Run 96663 includes the following BSK Sample ID# :

612129 612683 612684 612685 612854 613075 613278 613279 613280 613344 613455 613456 613457 613834 613835

BSK StarLims Run #: 96704

Analyst Initials: **MIKEA** Method Number: **NH3_ISE**

Analyte Results

Analyte	QC Type	Matrix Spike ID	Result	Units	% Rec or RPD	Spike RPD	Spk Conc	Matrix Conc	UCL	LCL	Date	
Ammonia (NH3-N)	LCS	N/A	20	mg/L	100		20	ND	120	80	07/29/05	*Acceptable*
Ammonia (NH3-N)	LCSD	N/A	21	mg/L	105	4.9	20	ND	120	80	07/29/05	*Acceptable*
Ammonia (NH3-N)	MS	612552	22	mg/L	100		20	2.0	120	80	07/29/05	*Acceptable*
	MS	612609	119	mg/Kg	110		100	ND	120	80	07/29/05	*Acceptable*
Ammonia (NH3-N)	MSD	612552	21	mg/L	95	4.7	20	2.0	120	80	07/29/05	*Acceptable*
	MSD	612609	110	mg/Kg	101	7.9	100	ND	120	80	07/29/05	*Acceptable*
Ammonia (NH3-N)	RBLK	N/A	0	mg/L	< 1				1	N/A	07/29/05	*Acceptable*

StarLims Run 96704 includes the following BSK Sample ID# :

612338 612339 612552 612553 612554 612609 612659 613047 613048 613049 613233 613278 613279 613280 613291 613292
613293 614075 614076 614077 614078 614079 614080 614081

BSK StarLims Run #: 97260

Analyst Initials: **BURTJ** Method Number: **CA_ICP_FL**

Analyte Results

Analyte	QC Type	Matrix Spike ID	Result	Units	% Rec or RPD	Spike RPD	Spk Conc	Matrix Conc	UCL	LCL	Date	
Calcium (Ca) - Dissolved	LCS	N/A	92	mg/L	92		100	ND	115	85	08/09/05	*Acceptable*
Magnesium (Mg) - Dissolved	LCS	N/A	91	mg/L	91		100	ND	115	85	08/09/05	*Acceptable*
Potassium (K) - Dissolved	LCS	N/A	56	mg/L	93		60	ND	115	85	08/09/05	*Acceptable*
Sodium (Na) - Dissolved	LCS	N/A	104	mg/L	104		100	ND	115	85	08/09/05	*Acceptable*
Calcium (Ca) - Dissolved	LCSD	N/A	93	mg/L	93	1	100	ND	115	85	08/09/05	*Acceptable*
Magnesium (Mg) - Dissolved	LCSD	N/A	92	mg/L	92	1	100	ND	115	85	08/09/05	*Acceptable*
Potassium (K) - Dissolved	LCSD	N/A	57	mg/L	95	1.8	60	ND	115	85	08/09/05	*Acceptable*
Sodium (Na) - Dissolved	LCSD	N/A	103	mg/L	103	0.97	100	ND	115	85	08/09/05	*Acceptable*
Calcium (Ca) - Dissolved	RBLK	N/A	0	mg/L	< 0.1				0.1	N/A	08/09/05	*Acceptable*
Magnesium (Mg) - Dissolved	RBLK	N/A	0	mg/L	< 0.1				0.1	N/A	08/09/05	*Acceptable*
Potassium (K) - Dissolved	RBLK	N/A	0	mg/L	< 2				2	N/A	08/09/05	*Acceptable*
Sodium (Na) - Dissolved	RBLK	N/A	0	mg/L	< 1				1	N/A	08/09/05	*Acceptable*

%Rec: Percent Recovered
RPD: Relative Percent Difference
UCL: Upper Control Limit
LCL: Lower Control Limit
LCS: Laboratory Control Sample
LCSD: Laboratory Control Sample Duplicate

Parent Sample: Sample used as background matrix for MS/MSD
OOS-High: QC Result Above UCL
OOS-Low: QC Result Below LCL
MS: Matrix Spike
MSD: Matrix Spike Duplicate
RBLK: Reagent (Method) Blank
Surrogate results for QC standards are not evaluated for acceptability (due to definition of a surrogate standard)

BSK ANALYTICAL LABORATORIES

QC Summary Report 08/23/2005

BSK Submission : **2005072097**
Client : **BSK and Associates - Geotechni**
Date Submitted : **07/28/2005**
Project ID : **D0500910F**

Project Desc : **Seven L Hostein**

NELAP Certificate #04227CA
ELAP Certificate #1180

StarLims Run 97260 includes the following BSK Sample ID# :

613278 613279 613280 613291 613292 613293 618062 618063 618064

BSK StarLims Run #: 97367

Analyst Initials: **VONGH** Method Number: **TKN**

Analyte Results

Analyte	QC Type	Matrix Spike ID	Result	Units	% Rec or RPD	Spike RPD	Spk Conc	Matrix Conc	UCL	LCL	Date	
Nitrogen - Total Kjeldahl (TKN)	LCS	N/A	4.9	mg/L	98		5.0	ND	110	90	08/12/05	*Acceptable*
Nitrogen - Total Kjeldahl (TKN)	LCSD	N/A	4.6	mg/L	92	6.3	5.0	ND	110	90	08/12/05	*Acceptable*
Nitrogen - Total Kjeldahl (TKN)	MS	613615	0	mg/L	0		4.0	ND	110	90	08/12/05	*OOS-Low*
	MS	613616	1.2	mg/L	30		4.0	ND	110	90	08/12/05	*OOS-Low*
Nitrogen - Total Kjeldahl (TKN)	MSD	613615	0.94	mg/L	23	N/A	4.0	ND	110	90	08/12/05	*OOS-Low*
	MSD	613616	1.4	mg/L	35	15	4.0	ND	110	90	08/12/05	*OOS-Low*
Nitrogen - Total Kjeldahl (TKN)	RBLK	N/A	0	mg/L	< 1.0				1.0	N/A	08/12/05	*Acceptable*

Run	Test	Analyte	Comment
97367	TKN	TKN	MS and MSD recoveries were affected by the matrix.
97367	TKN	TKN	MS and MSD recoveries were affected by the matrix.

StarLims Run 97367 includes the following BSK Sample ID# :

610035 612969 612970 613047 613048 613049 613196 613277 613278 613279 613280 613527 613573 613575 613576 613577
613615 613616 613618 613619 620385 620386 620387 620388 620389 620390 620391

Approved by: Cynthia Hamilton

%Rec: Percent Recovered
RPD: Relative Percent Difference
UCL: Upper Control Limit
LCL: Lower Control Limit
LCS: Laboratory Control Sample
LCSD: Laboratory Control Sample Duplicate

Parent Sample: Sample used as background matrix for MS/MSD
OOS-High: QC Result Above UCL
OOS-Low: QC Result Below LCL
MS: Matrix Spike
MSD: Matrix Spike Duplicate
RBLK: Reagent (Method) Blank
Surrogate results for QC standards are not evaluated for acceptability (due to definition of a surrogate standard)

Sample Integrity

Pg. 1 of 2

CL 2005072097 07/28/2005

BSK G

728115

TAT: Standard

Date Received 7/28/05

Section 1- Sampled Same Day

Sample Transport: (Walk In) SJVC BSK-Courier Transported In: Ice Chest Box Hand

Has chilling process begun? (Y) N Samples Received: (Chilled to Touch) / Ambient / On Ice

Section 2- Sampled Previously

Sample Transport: CAO UPS GSO Fed Exp. Airborne Exp. Other:_____

No. Coolers/Ice Chests: _____ Temperature(s): _____

Was Temperature In Range : Y N Received On Ice: Wet Blue

Describe type of packing materials: Bubble Wrap Foam Packing Peanuts Paper Other:_____

Were ice chest custody seals present? Y N Intact: Y N

Section 3- COC Info.	Completed Yes	Completed No	Info From Container		Completed Yes	Completed No	Info From Container
Was COC Received	—			Analysis Requested	—		
Date Sampled	—			Any hold times less than 72hr	—		
Time Sampled	—			Client Name	—		
Sample ID	—			Address	—		
Special Storage/Handling Ins.		—		Telephone #	—		

Section 4- Bottles / Analysis	Yes	No	N/A	Comment
Did all bottles arrive unbroken and intact?:	—			
Were bottle custody seals present?		—		
Were bottle custody seals intact?		—		
Did all bottle labels agree with COC?:	—			
Were correct containers used for the tests requested?:	—			
Were correct preservations used for the tests requested?:	—			
Was a sufficient amount of sample sent for tests indicated?:	—			
Were bubbles present in VOA Vials?: **(Volatile Methods Only)**			—	
Were Ascorbic Acid Bottles received with the VOAs			—	

Section 5- Comments / Discrepancies

Sample(s) Split : Yes (No) Container: _____ Preservative:_____ Init.:_____

Was Client Service Rep. notified of discrepancies: Yes (No) N/A CSR: Notified By: K

Explanations / Comments

Report Comment Entered:

F:/SHARE/QC/DOCCONTROL/FORMS/SMPINTG05 Labeled by: _____ Labels checked by: SB

Sample Integrity Pg 2 of 2

BSK Bottles (Yes) No

2005072097 07/28/2005

BSK G

728115

TAT: Standard

8oz (A) 16oz (B) 32oz (C) Amber Glass (AG)

Container(s) Received	1-3						
Bacti $Na_2S_2O_3$							
None (p) White Cap	1c -						
None (p) Blue Cap							
HNO_3 (p) Red Cap							
H_2SO_4 (p) Yellow Cap	1b -						
NaOH (p) Green Cap							
Other:							
Dissolved Oxygen 300ml (g)							
250ml (AG) None							
250ml (AG) H_2SO_4 TOC,COD Yellow Label							
250ml (AG) $Na_2S_2O_3$ 515,547 Blue Label							
250ml (AG) $Na_2S_2O_3$+ MCAA 531.1 Orange Label							
250ml (AG) NH_4Cl 552 Purple Label							
250ml (AG) EDA DBPs Brown Label							
250ml (AG) Other:							
500ml (AG) None							
500ml (AG) H_2SO_4 TPH-Diesel Yellow Label							
500ml (AG) Other:							
1 Liter (AG) None							
1 Liter (AG) H_2SO_4 O&G Yellow Label							
1 Liter (AG) Na_2SO_3 525 N-Green Label							
1 Liter (AG) $Na_2S_2O_3$ 548 Blue Label							
1 Liter (P) $Na_2S_2O_3$+ H_2SO_4 549							
1 Liter (AG) NaOH+ZnAc Sulfide							
1 Liter (AG) Other:							
40ml VOA Vial Clear – HCL							
40ml VOA Vial Amber – $Na_2S_2O_3$							
40ml VOA Vial Clear – None							
40ml VOA Vial Clear - $Na_2S_2O_3$ 504, 505							
40ml VOA Vial Other							
Other:							
Asbestos 1-Liter Plastic/Foil							
Radiological GA / GB (½ Gal Plastic)							
Radiological 226 / 228 (32 oz plastic N-BSK)							
Radon 200ml Clear (g)							
Low Level Hg/Metals Double Baggie							
THM-FP 4-40ml VOA None							
250 Clear Glass Jar							
500 Clear Glass Jar							
1 Liter Clear Glass Jar							
Plastic Bag							
Soil Tube Brass / Steel / Plastic							
Tedlar Bags							

K 7/28

BSK ANALYTICAL LABORATORIES

1414 Stanislaus Street
Fresno, CA 93706-1623
(559) 497-2888, (800) 877-8310
FAX (559) 485-6935

TEMP:

www.bsklabs.com

2005072097 07/28/2005
BSK G
728115
TAT: Standard

Client Name	Report Attn:	Phone #	FAX #	E-mail:
BSK-G	* DAVE SMITH			

Address	Project Name	Project #	Carbon Copies: (Check Box)
567. W SHAW	BEVEN L HOSTEIN	DOS-009.10F	CDHS ☐ FresnoCo ☐ EPA ☐ Merced Co ☐ Tulare Co ☐ Other:

City State Zip	Quote #	PO #	Rush Request (Circle One)
FRESNO CA			7Day 5Day 2Day 1Day

Sampler Name Printed	Sampler Signature	QC Required (Circle One)	Regulatory Compliance
DON GRIFFITH	Don Griffith	STD Level II Level III	Electronic Data Transfer: Y N System #

Matrix Types: RSW = Raw Surface Water CFW = Chlorinated Finished Water CWW = Chlorinated Waste Water BW = Bottled Water RGW = Raw Ground Water FW = Finished Water WW = Waste Water SW = Storm Water DW = Drinking Water SO = Solid

Sample #	# Btls	Date / Time Sampled	Sample Description/Location	Matrix	Comments / Station Code	DAILY PROFILE
1	2	7-28/1243	MW-1		613278	X
2	2	/1324	MW-2		79	X
3	2	/1359	MW-3		80	X
		/				
		/				
		/				
		/				
		/				
		/				
		/				
		/				

* 7/29/05 - PER MARK P. PUTS $ INVOICE GO BACK TO HIM GB

Relinquished by: (Signature and Printed Name)	Company	Date	Time	Received by (Signature and Print Name)	Company
Don Griffith DON GRIFFITH	BSK-G	7-28	15:50		
Relinquished by: (Signature and Printed Name)	Company	Date	Time	Received by (Signature and Print Name)	Company
Relinquished by: (Signature and Printed Name)	Company	Date	Time	Received by (Signature and Print Name)	Company
Received for lab by: (Signature and Printed Name)		Date	Time	Payment Received at Delivery:	
		7/28	1550	Date: Amount: Check/Cash/Card PIA #	Init.

WATER SAMPLE LOG

Project Name: SEVEN L HOLSTEIN	Job #: 605.009.16F	Field Personnel: DON GRIFFITH
Day: Mon Tu Wed (Thur) Fri Sat Sun (circle one)	Date: 7-28-05	Weather: (Clear) Partly Cloudy Overcast Rain (circle) Cold Cool (Warm) (Hot) Very Hot

Well:	MW-1	Water Level Measurement Technique: (Circle) Electric Sounder Ser # 300 Not Measured
Static Depth to Water-Ft. (A)	113.07	Purge Method: (Circle) (Grundfos Submersible Pump) Pneumatic Pump Electric Pump Hand Bailed Other ____
Total Depth of Casing-Ft. (B)	136.39	
Total Ft. of Water (B-A)	23.32	
Casing Dia-in.	(2") 4" Other	Dedicated System: Yes (No)
Casing Capacity-gal/ft (C)	(163).653	Dedicated System: ____ Yes ____ No
Gallons per Casing Volume	(B-A)*C 3.88	pH Calibration: 4.0 ____ 7.0 ____ 10.0 EC Calibration(µmhos) ____

Time	Gallons Purged	Casing Volumes	pH	EC (µmhos)	Temp (°F/°C)	Turbidity NTU or D.O. mg/l	Remarks (Color, Odor, Turbidity, etc.)
1225	0	0	—	—	—	—	Started Purge/Opened Sample Port
1232	4	1	7.08	613	34.0		TURBID NO ODOR CLEARING
1236	8	2	7.65	658	26.4		
1239	12	3	7.67	651	23.5		

1243	12+	3+	7.62	580	240		Sampled/Stopped
Chloride		Sulfate		Nitrate	X4.4		Other Field Results:

Purge Pump On	1225	Discharge Measurement: (Circle) (Bucket) Tank Flowmeter
Purge Pump Off	1245	Sample Collection Method: X Direct From Discharge Hose ____ Teflon Bailer ____ Disposable Bailer
Total Gallons Purged	12+	
Purge Rate (gpm)		Ice Chest Coolant ____ Crushed Ice X Blue Ice Ice Chest Temp (°C) 4°

Sample Time	Analyses	Amount/Container Used	Sample Description
1243			

Well Vault Type:	MONUMENT	Floating Product: ____ Yes ____ No ____ NA
Lock Number/Type:	—	Thickness: —
Drums Filled/Used:	—	Description: —

Notes: ____

WATER SAMPLE LOG

Project Name: SEVEN L HOLSTEIN	Job #: D05.009.10F	Field Personnel: DON GRIFFITH
Day: Mon Tu Wed (Thur) Fri Sat Sun (circle one)	Date: 7-28-05	Weather: (Clear) Partly Cloudy Overcast Rain (circle) Cold Cool Warm (Hot) Very Hot

Well:	MW-2	Water Level Measurement Technique: (Circle) Electric Sounder Ser # 300 Not Measured
Static Depth to Water-Ft. (A)	113.98	Purge Method: (Circle) (Grundfos Submersible Pump) Pneumatic Pump Electric Pump Hand Bailed
Total Depth of Casing-Ft. (B)	138.39	
Total Ft. of Water (B-A)	24.41	Other _____
Casing Dia-in.	(2") 4" Other	Dedicated System: Yes (No)
Casing Capacity-gal/ft (C)	(.163) .653	Dedicated System: ____ Yes (X) No
Gallons per Casing Volume	(B-A)*C 3.97	pH Calibration: 4.0 (7.0) 10.0 EC Calibration(µmhos) ____

Time	Gallons Purged	Casing Volumes	PH	EC (µmhos)	Temp (°F/°C)	Turbidity NTU or D.O. mg/l	Remarks (Color, Odor, Turbidity, etc.)
1305	0	0	—	—	—	—	Started Purge/Opened Sample Port
1313	4	1	753	705	23.7		TURBID NO ODOR CLEARING
1318	8	2	757	694	25.0		
1324	12	3	756	693	25.3		

1324	12+	3+	758	689	25.1		Sampled/Stopped
Chloride		Sulfate		Nitrate	X4.4		Other Field Results:

Purge Pump On	1305	Discharge Measurement: (Circle) (Bucket) Tank Flowmeter
Purge Pump Off	1324	Sample Collection Method: (X) Direct From Discharge Hose
Total Gallons Purged	12+	____ Teflon Bailer ____ Disposable Bailer
Purge Rate (gpm)	2.0	Ice Chest Coolant ____ Crushed Ice (X) Blue Ice Ice Chest Temp (°C) 4°

Sample Time	Analyses	Amount/Container Used	Sample Description
1324			

Well Vault Type:	MONUMENT	Floating Product: ____ Yes ____ No — NA
Lock Number/Type:	—	Thickness: ____
Drums Filled/Used:	—	Description: —

Notes: —

.OC-Top Of well Casing

WATER SAMPLE LOG

Project Name: SEVEN L HOLSTEIN	Job #: D05.009.10F	Field Personnel: DON GRIFFITH
Day: Mon Tu Wed Thur Fri Sat Sun (circle one)	Date: 7-28-05	Weather: Clear Partly Cloudy Overcast Rain (circle) Cold Cool Warm Hot Very Hot

Well:	MW-3	Water Level Measurement Technique: (Circle) Electric Sounder Ser # 3e0 Not Measured
Static Depth to Water-Ft. (A)	116.96	Purge Method: (Circle) Grundfos Submersible Pump Pneumatic Pump
Total Depth of Casing-Ft. (B)	127.45	Electric Pump Hand Bailed
Total Ft. of Water (B-A)	10.49	Other _____
Casing Dia-in.	2" 4" Other	Dedicated System: Yes No
Casing Capacity-gal/ft (C)	.163 .653	Dedicated System: ____ Yes ____ No
Gallons per Casing Volume	(B-A)*C 1.76	pH Calibration: 4.0 7.0 10.0 EC Calibration(µmhos)_____

Time	Gallons Purged	Casing Volumes	pH	EC (µmhos)	Temp (°F/°C)	Turbidity NTU or D.O. mg/l	Remarks (Color, Odor, Turbidity, etc.)
1340	0	0	—	—	—	—	Started Purge/Opened Sample Port
1349	2	1	756	673	29.1		TURBID NO ODOR NOT CLEARING
1351	4	2	752	678	28.3		
1354	6	3	750	674	30.0		

1359	6+	3+	751	676	29.4		Sampled/Stopped
Chloride		Sulfate		Nitrate	X4.4		Other Field Results:

Purge Pump On	1340	Discharge Measurement: (Circle) Bucket Tank Flowmeter
Purge Pump Off	1359	Sample Collection Method: X Direct From Discharge Hose
Total Gallons Purged	6+	____ Teflon Bailer ____ Disposable Bailer
Purge Rate (gpm)	1.0	Ice Chest Coolant ____ Crushed Ice ✓ Blue Ice Ice Chest Temp (°C) 4°

Sample Time	Analyses	Amount/Container Used	Sample Description
1359			

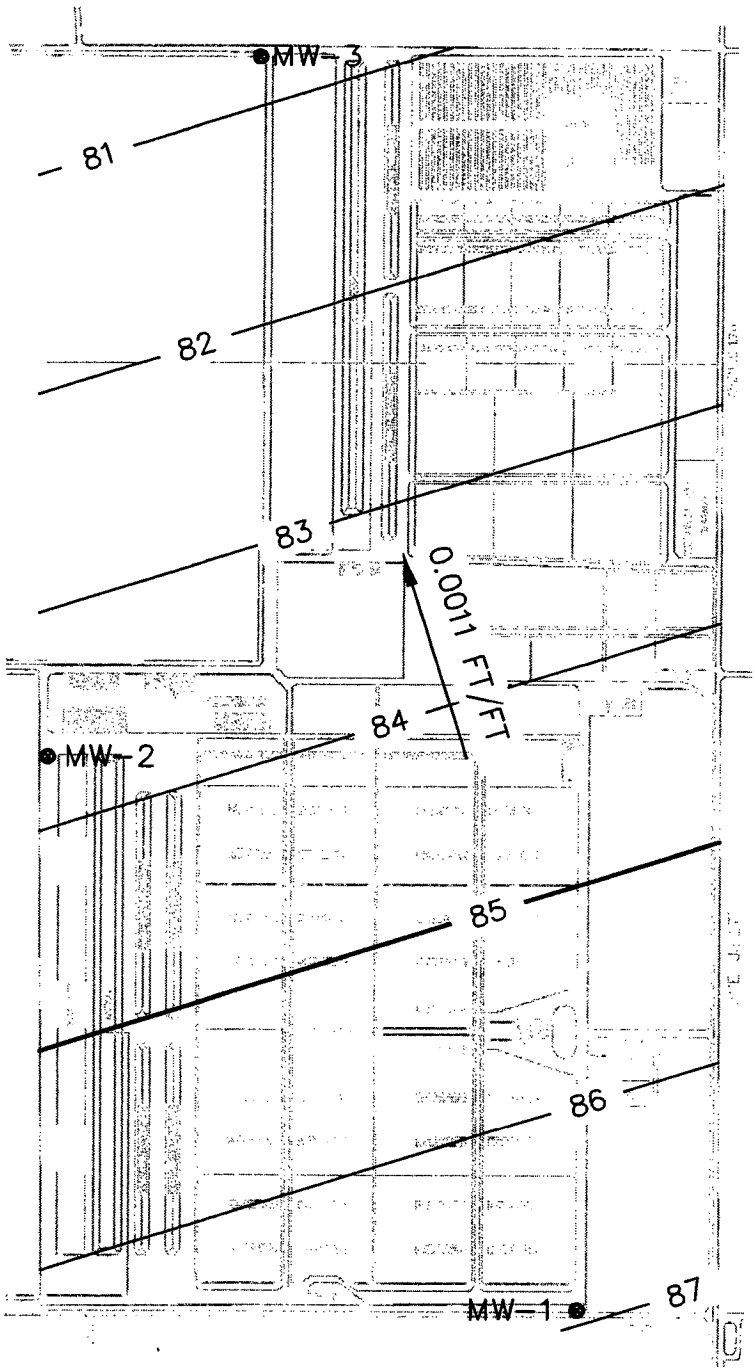
Well Vault Type:	MONUMENT	Floating Product: ____ Yes ____ No — NA
Lock Number/Type:	—	Thickness: —
Drums Filled/Used:	—	Description: —

Notes: —

TOC-Top Of well Casing

Appendix E

Potentiometric Groundwater Surface Map



GROUNDWATER GRADIENT

N

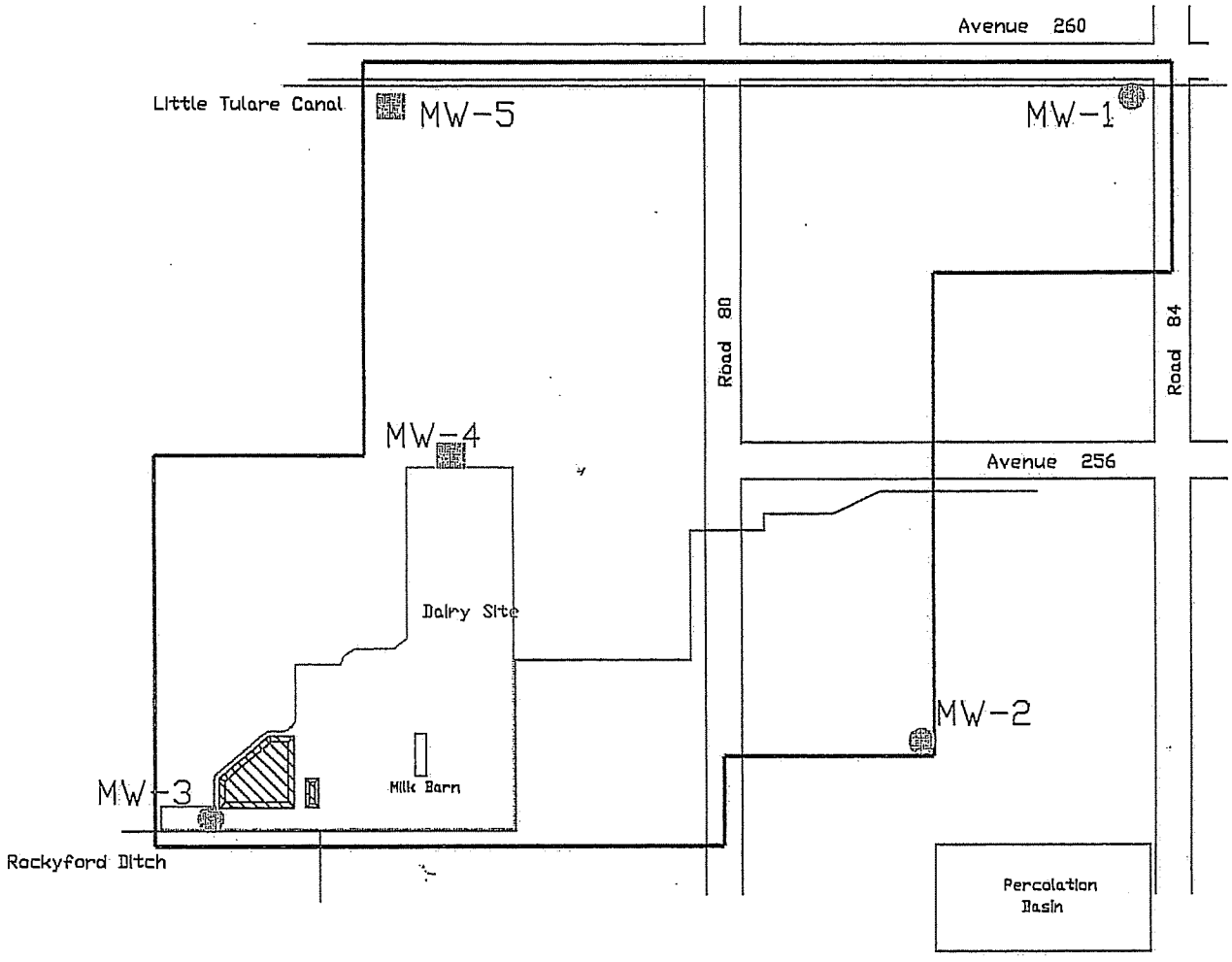
SCALE: 1" = 800'-0"

LEGEND	
GROUNDWATER SURFACE CONTOURS	—— 50 ——

NOTE:
MONITORING WELL AND GROUNDWATER ELEVATION DATA ARE BASED ON AN ASSUMED DATUM.

V:\Clients\Legendekker, Nick 3038\3038-03V1 RWQCB Compliance\Drawings ACAD\GradientMapSampled072805.dwg, Sheet, 1/20/2006 3:03:51 PM, Adamm

HYN



LEGEND

- Facility Boundary
- Dairy Boundary
- Storage Ponds
- Canal or Ditch
- Monitoring Well
- Additional Monitoring Wells

MW-1 thru MW-3 are board requested.
MW-4 thru MW-5 is optional and
for owners knowledge only.

B-1 = SOIL BORING LOCATIONS

TECHNICON ENGINEERING SERVICES, INC.	PROJECT NO.: 16760	DATE: 01/31/07	SITE MAP H & R BARTHELEMY DAIRY KEYES CALIFORNIA ON WASHINGTON BOULEVARD TULARE, CALIFORNIA	FIGURE 1
	SOURCE: JMLORD INC.	APPROVED BY: A.J.		

KEY TO SYMBOLS

Symbol Description

Strata symbols

Sandy SILT

Silty SAND

Poorly graded SAND with silt

Poorly Graded SAND

Misc. Symbols

Water table during drilling

Soil Samplers

Standard Penetration Test - 3.0-inch OD

Notes:

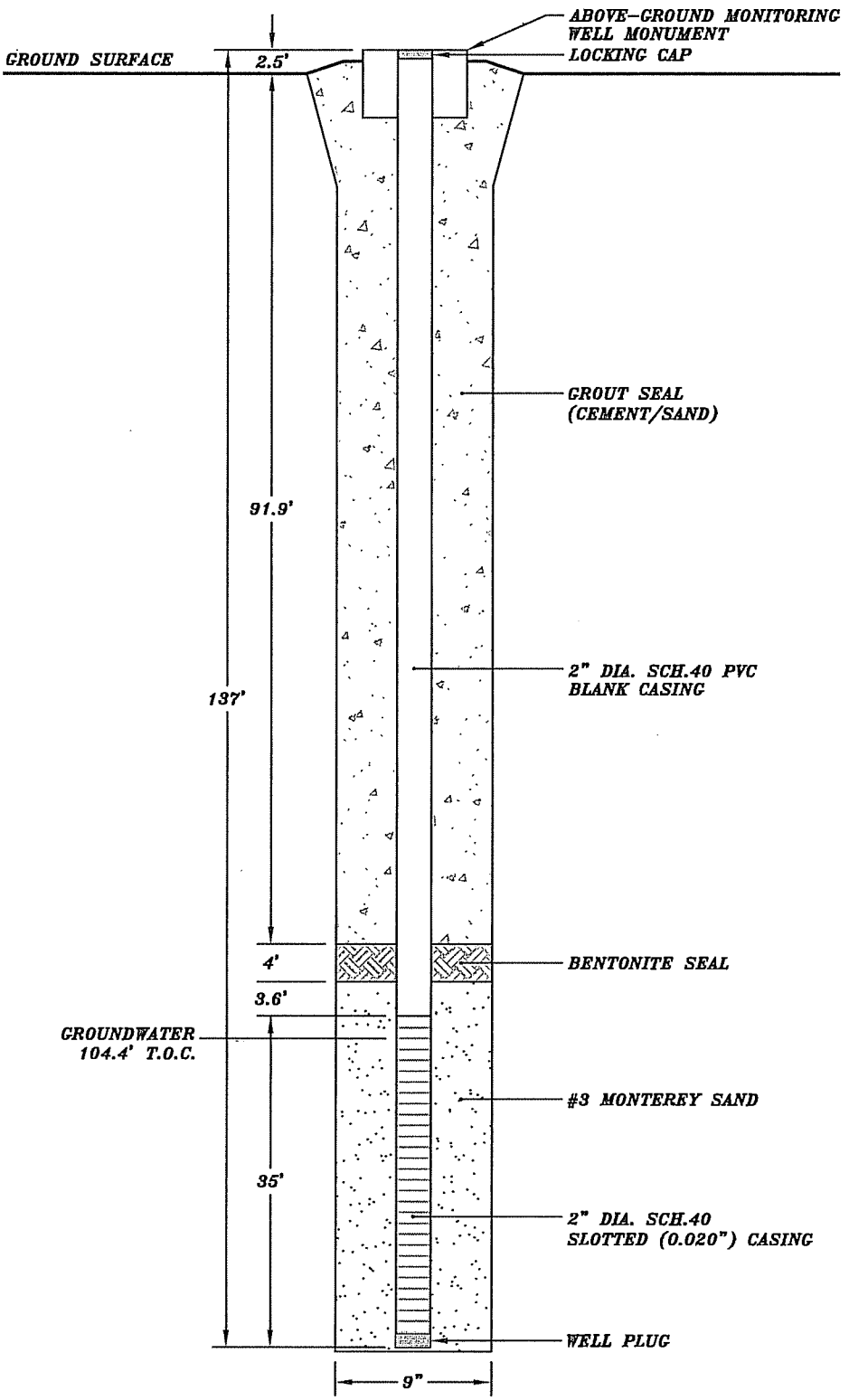
1. Exploratory borings were excavated on 12-4-06 using a 7.5" Hollow Stem Auger.

2. Boring locations were measured from existing features and elevations extrapolated from the final design schematic plan.

3. These logs are subject to the limitations, conclusions, and recommendations in this report.

4. Results of tests conducted on samples recovered are reported on the logs.

MONITORING WELL MW-1
(LAT.: 36.26157°N, LONG.: 119.38438°W)



T.O.C.=TOP OF CASING

NOTE:
ALL MEASUREMENTS ARE TAKEN FROM THE TOP OF CASING

TECHNICON ENGINEERING SERVICES, INC.	PROJECT NO.: 16760 DRAWN BY: M.H.	MONITORING WELL #1 DETAIL H & R BARTHELEMY DAIRY KEYES CALIFORNIA ON WASHINGTON BOULEVARD TULARE, CALIFORNIA	FIGURE 2

*The free Adobe Reader may be used to view and complete this form. However, software must be purchased to complete, save, and reuse a saved form.

File Original with DWR

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e050760

Page 1 of 1

Owner's Well Number MW-1

Date Work Began 12/06/2006 Date Work Ended 12/7/2006

Local Permit Agency Tulare County Enviromental Health Services

Permit Number ~~67035~~ 06-436 Permit Date 11/27/06

DWR Use Only – Do Not Fill In

State Well Number/Site Number

N W

Latitude Longitude

APN/TRS/Other

Geologic Log

Orientation ⦿ Vertical ○ Horizontal ○ Angle Specify

Drilling Method Drilling Fluid

Depth from Surface Feet	to Feet	Description Describe material, grain size, color, etc
		Boring logs, well diagram, & site map attatched.

Total Depth of Boring 135 Feet

Total Depth of Completed Well 134.5 Feet

Well Owner

Name Roland Barthelemy

Mailing Address 16500 Chino Corona Rd.

City Chino State CA Zip 91710

Well Location

Address South west corner of Ave. 260 & Road 84

City Tulare County Tulare

Latitude Deg. Min. Sec. N Longitude Deg. Min. Sec. W

Datum WGS84 Decimal Lat. 36.26157 Decimal Long. 119.38438

APN Book 148 Page 030 Parcel 029

Township 19S Range 24E Section 19

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North

West East

South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

⦿ New Well

○ Modification/Repair

○ Deepen

○ Other

○ Destroy

Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply

☐ Domestic ☐ Public

☐ Irrigation ☐ Industrial

○ Cathodic Protection

○ Dewatering

○ Heat Exchange

○ Injection

⦿ Monitoring

○ Remediation

○ Sparging

○ Test Well

○ Vapor Extraction

○ Other

Water Level and Yield of Completed Well

Depth to first water 102 (Feet below surface)

Depth to Static Water Level 104 (Feet) Date Measured 12/09/2006

Estimated Yield * (GPM) Test Type

Test Length (Hours) Total Drawdown (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)
0	100	9	Blank	PVC Sch. 40	0.25	2		
100	135	9	Screen	PVC Sch. 40	0.25	2	Milled Slots	0.020

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0	92	Cement	Neat Cement
92	96	Bentonite	Medium Chips
96	135	Filter Pack	#3 Sand

Attachments

☑ Geologic Log

☑ Well Construction Diagram

☐ Geophysical Log(s)

☐ Soil/Water Chemical Analyses

☑ Other Site map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name Technicon Engineering Services (Person, Firm or Corporation)

4539 N. Brawley (Address) Fresno (City) CA (State) 93722 (Zip)

Signed Ashley Jones Dept. Manager (C-57 Licensed Water Well Contractor) 1-31-07 (Date Signed) 767888 (C-57 License Number)

DWR 188 REV. 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TECHNICON
ENGINEERING SERVICES, Inc.

4539 N. Brawley Ave., #108
Fresno, CA 93722

Ph: (559) 276-9311
Fax: (559) 276-9344

Project: H.R. Barthelemy Dairy Job #: 16760-V79

Boring #: MW-1 Surface Condition: Flat bare ground with patches of grass.

Drilled By: L. Mattos	Started: 12-6-06	Finished: 12-7-06
Equipment: CME-55	Surface Elevation (ft): Original Ground	
Auger Type: 9" H.S.A.	Completed Depth (ft): 133	
Logged By: J. Ruiz Checked By: S. Curra	Groundwater Depth (ft): 102	

Depth (Feet)	Description	Blows per Foot	Moisture Content (%)	Dry Density (pcf)	Remarks
0					
5	Sandy Silt(ML), brown,moist, stiff, fine grain sand trace of medium grained sand.	11			
					Change @ 8'
10	Silty Sand(SM), brown, moist, loose, fine grain trace of medium grain.	8			
15	Light brown, medium dense, fine to medium grain.	12			
					Change @ 17'
20	Poorly graded sand with silt(SP-SM), light brown, moist, medium dense, fine to medium grain.	10			
25	Poorly graded sand(SP), Tan, moist, medium dense, fine to medium grain trace of coarse grain.	13			
					Change @ 29'
30	Sandy Silt(ML), brown with orange mottling, moist, stiff, fine grain sand with medium grain sand.	14			
35	Silty Sand(SM), light brown, moist, medium dense, fine to medium grain.	16			Change @ 35'

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ENGINEERING SERVICES, Inc.

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Fresno, CA 93722

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Drilled By: L. Mattos	Started: 12-6-06	Finished: 12-7-06
Equipment: CME-55	Surface Elevation (ft): Original Ground	
Auger Type: 9" H.S.A.	Completed Depth (ft): 133	
Logged By: J. Ruiz / Checked By: S. Curra	Groundwater Depth (ft): 102	

Depth (Feet)	Description	Blows per Foot	Moisture Content (%)	Dry Density (pcf)	Remarks
40	Silty Sand(SM), brown, moist, medium dense, fine to medium grain trace of coarse grain.	19			
45	Fine to medium grain with coarse grain	23			
					Change @ 47'
50	Poorly Graded Sand with silt(SP-SM), light brown, moist, medium dense, fine to medium grain.	20			
55	Poorly Graded Sand(SP), tan, moist, medium dense, fine to medium grain with coarse grain.	18			
					Change @ 59'
60	Silty Sand(SM), brown, moist, medium dense, fine to medium grain.	19			
65	Trace of coarse grain.	22			
70	Decrease in silt.	16			
75	With coarse grain.	18			
					Change @ 77'

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Project: H.R. Barthelemy Dairy Job #: 16760-V79

Boring #: MW-1 Surface Condition: Flat bare ground with patches of grass.

Drilled By: L. Mattos	Started: 12-6-06	Finished: 12-7-06
Equipment: CME-55	Surface Elevation (ft): Original Ground	
Auger Type: 9" H.S.A.	Completed Depth (ft): 133	
Logged By: J. Ruiz / Checked By: S. Curra	Groundwater Depth (ft): 102	

Depth (Feet)	Description	Blows per Foot	Moisture Content (%)	Dry Density (pcf)	Remarks
80	Poorly Graded Sand(SP), light brown, moist, medium dense, fine to medium grain with coarse grain.	25			
85	Trace of fine gravel.	23			
90	With fine gravel.	27			
95	Trace of silt.	24			
					Change @ 98'
100	Silty Sand(SM), brown, moist, dense, fine to medium grain.	31			Wet at the tip of the sampler.
			▽		Ground water encountered.
105	Poorly Graded Sand with Silt(SP-SM), tan, wet, loose, fine to medium grain with coarse grain.	4			Change @ 105'
110					
115					

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ENGINEERING SERVICES, Inc.

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Equipment: CME-55	Surface Elevation (ft): Original Ground	
Auger Type: 9" H.S.A.	Completed Depth (ft): 133	
Logged By: J. Ruiz / Checked By: S. Curra	Groundwater Depth (ft): 102	

Depth (Feet)	Description	Blows per Foot	Moisture Content (%)	Dry Density (pcf)	Remarks
120					
125					
130					
135					Bottom of boring at 135'. Bottom of well at 134.5'. GPS:N36.26157,W119.38438
140					
145					
150					
155					

Well Development Log

Project Name:	Barthelemy Dairy	Well ID:	MW-1
Project #:	16760-V79	Elevation (TOC):	N/A
Location:	South west corner of Ave. 260 + Rd. 84	Well Diameter:	2"
		Well Depth (A):	137.0' TOC
Date:	12-9-06	Depth to Water (B):	104.4' TOC
Sketch Map: GPS Location N: 36.26157 W: 119.38433		Water Column (A-B): 32.6	Casing Height 2.5'
		Well Volume: 2" casing = 0.17 gal/ft. 4" casing = 0.66 gal/ft.	5.54 gal.
		Borehole Volume: 8" hole = 2.78 gal/ft. 10" hole = 4.29 gal/ft.	
north		Purge Method: Surgeblock Sub. Pump	= ES-200

TIME	VOLUME WITHDRAWN (gallons)	TEMP (C/F)	pH	EC (mhos/cm)	REMARKS
10:35 AM	6 gal.	61.0	7.67	1207	Very Turbid Pump @ 132'
10:41		63.1	7.61	998.4	
10:46		62.7	7.59	848.6	
10:52		65.3	7.57	760.6	Moderatly turbid pump @ 126'
10:58		65.8	7.56	748.4	
11:05		66.0	7.54	723.7	
11:11		66.7	7.55	721.2	
11:17		65.3	7.54	673.8	Slightly turbid
11:22		66.8	7.56	705.6	pump @ 120'
11:27		65.8	7.53	686.2	
11:33		66.2	7.54	555.4	Moderatly Turbid
11:39		65.7	7.61	546.5	pump @ 115'
11:45		65.5	7.55	689.8	
11:51		66.1	7.52	596.8	Slightly Turbid
11:58		65.9	7.55	597.5	pump @ 110'
12:04 PM		65.0	7.54	591.2	Clear
12:10	Total 102 gal.	65.6	7.54	593.4	pump @ 130'

Technician: Ashley Jones Signature: Ashley Jones Date: 12-9-06

TULARE COUNTY ENVIRONMENTAL HEALTH SERVICES DIVISION
5957 SOUTH MOONEY BLVD., VISALIA, CA 93277
PHONE (559) 733-6441 FAX (559) 733-6932

WP _____ Permit No 06-436

WELL PERMIT APPLICATION

Legal Property Owner Roland Barthelemy Phone No 1-909-613-5080

Mailing Address 16500 Chino Corona Rd. Chino, CA 91710
Address City State/Zip Code

Site Address/Location of Well South West corner of Ave. 260 & Road 84 Tulare, CA

Assessor's Parcel Number 148-030-029 Township-Range-Section T 19S R 24E S 19+20

Parcel Size 72.69 Acre(s) Drilling Area: Valley ☒ Foothills or Mountains ☐ Project Start Date 11-28-06

LICENSED CONTRACTOR DECLARATION

Licensed under the provisions of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code (B. & P.C.), as a well drilling contractor and such license is in full force and effect.

Ashley Jones — Print Name of Driller
Ashley Jones — Signature of Driller
11-23-06 — Date

Business Name Technicon Engineering Services

License Classification & License No. C-57 767888 Office No. (559) 276-9311 Cell No. (559) 994-7486

Address 4539 N. Brawley Fresno, CA 93722
Include City, State, and Zip

TYPE OF WORK
- Drilling ☒
- Recondition ☐
- Deepen ☐
- Destruction ☐
- Inactivation ☐

DRILLING METHOD
- Cable Tool ☐
- Rotary ☒
- Reverse Rotary ☐
- Air Rotary ☐
- Other _____

TYPE OF WELL
- Private ☐
- Public Domestic ☐
- Agricultural ☐
- Industrial ☐
- Monitoring ☒
- Soil Boring ☐
- Cathodic Protection ☐
- Other _____

CASING INFORMATION

Casing Material: Steel ☐ PVC ☒ Other _____

Diameter 2" Gauge 40 Thickness in inches 0.25

Perforations Yes ☒ No ☐

Slot Size 0.020 in

Perforation Depths 35' ft

WELL CONSTRUCTION

Proposed Depth of Well 130 ft

Gravel Packed Yes ☒ (#3 Sand) No ☐

Depth of Annular Seal 95 ft

SEAL MATERIAL
- Neat Cement ☒
- Cement Grout ☐
- Concrete ☐
- Other _____

SEAL METHOD
- Pressure Grout ☐
- Tremie Pipe ☒
- Freefall/Pour ☒
- Other _____

Permit Issued on: _____

Envision: PWSP
____ Entered Well Permit Application
____ Entered Well Completion Report
____ Entered Results & Lat/Long Data

RECEIVED NOV 27 2006

MW-1

19 S 24 E 20

Initial Paragraphs 1 & 2

_____1. I hereby agree to comply with all regulations of Tulare County pertaining to well construction, recondition, deepening and destruction. Within 30 days of work completed, I will furnish Tulare County Environmental Health Services Division a completed well log for well construction, recondition, deepening and destruction.

_____2. I certify that I have read this application and declare under penalty of perjury that the information contained herein is true, correct and complete. I agree to comply with all county ordinances and state laws relating to building, development and construction. I hereby authorize representatives of Tulare County to enter the premises for the purpose of inspecting the work described herein for compliance with county requirements.

WHEN SIGNED BY TULARE COUNTY ENVIRONMENTAL HEALTH SERVICES DIVISION REPRESENTATIVE, this application shall be deemed a permit for the work described. THIS PERMIT SHALL EXPIRE upon completion of the job authorized; in any event shall expire 6 MONTHS from date of issuance. No changes from the approved plan are permitted without prior approval from this Division.

NOTICE: After permit approval an inspection must be scheduled at least 48 hours in advance at (559) 733-6441 for:

1. The sealing of the annular space on a public domestic well or a dairy well.
2. The destruction of all wells.
3. Any other operation stipulated on the permit by the county to deal with special or unusual conditions.

NOTE TO HOMEOWNERS: Contact Tulare County Environmental Health when private well construction and disinfection are complete and water samples can be obtained.

ENVIRONMENTAL HEALTH SERVICES DIVISION USE ONLY

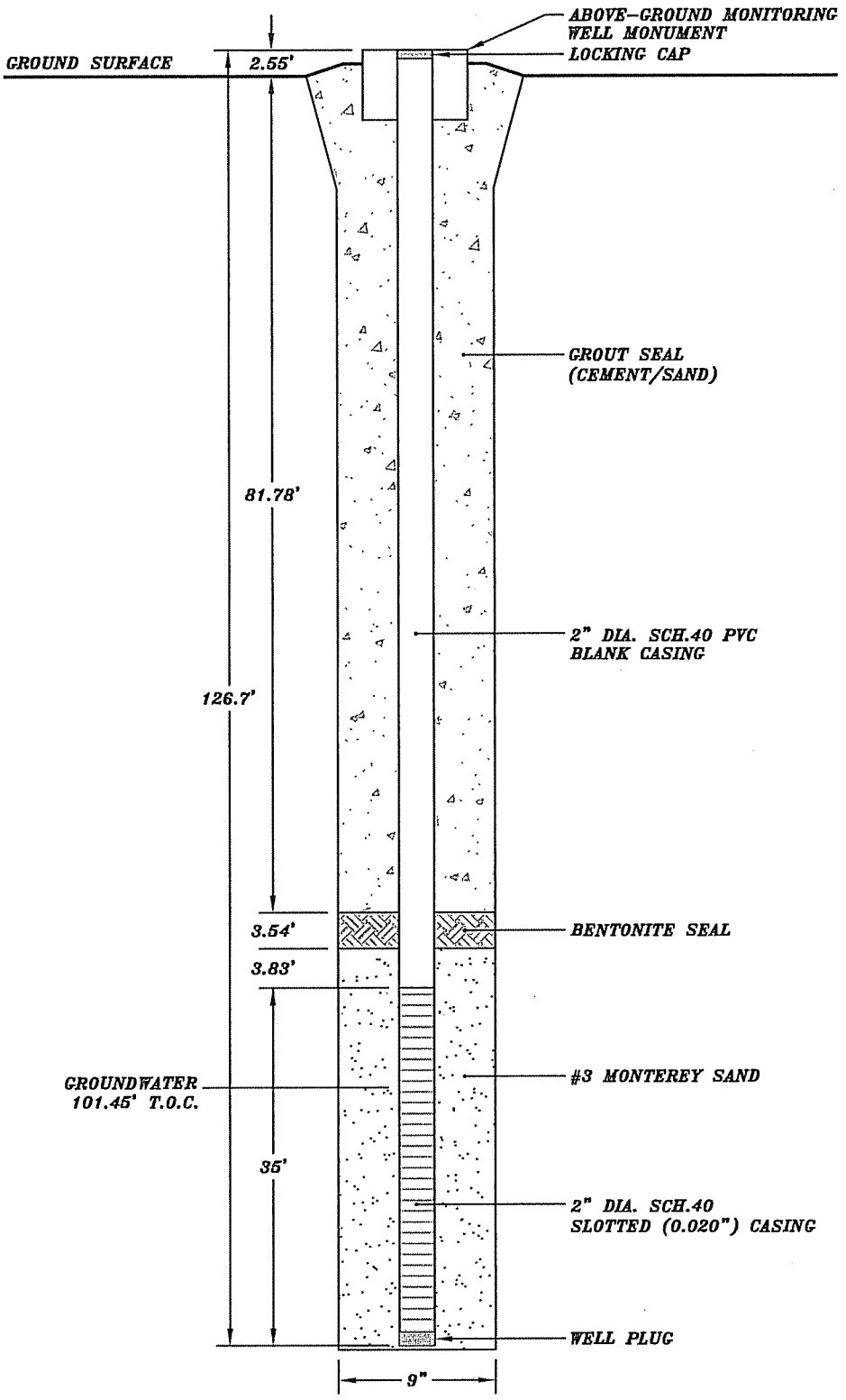
Fee Amount 91.00 Date Rec'd 11-27-06 Rec'd by J.P. Check No 37702 Receipt No 67035

Date Issued 11-27-06 Environmental Health Representative [illegible]

Conditions/Comments: Please install as per approved workplan and/or Bulletin 74-90.

RB 11/27/06

MONITORING WELL MW-2
(LAT.: 36.24919°N, LONG.: 119.38848°W)



NOTE:
ALL MEASUREMENTS ARE TAKEN FROM THE TOP OF CASING

T.O.C.=TOP OF CASING

TECHNICON ENGINEERING SERVICES, INC.	PROJECT NO.: 16760	MONITORING WELL #2 DETAIL H & R BARTHELEMY DAIRY KEYES CALIFORNIA ON WASHINGTON BOULEVARD TULARE, CALIFORNIA	FIGURE 3
	DRAWN BY: M.H.		

*The free Adobe Reader may be used to view and complete this form. However, software must be purchased to complete, save, and reuse a saved form.

File Original with DWR

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e050765

Page 1 of 1

Owner's Well Number MW-2

Date Work Began 11/28/2006 Date Work Ended 11/29/2006

Local Permit Agency Tulare County Enviromental Health Services

Permit Number 06-437 Permit Date 11/27/06

DWR Use Only – Do Not Fill In

State Well Number/Site Number

N W

Latitude Longitude

APN/TRS/Other

Geologic Log

Orientation ⦿ Vertical ○ Horizontal ○ Angle Specify

Drilling Method Drilling Fluid

Depth from Surface Feet	to Feet	Description Describe material, grain size, color, etc
		Boring logs, well diagram, & site map attatched.

Total Depth of Boring 125 Feet

Total Depth of Completed Well 124 Feet

Well Owner

Name Roland Barthelemy

Mailing Address 16500 Chino Corona Rd.

City Chino State CA Zip 91710

Well Location

Address South east of Ave. 256 & Road 80

City Tulare County Tulare

Latitude Deg. Min. Sec. N Longitude Deg. Min. Sec. W

Datum WGS84 Decimal Lat. 36.24919 Decimal Long. 119.38848

APN Book 148 Page 070 Parcel 009

Township 19S Range 24E Section 29

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North

West East

South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

⦿ New Well
○ Modification/Repair
○ Deepen
○ Other
○ Destroy

Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
⦿ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other

Water Level and Yield of Completed Well

Depth to first water 100 (Feet below surface)

Depth to Static Water Level 99 (Feet) Date Measured 12/09/2006

Estimated Yield * (GPM) Test Type

Test Length (Hours) Total Drawdown (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)
0	89	9	Blank	PVC Sch. 40	0.25	2		
89	124	9	Screen	PVC Sch. 40	0.25	2	Milled Slots	0.020

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0	82	Cement	Neat Cement
82	86	Bentonite	Medium Chips
86	124	Filter Pack	#3 Sand

Attachments

☑ Geologic Log
☑ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☑ Other Site map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name Technicon Engineering Services
Person, Firm or Corporation

4539 N. Brawley Fresno CA 93722
Address City State Zip

Signed Ashley Jones Dept. Manager 1-31-07 767888
C-57 Licensed Water Well Contractor Date Signed C-57 License Number

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TECHNICON
ENGINEERING SERVICES, Inc.

4539 N. Brawley Ave., #108
Fresno, CA 93722

Ph: (559) 276-9311
Fax: (559) 276-9344

Project: H.R. Barthelemy Dairy Job #: 16760-V79

Boring #: MW-2 Surface Condition: Flat bare ground.

Drilled By: L. Mottos	Started: 11-28-06	Finished: 11-29-06
Equipment: CME-55	Surface Elevation (ft): Original Ground	
Auger Type: 9" H.S.A.	Completed Depth (ft): 125	
Logged By: A. Jones Checked By: S. Curry	Groundwater Depth (ft): 100	

Depth (Feet)	Description	Blows per Foot	Moisture Content (%)	Dry Density (pcf)	Remarks
0					
5	Silty Sand(SM), brown, moist, loose, fine to medium grain.	8			
10	Medium dense, fine grain, with clay.	11			
					Change @ 12'
15	Clayey Sandy Silt(ML), brown, medium stiff, slightly plastic, fine grain sand.	5			
					Change @ 19'
20	Silty Sand(SM), brown, moist, medium dense, fine grain.	14			
25	Fine grain with medium grain.	11			Change @ 25'
30	Poorly graded sand with silt(SP-SM), tan, moist, medium dense, fine to medium grain with coarse grain and fine gravel.	15			Change @ 30'
35	Poorly Graded Sand(SP), tan, moist, medium dense, fine to medium grain with coarse grain and fine gravel, trace of silt.	18			

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Equipment: CME-55	Surface Elevation (ft): Original Ground	
Auger Type: 9" H.S.A.	Completed Depth (ft): 125	
Logged By: A. Jones Checked By: S. Curry	Groundwater Depth (ft): 100	

Depth (Feet)	Description	Blows per Foot	Moisture Content (%)	Dry Density (pcf)	Remarks
40	medium dense, fine grain with medium grain.	16			
45	Silt(ML), tan, moist, very stiff, trace of clay.	15			Change @ 45'
50	Sandy Silt(ML), light brown, moist, stiff, fine grain sand.	11			
	Silty Sand(SM), tan, moist, fine grain.				Change @ 53'
55	Silt(ML), tan, moist, medium stiff, trace of fine grain sand, trace of clay.	7			Change @ 55'
60	Stiff with fine grain sand.	11			
65	Poorly Graded Sand(SP-SM), light brown, moist, dense, fine to medium grain.	36			Change @ 65'
70	Poorly Graded Sand(SP), tan, moist, medium dense, fine to medium grain trace of coarse grain.	22			
75	Fine to medium grain with coarse grain.	30			

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Equipment: CME-55	Surface Elevation (ft): Original Ground	
Auger Type: 9" H.S.A.	Completed Depth (ft): 125	
Logged By: A. Jones Checked By: S. Curry	Groundwater Depth (ft): 100	

Depth (Feet)	Description	Blows per Foot	Moisture Content (%)	Dry Density (pcf)	Remarks
80	Trace of silt.	25			
85	Silty Sand(SM), brown, moist, dense, fine grain with medium grain.	36			Change @ 85'
					Change @ 88'
90	Sandy Silt(ML), brown, moist, fine grain sand, trace of clay.	25			
95	Clayey Sandy Silt, brown with black mottling, moist, very stiff, fine grain sand, slightly plastic.	29			
100	Silty Sand(SM), light brown, wet, loose, fine to medium grain.	7	▽		Change @ 100' Ground water encountered
105	Poorly Graded Sand with Silt(SP-SM), tan, wet, loose, fine to medium grain	5			Change @ 105'
110					
115					

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Equipment: CME-55	Surface Elevation (ft): Original Ground	
Auger Type: 9" H.S.A.	Completed Depth (ft): 125	
Logged By: A. Jones / Checked By: S. Curry	Groundwater Depth (ft): 100	

Depth (Feet)	Description	Blows per Foot	Moisture Content (%)	Dry Density (pcf)	Remarks
120					
125					Bottom of boring at 125'. Bottom of well at 124'. GPS:N36.24919,W119.38848
130					
135					
140					
145					
150					
155					

Well Development Log

Project Name:	Barthelemy Dairy	Well ID:	MW-2
Project #:	16760-V79	Elevation (TOC):	N/A
Location:	Southeast of	Well Diameter:	2"
	Ave. 260 & Rd. 80	Well Depth (A):	126.7 TOC
Date:	1-8-07	Depth to Water (B):	101.45 TOC
Sketch Map: Gps Location N:36.24919		Water Column (A-B): 25.25'	Casing Height 2.55'
		Well Volume: 2" casing = 0.17 gal/ft. 4" casing = 0.66 gal/ft.	4.29
		Borehole Volume: 8" hole = 2.78 gal/ft. 10" hole = 4.29 gal/ft.	
north		Purge Method: Surge Block	Sub. Pump ES-200

TIME	VOLUME WITHDRAWN (gallons)	TEMP (C/F)	pH	EC (mhos/cm)	REMARKS
10:25 Am	5 gal.	68.5	8.28	1289	Turbid Pump @ 121'
10:31		66.6	8.27	789.0	
10:36		67.2	8.24	723.5	
10:42		66.9	8.26	678.8	Slightly Turbid
10:48		66.9	8.26	642.5	Pump @ 115'
10:54		67.4	8.25	619.8	
11:00		66.8	8.31	581.4	Clear
11:06		67.5	8.29	548.7	Pump @ 110'
11:12		68.2	8.27	509.8	Turbid
11:18		69.1	8.24	473.1	
11:23		68.7	8.34	453.3	Slightly Turbid
11:28		69.0	8.26	432.7	Pump @ 122'
11:33		69.0	8.25	419.7	
11:38		69.1	8.24	407.5	Clear
11:44		69.0	8.24	401.8	
11:52		68.8	8.25	391.5	
11:58	Total=85 gal.	68.9	8.24	386.2	

Technician: Ashley Jones Signature: Ashley Jones Date: 1-8-07

TULARE COUNTY ENVIRONMENTAL HEALTH SERVICES DIVISION
5957 SOUTH MOONEY BLVD., VISALIA, CA 93277
PHONE (559) 733-6441 FAX (559) 733-6932

WP _____ Permit No 06-437

WELL PERMIT APPLICATION

Legal Property Owner Roland Barthelemy Phone No 1-909-613-5080

Mailing Address 16500 Chino Corona Rd. Chino, CA 91710
Address City State/Zip Code

Site Address/Location of Well 2000' South East of Ave. 256 + Road 80 Tulare, CA

Assessor's Parcel Number 148-070-009 Township-Range-Section T 19S R 24E S 29

Parcel Size 58.55 Acre(s) Drilling Area: Valley ☒ Foothills or Mountains ☐ Project Start Date 11-29-06

LICENSED CONTRACTOR DECLARATION

Licensed under the provisions of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code (B. & P.C.), as a well drilling contractor and such license is in full force and effect.

Ashley Jones — Print Name of Driller
Ashley Jones — Signature of Driller
11-23-06 — Date

Business Name Technicon Engineering Services

License Classification & License No. C-57 767888 Office No. (559) 276-9311 Cell No. (559) 994-7486

Address 4539 N. Brawley Fresno, CA 93722
Include City, State, and Zip

TYPE OF WORK		DRILLING METHOD		TYPE OF WELL			
Drilling	☒	Cable Tool	☐	Private	☐	Soil Boring	☐
Recondition	☐	Rotary	☒	Public Domestic	☐	Cathodic Protection	☐
Deepen	☐	Reverse Rotary	☐	Agricultural	☐	Other	
Destruction	☐	Air Rotary	☐	Industrial	☐		
Inactivation	☐	Other		Monitoring	☒		

CASING INFORMATION

Casing Material: Steel ☐ PVC ☒ Other _____

Diameter 2" Gauge 40 Thickness in inches 0.25

Perforations Yes ☒ No ☐

Slot Size 0.020 in

Perforation Depths 35' ft

WELL CONSTRUCTION

Proposed Depth of Well 130 ft

Gravel Packed Yes ☒ (#3 Sand) No ☐

Depth of Annular Seal 95 ft

SEAL MATERIAL		SEAL METHOD	
Neat Cement	☒	Pressure Grout	☐
Cement Grout	☐	Tremie Pipe	☒
Concrete	☐	Freefall/Pour	☒
Other		Other	

Permit Issued on: _____

Envision: PWSP
____Entered Well Permit Application
____Entered Well Completion Report
____Entered Results & Lat/Long Data

RECEIVED NOV 27 2006

MW-2

Initial Paragraphs 1 & 2

_____1. I hereby agree to comply with all regulations of Tulare County pertaining to well construction, recondition, deepening and destruction. Within 30 days of work completed, I will furnish Tulare County Environmental Health Services Division a completed well log for well construction, recondition, deepening and destruction.

_____2. I certify that I have read this application and declare under penalty of perjury that the information contained herein is true, correct and complete. I agree to comply with all county ordinances and state laws relating to building, development and construction. I hereby authorize representatives of Tulare County to enter the premises for the purpose of inspecting the work described herein for compliance with county requirements.

WHEN SIGNED BY TULARE COUNTY ENVIRONMENTAL HEALTH SERVICES DIVISION REPRESENTATIVE, this application shall be deemed a permit for the work described. THIS PERMIT SHALL EXPIRE upon completion of the job authorized; in any event shall expire 6 MONTHS from date of issuance. No changes from the approved plan are permitted without prior approval from this Division.

NOTICE: After permit approval an inspection must be scheduled at least 48 hours in advance at (559) 733-6441 for:

1. The sealing of the annular space on a public domestic well or a dairy well.
2. The destruction of all wells.
3. Any other operation stipulated on the permit by the county to deal with special or unusual conditions.

NOTE TO HOMEOWNERS: Contact Tulare County Environmental Health when private well construction and disinfection are complete and water samples can be obtained.

ENVIRONMENTAL HEALTH SERVICES DIVISION USE ONLY

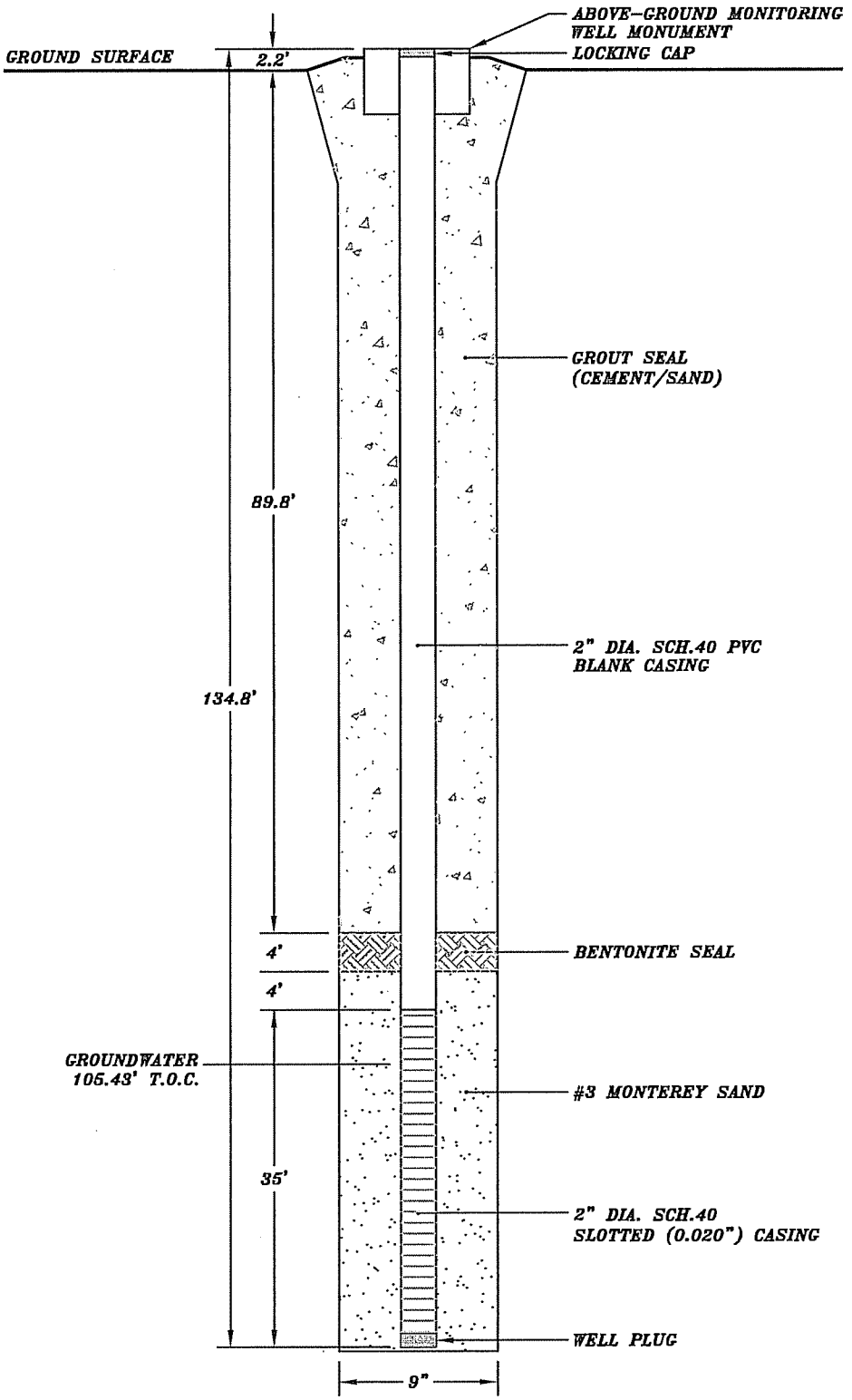
Fee Amount 91.00 Date Rec'd 11-27-06 Rec'd by J. P. Check No 37702 Receipt No 67035

Date Issued 11-27-06 Environmental Health Representative Ken Bowen

Conditions/Comments: Please install as per approved work plan and/or Bulletin 74-90

KB 11/27/06

MONITORING WELL MW-3
(LAT.: 36.24731°N, LONG.: 119.40475°W)



T.O.C.=TOP OF CASING

NOTE:
ALL MEASUREMENTS ARE TAKEN FROM THE TOP OF CASING

TECHNICON ENGINEERING SERVICES, INC.	PROJECT NO.: 16760 DRAWN BY: M.H.	MONITORING WELL #3 DETAIL H & R BARTHELEMY DAIRY KEYES CALIFORNIA ON WASHINGTON BOULEVARD TULARE, CALIFORNIA	FIGURE 4

*The free Adobe Reader may be used to view and complete this form. However, software must be purchased to complete, save, and reuse a saved form.

File Original with DWR

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e050767

Page 1 of 1

Owner's Well Number MW-3

Date Work Began 12/08/2006 Date Work Ended 12/9/2006

Local Permit Agency Tulare County Enviromental Health Services

Permit Number 06-438 Permit Date 11/27/06

DWR Use Only – Do Not Fill In

State Well Number/Site Number

N W

Latitude Longitude

APN/TRS/Other

Geologic Log

Orientation ⦿ Vertical ○ Horizontal ○ Angle Specify

Drilling Method Drilling Fluid

Depth from Surface Feet	to Feet	Description Describe material, grain size, color, etc
		Boring logs, well diagram, & site map attatched.

Total Depth of Boring 134 Feet

Total Depth of Completed Well 133 Feet

Well Owner

Name Roland Barthelemy

Mailing Address 16500 Chino Corona Rd.

City Chino State CA Zip 91710

Well Location

Address 2,600' south west of Palm Ave. & Oakdale Ave.

City Tulare County Tulare

Latitude Deg. Min. Sec. N Longitude Deg. Min. Sec. W

Datum WGS84 Decimal Lat. 36.24731 Decimal Long. 119.40475

APN Book 148 Page 070 Parcel 014

Township 19S Range 24E Section 29

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North

West East

South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

⦿ New Well
○ Modification/Repair
○ Deepen
○ Other
○ Destroy

Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
⦿ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other

Water Level and Yield of Completed Well

Depth to first water 103 (Feet below surface)

Depth to Static Water Level 103 (Feet) Date Measured 12/14/2006

Estimated Yield * (GPM) Test Type

Test Length (Hours) Total Drawdown (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)
0	98	9	Blank	PVC Sch. 40	0.25	2		
98	133	9	Screen	PVC Sch. 40	0.25	2	Milled Slots	0.020

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0	90	Cement	Neat Cement
90	94	Bentonite	Medium Chips
94	133	Filter Pack	#3 Sand

Attachments

☑ Geologic Log
☑ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☑ Other Site map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name Technicon Engineering Services
Person, Firm or Corporation

4539 N. Brawley Fresno CA 93722
Address City State Zip

Signed Ashley Grace Dept. Manager 1-31-07 767888
C-57 Licensed Water Well Contractor Date Signed C-57 License Number

DWR 188 REV. 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

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ENGINEERING SERVICES, Inc.

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Fresno, CA 93722

Ph: (559) 276-9311
Fax: (559) 276-9344

Project: H.R. Barthelemy Dairy Job #: 16760-V79

Boring #: MW-3 Surface Condition: Flat bare ground.

Drilled By: L. Mattos	Started: 12-8-06	Finished: 12-9-06
Equipment: CME-55	Surface Elevation (ft): Original Ground	
Auger Type: 9" H.S.A.	Completed Depth (ft): 134	
Logged By: J. Ruiz / Checked By: S. Curra	Groundwater Depth (ft): 103	

Depth (Feet)	Description	Blows per Foot	Moisture Content (%)	Dry Density (pcf)	Remarks
0					
5	Sandy Silt(ML), brown with white mottling,moist, stiff, fine grain sand.	13			
	Silty Sand(SM), brown, moist, fine grain trace of medium grain.				Change @ 7'
10	Poorly Graded Sand with Silt(SP-SM), light brown, moist, loose, fine to medium grain with coarse grain.	9			Change @ 10'
15	Medium dense, with fine gravel.	10			
					Increase in silt @ 17'
					Change @ 19'
20	Sandy Silt(ML), brown, moist, medium stiff, fine grain sand trace of medium grain sand, trace of clay.	4			
25	Stiff, fine grain sand.	12			
30	Silt(ML), brown with orange mottling, moist, stiff, with fine grain sand, trace of clay.	11			
35	Light brown, very stiff.	16			

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Logged By: J. Ruiz / Checked By: S. Curra	Groundwater Depth (ft): 103	

Depth (Feet)	Description	Blows per Foot	Moisture Content (%)	Dry Density (pcf)	Remarks
40	Sandy Silt(ML), brown with black mottling, moist, very stiff, fine grain sand trace of medium grain sand.	18			
45	Silty Sand(SM), brown, moist, medium dense, fine to medium grain.	23			Change @ 45'
50	Poorly Graded Sand(SP), tan, moist, medium dense, fine to medium grain trace of coarse grain.	25			Change @ 50'
55	Poorly Graded Sand with silt(SP-SM), light brown, moist, medium dense, fine to medium grain with coarse grain.	18			
					Change @ 58'
60	Clayey Silt(ML), brown with black mottling, moist, stiff, with fine grain sand.	12			
65	Light brown, trace of clay.	13			
70	Tan with white mottling, very stiff, trace of medium grain sand.	16			
75	Light brown, trace of fine grain sand.	15			Decreasing sand.

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Auger Type: 9" H.S.A.	Completed Depth (ft): 134	
Logged By: J. Ruiz / Checked By: S. Curra	Groundwater Depth (ft): 103	

Depth (Feet)	Description	Blows per Foot	Moisture Content (%)	Dry Density (pcf)	Remarks
80	Stiff, trace of clay.	14			
85	Sandy Silt(ML), brown, moist, very stiff, fine grain sand with medium grain sand.	17			
90	Fine to medium grain sand.	21			Increasing sand.
95	Poorly Graded Sand(SP), light brown, moist, medium dense, fine to medium grain with coarse grain.	23			Change @ 95'
100	Fine to coarse grain with fine gravel.	20			
	Wet trace of silt.	24	▽		Ground water encountered. Flowing sand surge @ 103'
105					
110					
115					

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Logged By: J. Ruiz / Checked By: S. Curra	Groundwater Depth (ft): 103	

Depth (Feet)	Description	Blows per Foot	Moisture Content (%)	Dry Density (pcf)	Remarks
120					
125					
130					
135					Bottom of boring at 134'. Bottom of well at 133'. GPS:N36.24731,W119.40475
140					
145					
150					
155					

Well Development Log

Project Name:	Barthelemy Dairy	Well ID:	MW-3
Project #:		Elevation (TOC):	N/A
Location:	SWC of Dairy	Well Diameter:	2"
	Facility	Well Depth (A):	134.62'
Date:	1-30-07	Depth to Water (B):	105.59
Sketch Map:		Water Column (A-B):	29.03
		Well Volume: 2" casing = 0.17 gal/ft. 4" casing = 0.66 gal/ft.	4.94 gal
		Borehole Volume: 8" hole = 2.78 gal/ft. 10" hole = 4.29 gal/ft.	
north		Purge Method:	Sub. Pump

GPS Location
N: 36.24731
W: 119.40475

TIME	VOLUME WITHDRAWN (gallons)	TEMP (C/F)	pH	EC (mhos/cm)	REMARKS
3:45	1	63.6°	7.48	937.5	Turbid
3:47	3	64.5°	7.14	1087	very cloudy
3:49	5	65.3	7.10	1146	"
3:51	7	65.2	7.17	1173	"
3:52	9	65.0	7.23	1194	"
3:54	11	65.2	7.01	1197	cloudy
3:56	13	64.7	7.17	1206	"
3:58	15	64.8	7.24	1160	"
4:01	17	65.3	7.04	1178	"
4:05	20	65.2	7.10	1136	slightly cloudy - stp. pmp.
5:18	25	62.1	7.09	1163	surge & repump - cloudy
5:23	30	64.4	7.31	1140	very cloudy
5:29	35	65.1	7.44	1128	cloudy
5:35	40	64.8	7.39	1137	"

Technician C. Barsamian Signature: [signature] Date: 1/30/07

TULARE COUNTY ENVIRONMENTAL HEALTH SERVICES DIVISION
5957 SOUTH MOONEY BLVD., VISALIA, CA 93277
PHONE (559) 733-6441 FAX (559) 733-6932

WP _____ Permit No 06-438

WELL PERMIT APPLICATION

Legal Property Owner Roland Barthelemy Phone No 1-909-613-5080

Mailing Address 16500 Chino Corona Rd. Chino, CA 91710
Address City State/Zip Code

Site Address/Location of Well MW-3 (2,600' South west of Palm Ave. + Oakdale Ave. Tulare, CA
MW-4 (At the intersection of Palm Ave. + Oakdale Ave. Tulare, C

Assessor's Parcel Number 148-070-014 Township-Range-Section T 19S R 24E S 29

Parcel Size 64.49 Acre(s) Drilling Area: Valley ☒ Foothills or Mountains ☐ Project Start Date 11-30-06

LICENSED CONTRACTOR DECLARATION
Licensed under the provisions of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code (B. & P.C.), as a well drilling contractor and such license is in full force and effect.

Ashley Jones — Print Name of Driller
Ashley Jones — Signature of Driller
11-23-06 — Date

Business Name Technicon Engineering Services

License Classification & License No. C-57 767888 Office No. (559) 276-9311 Cell No. (559) 994-7486

Address 4539 N. Brawley Fresno, CA 93722
Include City, State, and Zip

TYPE OF WORK
- Drilling ☒
- Recondition ☐
- Deepen ☐
- Destruction ☐
- Inactivation ☐

DRILLING METHOD
- Cable Tool ☐
- Rotary ☒
- Reverse Rotary ☐
- Air Rotary ☐
- Other _____

TYPE OF WELL
- Private ☐
- Public Domestic ☐
- Agricultural ☐
- Industrial ☐
- Monitoring ☒
- Soil Boring ☐
- Cathodic Protection ☐
- Other _____

CASING INFORMATION

Casing Material: Steel ☐ PVC ☒ Other _____

Diameter 2" Gauge 40 Thickness in inches 0.25

Perforations Yes ☒ No ☐

Slot Size 0.020 in

Perforation Depths 35' ft

WELL CONSTRUCTION

Proposed Depth of Well 130 ft

Gravel Packed Yes ☒ No ☐ #3 Sand

Depth of Annular Seal 95 ft

SEAL MATERIAL
- Neat Cement ☒
- Cement Grout ☐
- Concrete ☐
- Other _____

SEAL METHOD
- Pressure Grout ☐
- Tremie Pipe ☒
- Freefall/Pour ☒
- Other _____

Permit Issued on: _____

Envision: PWSP
____Entered Well Permit Application
____Entered Well Completion Report
____Entered Results & Lat/Long Data

RECEIVED NOV 27 2006

MW-3
MW-4

Initial Paragraphs 1 & 2

_____1. I hereby agree to comply with all regulations of Tulare County pertaining to well construction, recondition, deepening and destruction. Within 30 days of work completed, I will furnish Tulare County Environmental Health Services Division a completed well log for well construction, recondition, deepening and destruction.

_____2. I certify that I have read this application and declare under penalty of perjury that the information contained herein is true, correct and complete. I agree to comply with all county ordinances and state laws relating to building, development and construction. I hereby authorize representatives of Tulare County to enter the premises for the purpose of inspecting the work described herein for compliance with county requirements.

WHEN SIGNED BY TULARE COUNTY ENVIRONMENTAL HEALTH SERVICES DIVISION REPRESENTATIVE, this application shall be deemed a permit for the work described. THIS PERMIT SHALL EXPIRE upon completion of the job authorized; in any event shall expire 6 MONTHS from date of issuance. No changes from the approved plan are permitted without prior approval from this Division.

NOTICE: After permit approval an inspection must be scheduled at least 48 hours in advance at (559) 733-6441 for:

1. The sealing of the annular space on a public domestic well or a dairy well.
2. The destruction of all wells.
3. Any other operation stipulated on the permit by the county to deal with special or unusual conditions.

NOTE TO HOMEOWNERS: Contact Tulare County Environmental Health when private well construction and disinfection are complete and water samples can be obtained.

ENVIRONMENTAL HEALTH SERVICES DIVISION USE ONLY

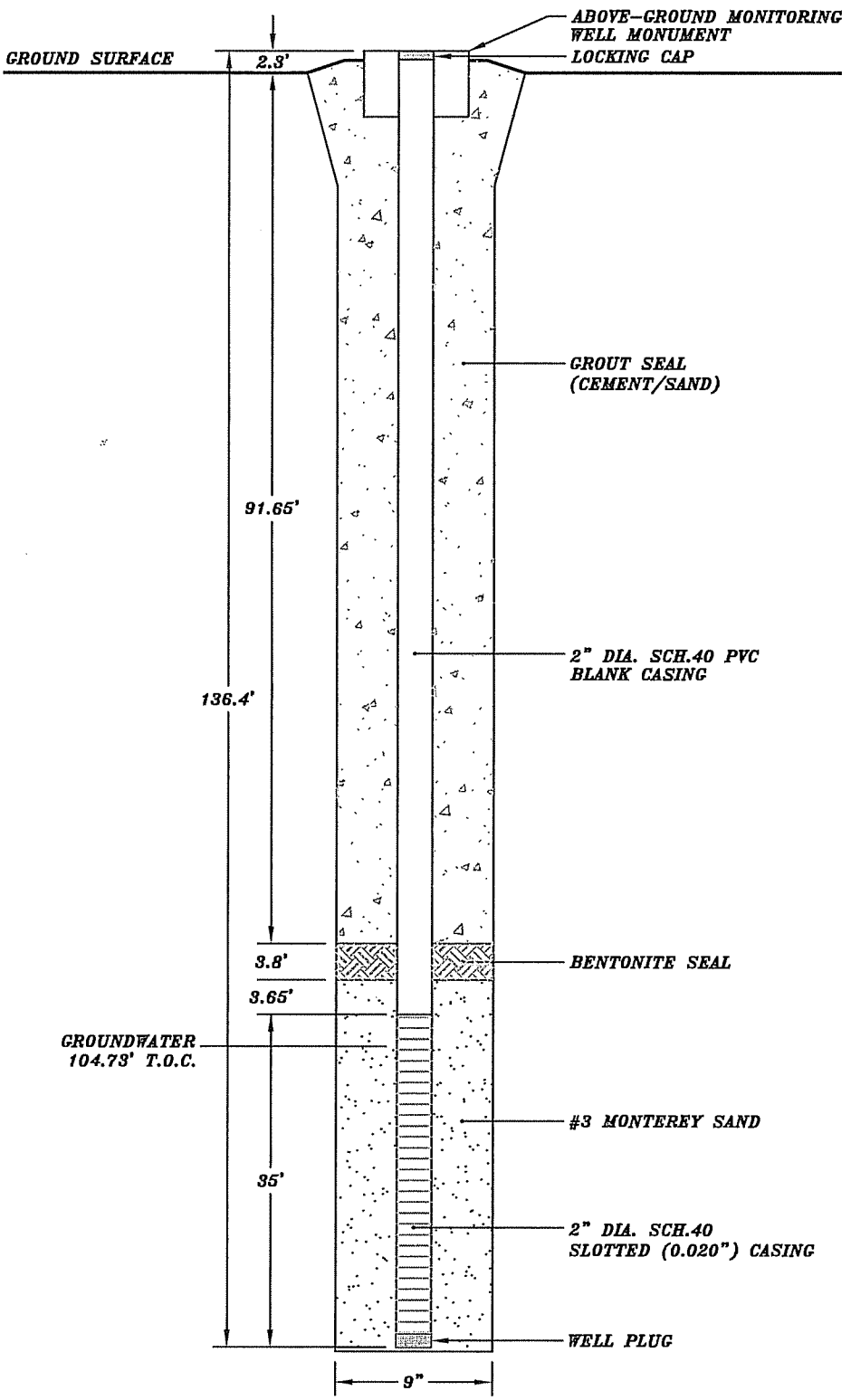
Fee Amount 91-00 Date Rec'd 11-27-06 Rec'd by J.P. Check No 37702 Receipt No 67035

Date Issued 11-27-06 Environmental Health Representative Ken Bowman

Conditions/Comments: Please install as per approved work plan and/or Bulletin 74-90

KB 11/27/06

MONITORING WELL MW-5
(LAT.: 36.26151°N, LONG.: 119.40195°W)



NOTE:
ALL MEASUREMENTS ARE TAKEN FROM THE TOP OF CASING

T.O.C.=TOP OF CASING

TECHNICON ENGINEERING SERVICES, INC.	PROJECT NO.: 16760 DRAWN BY: M.H.	MONITORING WELL #5 DETAIL H & R BARTHELEMY DAIRY KEYES CALIFORNIA ON WASHINGTON BOULEVARD TULARE, CALIFORNIA	FIGURE 5

*The free Adobe Reader may be used to view and complete this form. However, software must be purchased to complete, save, and reuse a saved form.

File Original with DWR

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e050768

Page 1 of 1

Owner's Well Number MW-5

Date Work Began 12/04/2006 Date Work Ended 12/5/2006

Local Permit Agency Tulare County Enviromental Health Services

Permit Number 06-439 Permit Date 11/27/06

DWR Use Only – Do Not Fill In

State Well Number/Site Number

N W

Latitude Longitude

APN/TRS/Other

Geologic Log

Orientation ⦿ Vertical ○ Horizontal ○ Angle Specify

Drilling Method Drilling Fluid

Depth from Surface Feet	to Feet	Description Describe material, grain size, color, etc
		Boring logs, well diagram, & site map attatched.

Total Depth of Boring 135 Feet

Total Depth of Completed Well 134 Feet

Well Owner

Name Roland Barthelemy

Mailing Address 16500 Chino Corona Rd.

City Chino State CA Zip 91710

Well Location

Address South east corner of Palm Ave. & Ave. 260

City Tulare County Tulare

Latitude Deg. Min. Sec. N Longitude Deg. Min. Sec. W

Datum WGS84 Decimal Lat. 36.26151 Decimal Long. 119.40195

APN Book 148 Page 030 Parcel 027

Township 19S Range 24E Section 19

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North

West East

South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

⦿ New Well

○ Modification/Repair

○ Deepen

○ Other

○ Destroy

Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply

☐ Domestic ☐ Public

☐ Irrigation ☐ Industrial

○ Cathodic Protection

○ Dewatering

○ Heat Exchange

○ Injection

⦿ Monitoring

○ Remediation

○ Sparging

○ Test Well

○ Vapor Extraction

○ Other

Water Level and Yield of Completed Well

Depth to first water 102 (Feet below surface)

Depth to Static Water Level 102 (Feet) Date Measured 12/14/2006

Estimated Yield * (GPM) Test Type

Test Length (Hours) Total Drawdown (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)
0	99	9	Blank	PVC Sch. 40	0.25	2		
99	134	9	Screen	PVC Sch. 40	0.25	2	Milled Slots	0.020

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0	92	Cement	Neat Cement
92	96	Bentonite	Medium Chips
96	134	Filter Pack	#3 Sand

Attachments

☑ Geologic Log

☑ Well Construction Diagram

☐ Geophysical Log(s)

☐ Soil/Water Chemical Analyses

☑ Other Site map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name Technicon Engineering Services (Person, Firm or Corporation)

4539 N. Brawley (Address) Fresno (City) CA (State) 93722 (Zip)

Signed [signature] Dept. Manager (C-57 Licensed Water Well Contractor) 1-31-07 (Date Signed) 767888 (C-57 License Number)

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TECHNICON
ENGINEERING SERVICES, Inc.

4539 N. Brawley Ave., #108
Fresno, CA 93722

Ph: (559) 276-9311
Fax: (559) 276-9344

Project: H.R. Barthelemy Dairy Job #: 16760-V79

Boring #: MW-5 Surface Condition: Flat bare ground with patches of grass.

Drilled By: L. Mattos	Started: 12-4-06	Finished: 12-5-06
Equipment: CME-55	Surface Elevation (ft): Original Ground	
Auger Type: 9" H.S.A.	Completed Depth (ft): 135	
Logged By: J. Ruiz Checked By: S. Curra	Groundwater Depth (ft): 102	

Depth (Feet)	Description	Blows per Foot	Moisture Content (%)	Dry Density (pcf)	Remarks
0					
5	Sandy Silt(ML), brown,moist, stiff, fine grain sand trace of medium grained sand.	14			
10	With fine grain sand.	13			Decrease in sand.
15	Silt (ML), brown, moist, stiff, trace of fine grain sand.	9			
20	Medium stiff, trace of clay.	8			
25	Stiff.	11			
30	With fine grain sand.	14			Increase in sand.
35	Very stiff.	18			

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Auger Type: 9" H.S.A.	Completed Depth (ft): 135	
Logged By: J. Ruiz / Checked By: S. Curra	Groundwater Depth (ft): 102	

Depth (Feet)	Description	Blows per Foot	Moisture Content (%)	Dry Density (pcf)	Remarks
40	Sandy Silt(ML), light brown with orange mottling, very moist, stiff, fine grain sand with medium grain sand.	20			
45	Silty Sand(SM), brown, moist, medium dense, fine to medium grain trace of coarse grain.	14			Change @ 45'
50	With coarse grain.	19			
55	Dense.	31			Increase in sand.
60	Poorly Graded Sand with Silt(SP-SM), tan, moist, medium dense, fine to medium grain with coarse grain.	23			Change @ 60'
65	Poorly Graded Sand(SP), tan, moist, medium dense, fine to medium grain with coarse grain.	20			
70	Silty Sand(SM), brown, moist, medium dense, fine to medium grain.	17			Change @ 70'
75	With coarse grain, trace of clay.	24			

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Auger Type: 9" H.S.A.	Completed Depth (ft): 135	
Logged By: J. Ruiz Checked By: S. Curra	Groundwater Depth (ft): 102	

Depth (Feet)	Description	Blows per Foot	Moisture Content (%)	Dry Density (pcf)	Remarks
80	Clayey Silt(ML), brown, moist, very stiff, slightly plastic, trace of fine grain sand.	19			Change @ 80'
85	Very stiff, with fine grain sand.	27			
90	Silt(ML), light brown, moist, hard, with fine grain sand.	31			
95	Tan, trace of medium grain.	33			
100	Sandy Silt(ML), brown, moist, very stiff, fine grain sand.	28			
			▽		Change @ 103' Ground water encountered.
105	Poorly Graded Sand(SP), tan, wet, medium dense, fine to medium grain with coarse grain.	25			
110					
115					

TECHNICON
ENGINEERING SERVICES, Inc.

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Auger Type: 9" H.S.A.	Completed Depth (ft): 135	
Logged By: J. Ruiz / Checked By: S. Curra	Groundwater Depth (ft): 102	

Depth (Feet)	Description	Blows per Foot	Moisture Content (%)	Dry Density (pcf)	Remarks
120					
125					
130					
135					Bottom of boring at 135'. Bottom of well at 134'. GPS:N36.26151, W119.40195
140					
145					
150					
155					

Well Development Log

Project Name:	Barthelemy Dairy	Well ID:	MW-5
Project #:		Elevation (TOC):	
Location:	N. Palm & Ave 260	Well Diameter:	2"
	Tulare Co., CA	Well Depth (A):	136.25'
Date:	1-30-07	Depth to Water (B):	105.03'
Sketch Map:		Water Column (A-B):	31.22'
		Well Volume: 2" casing = 0.17 gal/ft. 4" casing = 0.66 gal/ft.	5.31 gal
		Borehole Volume: 8" hole = 2.78 gal/ft. 10" hole = 4.29 gal/ft.	
north		Purge Method:	Sub. Pump

GPS Location
N: 36.26151
W: 119.40195

TIME	VOLUME WITHDRAWN (gallons)	TEMP (C/F)	pH	EC (mhos/cm)	REMARKS
2:55	1 gallon	64.8°	6.90	626.5	very turbid
2:58	3 gal	66.3°	7.54	587.6	turbid
3:00	5 gal	66.5°	7.62	571.2	"
3:02	7 gal	66.7	7.62	557.4	very cloudy
3:04	9 gal	66.9	7.68	542.5	cloudy
3:07	10 gal	67.0	7.67	531.1	~~slightly~~ cloudy
3:09	13 gal	67.1	7.67	520.2	"
3:11	15 gal	67.2	7.66	513.2	slightly cloudy
3:13	17 gal	67.1	7.66	511.1	"
3:16	20 gal	67.0	7.65	514.0	" STOP PUMPING
4:36	25 gal	63.6	7.96	527.4	SURGE & RE PUMP - TURBID
4:40	30 gal	65.5	7.88	527.4	very cloudy
4:46	35 gal	65.9	7.73	515.1	slight cloudy
4:51	40 gal	66.5	7.71	510.9	" STOP PUMPING

Technician: C. Barsamian Signature: [signature] Date: 1/30/07

TULARE COUNTY ENVIRONMENTAL HEALTH SERVICES DIVISION
5957 SOUTH MOONEY BLVD., VISALIA, CA 93277
PHONE (559) 733-6441 FAX (559) 733-6932

WP _____ Permit No 06-439

WELL PERMIT APPLICATION

Legal Property Owner Roland Barthelemy Phone No 1-909-613-5080

Mailing Address 16500 Chino Corona Rd. Chino, CA 91710
Address City State/Zip Code

Site Address/Location of Well South East corner of Palm Ave. + Ave. 260 Tulare, CA

Assessor's Parcel Number 148-030-027 Township-Range-Section T 19S R 24E S 19+20

Parcel Size 154.6 Acre(s) Drilling Area: Valley ☒ Foothills or Mountains ☐ Project Start Date 12-2-06

LICENSED CONTRACTOR DECLARATION

Licensed under the provisions of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code (B. & P.C.), as a well drilling contractor and such license is in full force and effect.

Ashley Jones — Print Name of Driller
Ashley Jones — Signature of Driller
11-23-06 — Date

Business Name Technicon Engineering Services

License Classification & License No. C-57 767888 Office No. (559) 276-9311 Cell No. (559) 994-7486

Address 4539 N. Brawley Fresno, CA 93722
Include City, State, and Zip

TYPE OF WORK
- Drilling ☒
- Recondition ☐
- Deepen ☐
- Destruction ☐
- Inactivation ☐

DRILLING METHOD
- Cable Tool ☐
- Rotary ☒
- Reverse Rotary ☐
- Air Rotary ☐
- Other _____

TYPE OF WELL
- Private ☐
- Public Domestic ☐
- Agricultural ☐
- Industrial ☐
- Monitoring ☒
- Soil Boring ☐
- Cathodic Protection ☐
- Other _____

CASING INFORMATION

Casing Material: Steel ☐ PVC ☒ Other _____

Diameter 2" Gauge 40 Thickness in inches 0.25

Perforations Yes ☒ No ☐

Slot Size 0.020 in

Perforation Depths 35' ft

WELL CONSTRUCTION

Proposed Depth of Well 130 ft

Gravel Packed Yes ☒ No ☐ #3 Sand

Depth of Annular Seal 95 ft

SEAL MATERIAL
- Neat Cement ☒
- Cement Grout ☐
- Concrete ☐
- Other _____

SEAL METHOD
- Pressure Grout ☐
- Tremie Pipe ☒
- Freefall/Pour ☒
- Other _____

Permit Issued on: _____

Envision: PWSP
____ Entered Well Permit Application
____ Entered Well Completion Report
____ Entered Results & Lat/Long Data

RECEIVED NOV 27 2006

19 24 20

MW-5

Initial Paragraphs 1 & 2

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NOTE TO HOMEOWNERS: Contact Tulare County Environmental Health when private well construction and disinfection are complete and water samples can be obtained.

ENVIRONMENTAL HEALTH SERVICES DIVISION USE ONLY

Fee Amount 91.00 Date Rec'd 11-27-06 Rec'd by J.P. Check No 37702 Receipt No 67035

Date Issued 11-27-06 Environmental Health Representative Ken Bowen

Conditions/Comments: Please install as per approved workplan and for Bulletin 74-90.

11/27/06

JAD

DEE
LPS

MEC
Macedo Engineering & Consulting

November 7, 2011

RECEIVED
NOV 16 2011
RWQCB-CVR
FRESNO, CALIF.

Mr. Dale Essary
California Regional Water Quality Control Board
1685 E Street
Fresno, CA 93706

RE: J&A Dairy, WDID# 5C54NC00014, ~~12400~~ 12212 Ave 176, Tulare County.

Dear Mr. Essary,

Please find the enclosed First Semiannual 2011 Groundwater Monitoring Report for J&A Dairy. If you should have any questions please feel free to call our office.

Regards,

Josh Spink

cc: J&A Dairy, Gerben Leyendekker
File

Attachments: First Semiannual 2011 Groundwater Monitoring Report

4001 South K Street
Tulare, CA 93274

(559) 688-7688
(559) 688-7801 (fax)

First Semiannual 2011 Groundwater Monitoring Report

RECEIVED
NOV 16 2011
RWQCB-CVR
FRESNO, CALIF.

J&A Dairy
Tulare, Tulare County, California

April 26, 2011, Monitoring Event

REGISTERED PROFESSIONAL ENGINEER
MICHAEL C MITCHELL
C49434
EXP 09/30/2012
CIVIL
STATE OF CALIFORNIA
10/24/11

Prepared by:
Macedo Engineering & Consulting
4001 South K St.
Tulare, California 93274
(559) 688-7688

MEC
Macedo Engineering & Consulting

TABLE OF CONTENTS

1.0 INTRODUCTION 1

2.0 HISTORY 1
- 2.1 Site Description 1
- 2.2 Monitoring Wells 1
- 2.3 Monitoring Well Construction 1
- 2.4 Well Survey Data 1

3.0 MONITORING PROCEDURES 1
- 3.1 Monitoring Well Samples 1
- 3.2 Well Water Sampling 2

4.0 GROUNDWATER MONITORING 2

5.0 LABORATORY ANALYTICAL RESULTS 2
- 5.1 Groundwater Analytical Results 2
- 5.2 Manure Effluent Analytical Results 2
- 5.3 Well Water Analytical Results 2

6.0 CONCLUSION 3

TABLES

Table 1 Construction and Survey Details
Table 2 Depth to Groundwater
Table 3 Groundwater Analytical Results
Table 4 Manure Effluent Analytical Results
Table 5 Well Water Analytical Results

FIGURES

Figure 1 Site Location Map

ATTACHMENTS

Attachment 1 – Supply Well Locations
Attachment 2 – Site Plan
Attachment 3 – MEC Groundwater Field Monitoring Summary Report
Attachment 4 – Groundwater Analytical Results and Chain of Custody
Attachment 5 – Effluent Analytical Results and Chain of Custody
Attachment 6 – Well Water Analytical Results and Chain of Custody

1.0 INTRODUCTION

Macedo Engineering & Consulting (MEC) was retained by J&A Dairy to conduct their first semiannual 2011 groundwater monitoring event. This report summarizes the activity conducted during the monitoring event on April 26, 2011, and the analysis of all samples taken.

2.0 HISTORY

2.1 Site Description

J&A Dairy is located within Tulare County in portions of Sections 8, 17, and 18 of Township 21 South and Range 25 East. The facility address is 12400 Ave 176, Tulare, California. This dairy operates under County of Tulare Conditional Use Permit No. 73-014. There are approximately 537 acres of cropland affiliated with this facility. A site location map is provided on Figure 1.

2.2 Monitoring Wells

The original monitoring work plan was prepared by Moore Twining Associates, Inc., of Fresno, California. This work plan was approved by the California Regional Water Quality Control Board. The location of the monitoring wells and all domestic and irrigation wells for this dairy facility are shown in Attachment 1.

There are three monitoring wells located on the dairy. Monitoring well 1 (MW1) is located adjacent to the corrals on the southwest part of the dairy. MW2 is located adjacent to Irrigation Well #3. MW3 is located in the drive west of the ponds, between fields #2 and #3 (Attachment 2).

2.3 Monitoring Well Construction

The Twining Laboratories, Inc., installed the three monitoring wells in January 2004. All three wells were installed to depths of 68 to 70 feet below ground surface. The monitoring wells were constructed from 2-inch diameter schedule 40 polyvinyl chloride pipe. Each well has approximately 43 feet of perforated and screened interval. Well construction detail is shown in Table 1.

2.4 Well Survey Data

The well surveys were performed in January 2004 by licensed surveyor J.M Kazynski. Well survey detail of each monitoring well is shown in Table 1.

3.0 MONITORING PROCEDURES

3.1 Monitoring Well Samples

A representative from MEC measured the static depth to water in all groundwater monitoring wells to one hundredth of an inch for with a Solinist depth to water meter.

This meter was decontaminated with alconox after each reading and once again prior to the next reading. Each well was sounded for depth to water and total depth in order to determine the water column and calculate the required purge volume. The water was analyzed in the field for pH, electrical conductance, and temperature; the color and odor were noted; and the results were recorded in the sampling log (Attachment 3).

A sample was collected after the final purge was complete. All samples were labeled and logged into a chain-of-custody form. Samples were then placed into an ice chest with blue ice and transported to A & L Western Laboratories, Inc. (A&L), upon completion of the sampling event.

3.2 Well Water Sampling

A representative from MEC collected samples from the irrigation and domestic wells. The collected samples were labeled with well location, description, date, and time. All samples were labeled and logged into a chain-of-custody form and field activity report. Samples were then placed into an ice chest with blue ice and transported to A&L.

4.0 GROUNDWATER MONITORING

Based on the April 26, 2011, soundings, first encountered groundwater is at depths that range from 53 to 63 feet below the top of the monitoring well casings (Table 2). The standing water column in the monitoring wells ranged from 6 to 15 feet deep. Well MW2 was dry.

The highest groundwater level was recorded in well MW1 and the lowest in well MW3. A groundwater contour map was not developed due to well MW2 being dry.

5.0 LABORATORY ANALYTICAL RESULTS

5.1 Groundwater Analytical Results

Analytical results of groundwater samples collected on April 26, 2011, are provided in Table 3. Copies of the laboratory analytical results and chain-of-custody forms for groundwater analytical results are provided in Attachment 4.

5.2 Manure Effluent Analytical Results

Analytical results of the manure effluent sample are provided in Table 4. Copies of the laboratory analytical result and chain-of-custody form for the manure effluent sample are provided in Attachment 5.

5.3 Well Water Analytical Results

Analytical results of water samples from irrigation and domestic wells are provided in Table 5. Copies of the laboratory analytical results, chain-of-custody forms, and field activity reports for the well water samples are provided in Attachment 6.

6.0 CONCLUSION

Proper management of the nutrient resources on the dairy is important in maintaining groundwater quality. J&A Dairy has been supplying monitoring information to the Regional Water Quality Control Board since 2004. This dairy has and will continue to maintain good wastewater management practices.

TABLES

TABLE 1
CONSTRUCTION AND SURVEY DETAILS[1]

J&A Dairy
Tulare Tulare County, California

Monitoring Well	Casing Diameter (inches)	Perforated Interval (feet bgs)[2]	Gravel Pack Interval (feet bgs)	Seal Depth Interval (feet bgs)	Relative Casing-Top Elevation (feet AMSL)[3]
MW1	2	49-69	47-69	0-47	275.91
MW2	2	50-70	46-70	0-46	278.99
MW3	2	48-68	46-68	0-46	260.80

1. Surveyed by J.M. Kazynski in January 2004.
2. Feet bgs = feet below ground surface.
3. Feet AMSL = feet above mean sea level.

TABLE 2
DEPTH TO GROUNDWATER

J&A Dairy
Tulare Tulare County, California

Monitoring Well	Relative Casing-Top Elevation (feet AMSL)[1]	Date	Depth to Water (feet BTOC)[2]	Relative Water Table Elevation (feet)
MW1	275.91	01/20/04	50.13	225.78
		08/20/07	56.09	219.82
		12/21/07	58.44	217.47
		06/24/08	64.21	211.70
		12/29/08	65.86	210.05
		07/09/09	Dry	--
		12/29/09	Dry	--
		04/28/10	Dry	--
		11/30/10	Dry	--
		04/26/11	63.10	212.81
MW2	278.99	01/20/04	56.80	222.19
		08/20/07	61.92	217.07
		12/21/07	63.98	215.01
		06/24/08	Dry	--
		12/29/08	Dry	--
		07/09/09	Dry	--
		12/29/09	Dry	--
		04/28/10	Dry	--
		11/30/10	Dry	--
		04/26/11	Dry	--
MW3	260.8	01/20/04	44.66	216.14
		08/20/07	46.56	214.24
		12/21/07	51.91	208.89
		06/24/08	57.13	203.67
		12/29/08	58.18	202.62
		07/09/09	62.50	198.30
		12/29/09	64.23	196.57
		04/28/10	66.32	194.48
		11/30/10	54.50	206.30
		04/26/11	53.10	207.70

1. Feet above mean sea level (AMSL) as measured from the top of the casing. Surveyed by J.M. Kazynski in January 2004.
2. Feet below top of casing (BTOC).

TABLE 3
GROUNDWATER ANALYTICAL RESULTS

J&A Dairy
Tulare Tulare County, California

Monitoring Well	Date	Lab ID	Analytical Results[1]																			
			Na (meq/L)	Ca (meq/L)	Mg (meq/L)	CO_3 (meq/L)	HCO_3 (meq/L)	Cl (meq/L)	EC (dS/m)	pH	Fe (ppm)	Mn (ppm)	P (ppm)	K (ppm)	SO_4 (ppm)	B (ppm)	TDS (ppm)	Hardness (mg/L)	NO_2-N (mg/L)	NO_3-N (mg/L)	NH_4-N (mg/L)	TKN (mg/L)
MW1	01/20/04	--	4.78	5.99	1.48	<0.03	8.85	1.30	1.10	7.0	<0.1	0.028	na	3.0	45	na	760	na	na	na	na	1.6
	08/20/07	--	0.91	1.75	0.30	<0.67	7.70	0.90	1.00	7.1	<0.1	<0.005	na	<1.0	61	na	740	na	na	na	na	2.6
	12/21/07	--	3.48	6.99	1.40	<0.67	7.87	0.90	0.99	7.1	<0.1	<0.005	na	1.2	61	na	780	na	na	na	na	<1.0
	06/24/08	--	3.52	7.49	1.48	<0.67	8.69	1.02	1.10	7.2	<0.2	<0.01	na	<2.0	62	na	790	450	<0.91	23	na	3.3
	12/29/08	--	3.48	7.49	1.40	<0.67	8.85	0.99	1.00	7.4	0.5	0.0092	na	1.3	67	na	780	440	<0.61	21	<1.0	2.5
	07/09/09	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/29/09	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	04/28/10	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/30/10	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	04/26/11	62179	3.78	9.13	2.06	0.00	10.00	1.24	1.11	7.1	0.50	0.01	<0.01	1.1	76	0.15	1,133	560	<0.6	24.2	<0.3	<0.3
MW2	01/20/04	--	6.09	8.98	2.71	<0.03	21.31	3.67	1.50	6.8	<0.1	1.5	na	7.2	45	na	1,000	na	na	na	na	2.4
	08/20/07	--	3.52	8.98	1.97	<0.67	9.01	1.30	1.30	6.8	<0.1	0.018	na	2.1	65	na	910	na	na	na	na	1.9
	12/21/07	--	4.00	10.48	2.22	<0.67	9.34	1.97	1.40	6.8	<0.1	0.038	na	2.3	75	na	1,100	na	na	na	na	1.3
	06/24/08	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/29/08	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	07/09/09	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/29/09	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	04/28/10	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/30/10	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	04/26/11	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW3	01/20/04	--	3.78	5.99	1.64	<0.03	8.20	1.10	1.00	7.1	<0.1	<0.03	na	3.3	78	na	720	na	na	na	na	2.0
	08/20/07	--	3.48	6.99	1.48	<0.67	6.88	0.37	1.00	7.2	<0.1	<0.005	na	1.6	150	na	780	na	na	na	na	2.0
	12/21/07	--	3.48	6.49	1.40	<0.67	7.05	0.45	0.96	7.2	<0.1	<0.005	na	1.7	130	na	760	na	na	na	na	<1.0
	06/24/08	--	3.30	6.99	1.48	<0.67	7.21	0.37	0.96	7.3	<0.2	<0.01	na	<2.0	120	na	730	420	<0.91	16	na	3.0
	12/29/08	--	3.48	6.49	1.32	<0.67	6.72	0.45	0.98	7.4	<0.1	<0.005	na	1.7	140	na	760	400	<0.61	16	na	1.4
	07/09/09	67653	3.96	7.98	1.73	0.00	6.70	0.54	1.09	7.2	0.35	0.01	<0.01	2.9	197	0.04	981	486	<0.6	18.3	<0.3	<0.3
	12/29/09	62698	3.78	7.73	1.73	0.00	7.66	0.51	0.99	7.2	0.68	0.02	<0.01	2.1	145	0.06	995	474	<0.6	22.6	<0.3	<0.3
	04/28/10	64327	4.09	7.68	1.97	0.00	8.05	0.90	0.97	7.2	7.31	0.14	<0.01	2.7	147	0.14	1,013	483	<0.6	15.3	<0.3	0.7

TABLE 3
GROUNDWATER ANALYTICAL RESULTS

Monitoring Well	Date	Lab ID	Analytical Results[1]																			
			Na (meq/L)	Ca (meq/L)	Mg (meq/L)	CO_3 (meq/L)	HCO_3 (meq/L)	Cl (meq/L)	EC (dS/m)	pH	Fe (ppm)	Mn (ppm)	P (ppm)	K (ppm)	SO_4 (ppm)	B (ppm)	TDS (ppm)	Hardness (mg/L)	NO_2-N (mg/L)	NO_3-N (mg/L)	NH_4-N (mg/L)	TKN (mg/L)
MW3	11/30/10	60255	3.13	6.24	1.40	0.00	7.39	0.65	0.98	7.1	0.19	0.01	<0.01	0.9	117	0.05	863	382	<0.6	12.9	<1.0	1.0
continued	04/26/11	62180	3.70	6.79	1.73	0.00	7.90	0.76	0.93	7.4	0.80	0.02	0.04	1.4	114	0.14	928	426	<0.6	13.8	<0.3	<0.3

1. Na = sodium, Ca = calcium, Mg = magnesium, CO_3 = carbonate, HCO_3 = bicarbonate, Cl = chloride, EC = conductivity, Fe = iron, Mn = manganese, P = phosphorus, K = potassium, SO_4 = sulfate, B = boron, TDS = total dissolved solids, NO_2-N = nitrite as nitrogen, NO_3-N = nitrate as nitrogen, NH_4-N = ammonium as nitrogen, TKN = total Kjeldahl nitrogen, meq/L = milliequivalents per liter, dS/m = deciSiemens per meter, ppm = parts per million, mg/L = milligrams per liter, na = not analyzed, < = less than the detection limit shown, -- = not sampled.
Laboratory results for Na, Ca, CO_3, HCO_3, Cl, and Mg were previously reported in mg/L. These values have been converted to meq/L.
Laboratory results for EC were previously reported in micromhos per centimeter. These values have been converted to dS/m.

TABLE 4
MANURE EFFLUENT ANALYTICAL RESULTS

J&A Dairy
Tulare Tulare County, California

Sample Location	Date	Lab ID	Analytical Results[1]															
			TKN (mg/L)	NH_4-N (mg/L)	NO_3-N (mg/L)	TDS (mg/L)	pH	EC (µmhos/cm)	CO_3 as $CaCO_3$ (mg/L)	HCO_3 as $CaCO_3$ (mg/L)	Total P (mg/L)	K (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Na (mg/L)	Cl (mg/L)	SAR
Wastewater	05/19/11	62465	286	206	<0.5	1544	7.2	3,480	0	2,250	63	253	71	167	63	173	239	2.88

1. TKN = total Kjeldahl nitrogen, NH_4-N = ammonium as nitrogen, NO_3-N = nitrate as nitrogen, TDS = total dissolved solids, EC = specific conductance, CO_3 = carbonate, $CaCO_3$ = calcium carbonate, HCO_3 = bicarbonate, P = phosphorus, K = potassium, SO_4 = sulfate, Ca = calcium, Mg = magnesium, Na = sodium, Cl = chloride, SAR = sodium adsorption ratio, mg/L = milligrams per liter, µmhos/cm = micromhos per centimeter.

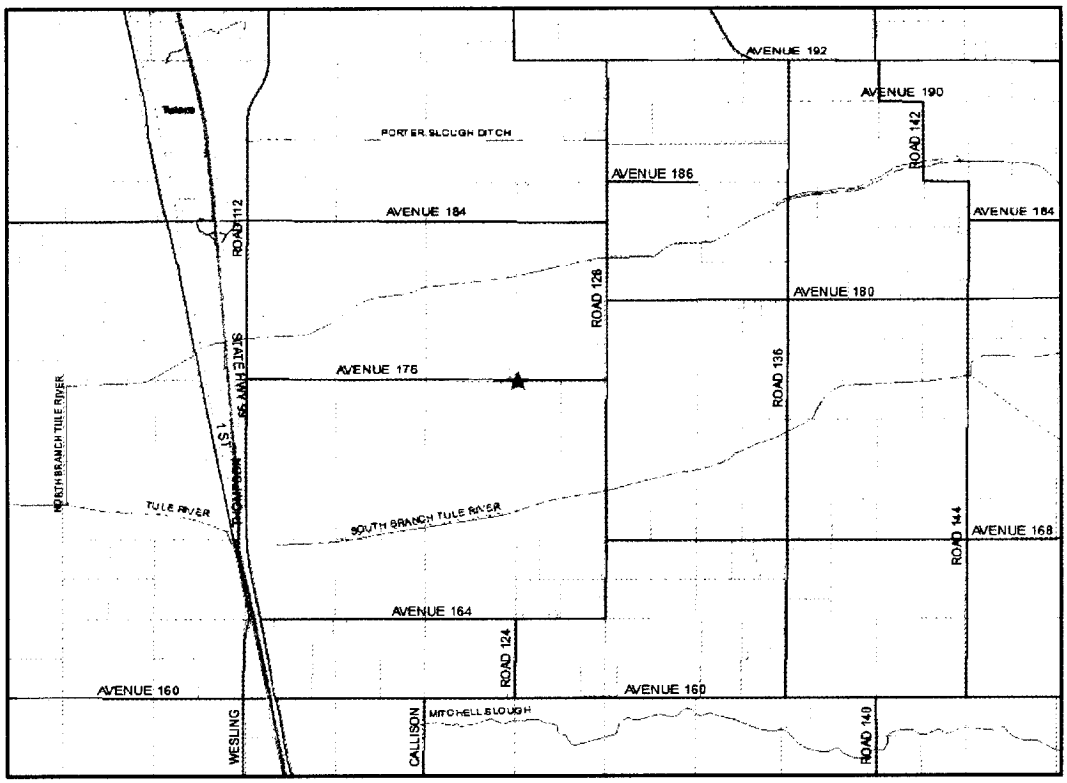
TABLE 5
WELL WATER ANALYTICAL RESULTS

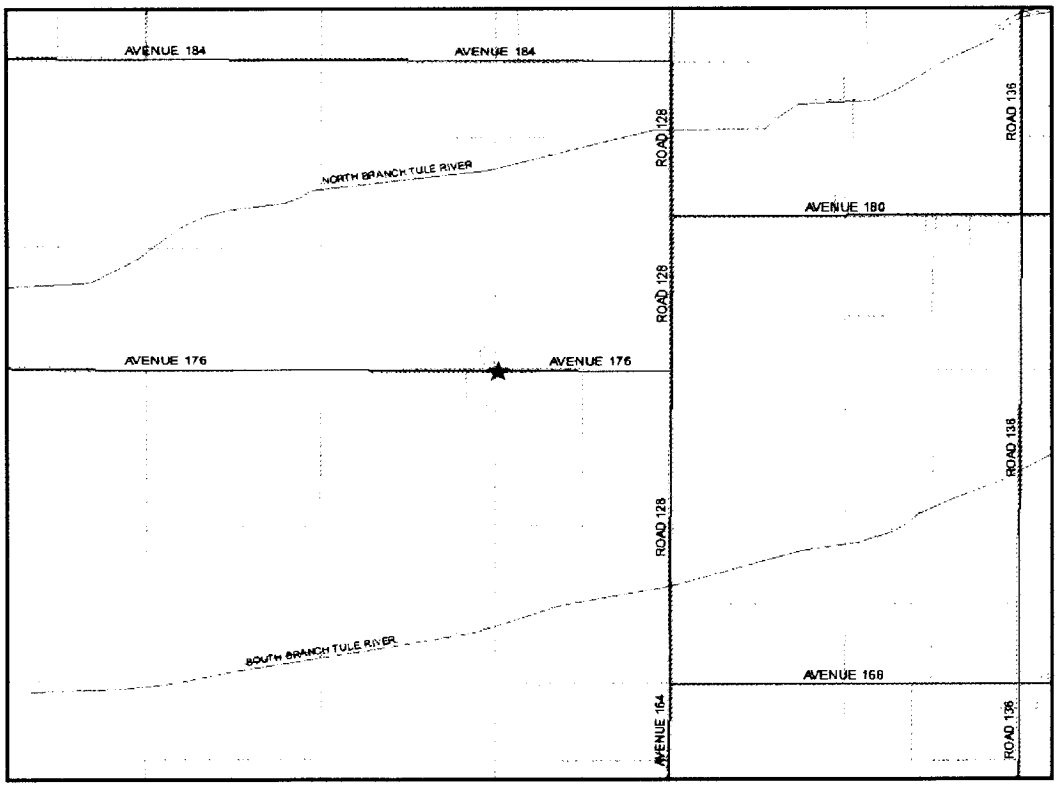
J&A Dairy
Tulare Tulare County, California

Well ID	Date	Lab ID	Analytical Results[1]																			
			Na (meq/L)	Ca (meq/L)	Mg (meq/L)	CO_3 (meq/L)	HCO_3 (meq/L)	Cl (meq/L)	EC (dS/m)	pH	Fe (ppm)	Mn (ppm)	P (ppm)	K (ppm)	SO_4 (ppm)	B (ppm)	TDS (ppm)	Hardness (mg/L)	NO_2-N (mg/L)	NO_3-N (mg/L)	NH_4-N (mg/L)	TKN (mg/L)
Irr Well #1	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Irr Well #3	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Irr Well #4	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Irr Well #5	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Irr Well #6	04/14/11	62007	2.48	0.30	0.08	0.50	1.00	0.45	0.30	8.9	<0.04	<0.01	<0.01	0.8	50	0.06	207	19	<0.6	<0.5	<0.3	<0.3
Irr Well #7	04/14/11	61967	2.44	0.25	0.08	0.57	1.25	0.65	0.24	9.0	na	na	<0.01	0.5	19	na	198	na	na	<0.5	<0.3	<0.3
Irr Well #8	04/14/11	61968	2.83	0.55	0.08	0.00	2.00	0.65	0.31	8.3	na	na	<0.01	0.6	28	na	263	na	na	2.7	<0.3	<0.3
Irr Well #9	04/14/11	61969	2.70	0.25	0.08	0.40	2.25	0.34	0.26	8.8	na	na	<0.01	0.8	15	na	244	na	na	<0.5	<0.3	<0.3
Irr Well Average			2.61	0.34	0.08	0.37	1.63	0.52	0.28	8.8	<0.04	<0.01	<0.01	0.7	28	0.06	228	19	<0.6	0.7	<0.3	<0.3
Dom Well 1	04/14/11	61962	4.74	3.39	0.25	0.00	4.61	0.90	0.67	7.5	na	na	0.01	1.7	85	na	608	na	na	6.3	<0.3	<0.3
Dom Well 2	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dom Well 2A	04/14/11	61963	4.91	8.58	1.23	0.00	9.25	1.44	1.13	7.4	na	na	<0.01	2.6	86	na	1108	na	na	23.5	<0.3	<0.3
Dom Well 3	04/14/11	61964	4.52	2.10	0.16	0.00	4.75	0.51	0.56	7.6	na	na	<0.01	1.2	40	na	527	na	na	6.8	<0.3	<0.3
Dom Well 4	04/14/11	61965	4.26	1.95	0.16	0.00	4.66	0.45	0.53	7.8	na	na	<0.01	1.3	38	na	505	na	na	6.1	<0.3	<0.3
Dom Well 5	04/14/11	61966	5.57	4.04	0.41	0.00	7.30	1.10	0.81	7.2	na	na	<0.01	2.3	67	na	795	na	na	6.3	<0.3	<0.3

1. Na = sodium, Ca = calcium, Mg = magnesium, CO_3 = carbonate, HCO_3 = bicarbonate, Cl = chloride, EC = conductivity, Fe = iron, Mn = manganese, P = phosphorus, K = potassium, SO_4 = sulfate, B = boron, TDS = total dissolved solids, NO_2-N = nitrite as nitrogen, NO_3-N = nitrate as nitrogen, NH_4-N = ammonium as nitrogen, TKN = total Kjeldahl nitrogen, meq/L = milliequivalents per liter, dS/m = deciSiemens per meter, ppm = parts per million, mg/L = milligrams per liter, na = not analyzed, < = less than the detection limit shown, -- = not sampled.

FIGURES

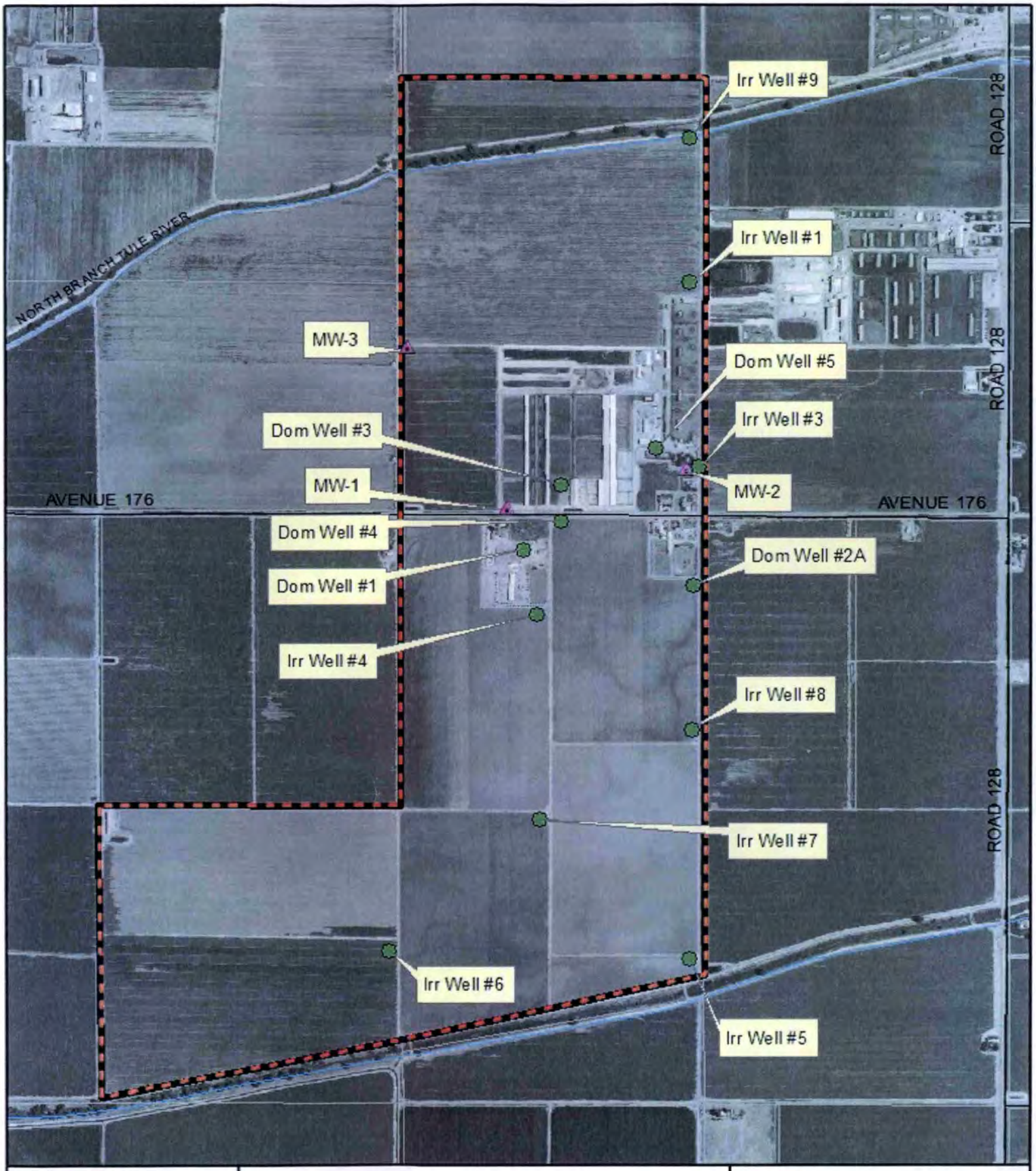




MEC	SITE LOCATION MAP J&A Dairy Tulare, Tulare County, California	Project: 07-012	By: JS
		Date: 10/17/2011	
		Figure	1

ATTACHMENT 1

SUPPLY WELL LOCATIONS



MEC

07-012 OVERVIEW

0 1,000 2,000 Feet

Land App Area

Water Supply Well

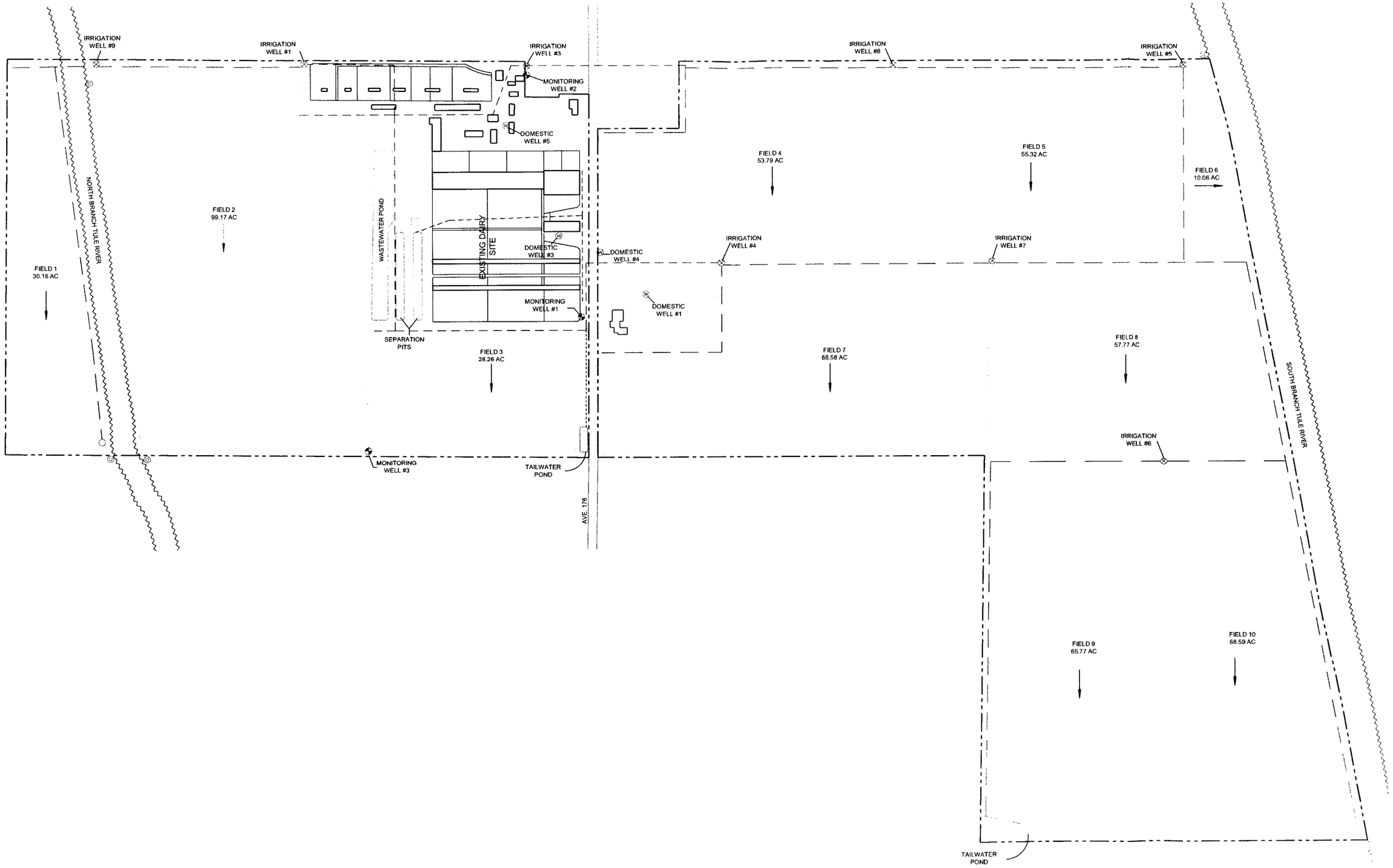
XXX Field Name

Monitoring Well Location

N

ATTACHMENT 2

SITE PLAN



Macedo Engineering & Consulting
4001 So. K Street
Tulare, CA 93274
(559) 688-7688
(559) 688-7801 (Fax)
MEC

J&A

SITE PLAN

PROJECT #:	07-012
DESIGN:	
DRAWN:	AL
REVIEW:	MACEDO
DATE:	12/29/09
SCALE:	1"=625'
DWG NAME:	SITE PLAN
SHEET	SP

ATTACHMENT 3

MEC GROUNDWATER FIELD MONITORING SUMMARY REPORT

2011 GROUNDWATER FIELD MONITORING SUMMARY REPORT

J&A DAIRY
12212 AVENUE 176
TULARE, CA
Tulare County

April 26, 2011

Prepared by:

Macedo Engineering & Consulting

4001 South K St

Tulare, CA 93274

(559) 688-7688

MEC

Macedo Engineering & Consulting

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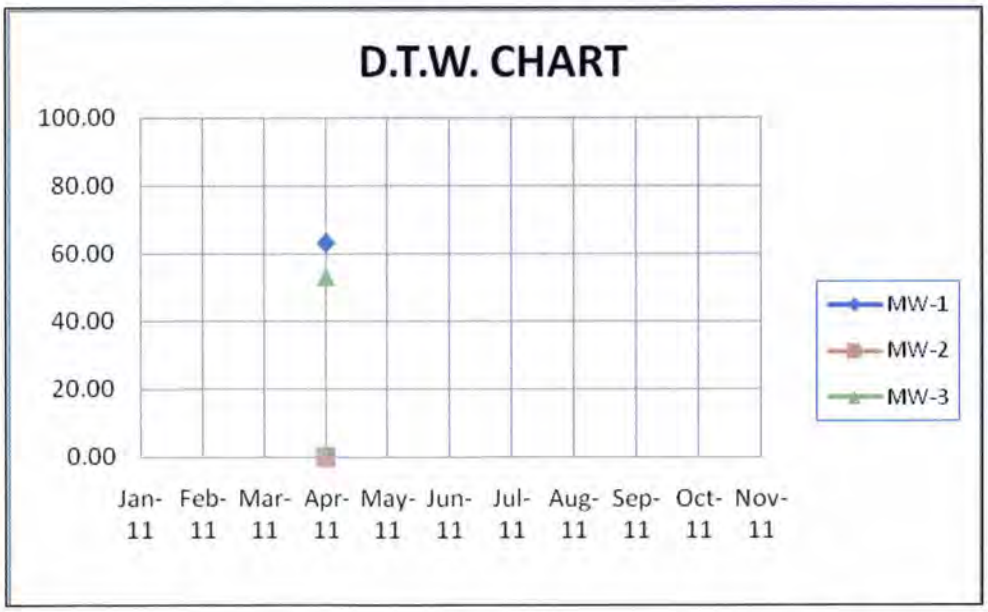
(559) 688-7801 fax

MEC
Macedo Engineering & Consulting

MONITORING WELL FIELD SUMMARY LOG 2011
DEPTH TO WATER MEASUREMENTS

J&A DAIRY
12212 Ave 176/TULARE, CA

	QTR 1	QTR 2	QTR 3	QTR 4	TOTAL
DATE		4/26/2011			DEPTH
	SPRING	SUMMER	FALL	WINTER	
LOCATION					
MW-1		63.1			69.00
MW-2		Dry			70.00
MW-3		53.1			68.00



Note: All measurements are made from the North side and top edge of the well casing. The top of casing with a notch or permanent markings, which ever one condition is appropriate.

MONITOR WELL SAMPLING LOG

MACEDO ENGINEERING

4001 SOUTH K STREET
TULARE, CA 93274
Phone 559-688-7688

Job #	**07-012**
Project Site/Name:	**J&A Dairy**
Field Personnel:	**Sherri King/MEC**
Signature:	Sherri King
Date:	**04/26/10**
Day:	Tuesday
Weather:	Clear & Sunny

Well Vault Type	flush grade / stove pipe	Floating Product (Free Phase): ___Yes ___No
Lock Number/Type		Floating Product (Free Phase) Thickness :_____(ft.)
Drums Filled/Used	None	Floating Product (Free Phase) Description:_____
Well Physical Condition/Notes:	Good	

Well Data	MW#1	Water level measurement technique
Static Depth to Water-ft [A]	63.10	☐ Electrical. Sounder Serial# 20974 ☐ Not Measured
Total Depth of Casing-ft [B]	69.00	Purge Method: Grundfos Sub. Pneumatic
Water Column Height-ft [B-A]	5.90	(Circle) Electric Pump Hand Bail X
Casing Diameter-in (circle)	2" 4"	Other_____
Casing Capacity-gal/ft (circle) [C]	.163 .653	Dedicated System: Yes No X
Gallons per case volume (B-A)*C	0.96	pH Calibration: 4.0 ☑ 7.0 ☑ 10.0 ☑ (Time:_8:00)
Three case volume min. [(B-A)*C]3	2.89	EC Calibration: 1 mS/cm conductivity standard

Time	Gallons Purged	Bailers	pH (units)	EC (UmMHOS)	Temp °C	TurbidityNTU DO mg/L ORP mv	Remarks (Color, Odor, Turbidity, etc.)
0	0	0					Started Purge/Opened Sample Port
10:05 AM	0.96	3	7.32	1485	19.3		Clear
10:12 AM	1.92	6	7.25	1303	19.1		Clear & slightly milky
10:19 AM	2.88	9	7.27	1228	18.9		Clear & slightly milky
10:21 AM	3.84	12	7.18	1220	18.9		Milky

Purge Pump time on		
Purge Pump time off		Sample Collection Method (check): ☐ Direct from discharge hose
Total Gallons Purged		☐ Teflon Bailer
Purge Rate (gpm)		☐ Disposable Bailer
Sample Rate (ml/Min)		Ice Chest Coolant (check) __ _Crushed Ice _ _Blue Ice

Sample Time (am / pm)	Analyses to Perform	Volume Collected	Container Style/Type/Qty	Other
10:25 AM	See Chains of Custody	1000cc	2 poly containers	

Observations/Notes:

MONITOR WELL SAMPLING LOG

MACEDO ENGINEERING

4001 SOUTH K STREET
TULARE, CA 93274
Phone 559-688-7688

Job #	**07-012**
Project Site/Name:	**J&A Dairy**
Field Personnel:	**Sherri King/MEC**
Signature:	Sherri King
Date:	**04/26/10**
Day:	Tuesday
Weather:	Clear & Sunny

Well Vault Type	flush grade / stove pipe	Floating Product (Free Phase): ___Yes ___No
Lock Number/Type		Floating Product (Free Phase) Thickness :_____(ft.)
Drums Filled/Used	None	Floating Product (Free Phase) Description:_____
Well Physical Condition/Notes:	Good	

Well Data	MW#2	
Static Depth to Water-ft [A]	Dry	Water level measurement technique ☑ Electrical. Sounder Serial# 20974 ☐ Not Measured
Total Depth of Casing-ft [B]	70.00	Purge Method: Grundfos Sub. Pneumatic
Water Column Height-ft [B-A]		(Circle) Electric Pump Hand Bail
Casing Diameter-in (circle)	2" 4"	Other_____
Casing Capacity-gal/ft (circle) [C]	.163 .653	Dedicated System: Yes No
Gallons per case volume (B-A)*C		pH Calibration: 4.0 ☐ 7.0☐ 10.0 ☐ (Time:_)
Three case volume min. [(B-A)*C]3		EC Calibration: 1 mS/cm conductivity standard

Time	Gallons Purged	Bailers	pH (units)	EC (UmMHOS)	Temp °C	TurbidityNTU DO mg/L ORP mv	Remarks (Color, Odor, Turbidity, etc..)
0	0	0	0				Started Purge/Opened Sample Port

Purge Pump time on		
Purge Pump time off		Sample Collection Method (check): ☐ Direct from discharge hose
Total Gallons Purged		☐ Teflon Bailer
Purge Rate (gpm)		☐ Disposable Bailer
Sample Rate (ml/Min)		Ice Chest Coolant (check) __Crushed Ice __Blue Ice

Sample Time (am / pm)	Analyses to Perform	Volume Collected	Container Style/Type/Qty	Other

Observations/Notes:
Well is dry. Therefore, no sample was taken.

MONITOR WELL SAMPLING LOG

MACEDO ENGINEERING

4001 SOUTH K STREET
TULARE, CA 93274
Phone 559-688-7688

Job #	**07-012**
Project Site/Name:	**J&A Dairy**
Field Personnel:	**Sherri King/MEC**
Signature:	Sherri King
Date:	**04/26/10**
Day:	Tuesday
Weather:	Clear & Sunny

Well Vault Type	flush grade / stove pipe	Floating Product (Free Phase): ___Yes ___No
Lock Number/Type		Floating Product (Free Phase) Thickness :_____(ft.)
Drums Filled/Used		Floating Product (Free Phase) Description:_____
Well Physical Condition/Notes:	Good	

Well Data	MW#3	
Static Depth to Water-ft [A]	53.10	Water level measurement technique: ☑ Electrical. Sounder Serial# 20974 ☐ Not Measured
Total Depth of Casing-ft [B]	68.00	Purge Method: Grundfos Sub. Pneumatic
Water Column Height-ft [B-A]	14.90	(Circle) Electric Pump Hand Bail
Casing Diameter-in (circle)	2" 4"	Other_____
Casing Capacity-gal/ft (circle) [C]	.163 .653	Dedicated System: Yes No
Gallons per case volume (B-A)*C	2.43	pH Calibration: 4.0 ☐ 7.0 ☑ 10.0 ☑ (Time: 8:00 am)
Three case volume min. [(B-A)*C]3	7.29	EC Calibration: 1 mS/cm conductivity standard

Time	Gallons Purged	Bailers	pH (units)	EC (UmMHOS)	Temp °C	TurbidityNTU DO mg/L ORP mv	Remarks (Color, Odor, Turbidity, etc..)
0	0	0					Started Purge/Opened Sample Port
10:47 AM	0.96	3	7.14	994	19.3		Clear
10:50 AM	1.92	6	7.26	964	19.3		milky
10:54 AM	2.88	9	7.52	965	18.8		milky
10:57 AM	3.84	12	7.26	961	18.9		sandy

Purge Pump time on		
Purge Pump time off		Sample Collection Method (check): ☐ Direct from discharge hose
Total Gallons Purged		☐ Teflon Bailer
Purge Rate (gpm)		☑ Disposable Bailer
Sample Rate (ml/Min)		Ice Chest Coolant (check) _X_Crushed Ice _X_Blue Ice

Sample Time (am / pm)	Analyses to Perform	Volume Collected	Container Style/Type/Qty	Other
11:00 AM	See Chains of Custody	1000cc	2 poly containers	

Observations/Notes:

ATTACHMENT 4

GROUNDWATER ANALYTICAL RESULTS AND CHAIN OF CUSTODY

A & L WESTERN LABORATORIES, INC.

1311 Woodland Ave. #1 • Modesto, California 95351 • Phone 209-529-4080

CHAIN OF CUSTODY

11-117.022

Client MACEDO ENGINEERING

Address 4001 SOUTH K ST.

TULARE CA Zip 93274

Phone (559) 688-7688

CC to:

Signature of person authorizing work under terms stated below* Sherri Kf

*Net 30 days. All accounts past due will be subject to interest charges of 1.5% per month.
*Hazardous materials are the property of the client. The client is responsible for proper disposal of hazardous wastes. Clients not picking up hazardous wastes may be assessed an appropriate fee.

PROJECT ID 07.012

SAMPLED BY: (signature): Sherri Kf

Date	Time	sample type Grab	sample type Comp.	Sample Location	No. of Containers	W2 Package	W4 Package	Nitrate NO3+SO4	TKN, NH4N	NO3N, NO2N	Total Hardness	Total P	Total K	REMARKS
4/26/11	10:25a	✓		MW-1	2	✓	✓	✓	✓	✓	✓	✓	✓	
														Refer to report #
														Add Total P & Total K to Water Analysis page

62179

Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Sherri Kf	4/26/11	3:00p	Jeff Bailey	4/27/11	0940
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time

ite Time:
Start: Finish: Total Hours:

Driving Time:
Start: Finish: Total Hours:

IRR WATER / DRN WATER

Dedicated Exclusively to Providing Quality Analytical Services

A & L WESTERN AGRICULTURAL LABORATORIES

1311 WOODLAND AVE #1 • MODESTO, CALIFORNIA 95351 • (209) 529-4080 • FAX (209) 529-4736

REPORT NUMBER: 11-117-022 **CLIENT:** 5095-D

SUBMITTED BY: SHERRI KING

SEND TO: MACEDO ENGINEERING
4001 SOUTH K ST
TULARE, CA 93274

GROWER: 07-012

DATE OF REPORT: 05/09/11

IRRIGATION WATER ANALYSIS REPORT

Sample ID	Lab Number	Sodium Na meq/L	Calcium Ca meq/L	Magnesium Mg meq/L	Carbonate CO_3 meq/L	Bicarbonate HCO_3 meq/L	Chloride Cl meq/L	Conductivity E.C. dS/m	pH	Copper Cu ppm	Iron Fe ppm	Manganese Mn ppm	Zinc Zn ppm
MW-1	62179	3.78	9.13	2.06	0.00	10.00	1.24	1.11	7.1		0.50	0.01	

Sample ID	Phosphorus P ppm	Potassium K ppm	Nitrate NO_3 ppm	Sulfate SO_4 ppm	Boron B ppm	Dissolved Solids ppm	Adjusted S.A.R.	Langelier Saturation Index
MW-1	<0.01	1.1	107	76	0.15	1133	2.66	

NOTES:

This report applies only to the sample(s) tested. Samples are retained a maximum of thirty days after testing.

Mike Buttress, CPAg
A & L WESTERN LABORATORIES, INC.

A & L WESTERN AGRICULTURAL LABORATORIES, INC.

Report No: 11-117-022 1311 Woodland Avenue, Suite 1 • Modesto, California 95351 • (209) 529-4080
Account No: 5095-D

Send to: MACEDO ENGINEERING
4001 SOUTH K ST
TULARE, CA 93274

Project ID: 07-012

Submitted By: Sherri King

Lab Number: 62179

Sample ID: MW-1

Date Received: 04/27/2011
Date Reported: 05/06/2011

WATER ANALYSIS REPORT

Detection Limit	Analyte	Level Found	Method Code
0.3 mg/L	Kjeldahl Nitrogen	BDL	SM 4500-NH_3 B
0.3 mg/L	Ammonia Nitrogen	BDL	SM 4500- NH_3 B
0.5 mg/L	Nitrate Nitrogen	24.2 mg/L	SM 4500-NO_3 F
0.6 mg/L	Nitrite Nitrogen	BDL	SM 4500-NO_3 F
10 mg/L	Total Hardness	560 mg/L	SM 2340 B
0.1 mg/L	Total Phosphorus	BDL	SM 4500 PF
0.1 mg/L	Total Potassium	1.1 mg/L	SM 3120 B

BDL - INDICATES THE LEVEL FOUND IS BELOW THE ESTABLISHED DETECTION LIMIT FOR THAT ANALYTE.

A & L Western Agricultural Laboratories

Robert Butterfield
Laboratory Director

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1311 Woodland Avenue, Suite 1 • Modesto, California 95351 • (209) 529-4080

QUALITY ASSURANCE REPORT

Run Date: 04/28/2011

Analyte:	LCS True Value mg/L	LCS Result mg/L	% Recovery	Acceptance Limits mg/L	Comments
NO_3-N	20	19	95	16-24	Acceptable
NH_4-N	10	10.3	103	8-12	Acceptable
E.C.	1412 µmhos/cm	1411 µmhos/cm		+/- 5%	Acceptable
T. Phosphorus	1.0	0.99	99	0.8-1.2	Acceptable
Potassium	10	10.8	108	8-12	Acceptable

Samples included in run: 62165, 62166, 62167, 62168, 62169, 62170, 62171, 62172, 62173, 62174, 62175, 62176, 62177, 62178, 62179, 62180, 62181

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1311 Woodland Avenue, Suite 1 • Modesto, California 95351 • (209) 529-4080

QUALITY ASSURANCE REPORT

Run Date: 05/04/2011

Analyte:	LCS True Value mg/L	LCS Result mg/L	% Recovery	Acceptance Limits mg/L	Comments
NO_2-N	0.6	0.6	100	0.48-0.72	Acceptable

Samples included in run: 62174, 62175, 62176, 62177, 62178, 62179, 62180

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A & L WESTERN LABORATORIES, INC.

1311 Woodland Ave. #1 • Modesto, California 95351 • Phone 209-529-4080

CHAIN OF CUSTODY

11-117.023

Client: MACEDO ENGINEERING

Address: 4001 SOUTH K ST.

TULARE CA Zip 93274

Phone (559) 688-7688

CC to:

Signature of person authorizing work under terms stated below*: Shem Kf

*Net 30 days. All accounts past due will be subject to interest charges of 1.5% per month.
*Hazardous materials are the property of the client. The client is responsible for proper disposal of hazardous wastes. Clients not picking up hazardous wastes may be assessed an appropriate fee.

PROJECT ID: 07-012

SAMPLED BY: (signature): Shem Kf

Date	Time	sample type Grab	sample type Comp.	Sample Location	No. of Containers	W2 Package	W4 Package	Nitrate, NO3+SO4	TKN, NH4N	NO3N, NO2N	Total Hardness	Total P	Total K	REMARKS
4/26/11	11:00A	✓		MW-3	2	✓	✓	✓	✓	✓	✓	✓	✓	

62180

Refer to report #

Add Total P & Total K to Water Analysis page

Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Shem Kf	4/26/11	3:00p	Gita Bailey	4/27/11	8945
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time

Date Time:
Start: Finish: Total Hours:

Driving Time:
Start: Finish: Total Hours:

IRR WATER / DRM WATER

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A & L WESTERN AGRICULTURAL LABORATORIES

1311 WOODLAND AVE #1 • MODESTO, CALIFORNIA 95351 • (209) 529-4080 • FAX (209) 529-4736

REPORT NUMBER: 11-117-023 **CLIENT:** 5095-D

SUBMITTED BY: SHERRI KING

SEND TO: MACEDO ENGINEERING
4001 SOUTH K ST
TULARE, CA 93274

GROWER: 07-012

DATE OF REPORT: 05/09/11

IRRIGATION WATER ANALYSIS REPORT

Sample ID	Lab Number	Sodium Na meq/L	Calcium Ca meq/L	Magnesium Mg meq/L	Carbonate CO_3 meq/L	Bicarbonate HCO_3 meq/L	Chloride Cl meq/L	Conductivity E.C. dS/m	pH	Copper Cu ppm	Iron Fe ppm	Manganese Mn ppm	Zinc Zn ppm
MW-3	62180	3.70	6.79	1.73	0.00	7.90	0.76	0.93	7.4		0.80	0.02	

Sample ID	Phosphorus P ppm	Potassium K ppm	Nitrate NO_3 ppm	Sulfate SO_4 ppm	Boron B ppm	Dissolved Solids ppm	Adjusted S.A.R.	Langelier Saturation Index
MW-3	0.04	1.4	61	114	0.14	928	2.77	

NOTES:

This report applies only to the sample(s) tested. Samples are retained a maximum of thirty days after testing.

Mike Buttress, CPAg
A & L WESTERN LABORATORIES, INC.

A & L WESTERN AGRICULTURAL LABORATORIES, INC.

Report No: 11-117-023 1311 Woodland Avenue, Suite 1 • Modesto, California 95351 • (209) 529-4080
Account No: 5095-D

Send to: MACEDO ENGINEERING
4001 SOUTH K ST
TULARE, CA 93274

Project ID: 07-012

Submitted By: Sherri King

Lab Number: 62180

Sample ID: MW-3

Date Received: 04/27/2011
Date Reported: 05/06/2011

WATER ANALYSIS REPORT

Detection Limit	Analyte	Level Found	Method Code
0.3 mg/L	Kjeldahl Nitrogen	BDL	SM 4500-NH_3 B
0.3 mg/L	Ammonia Nitrogen	BDL	SM 4500- NH_3 B
0.5 mg/L	Nitrate Nitrogen	13.8 mg/L	SM 4500-NO_3 F
0.6 mg/L	Nitrite Nitrogen	BDL	SM 4500-NO_3 F
10 mg/L	Total Hardness	426 mg/L	SM 2340 B
0.1 mg/L	Total Phosphorus	BDL	SM 4500 PF
0.1 mg/L	Total Potassium	1.4 mg/L	SM 3120 B

BDL - INDICATES THE LEVEL FOUND IS BELOW THE ESTABLISHED DETECTION LIMIT FOR THAT ANALYTE.

A & L Western Agricultural Laboratories

Robert Butterfield
Laboratory Director

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1311 Woodland Avenue, Suite 1 • Modesto, California 95351 • (209) 529-4080

QUALITY ASSURANCE REPORT

Run Date: 04/28/2011

Analyte:	LCS True Value mg/L	LCS Result mg/L	% Recovery	Acceptance Limits mg/L	Comments
NO_3-N	20	19	95	16-24	Acceptable
NH_4-N	10	10.3	103	8-12	Acceptable
E.C.	1412 µmhos/cm	1411 µmhos/cm		+/- 5%	Acceptable
T. Phosphorus	1.0	0.99	99	0.8-1.2	Acceptable
Potassium	10	10.8	108	8-12	Acceptable

Samples included in run: 62165, 62166, 62167, 62168, 62169, 62170, 62171, 62172, 62173, 62174, 62175, 62176, 62177, 62178, 62179, 62180, 62181

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1311 Woodland Avenue, Suite 1 • Modesto, California 95351 • (209) 529-4080

QUALITY ASSURANCE REPORT

Run Date: 05/04/2011

Analyte:	LCS True Value mg/L	LCS Result mg/L	% Recovery	Acceptance Limits mg/L	Comments
NO_2-N	0.6	0.6	100	0.48-0.72	Acceptable

Samples included in run: 62174, 62175, 62176, 62177, 62178, 62179, 62180

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ATTACHMENT 5

EFFLUENT ANALYTICAL RESULTS AND CHAIN OF CUSTODY

A & L WESTERN LABORATORIES, INC.

1311 Woodland Ave. #1 • Modesto, California 95351 • Phone 209-529-4080

CHAIN OF CUSTODY

11.140.018

Client: MACEDO ENGINEERING

Address: 4001 SOUTH K ST.

TULARE CA Zip 93274

Phone (559)688-7688

CC to:

Signature of person authorizing work under terms stated below*: Sherm Kf

*Net 30 days. All accounts past due will be subject to interest charges of 1.5% per month.
*Hazardous materials are the property of the client. The client is responsible for proper disposal of hazardous wastes. Clients not picking up hazardous wastes may be assessed an appropriate fee.

PROJECT ID: 07.012

SAMPLED BY: (signature): Josh Cox

Date	Time	sample type Grab	sample type Comp.	Sample Location	No. of Containers	TKN	Ammonia Nitrogen	NO_3 N, TDS	pH, EC	Total Alkalinity	CO_3 as $CaCO_3$	Total P	K, sulfate, Ca	Mg, Na, Cl, SAR	HCO_3 as $CaCO_3$	REMARKS
5/19/11	9:15a	X		Wastewater	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

62465

Refer to Project # ~~07.093.023~~. Please add HCO_3 as $CaCO_3$ to this results page 10.015.009

Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Josh Cox	5/19/11	3:00p	Jack Bailey	5/20/11	0930
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time

Site Time: Start: Finish: Total Hours:

Driving Time: Start: Finish: Total Hours:

WASTEWATER

Dedicated Exclusively to Providing Quality Analytical Services

A & L WESTERN AGRICULTURAL LABORATORIES, INC.

Report No: 11-140-018

1311 Woodland Avenue, Suite 1 • Modesto, California 95351 • (209) 529-4080

Account No: 5095

Send to: MACEDO ENGINEERING & CONSULTING
4001 SOUTH K STREET
TULARE, CA 93274

Project Id: 07-012

Submitted by: Josh Cox

Lab Number: 62465

Sample ID: Wastewater

Date Received: 05/20/2011
Date Reported: 06/07/2011

WATER ANALYSIS REPORT

Detection Limit		Analyte	Level Found		Method Code
0.3	mg/L	Kjeldahl Nitrogen	286	mg/L	SM 4500-NH_3 B
0.3	mg/L	Ammonia Nitrogen	206	mg/L	SM 4500-NH_3 H
0.5	mg/L	Nitrate Nitrogen	BDL		SM 4500-$N0_3$ F
10	mg/L	Total Dissolved Solids	1544	mg/L	SM 2540 C
Range=4-10	std. units	pH	7.2	std. units	SM 4500-H^+B
10	µmhos/cm	Electrical Conductivity	3480	µmhos/cm	SM 2510 B
10	mg/L	Total Alkalinity $CaCO_3$	2250	mg/L	SM 2320 B
10	mg/L	Carbonate as $CaCO_3$	0		SM 2320 B
10	mg/L	HCO_3 as $CaCO_3$	2250	mg/L	SM 2320 B
0.1	mg/L	Total Phosphorus	63	mg/L	SM 4500 P-F
0.1	mg/L	Potassium	253	mg/L	SM 3120 B
1	mg/L	Sulfate	71	mg/L	SM 3120 B
1	mg/L	Calcium	167	mg/L	SM 3120 B
1	mg/L	Magnesium	63	mg/L	SM 3120 B
1	mg/L	Sodium	173	mg/L	SM 3120 B
2	mg/L	Chloride	239	mg/L	SM 4500 CLD
		SAR	2.88		CALCULATED

BDL - INDICATES THE LEVEL FOUND IS BELOW THE ESTABLISHED DETECTION LIMIT FOR THAT ANALYTE.

A & L Western Agricultural Laboratories

Robert Butterfield
Laboratory Director

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1311 Woodland Avenue, Suite 1 • Modesto, California 95351 • (209) 529-4080

QUALITY ASSURANCE REPORT

Run Date: 05/23/2011

Analyte:	LCS True Value mg/L	LCS Result mg/L	% Recovery	Acceptance Limits mg/L	Comments
NO_3-N	20	18	90	16-24	Acceptable
T. Phosphorus	1.0	1.0	100	0.8-1.2	Acceptable
Potassium	10.0	10.6	106	8-12	Acceptable
Sulfate	30	32	107	24-36	Acceptable
Calcium	50	56	112	40-60	Acceptable
Magnesium	50	56	112	40-60	Acceptable
Chloride	106	110	104	95.4-117	Acceptable
TKN	10	11	110	8-12	Acceptable
NO_2-N	0.6	0.6	100	0.48-0.72	Acceptable
Sodium	50	51	102	40-60	Acceptable
Bicarbonate	41.45	40	96.5	37.3-45.6	Acceptable

Samples included in run: 62464, 62465

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A & L WESTERN AGRICULTURAL LABORATORIES, INC.

1311 Woodland Avenue, Suite 1 • Modesto, California 95351 • (209) 529-4080

QUALITY ASSURANCE REPORT

Run Date: 05/24/2011

Analyte:	LCS True Value mg/L	LCS Result mg/L	% Recovery	Acceptance Limits mg/L	Comments
NH_4-N	10	9.3	93	8-12	Acceptable

Samples included in run: 62464, 62465

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A & L WESTERN AGRICULTURAL LABORATORIES, INC.

1311 Woodland Avenue, Suite 1 • Modesto, California 95351 • (209) 529-4080

Send to: MACEDO ENGINEERING & CONSULTING
4001 SOUTH K STREET
TULARE, CA 93274

QC REPORT

Parameter	Level Found	Acceptance Level
Run Date: 05/27/11 Total Dissolved Solids Lab No: 62465	Replicate 1 = 420 mg/L Replicate 2 = 408 mg/L % RPD = 2.90 %	5 %

Samples included in run: 62465, 62482

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Macedo Engineering & Consulting
4001 South K Street
Tulare, CA 93274
(559) 688-7688 office
(559) 688-7801 fax

MEC
Macedo Engineering & Consulting

Wastewater Field Activity Report

SAMPLE LOCATION:	Wastewater	DATE:	5/19/11
SAMPLE TIME:	9:15am		

PROJECT NAME:	J&A	PROJECT MANAGER:	Sherri King
ADDRESS:		FIELD PERSONNEL:	Josh Cox/MEC
CITY, STATE:	Tulare, CA	SIGNATURE:	
SITE CONTACT:	Jeff Kampen		
CONSULTANT:	Tina Macedo		

WEATHER: ☐ Clear ☒ Cloudy ☐ Overcast ☐ Fog ☐ Rain ☐ Wet ☒ Cold ☐ Warm ☐ Hot

LAB ANALYSIS PERFORMED:	SEE CHAIN OF CUSTODY
FIELD ANALYSIS PERFORMED:	E.C. =0, Temp. = 0°C
SAMPLE CONTAINERS:	2 POLY CONTAINERS
PRESERVATIVES:	H_2SO_4
ESTIMATED AMT. OF WATER REMOVED	6000cc
COLLECTING TECHNIQUE:	☐ GRAB (from discharge standpipe) ☒ COMP. (if checked, fill below)

WHEN SAMPLING DIRECTLY FROM THE WASTEWATER POND, AT LEAST 10 SUB-SAMPLES WERE COLLECTED. SUB-SAMPLES LISTED BELOW:

SUB-SAMPLE #1 LOCATION:	West	DEPTH:	1,2,3 Feet
SUB-SAMPLE #2 LOCATION:	South	DEPTH:	1,2,3 Feet
SUB-SAMPLE #3 LOCATION:	East	DEPTH:	1,2,3 Feet
SUB-SAMPLE #4 LOCATION:	North	DEPTH:	1,2,3 Feet

THE COLLECTED SUB-SAMPLES WERE THOROUGHLY MIXED IN A CLEAN CONTAINER AND A PORTION OF THE MIXED SUB-SAMPLES DECANTED INTO APPROPRIATE SAMPLE CONTAINER(S).

AMT. OF FREEBOARD IN POND:	10 Feet	
WASTEWATER MIXING DEVICES:	☐ PRESENT	☒ ABSENT
OFF-SITE DISCHARGE?:	☐ YES	☒ NO

COMMENTS: Project #07-012

ATTACHMENT 6

WELL WATER ANALYTICAL RESULTS AND CHAIN OF CUSTODY

A & L WESTERN LABORATORIES, INC.

1311 Woodland Ave. #1 • Modesto, California 95351 • Phone 209-529-4080

CHAIN OF CUSTODY

11·105·039

Client: MACEDO ENGINEERING

Address: 4001 SOUTH K ST.

TULARE CA Zip 93274

Phone (559)688·7688

CC to:

Signature of person authorizing work under terms stated below*: Sherri Kj

4/14/11

*Net 30 days. All accounts past due will be subject to interest charges of 1.5% per month.
*Hazardous materials are the property of the client. The client is responsible for proper disposal of hazardous wastes. Clients not picking up hazardous wastes may be assessed an appropriate fee.

PROJECT ID: 07-012

SAMPLED BY: (signature): Tania Ribeiro

Date	Time	sample type Grab	sample type Comp.	Sample Location	No. of Containers	TKN	Ammonia Nitrogen	NO3 N	TDS	pH	EC	Total Alkalinity	CO3 as CaCO3	Total P	Ca	K	sulfate	Na	Cl	SAR	Mg	HCO3	as CaCO3	REMARKS
4/14/11	11:08	X		Dom Well #1	2	✓	✓	✓	✓	✓	✓	✓										✓		

61962

Refer to Project # 10·098·073. Please add HCO3 as CaCO3 to this results page

Relinquished by (signature)	Date	Time	Received by (signature)	Date	Time
Tania Ribeiro	4/14/11	4:30	[illegible]	4/15/11	12:00
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time

Site Time: Start: Finish: Total Hours:

Driving Time: Start: Finish: Total Hours:

WASTEWATER

Dedicated Exclusively to Providing Quality Analytical Services

A & L WESTERN AGRICULTURAL LABORATORIES

1311 WOODLAND AVE #1 • MODESTO, CALIFORNIA 95351 • (209) 529-4080 • FAX (209) 529-4736

REPORT NUMBER: 11-105-039 **CLIENT:** 5095-D

SUBMITTED BY: SHERI KING

SEND TO: MACEDO ENGINEERING
4001 SOUTH K ST
TULARE, CA 93274

GROWER: 07-012

DATE OF REPORT: 09/09/11

IRRIGATION WATER ANALYSIS REPORT

Sample ID	Lab Number	Sodium Na meq/L	Calcium Ca meq/L	Magnesium Mg meq/L	Carbonate CO_3 meq/L	Bicarbonate HCO_3 meq/L	Chloride Cl meq/L	Conductivity E.C. dS/m	pH	Copper Cu ppm	Iron Fe ppm	Manganese Mn ppm	Zinc Zn ppm
DOM WELL	61962	4.74	3.39	0.25	0.00	4.61	0.90	0.67	7.5				

Sample ID	Phosphorus P ppm	Potassium K ppm	Nitrate NO_3 ppm	Sulfate SO_4 ppm	Boron B ppm	Dissolved Solids ppm	Adjusted S.A.R.	Langelier Saturation Index
DOM WELL	0.01	1.7	28	85		608	4.93	

NOTES:

This report applies only to the sample(s) tested. Samples are retained a maximum of thirty days after testing.

Mike Buttress, CPAg
A & L WESTERN LABORATORIES, INC.

A & L WESTERN AGRICULTURAL LABORATORIES, INC.

Report No: 11-105-039

1311 Woodland Avenue, Suite 1 • Modesto, California 95351 • (209) 529-4080

Account No: 5095

Send to: MACEDO ENGINEERING & CONSULTING
4001 SOUTH K STREET
TULARE, CA 93274

Project Id: 07-012

Submitted by: Tania Ribeiro

Lab Number: 61962

Sample ID: Dom Well #1

Date Received: 04/15/2010
Date Reported: 04/26/2010

WATER ANALYSIS REPORT

Detection Limit		Analyte	Level Found		Method Code
0.3	mg/L	Kjeldahl Nitrogen	BDL		SM 4500-NH_3 B
0.3	mg/L	Ammonia Nitrogen	BDL		SM 4500-NH_3 H
0.5	mg/L	Nitrate Nitrogen	6.3	mg/L	SM 4500-$N0_3$ F
10	mg/L	Total Dissolved Solids	427	mg/L	SM 2540 C
Range=4-10	std. units	pH	7.5	std. units	SM 4500-H^+B
10	µmhos/cm	Electrical Conductivity	674	µmhos/cm	SM 2510 B
10	mg/L	Total Alkalinity $CaCO_3$	232	mg/L	SM 2320 B
10	mg/L	Carbonate as $CaCO_3$	0		SM 2320 B
10	mg/L	HCO_3 as $CaCO_3$	281	mg/L	SM 2320 B
0.1	mg/L	Total Phosphorus	BDL		SM 4500 P-F
0.1	mg/L	Potassium	1.7	mg/L	SM 3120 B
1	mg/L	Sulfate	85	mg/L	SM 3120 B
1	mg/L	Calcium	68	mg/L	SM 3120 B
1	mg/L	Magnesium	3	mg/L	SM 3120 B
1	mg/L	Sodium	109	mg/L	SM 3120 B
2	mg/L	Chloride	32	mg/L	SM 4500 CLD
		SAR	3.51		CALCULATED

BDL - INDICATES THE LEVEL FOUND IS BELOW THE ESTABLISHED DETECTION LIMIT FOR THAT ANALYTE.

A & L Western Agricultural Laboratories

Robert Butterfield
Laboratory Director

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QUALITY ASSURANCE REPORT

Run Date: 04/18/2011

Analyte:	LCS True Value mg/L	LCS Result mg/L	% Recovery	Acceptance Limits mg/L	Comments
NO_3-N	20	20	100	16-24	Acceptable
E.C.	1412 µmhos/cm	1412 µmhos/cm		+/- 5%	Acceptable
T. Phosphorus	1.0	0.94	94	0.8-1.2	Acceptable
Potassium	10.0	10.10	101	8-12	Acceptable
Sulfate	30	30	100	24-36	Acceptable
Calcium	50	53	106	40-60	Acceptable
Magnesium	50	56	112	40-60	Acceptable
Chloride	106	103	97	95.4-117	Acceptable
Total Alkalinity	34	35	103	30.6-37.4	Acceptable
TKN	10	10.7	107	8-12	Acceptable
NH_4-N	10	10	100	8-12	Acceptable
Sodium	50	49	98	40-60	Acceptable

Samples included in run: 61958, 61959, 61960, 61961, 61962, 61963, 61964, 61965, 61966, 61967, 61968, 61969

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MEC
Macedo Engineering & Consulting

Macedo Engineering & Consulting
4001 South K Street
Tulare, CA 93274
(559) 688-7688 office
(559) 688-7801 fax

Water Supply Well Field Activity Report

SAMPLE LOCATION:	Dom Well #1	DATE:	4/14/11
SAMPLE TIME:	11:08am		

PROJECT NAME:	J&A Dairy	PROJECT MANAGER:	Sherri King
ADDRESS:	12212 Ave 176	FIELD PERSONNEL:	Tania Ribeiro/MEC
CITY, STATE:	Tulare, CA	SIGNATURE:	Tania Ribeiro
SITE CONTACT:	Jeff Kampen		
CONSULTANT:	Tina Macedo		

WEATHER: ☒ Clear ☐ Cloudy ☐ Overcast ☐ Rain ☐ Wet ☐ Cold ☒ Warm ☐ Hot
GPS COORDINATES: na

WELL PURGE TIME	TIME	EC (UmMHOS)	TEMP °C
> 30 Minutes	na	na	na

ANALYSIS PERFORMED:	SEE CHAIN OF CUSTODY
SAMPLE CONTAINERS:	2 POLY CONTAINERS
PRESERVATIVES:	H_2SO_4
ESTIMATED AMT. OF WATER REMOVED	1000cc
COLLECTING TECHNIQUE:	☒ GRAB ☐ COMP.
LAB. ANALYSIS BY:	A&L WESTERN LABS.
COLLECTED FROM:	☐ SPIGOT ☒ STANDPIPE OPEN DISCHARGE
COLLANT USED FOR ICE CHEST:	☒ BLUE ICE ☒ CRUSHED ICE

COMMENTS: Project #07-012. .

A & L WESTERN LABORATORIES, INC.

1311 Woodland Ave. #1 • Modesto, California 95351 • Phone 209-529-4080

CHAIN OF CUSTODY

11·105·040

Client: MACEDO ENGINEERING

Address: 4001 SOUTH K ST.

TULARE CA Zip 93274

Phone (559)688·7688

CC to:

Signature of person authorizing work under terms stated below*: Sherri Kj

*Net 30 days. All accounts past due will be subject to interest charges of 1.5% per month.
*Hazardous materials are the property of the client. The client is responsible for proper disposal of hazardous wastes. Clients not picking up hazardous wastes may be assessed an appropriate fee.

4/14/11

PROJECT ID: 07-012

SAMPLED BY: (signature): Tania Ribeiro

Date	Time	sample type Grab	sample type Comp.	Sample Location	No. of Containers	TKN	Ammonia Nitrogen	NO3 N, TDS	pH, EC	Total Alkalinity	CO3 as Ca CO3	Total P	K, sulfate, Ca, Mg, Na, Cl, SAR	HCO3 as Ca CO3	REMARKS
4/14/11	10:08	X		Dom Well #2A	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	

61963

Refer to Project # 10·098·073. Please add HCO3 as Ca CO3 to the results page

Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Tania Ribeiro	4/14/11	4:30	[illegible]	4/15/11	1600
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time

Site Time: Start: Finish: Total Hours:

Driving Time: Start: Finish: Total Hours:

WASTEWATER

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1311 WOODLAND AVE #1 • MODESTO, CALIFORNIA 95351 • (209) 529-4080 • FAX (209) 529-4736

REPORT NUMBER: 11-105-040 **CLIENT:** 5095-D

SUBMITTED BY: SHERI KING

SEND TO: MACEDO ENGINEERING
4001 SOUTH K ST
TULARE, CA 93274

GROWER: 07-012

DATE OF REPORT: 09/09/11

IRRIGATION WATER ANALYSIS REPORT

Sample ID	Lab Number	Sodium Na meq/L	Calcium Ca meq/L	Magnesium Mg meq/L	Carbonate CO_3 meq/L	Bicarbonate HCO_3 meq/L	Chloride Cl meq/L	Conductivity E.C. dS/m	pH	Copper Cu ppm	Iron Fe ppm	Manganese Mn ppm	Zinc Zn ppm
DOM WELL	61963	4.91	8.58	1.23	0.00	9.25	1.44	1.13	7.4				

Sample ID	Phosphorus P ppm	Potassium K ppm	Nitrate NO_3 ppm	Sulfate SO_4 ppm	Boron B ppm	Dissolved Solids ppm	Adjusted S.A.R.	Langelier Saturation Index
DOM WELL	<0.01	2.6	104	86		1108	3.87	

NOTES:

This report applies only to the sample(s) tested. Samples are retained a maximum of thirty days after testing.

Mike Buttress, CPAg
A & L WESTERN LABORATORIES, INC.

A & L WESTERN AGRICULTURAL LABORATORIES, INC.

Report No: 11-105-040

1311 Woodland Avenue, Suite 1 • Modesto, California 95351 • (209) 529-4080

Account No: 5095

Send to: MACEDO ENGINEERING & CONSULTING
4001 SOUTH K STREET
TULARE, CA 93274

Project Id: 07-012

Submitted by: Tania Ribeiro

Lab Number: 61963

Sample ID: Dom Well #2A

Date Received: 04/15/2010
Date Reported: 04/26/2010

WATER ANALYSIS REPORT

Detection Limit		Analyte	Level Found		Method Code
0.3	mg/L	Kjeldahl Nitrogen	BDL		SM 4500-NH_3 B
0.3	mg/L	Ammonia Nitrogen	BDL		SM 4500-NH_3 H
0.5	mg/L	Nitrate Nitrogen	23.5	mg/L	SM 4500-$N0_3$ F
10	mg/L	Total Dissolved Solids	730	mg/L	SM 2540 C
Range=4-10	std. units	pH	7.4	std. units	SM 4500-H^+B
10	µmhos/cm	Electrical Conductivity	1129	µmhos/cm	SM 2510 B
10	mg/L	Total Alkalinity $CaCO_3$	467	mg/L	SM 2320 B
10	mg/L	Carbonate as $CaCO_3$	0		SM 2320 B
10	mg/L	HCO_3 as $CaCO_3$	564	mg/L	SM 2320 B
0.1	mg/L	Total Phosphorus	BDL		SM 4500 P-F
0.1	mg/L	Potassium	2.6	mg/L	SM 3120 B
1	mg/L	Sulfate	86	mg/L	SM 3120 B
1	mg/L	Calcium	172	mg/L	SM 3120 B
1	mg/L	Magnesium	15	mg/L	SM 3120 B
1	mg/L	Sodium	113	mg/L	SM 3120 B
2	mg/L	Chloride	51	mg/L	SM 4500 CLD
		SAR	2.21		CALCULATED

BDL - INDICATES THE LEVEL FOUND IS BELOW THE ESTABLISHED DETECTION LIMIT FOR THAT ANALYTE.

A & L Western Agricultural Laboratories

Robert Butterfield
Laboratory Director

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QUALITY ASSURANCE REPORT

Run Date: 04/18/2011

Analyte:	LCS True Value mg/L	LCS Result mg/L	% Recovery	Acceptance Limits mg/L	Comments
NO_3-N	20	20	100	16-24	Acceptable
E.C.	1412 µmhos/cm	1412 µmhos/cm		+/- 5%	Acceptable
T. Phosphorus	1.0	0.94	94	0.8-1.2	Acceptable
Potassium	10.0	10.10	101	8-12	Acceptable
Sulfate	30	30	100	24-36	Acceptable
Calcium	50	53	106	40-60	Acceptable
Magnesium	50	56	112	40-60	Acceptable
Chloride	106	103	97	95.4-117	Acceptable
Total Alkalinity	34	35	103	30.6-37.4	Acceptable
TKN	10	10.7	107	8-12	Acceptable
NH_4-N	10	10	100	8-12	Acceptable
Sodium	50	49	98	40-60	Acceptable

Samples included in run: 61958, 61959, 61960, 61961, 61962, 61963, 61964, 61965, 61966, 61967, 61968, 61969

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Macedo Engineering & Consulting
4001 South K Street
Tulare, CA 93274
(559) 688-7688 office
(559) 688-7801 fax

Water Supply Well Field Activity Report

SAMPLE LOCATION:	Dom Well #2A	DATE:	4/14/11
SAMPLE TIME:	10:08am		

PROJECT NAME:	J&A Dairy	PROJECT MANAGER:	Sherri King
ADDRESS:	12212 Ave 176	FIELD PERSONNEL:	Tania Ribeiro/MEC
CITY, STATE:	Tulare, CA	SIGNATURE:	Tania Ribeiro
SITE CONTACT:	Jeff Kampen		
CONSULTANT:	Tina Macedo		

WEATHER: ☒ Clear ☐ Cloudy ☐ Overcast ☐ Rain ☐ Wet ☐ Cold ☒ Warm ☐ Hot
GPS COORDINATES: na

WELL PURGE TIME	TIME	EC (UmMHOS)	TEMP °C
> 30 Minutes	na	na	na

ANALYSIS PERFORMED:	SEE CHAIN OF CUSTODY
SAMPLE CONTAINERS:	2 POLY CONTAINERS
PRESERVATIVES:	H_2SO_4
ESTIMATED AMT. OF WATER REMOVED	1000cc
COLLECTING TECHNIQUE:	☒ GRAB ☐ COMP.
LAB. ANALYSIS BY:	A&L WESTERN LABS.
COLLECTED FROM:	☐ SPIGOT ☒ STANDPIPE OPEN DISCHARGE
COLLANT USED FOR ICE CHEST:	☒ BLUE ICE ☒ CRUSHED ICE

COMMENTS: Project #07-012. .

A & L WESTERN LABORATORIES, INC.

1311 Woodland Ave. #1 • Modesto, California 95351 • Phone 209-529-4080

11·105·041

CHAIN OF CUSTODY

Client: MACEDO ENGINEERING

Address: 4001 SOUTH K ST.

TULARE CA Zip 93274

Phone (559)688·7688

CC to:

Signature of person authorizing work under terms stated below*: Sherri Kf

4/14/11

*Net 30 days. All accounts past due will be subject to interest charges of 1.5% per month.
*Hazardous materials are the property of the client. The client is responsible for proper disposal of hazardous wastes. Clients not picking up hazardous wastes may be assessed an appropriate fee.

PROJECT ID: 07-012

SAMPLED BY: (signature): Tania Ribeiro

Date	Time	Sample type: Grab	Sample type: Comp.	Sample Location	No. of Containers	TKN	Ammonia Nitrogen	NO3 N, TDS	pH, EC	Total Alkalinity	CO3 as CaCO3	Total P	K, sulfate, Ca, Mg, Na, Cl, SAR	HCO3 as CaCO3	REMARKS
4/14/11	10:53	X		Dom Well #3	2	—	—	—	—	—	—	—	—	✓	

61964

Refer to Project # 10·098·073. Please add HCO3 as CaCO3 to the results page

Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Tania Ribeiro	4/14/11	4:30	[illegible]	4/15/11	1600
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time

Site Time: Start: Finish: Total Hours:

Driving Time: Start: Finish: Total Hours:

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REPORT NUMBER: 11-105-041 **CLIENT:** 5095-D

SUBMITTED BY: SHERI KING

SEND TO: MACEDO ENGINEERING
4001 SOUTH K ST
TULARE, CA 93274

GROWER: 07-012

DATE OF REPORT: 09/09/11

IRRIGATION WATER ANALYSIS REPORT

Sample ID	Lab Number	Sodium Na meq/L	Calcium Ca meq/L	Magnesium Mg meq/L	Carbonate CO_3 meq/L	Bicarbonate HCO_3 meq/L	Chloride Cl meq/L	Conductivity E.C. dS/m	pH	Copper Cu ppm	Iron Fe ppm	Manganese Mn ppm	Zinc Zn ppm
DOM WELL	61964	4.52	2.10	0.16	0.00	4.75	0.51	0.56	7.6				

Sample ID	Phosphorus P ppm	Potassium K ppm	Nitrate NO_3 ppm	Sulfate SO_4 ppm	Boron B ppm	Dissolved Solids ppm	Adjusted S.A.R.	Langelier Saturation Index
DOM WELL	<0.01	1.2	30	40		527	5.61	

NOTES:

This report applies only to the sample(s) tested. Samples are retained a maximum of thirty days after testing.

Mike Buttress, CPAg
A & L WESTERN LABORATORIES, INC.

A & L WESTERN AGRICULTURAL LABORATORIES, INC.

Report No: 11-105-041

1311 Woodland Avenue, Suite 1 • Modesto, California 95351 • (209) 529-4080

Account No: 5095

Send to: MACEDO ENGINEERING & CONSULTING
4001 SOUTH K STREET
TULARE, CA 93274

Project Id: 07-012

Submitted by: Tania Ribeiro

Lab Number: 61964

Sample ID: Dom Well #3

Date Received: 04/15/2010
Date Reported: 04/26/2010

WATER ANALYSIS REPORT

Detection Limit		Analyte	Level Found		Method Code
0.3	mg/L	Kjeldahl Nitrogen	BDL		SM 4500-NH_3 B
0.3	mg/L	Ammonia Nitrogen	BDL		SM 4500-NH_3 H
0.5	mg/L	Nitrate Nitrogen	6.8	mg/L	SM 4500-$N0_3$ F
10	mg/L	Total Dissolved Solids	334	mg/L	SM 2540 C
Range=4-10	std. units	pH	7.6	std. units	SM 4500-H^+B
10	µmhos/cm	Electrical Conductivity	558	µmhos/cm	SM 2510 B
10	mg/L	Total Alkalinity $CaCO_3$	240	mg/L	SM 2320 B
10	mg/L	Carbonate as $CaCO_3$	0		SM 2320 B
10	mg/L	HCO_3 as $CaCO_3$	290	mg/L	SM 2320 B
0.1	mg/L	Total Phosphorus	BDL		SM 4500 P-F
0.1	mg/L	Potassium	1.2	mg/L	SM 3120 B
1	mg/L	Sulfate	40	mg/L	SM 3120 B
1	mg/L	Calcium	42	mg/L	SM 3120 B
1	mg/L	Magnesium	2	mg/L	SM 3120 B
1	mg/L	Sodium	104	mg/L	SM 3120 B
2	mg/L	Chloride	18	mg/L	SM 4500 CLD
		SAR	3.98		CALCULATED

BDL - INDICATES THE LEVEL FOUND IS BELOW THE ESTABLISHED DETECTION LIMIT FOR THAT ANALYTE.

A & L Western Agricultural Laboratories

Robert Butterfield
Laboratory Director

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1311 Woodland Avenue, Suite 1 • Modesto, California 95351 • (209) 529-4080

QUALITY ASSURANCE REPORT

Run Date: 04/18/2011

Analyte:	LCS True Value mg/L	LCS Result mg/L	% Recovery	Acceptance Limits mg/L	Comments
NO_3-N	20	20	100	16-24	Acceptable
E.C.	1412 µmhos/cm	1412 µmhos/cm		+/- 5%	Acceptable
T. Phosphorus	1.0	0.94	94	0.8-1.2	Acceptable
Potassium	10.0	10.10	101	8-12	Acceptable
Sulfate	30	30	100	24-36	Acceptable
Calcium	50	53	106	40-60	Acceptable
Magnesium	50	56	112	40-60	Acceptable
Chloride	106	103	97	95.4-117	Acceptable
Total Alkalinity	34	35	103	30.6-37.4	Acceptable
TKN	10	10.7	107	8-12	Acceptable
NH_4-N	10	10	100	8-12	Acceptable
Sodium	50	49	98	40-60	Acceptable

Samples included in run: 61958, 61959, 61960, 61961, 61962, 61963, 61964, 61965, 61966, 61967, 61968, 61969

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4001 South K Street
Tulare, CA 93274
(559) 688-7688 office
(559) 688-7801 fax

Water Supply Well Field Activity Report

SAMPLE LOCATION:	Dom Well #3	DATE:	4/14/11
SAMPLE TIME:	10:53am		

PROJECT NAME:	J&A Dairy	PROJECT MANAGER:	Sherri King
ADDRESS:	12212 Ave 176	FIELD PERSONNEL:	Tania Ribeiro/MEC
CITY, STATE:	Tulare, CA	SIGNATURE:	Tania Ribeiro
SITE CONTACT:	Jeff Kampen		
CONSULTANT:	Tina Macedo		

WEATHER: ☒ Clear ☐ Cloudy ☐ Overcast ☐ Rain ☐ Wet ☐ Cold ☒ Warm ☐ Hot
GPS COORDINATES: na

WELL PURGE TIME	TIME	EC (UmMHOS)	TEMP °C
> 30 Minutes	na	na	na

ANALYSIS PERFORMED:	SEE CHAIN OF CUSTODY
SAMPLE CONTAINERS:	2 POLY CONTAINERS
PRESERVATIVES:	H_2SO_4
ESTIMATED AMT. OF WATER REMOVED	1000cc
COLLECTING TECHNIQUE:	☒ GRAB ☐ COMP.
LAB. ANALYSIS BY:	A&L WESTERN LABS.
COLLECTED FROM:	☐ SPIGOT ☒ STANDPIPE OPEN DISCHARGE
COLLANT USED FOR ICE CHEST:	☒ BLUE ICE ☒ CRUSHED ICE

COMMENTS: Project #07-012. .

A & L WESTERN LABORATORIES, INC.

1311 Woodland Ave. #1 • Modesto, California 95351 • Phone 209-529-4080

11·105·042

CHAIN OF CUSTODY

Client: MACEDO ENGINEERING

Address: 4001 SOUTH K ST.

TULARE CA Zip 93274

Phone (559)688·7688

CC to:

Signature of person authorizing work under terms stated below*: Sherri Kf

4/14/11

*Net 30 days. All accounts past due will be subject to interest charges of 1.5% per month.
*Hazardous materials are the property of the client. The client is responsible for proper disposal of hazardous wastes. Clients not picking up hazardous wastes may be assessed an appropriate fee.

PROJECT ID: 07-012

SAMPLED BY: (signature): Tania Ribeiro

Date	Time	sample type Grab	sample type Comp.	Sample Location	No. of Containers	TKN	Ammonia Nitrogen	NO_3 N, TDS	pH, EC	Total Alkalinity	CO_3 as $CaCO_3$	Total P	K, sulfate, Ca	Mg, Na, Cl, SAR	HCO_3 as $CaCO_3$	REMARKS
4/14/11	10:51	X		Dom Well #4	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

61965

Refer to Project # 10·098·073. Please add HCO_3 as $CaCO_3$ to the results page

Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Tania Ribeiro	4/14/11	4:30	[illegible]	4/15/11	1600
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time

Site Time: Start: Finish: Total Hours:

Driving Time: Start: Finish: Total Hours:

WASTEWATER

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A & L WESTERN AGRICULTURAL LABORATORIES

1311 WOODLAND AVE #1 • MODESTO, CALIFORNIA 95351 • (209) 529-4080 • FAX (209) 529-4736

REPORT NUMBER: 11-105-042 **CLIENT:** 5095-D

SUBMITTED BY: SHERI KING

SEND TO: MACEDO ENGINEERING
4001 SOUTH K ST
TULARE, CA 93274

GROWER: 07-012

DATE OF REPORT: 09/09/11

IRRIGATION WATER ANALYSIS REPORT

Sample ID	Lab Number	Sodium Na meq/L	Calcium Ca meq/L	Magnesium Mg meq/L	Carbonate CO_3 meq/L	Bicarbonate HCO_3 meq/L	Chloride Cl meq/L	Conductivity E.C. dS/m	pH	Copper Cu ppm	Iron Fe ppm	Manganese Mn ppm	Zinc Zn ppm
DOM WELL	61965	4.26	1.95	0.16	0.00	4.66	0.45	0.53	7.8				

Sample ID	Phosphorus P ppm	Potassium K ppm	Nitrate NO_3 ppm	Sulfate SO_4 ppm	Boron B ppm	Dissolved Solids ppm	Adjusted S.A.R.	Langelier Saturation Index
DOM WELL	<0.01	1.3	27	38		505	5.37	

NOTES:

This report applies only to the sample(s) tested. Samples are retained a maximum of thirty days after testing.

Mike Buttress, CPAg
A & L WESTERN LABORATORIES, INC.

A & L WESTERN AGRICULTURAL LABORATORIES, INC.

Report No: 11-105-042

1311 Woodland Avenue, Suite 1 • Modesto, California 95351 • (209) 529-4080

Account No: 5095

Send to: MACEDO ENGINEERING & CONSULTING
4001 SOUTH K STREET
TULARE, CA 93274

Project Id: 07-012

Submitted by: Tania Ribeiro

Lab Number: 61965

Sample ID: Dom Well #4

Date Received: 04/15/2010
Date Reported: 04/26/2010

WATER ANALYSIS REPORT

Detection Limit		Analyte	Level Found		Method Code
0.3	mg/L	Kjeldahl Nitrogen	BDL		SM 4500-NH_3 B
0.3	mg/L	Ammonia Nitrogen	BDL		SM 4500-NH_3 H
0.5	mg/L	Nitrate Nitrogen	6.1	mg/L	SM 4500-$N0_3$ F
10	mg/L	Total Dissolved Solids	320	mg/L	SM 2540 C
Range=4-10	std. units	pH	7.8	std. units	SM 4500-H^+B
10	µmhos/cm	Electrical Conductivity	531	µmhos/cm	SM 2510 B
10	mg/L	Total Alkalinity $CaCO_3$	235	mg/L	SM 2320 B
10	mg/L	Carbonate as $CaCO_3$	0		SM 2320 B
10	mg/L	HCO_3 as $CaCO_3$	284	mg/L	SM 2320 B
0.1	mg/L	Total Phosphorus	BDL		SM 4500 P-F
0.1	mg/L	Potassium	1.3	mg/L	SM 3120 B
1	mg/L	Sulfate	38	mg/L	SM 3120 B
1	mg/L	Calcium	39	mg/L	SM 3120 B
1	mg/L	Magnesium	2	mg/L	SM 3120 B
1	mg/L	Sodium	98	mg/L	SM 3120 B
2	mg/L	Chloride	16	mg/L	SM 4500 CLD
		SAR	4.14		CALCULATED

BDL - INDICATES THE LEVEL FOUND IS BELOW THE ESTABLISHED DETECTION LIMIT FOR THAT ANALYTE.

A & L Western Agricultural Laboratories

Robert Butterfield
Laboratory Director

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QUALITY ASSURANCE REPORT

Run Date: 04/18/2011

Analyte:	LCS True Value mg/L	LCS Result mg/L	% Recovery	Acceptance Limits mg/L	Comments
NO_3-N	20	20	100	16-24	Acceptable
E.C.	1412 µmhos/cm	1412 µmhos/cm		+/- 5%	Acceptable
T. Phosphorus	1.0	0.94	94	0.8-1.2	Acceptable
Potassium	10.0	10.10	101	8-12	Acceptable
Sulfate	30	30	100	24-36	Acceptable
Calcium	50	53	106	40-60	Acceptable
Magnesium	50	56	112	40-60	Acceptable
Chloride	106	103	97	95.4-117	Acceptable
Total Alkalinity	34	35	103	30.6-37.4	Acceptable
TKN	10	10.7	107	8-12	Acceptable
NH_4-N	10	10	100	8-12	Acceptable
Sodium	50	49	98	40-60	Acceptable

Samples included in run: 61958, 61959, 61960, 61961, 61962, 61963, 61964, 61965, 61966, 61967, 61968, 61969

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Macedo Engineering & Consulting

Macedo Engineering & Consulting
4001 South K Street
Tulare, CA 93274
(559) 688-7688 office
(559) 688-7801 fax

Water Supply Well Field Activity Report

SAMPLE LOCATION:	Dom Well #4	DATE:	4/14/11
SAMPLE TIME:	10:51am		

PROJECT NAME:	J&A Dairy	PROJECT MANAGER:	Sherri King
ADDRESS:	12212 Ave 176	FIELD PERSONNEL:	Tania Ribeiro/MEC
CITY, STATE:	Tulare, CA	SIGNATURE:	Tania Ribeiro
SITE CONTACT:	Jeff Kampen		
CONSULTANT:	Tina Macedo		

WEATHER: ☒ Clear ☐ Cloudy ☐ Overcast ☐ Rain ☐ Wet ☐ Cold ☒ Warm ☐ Hot
GPS COORDINATES: na

WELL PURGE TIME	TIME	EC (UmMHOS)	TEMP °C
> 30 Minutes	na	na	na

ANALYSIS PERFORMED:	SEE CHAIN OF CUSTODY
SAMPLE CONTAINERS:	2 POLY CONTAINERS
PRESERVATIVES:	H_2SO_4
ESTIMATED AMT. OF WATER REMOVED	1000cc
COLLECTING TECHNIQUE:	☒ GRAB ☐ COMP.
LAB. ANALYSIS BY:	A&L WESTERN LABS.
COLLECTED FROM:	☐ SPIGOT ☒ STANDPIPE OPEN DISCHARGE
COLLANT USED FOR ICE CHEST:	☒ BLUE ICE ☒ CRUSHED ICE

COMMENTS: Project #07-012. .

A & L WESTERN LABORATORIES, INC.

1311 Woodland Ave. #1 • Modesto, California 95351 • Phone 209-529-4080

11-105-043

CHAIN OF CUSTODY

Client: MACEDO ENGINEERING

Address: 4001 SOUTH K ST.

TULARE CA Zip 93274

Phone (559)688-7688

CC to:

Signature of person authorizing work under terms stated below*: Sherri Kf

4/14/11

*Net 30 days. All accounts past due will be subject to interest charges of 1.5% per month.
*Hazardous materials are the property of the client. The client is responsible for proper disposal of hazardous wastes. Clients not picking up hazardous wastes may be assessed an appropriate fee.

PROJECT ID: 07-012

SAMPLED BY: (signature): Tania Ribeiro

Date	Time	sample type Grab	sample type Comp.	Sample Location	No. of Containers	TKN	Ammonia Nitrogen	NO_3 N, TDS	pH, EC	Total Alkalinity	CO_3 as $CaCO_3$	Total P	K, sulfate, Ca	HO_3, Na, Cl, SAR	HCO_3 as $CaCO_3$	REMARKS
4/14/11	10:59	X		Dom Well #5	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

61966

Refer to Project # 10-098-073. Please add HCO_3 as $CaCO_3$ to the results page

Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Tania Ribeiro	4/14/11	4:30	[illegible]	4/15/11	1600
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time

Site Time: Start: Finish: Total Hours:

Driving Time: Start: Finish: Total Hours:

WASTEWATER

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1311 WOODLAND AVE #1 • MODESTO, CALIFORNIA 95351 • (209) 529-4080 • FAX (209) 529-4736

REPORT NUMBER: 11-105-043 **CLIENT:** 5095-D

SUBMITTED BY: SHERI KING

SEND TO: MACEDO ENGINEERING
4001 SOUTH K ST
TULARE, CA 93274

GROWER: 07-012

DATE OF REPORT: 09/21/11

IRRIGATION WATER ANALYSIS REPORT

Sample ID	Lab Number	Sodium Na meq/L	Calcium Ca meq/L	Magnesium Mg meq/L	Carbonate CO_3 meq/L	Bicarbonate HCO_3 meq/L	Chloride Cl meq/L	Conductivity E.C. dS/m	pH	Copper Cu ppm	Iron Fe ppm	Manganese Mn ppm	Zinc Zn ppm
DOM WELL	61966	5.57	4.04	0.41	0.00	7.30	1.10	0.81	7.2				

Sample ID	Phosphorus P ppm	Potassium K ppm	Nitrate NO_3 ppm	Sulfate SO_4 ppm	Boron B ppm	Dissolved Solids ppm	Adjusted S.A.R.	Langelier Saturation Index
DOM WELL	<0.01	2.3	28	67		795	5.92	

NOTES:

This report applies only to the sample(s) tested. Samples are retained a maximum of thirty days after testing.

Mike Buttress, CPAg
A & L WESTERN LABORATORIES, INC.

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Report No: 11-105-043

1311 Woodland Avenue, Suite 1 • Modesto, California 95351 • (209) 529-4080

Account No: 5095

Send to: MACEDO ENGINEERING & CONSULTING
4001 SOUTH K STREET
TULARE, CA 93274

Project Id: 07-012

Submitted by: Tania Ribeiro

Lab Number: 61966

Sample ID: Dom Well #5

Date Received: 04/15/2010
Date Reported: 04/26/2010

WATER ANALYSIS REPORT

Detection Limit		Analyte	Level Found		Method Code
0.3	mg/L	Kjeldahl Nitrogen	BDL		SM 4500-NH_3 B
0.3	mg/L	Ammonia Nitrogen	BDL		SM 4500-NH_3 H
0.5	mg/L	Nitrate Nitrogen	6.3	mg/L	SM 4500-$N0_3$ F
10	mg/L	Total Dissolved Solids	496	mg/L	SM 2540 C
Range=4-10	std. units	pH	7.2	std. units	SM 4500-H^+B
10	µmhos/cm	Electrical Conductivity	810	µmhos/cm	SM 2510 B
10	mg/L	Total Alkalinity $CaCO_3$	369	mg/L	SM 2320 B
10	mg/L	Carbonate as $CaCO_3$	0		SM 2320 B
10	mg/L	HCO_3 as $CaCO_3$	445	mg/L	SM 2320 B
0.1	mg/L	Total Phosphorus	BDL		SM 4500 P-F
0.1	mg/L	Potassium	2.3	mg/L	SM 3120 B
1	mg/L	Sulfate	67	mg/L	SM 3120 B
1	mg/L	Calcium	81	mg/L	SM 3120 B
1	mg/L	Magnesium	5	mg/L	SM 3120 B
1	mg/L	Sodium	128	mg/L	SM 3120 B
2	mg/L	Chloride	39	mg/L	SM 4500 CLD
		SAR	3.73		CALCULATED

BDL - INDICATES THE LEVEL FOUND IS BELOW THE ESTABLISHED DETECTION LIMIT FOR THAT ANALYTE.

A & L Western Agricultural Laboratories

Robert Butterfield
Laboratory Director

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QUALITY ASSURANCE REPORT

Run Date: 04/18/2011

Analyte:	LCS True Value mg/L	LCS Result mg/L	% Recovery	Acceptance Limits mg/L	Comments
NO_3-N	20	20	100	16-24	Acceptable
E.C.	1412 µmhos/cm	1412 µmhos/cm		+/- 5%	Acceptable
T. Phosphorus	1.0	0.94	94	0.8-1.2	Acceptable
Potassium	10.0	10.10	101	8-12	Acceptable
Sulfate	30	30	100	24-36	Acceptable
Calcium	50	53	106	40-60	Acceptable
Magnesium	50	56	112	40-60	Acceptable
Chloride	106	103	97	95.4-117	Acceptable
Total Alkalinity	34	35	103	30.6-37.4	Acceptable
TKN	10	10.7	107	8-12	Acceptable
NH_4-N	10	10	100	8-12	Acceptable
Sodium	50	49	98	40-60	Acceptable

Samples included in run: 61958, 61959, 61960, 61961, 62962, 61963, 61964, 61965, 61966, 61967, 61968, 61969

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Macedo Engineering & Consulting

Macedo Engineering & Consulting
4001 South K Street
Tulare, CA 93274
(559) 688-7688 office
(559) 688-7801 fax

Water Supply Well Field Activity Report

SAMPLE LOCATION:	Dom Well #5	DATE:	4/14/11
SAMPLE TIME:	10:59am		

PROJECT NAME:	J&A Dairy	PROJECT MANAGER:	Sherri King
ADDRESS:	12212 Ave 176	FIELD PERSONNEL:	Tania Ribeiro/MEC
CITY, STATE:	Tulare, CA	SIGNATURE:	Tania Ribeiro
SITE CONTACT:	Jeff Kampen		
CONSULTANT:	Tina Macedo		

WEATHER: ☒ Clear ☐ Cloudy ☐ Overcast ☐ Rain ☐ Wet ☐ Cold ☒ Warm ☐ Hot
GPS COORDINATES: na

WELL PURGE TIME	TIME	EC (UmMHOS)	TEMP °C
> 30 Minutes	na	na	na

ANALYSIS PERFORMED:	SEE CHAIN OF CUSTODY
SAMPLE CONTAINERS:	2 POLY CONTAINERS
PRESERVATIVES:	H_2SO_4
ESTIMATED AMT. OF WATER REMOVED	1000cc
COLLECTING TECHNIQUE:	☒ GRAB ☐ COMP.
LAB. ANALYSIS BY:	A&L WESTERN LABS.
COLLECTED FROM:	☐ SPIGOT ☒ STANDPIPE OPEN DISCHARGE
COLLANT USED FOR ICE CHEST:	☒ BLUE ICE ☒ CRUSHED ICE

COMMENTS: Project #07-012. .

A & L WESTERN LABORATORIES, INC.

1311 Woodland Ave. #1 • Modesto, California 95351 • Phone 209-529-4080

CHAIN OF CUSTODY

11-110-049

Client: MACEDO ENGINEERING
Address: 4001 SOUTH K ST.
TULARE CA Zip 93274

Phone (559) 688-7688
CC to:

Signature of person authorizing work under terms stated below*: Shem Kg

*Net 30 days. All accounts past due will be subject to interest charges of 1.5% per month.
*Hazardous materials are the property of the client. The client is responsible for proper disposal of hazardous wastes. Clients not picking up hazardous wastes may be assessed an appropriate fee.

PROJECT ID: 07.012

SAMPLED BY (signature): Shem Kg

Date	Time	sample type Grab	sample type Comp.	Sample Location	No. of Containers	W2 Package	W4 Package	Nitrate NO3+SO4	TKN, NH4N	NO3N, NO2N	Total Hardness	Total P	Total K	REMARKS
4/19/11	10:57a	✓		Irr. Well #6	2	✓	✓	✓	✓	✓	✓	✓	✓	

62007

Refer to report # ~~10-108~~ 10-119-087
Add Total P & Total K to Water Analysis page

Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Shem Kg	4/19/11	3:00p	Jute Bailey	4/20/11	1035
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time

Site Time: Start: Finish: Total Hours:

Driving Time: Start: Finish: Total Hours:

IRR WATER / DOM WATER

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1311 WOODLAND AVE #1 • MODESTO, CALIFORNIA 95351 • (209) 529-4080 • FAX (209) 529-4736

REPORT NUMBER: 11-110-049 **CLIENT:** 5095-D

SUBMITTED BY: SHERRI KING

SEND TO: MACEDO ENGINEERING
4001 SOUTH K ST
TULARE, CA 93274

GROWER: 07-012

DATE OF REPORT: 05/04/11

IRRIGATION WATER ANALYSIS REPORT

Sample ID	Lab Number	Sodium Na meq/L	Calcium Ca meq/L	Magnesium Mg meq/L	Carbonate CO_3 meq/L	Bicarbonate HCO_3 meq/L	Chloride Cl meq/L	Conductivity E.C. dS/m	pH	Copper Cu ppm	Iron Fe ppm	Manganese Mn ppm	Zinc Zn ppm
IRR WELL 6	62007	2.48	0.30	0.08	0.50	1.00	0.45	0.30	8.9		<0.04	<0.01	

Sample ID	Phosphorus P ppm	Potassium K ppm	Nitrate NO_3 ppm	Sulfate SO_4 ppm	Boron B ppm	Dissolved Solids ppm	Adjusted S.A.R.	Langelier Saturation Index
IRR WELL 6	<0.01	0.8	< 2	50	0.06	207	3.67	

NOTES:

This report applies only to the sample(s) tested. Samples are retained a maximum of thirty days after testing.

Mike Buttress, CPAg
A & L WESTERN LABORATORIES, INC.

A & L WESTERN AGRICULTURAL LABORATORIES, INC.

Report No: 11-110-049 1311 Woodland Avenue, Suite 1 • Modesto, California 95351 • (209) 529-4080
Account No: 5095-D

Send to: MACEDO ENGINEERING
4001 SOUTH K ST
TULARE, CA 93274

Project ID: 07-012

Submitted By: Sherri King

Lab Number: 62007

Sample ID: Irr Well #6

Date Received: 04/20/2011
Date Reported: 05/04/2011

WATER ANALYSIS REPORT

Detection Limit	Analyte	Level Found	Method Code
0.3 mg/L	Kjeldahl Nitrogen	BDL	SM 4500-NH_3 B
0.3 mg/L	Ammonia Nitrogen	BDL	SM 4500- NH_3 B
0.5 mg/L	Nitrate Nitrogen	BDL	SM 4500-NO_3 F
0.6 mg/L	Nitrite Nitrogen	BDL	SM 4500-NO_3 F
10 mg/L	Total Hardness	19 mg/L	SM 2340 B
0.1 mg/L	Total Phosphorus	BDL	SM 4500 PF
0.1 mg/L	Total Potassium	0.8 mg/L	SM 3120 B

BDL - INDICATES THE LEVEL FOUND IS BELOW THE ESTABLISHED DETECTION LIMIT FOR THAT ANALYTE.

A & L Western Agricultural Laboratories

Robert Butterfield
Laboratory Director

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1311 Woodland Avenue, Suite 1 • Modesto, California 95351 • (209) 529-4080

QUALITY ASSURANCE REPORT

Run Date: 04/21/2011

Analyte:	LCS True Value mg/L	LCS Result mg/L	% Recovery	Acceptance Limits mg/L	Comments
NO_3-N	20	19	95	16-24	Acceptable
NO_2-N	0.6	0.6	100	0.48-0.72	Acceptable
E.C.	1412 µmhos/cm	1412 µmhos/cm		+/- 5%	Acceptable
T. Phosphorus	1.0	0.89	89	0.8-1.2	Acceptable
Potassium	10	10.1	100.1	8-12	Acceptable

Samples included in run: 62004, 62005, 62006, 62007, 62008

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QUALITY ASSURANCE REPORT

Run Date: 04/26/2011

Analyte:	LCS True Value mg/L	LCS Result mg/L	% Recovery	Acceptance Limits mg/L	Comments
TKN	10	10.5	105	8-12	Acceptable

Samples included in run: 62004, 62005, 62006, 62007, 62008

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Macedo Engineering & Consulting
4001 South K Street
Tulare, CA 93274
(559) 688-7688 office
(559) 688-7801 fax

Water Supply Well Field Activity Report

SAMPLE LOCATION:	Irr Well #6	DATE:	4/19/11
SAMPLE TIME:	10:57am		

PROJECT NAME:	J&A	PROJECT MANAGER:	Sherri King
ADDRESS:		FIELD PERSONNEL:	Sherri King/MEC
CITY, STATE:	Tulare, CA	SIGNATURE:	Sherri King
SITE CONTACT:	Jeff Kampen		
CONSULTANT:	Tina Macedo		

WEATHER: ☐ Clear ☒ Cloudy ☐ Overcast ☐ Rain ☐ Wet ☐ Cold ☒ Warm ☐ Hot
GPS COORDINATES:

WELL PURGE TIME	TIME	EC (UmMHOS)	TEMP °C
>30 min	-	-	-

ANALYSIS PERFORMED:	SEE CHAIN OF CUSTODY
SAMPLE CONTAINERS:	2 POLY CONTAINERS
PRESERVATIVES:	H_2SO_4
ESTIMATED AMT. OF WATER REMOVED	1000cc
COLLECTING TECHNIQUE:	☒ GRAB ☐ COMP.
LAB. ANALYSIS BY:	A&L WESTERN LABS.
COLLECTED FROM:	☒ SPIGOT ☐ STANDPIPE OPEN DISCHARGE
COLLANT USED FOR ICE CHEST:	☒ BLUE ICE ☒ CRUSHED ICE

COMMENTS: Project #07-012

A & L WESTERN LABORATORIES, INC.

1311 Woodland Ave. #1 • Modesto, California 95351 • Phone 209-529-4080

CHAIN OF CUSTODY

11·105·044

Client: MACEDO ENGINEERING

Address: 4001 SOUTH K ST.

TULARE CA Zip 93274

Phone (559)688·7688

CC to:

Signature of person authorizing work under terms stated below*: Sherm Kg

4/14/11

*Net 30 days. All accounts past due will be subject to interest charges of 1.5% per month.
*Hazardous materials are the property of the client. The client is responsible for proper disposal of hazardous wastes. Clients not picking up hazardous wastes may be assessed an appropriate fee.

PROJECT ID: 07-012

SAMPLED BY: (signature): Tania Ribeiro

Date	Time	sample type Grab	sample type Comp.	Sample Location	No. of Containers	TKN	Ammonia Nitrogen	NO_3 N, TDS	pH, EC	Total Alkalinity	CO_3 as $CaCO_3$	Total P	K, sulfate, Ca	HO_3, Na, Cl, SAR	HCO_3 as $CaCO_3$	REMARKS
4/14/11	10:37	X		Irr. Well #7	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

61967

Refer to Project # 10·098·073. Please add HCO_3 as $CaCO_3$ to the results page

Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Tania Ribeiro	4/14/11	4:38		4/15/11	1600
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time

Site Time: Start: Finish: Total Hours:

Driving Time: Start: Finish: Total Hours:

WASTEWATER

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1311 WOODLAND AVE #1 • MODESTO, CALIFORNIA 95351 • (209) 529-4080 • FAX (209) 529-4736

REPORT NUMBER: 11-105-044 **CLIENT:** 5095-D

SUBMITTED BY: SHERI KING

SEND TO: MACEDO ENGINEERING
4001 SOUTH K ST
TULARE, CA 93274

GROWER: 07-012

DATE OF REPORT: 09/09/11

IRRIGATION WATER ANALYSIS REPORT

Sample ID	Lab Number	Sodium Na meq/L	Calcium Ca meq/L	Magnesium Mg meq/L	Carbonate CO_3 meq/L	Bicarbonate HCO_3 meq/L	Chloride Cl meq/L	Conductivity E.C. dS/m	pH	Copper Cu ppm	Iron Fe ppm	Manganese Mn ppm	Zinc Zn ppm
IRR WELL	61967	2.44	0.25	0.08	0.57	1.25	0.65	0.24	9.0				

Sample ID	Phosphorus P ppm	Potassium K ppm	Nitrate NO_3 ppm	Sulfate SO_4 ppm	Boron B ppm	Dissolved Solids ppm	Adjusted S.A.R.	Langelier Saturation Index
IRR WELL	<0.01	0.5	< 2	19		198	4.08	

NOTES:

This report applies only to the sample(s) tested. Samples are retained a maximum of thirty days after testing.

Mike Buttress, CPAg
A & L WESTERN LABORATORIES, INC.

A & L WESTERN AGRICULTURAL LABORATORIES, INC.

Report No: 11-105-044

1311 Woodland Avenue, Suite 1 • Modesto, California 95351 • (209) 529-4080

Account No: 5095

Send to: MACEDO ENGINEERING & CONSULTING
4001 SOUTH K STREET
TULARE, CA 93274

Project Id: 07-012

Submitted by: Tania Ribeiro

Lab Number: 61967

Sample ID: Irr Well #7

Date Received: 04/15/2010
Date Reported: 04/26/2010

WATER ANALYSIS REPORT

Detection Limit		Analyte	Level Found		Method Code
0.3	mg/L	Kjeldahl Nitrogen	BDL		SM 4500-NH_3 B
0.3	mg/L	Ammonia Nitrogen	BDL		SM 4500-NH_3 H
0.5	mg/L	Nitrate Nitrogen	BDL		SM 4500-$N0_3$ F
10	mg/L	Total Dissolved Solids	141	mg/L	SM 2540 C
Range=4-10	std. units	pH	9.0	std. units	SM 4500-H^+B
10	µmhos/cm	Electrical Conductivity	238	µmhos/cm	SM 2510 B
10	mg/L	Total Alkalinity $CaCO_3$	63	mg/L	SM 2320 B
10	mg/L	Carbonate as $CaCO_3$	28	mg/L	SM 2320 B
10	mg/L	HCO_3 as $CaCO_3$	35	mg/L	SM 2320 B
0.1	mg/L	Total Phosphorus	BDL		SM 4500 P-F
0.1	mg/L	Potassium	0.5	mg/L	SM 3120 B
1	mg/L	Sulfate	19	mg/L	SM 3120 B
1	mg/L	Calcium	5	mg/L	SM 3120 B
1	mg/L	Magnesium	1	mg/L	SM 3120 B
1	mg/L	Sodium	50	mg/L	SM 3120 B
2	mg/L	Chloride	23	mg/L	SM 4500 CLD
		SAR	5.98		CALCULATED

BDL - INDICATES THE LEVEL FOUND IS BELOW THE ESTABLISHED DETECTION LIMIT FOR THAT ANALYTE.

A & L Western Agricultural Laboratories

Robert Butterfield
Laboratory Director

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QUALITY ASSURANCE REPORT

Run Date: 04/18/2011

Analyte:	LCS True Value mg/L	LCS Result mg/L	% Recovery	Acceptance Limits mg/L	Comments
NO_3-N	20	20	100	16-24	Acceptable
E.C.	1412 µmhos/cm	1412 µmhos/cm		+/- 5%	Acceptable
T. Phosphorus	1.0	0.94	94	0.8-1.2	Acceptable
Potassium	10.0	10.10	101	8-12	Acceptable
Sulfate	30	30	100	24-36	Acceptable
Calcium	50	53	106	40-60	Acceptable
Magnesium	50	56	112	40-60	Acceptable
Chloride	106	103	97	95.4-117	Acceptable
Total Alkalinity	34	35	103	30.6-37.4	Acceptable
TKN	10	10.7	107	8-12	Acceptable
NH_4-N	10	10	100	8-12	Acceptable
Sodium	50	49	98	40-60	Acceptable

Samples included in run: 61958, 61959, 61960, 61961, 61962, 61963, 61964, 61965, 61966, 61967, 61968, 61969

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Macedo Engineering & Consulting

Macedo Engineering & Consulting
4001 South K Street
Tulare, CA 93274
(559) 688-7688 office
(559) 688-7801 fax

Water Supply Well Field Activity Report

SAMPLE LOCATION:	Irr Well #7	DATE:	4/14/11
SAMPLE TIME:	10:37am		

PROJECT NAME:	J&A Dairy	PROJECT MANAGER:	Sherri King
ADDRESS:	12212 Ave 176	FIELD PERSONNEL:	Tania Ribeiro/MEC
CITY, STATE:	Tulare, CA	SIGNATURE:	Tania Ribeiro
SITE CONTACT:	Jeff Kampen		
CONSULTANT:	Tina Macedo		

WEATHER: ☒ Clear ☐ Cloudy ☐ Overcast ☐ Rain ☐ Wet ☐ Cold ☒ Warm ☐ Hot
GPS COORDINATES: na

WELL PURGE TIME	TIME	EC (UmMHOS)	TEMP °C
> 30 Minutes	na	na	na

ANALYSIS PERFORMED:	SEE CHAIN OF CUSTODY
SAMPLE CONTAINERS:	2 POLY CONTAINERS
PRESERVATIVES:	H_2SO_4
ESTIMATED AMT. OF WATER REMOVED	1000cc
COLLECTING TECHNIQUE:	☒ GRAB ☐ COMP.
LAB. ANALYSIS BY:	A&L WESTERN LABS.
COLLECTED FROM:	☐ SPIGOT ☒ STANDPIPE OPEN DISCHARGE
COLLANT USED FOR ICE CHEST:	☒ BLUE ICE ☒ CRUSHED ICE

COMMENTS: Project #07-012. .

A & L WESTERN LABORATORIES, INC.

1311 Woodland Ave. #1 • Modesto, California 95351 • Phone 209-529-4080

CHAIN OF CUSTODY

11.105.045

Client: MACEDO ENGINEERING

Address: 4001 SOUTH K ST.

TULARE CA Zip 93274

Phone (559)688-7688

CC to:

Signature of person authorizing work under terms stated below*: Sherri Kf

4/14/11

*Net 30 days. All accounts past due will be subject to interest charges of 1.5% per month.
*Hazardous materials are the property of the client. The client is responsible for proper disposal of hazardous wastes. Clients not picking up hazardous wastes may be assessed an appropriate fee.

PROJECT ID: 07-012

SAMPLED BY: (signature): Tania Ribeiro

Date	Time	Sample type Grab	Sample type Comp.	Sample Location	No. of Containers	TKN	Ammonia Nitrogen	NO3 N, TDS	pH, EC	Total Alkalinity	CO3 as CaCO3	Total P	K, sulfate, Ca, Mg, Na, Cl, SAR	HCO3 as CaCO3	REMARKS
4/14/11	9:56	X		Irr. Well #8	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	

61968

Refer to Project # 10-098:073. Please add HCO3 as CaCO3 to this results page

Relinquished by (signature)	Date	Time	Received by (signature)	Date	Time
Tania Ribeiro	4/14/11	4:30		4/15/11	1600
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time

Site Time: Start: Finish: Total Hours:

Driving Time: Start: Finish: Total Hours:

WASTEWATER

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REPORT NUMBER: 11-105-045 **CLIENT:** 5095-D

SUBMITTED BY: SHERI KING

SEND TO: MACEDO ENGINEERING
4001 SOUTH K ST
TULARE, CA 93274

GROWER: 07-012

DATE OF REPORT: 09/09/11

IRRIGATION WATER ANALYSIS REPORT

Sample ID	Lab Number	Sodium Na meq/L	Calcium Ca meq/L	Magnesium Mg meq/L	Carbonate CO_3 meq/L	Bicarbonate HCO_3 meq/L	Chloride Cl meq/L	Conductivity E.C. dS/m	pH	Copper Cu ppm	Iron Fe ppm	Manganese Mn ppm	Zinc Zn ppm
IRR WELL	61968	2.83	0.55	0.08	0.00	2.00	0.65	0.31	8.3				

Sample ID	Phosphorus P ppm	Potassium K ppm	Nitrate NO_3 ppm	Sulfate SO_4 ppm	Boron B ppm	Dissolved Solids ppm	Adjusted S.A.R.	Langelier Saturation Index
IRR WELL	<0.01	0.6	12	28		263	4.26	

NOTES:

This report applies only to the sample(s) tested. Samples are retained a maximum of thirty days after testing.

Mike Buttress, CPAg
A & L WESTERN LABORATORIES, INC.

A & L WESTERN AGRICULTURAL LABORATORIES, INC.

Report No: 11-105-045

1311 Woodland Avenue, Suite 1 • Modesto, California 95351 • (209) 529-4080

Account No: 5095

Send to: MACEDO ENGINEERING & CONSULTING
4001 SOUTH K STREET
TULARE, CA 93274

Project Id: 07-012

Submitted by: Tania Ribeiro

Lab Number: 61968

Sample ID: Irr Well #8

Date Received: 04/15/2010
Date Reported: 04/26/2010

WATER ANALYSIS REPORT

Detection Limit		Analyte	Level Found		Method Code
0.3	mg/L	Kjeldahl Nitrogen	BDL		SM 4500-NH_3 B
0.3	mg/L	Ammonia Nitrogen	BDL		SM 4500-NH_3 H
0.5	mg/L	Nitrate Nitrogen	2.7	mg/L	SM 4500-$N0_3$ F
10	mg/L	Total Dissolved Solids	174	mg/L	SM 2540 C
Range=4-10	std. units	pH	8.3	std. units	SM 4500-H^+B
10	µmhos/cm	Electrical Conductivity	306	µmhos/cm	SM 2510 B
10	mg/L	Total Alkalinity $CaCO_3$	100	mg/L	SM 2320 B
10	mg/L	Carbonate as $CaCO_3$	0		SM 2320 B
10	mg/L	HCO_3 as $CaCO_3$	122	mg/L	SM 2320 B
0.1	mg/L	Total Phosphorus	BDL		SM 4500 P-F
0.1	mg/L	Potassium	0.6	mg/L	SM 3120 B
1	mg/L	Sulfate	28	mg/L	SM 3120 B
1	mg/L	Calcium	11	mg/L	SM 3120 B
1	mg/L	Magnesium	1	mg/L	SM 3120 B
1	mg/L	Sodium	65	mg/L	SM 3120 B
2	mg/L	Chloride	23	mg/L	SM 4500 CLD
		SAR	5.04		CALCULATED

BDL - INDICATES THE LEVEL FOUND IS BELOW THE ESTABLISHED DETECTION LIMIT FOR THAT ANALYTE.

A & L Western Agricultural Laboratories

Robert Butterfield
Laboratory Director

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QUALITY ASSURANCE REPORT

Run Date: 04/18/2011

Analyte:	LCS True Value mg/L	LCS Result mg/L	% Recovery	Acceptance Limits mg/L	Comments
NO_3-N	20	20	100	16-24	Acceptable
E.C.	1412 µmhos/cm	1412 µmhos/cm		+/- 5%	Acceptable
T. Phosphorus	1.0	0.94	94	0.8-1.2	Acceptable
Potassium	10.0	10.10	101	8-12	Acceptable
Sulfate	30	30	100	24-36	Acceptable
Calcium	50	53	106	40-60	Acceptable
Magnesium	50	56	112	40-60	Acceptable
Chloride	106	103	97	95.4-117	Acceptable
Total Alkalinity	34	35	103	30.6-37.4	Acceptable
TKN	10	10.7	107	8-12	Acceptable
NH_4-N	10	10	100	8-12	Acceptable
Sodium	50	49	98	40-60	Acceptable

Samples included in run: 61958, 61959, 61960, 61961, 61962, 61963, 61964, 61965, 61966, 61967, 61968, 61969

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Macedo Engineering & Consulting

Macedo Engineering & Consulting
4001 South K Street
Tulare, CA 93274
(559) 688-7688 office
(559) 688-7801 fax

Water Supply Well Field Activity Report

SAMPLE LOCATION:	Irr Well #8	DATE:	4/14/11
SAMPLE TIME:	9:56am		

PROJECT NAME:	J&A Dairy	PROJECT MANAGER:	Sherri King
ADDRESS:	12212 Ave 176	FIELD PERSONNEL:	Tania Ribeiro/MEC
CITY, STATE:	Tulare, CA	SIGNATURE:	Tania Ribeiro
SITE CONTACT:	Jeff Kampen		
CONSULTANT:	Tina Macedo		

WEATHER: ☒ Clear ☐ Cloudy ☐ Overcast ☐ Rain ☐ Wet ☐ Cold ☒ Warm ☐ Hot
GPS COORDINATES: na

WELL PURGE TIME	TIME	EC (UmMHOS)	TEMP °C
> 30 Minutes	na	na	na

ANALYSIS PERFORMED:	SEE CHAIN OF CUSTODY
SAMPLE CONTAINERS:	2 POLY CONTAINERS
PRESERVATIVES:	H_2SO_4
ESTIMATED AMT. OF WATER REMOVED	1000cc
COLLECTING TECHNIQUE:	☒ GRAB ☐ COMP.
LAB. ANALYSIS BY:	A&L WESTERN LABS.
COLLECTED FROM:	☐ SPIGOT ☒ STANDPIPE OPEN DISCHARGE
COLLANT USED FOR ICE CHEST:	☒ BLUE ICE ☒ CRUSHED ICE

COMMENTS: Project #07-012. .

A & L WESTERN LABORATORIES, INC.

1311 Woodland Ave. #1 • Modesto, California 95351 • Phone 209-529-4080

11·105·046

CHAIN OF CUSTODY

Client: MACEDO ENGINEERING

Address: 4001 SOUTH K ST.

TULARE CA Zip 93274

Phone (559)688-7688

CC to:

Signature of person authorizing work under terms stated below*: Sherri Kf

4/14/11

*Net 30 days. All accounts past due will be subject to interest charges of 1.5% per month.
*Hazardous materials are the property of the client. The client is responsible for proper disposal of hazardous wastes. Clients not picking up hazardous wastes may be assessed an appropriate fee.

PROJECT ID: 07-012

SAMPLED BY: (signature): Tania Ribeiro

Date	Time	Sample type: Grab	Sample type: Comp.	Sample Location	No. of Containers	TKN	Ammonia Nitrogen	NO3 N, TDS	pH, EC	Total Alkalinity	CO3 as CaCO3	Total P	K, sulfate, Ca, Mg, Na, Cl, SAR, HCO3 as CaCO3	REMARKS
4/14/11	10:17	X		Irr. Well #9	2	✓	✓	✓	✓	✓	✓	✓	✓ ✓ ✓	

61969

Refer to Project # 10·098·073. Please add HCO3 as CaCO3 to this results page

Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Tania Ribeiro	4/14/11	4:30		4/15/11	1600
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time
Relinquished by (signature):	Date	Time	Received by (signature):	Date	Time

Site Time: Start: Finish: Total Hours:

Driving Time: Start: Finish: Total Hours:

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REPORT NUMBER: 11-105-046 **CLIENT:** 5095-D

SUBMITTED BY: SHERI KING

SEND TO: MACEDO ENGINEERING
4001 SOUTH K ST
TULARE, CA 93274

GROWER: 07-012

DATE OF REPORT: 09/09/11

IRRIGATION WATER ANALYSIS REPORT

Sample ID	Lab Number	Sodium Na meq/L	Calcium Ca meq/L	Magnesium Mg meq/L	Carbonate CO_3 meq/L	Bicarbonate HCO_3 meq/L	Chloride Cl meq/L	Conductivity E.C. dS/m	pH	Copper Cu ppm	Iron Fe ppm	Manganese Mn ppm	Zinc Zn ppm
IRR WELL	61969	2.70	0.25	0.08	0.40	2.25	0.34	0.26	8.8				

Sample ID	Phosphorus P ppm	Potassium K ppm	Nitrate NO_3 ppm	Sulfate SO_4 ppm	Boron B ppm	Dissolved Solids ppm	Adjusted S.A.R.	Langelier Saturation Index
IRR WELL	<0.01	0.4	< 2	15		244	5.31	

NOTES:

This report applies only to the sample(s) tested. Samples are retained a maximum of thirty days after testing.

Mike Buttress, CPAg
A & L WESTERN LABORATORIES, INC.

A & L WESTERN AGRICULTURAL LABORATORIES, INC.

Report No: 11-105-046

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Account No: 5095

Send to: MACEDO ENGINEERING & CONSULTING
4001 SOUTH K STREET
TULARE, CA 93274

Project Id: 07-012

Submitted by: Tania Ribeiro

Lab Number: 61969

Sample ID: Irr Well #9

Date Received: 04/15/2010
Date Reported: 04/26/2010

WATER ANALYSIS REPORT

Detection Limit		Analyte	Level Found		Method Code
0.3	mg/L	Kjeldahl Nitrogen	BDL		SM 4500-NH_3 B
0.3	mg/L	Ammonia Nitrogen	BDL		SM 4500-NH_3 H
0.5	mg/L	Nitrate Nitrogen	BDL		SM 4500-$N0_3$ F
10	mg/L	Total Dissolved Solids	159	mg/L	SM 2540 C
Range=4-10	std. units	pH	8.8	std. units	SM 4500-H^+B
10	µmhos/cm	Electrical Conductivity	257	µmhos/cm	SM 2510 B
10	mg/L	Total Alkalinity $CaCO_3$	113	mg/L	SM 2320 B
10	mg/L	Carbonate as $CaCO_3$	20	mg/L	SM 2320 B
10	mg/L	HCO_3 as $CaCO_3$	93	mg/L	SM 2320 B
0.1	mg/L	Total Phosphorus	BDL		SM 4500 P-F
0.1	mg/L	Potassium	0.4	mg/L	SM 3120 B
1	mg/L	Sulfate	15	mg/L	SM 3120 B
1	mg/L	Calcium	5	mg/L	SM 3120 B
1	mg/L	Magnesium	1	mg/L	SM 3120 B
1	mg/L	Sodium	62	mg/L	SM 3120 B
2	mg/L	Chloride	12	mg/L	SM 4500 CLD
		SAR	6.65		CALCULATED

BDL - INDICATES THE LEVEL FOUND IS BELOW THE ESTABLISHED DETECTION LIMIT FOR THAT ANALYTE.

A & L Western Agricultural Laboratories

Robert Butterfield
Laboratory Director

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1311 Woodland Avenue, Suite 1 • Modesto, California 95351 • (209) 529-4080

QUALITY ASSURANCE REPORT

Run Date: 04/18/2011

Analyte:	LCS True Value mg/L	LCS Result mg/L	% Recovery	Acceptance Limits mg/L	Comments
NO_3-N	20	20	100	16-24	Acceptable
E.C.	1412 µmhos/cm	1412 µmhos/cm		+/- 5%	Acceptable
T. Phosphorus	1.0	0.94	94	0.8-1.2	Acceptable
Potassium	10.0	10.10	101	8-12	Acceptable
Sulfate	30	30	100	24-36	Acceptable
Calcium	50	53	106	40-60	Acceptable
Magnesium	50	56	112	40-60	Acceptable
Chloride	106	103	97	95.4-117	Acceptable
Total Alkalinity	34	35	103	30.6-37.4	Acceptable
TKN	10	10.7	107	8-12	Acceptable
NH_4-N	10	10	100	8-12	Acceptable
Sodium	50	49	98	40-60	Acceptable

Samples included in run: 61958, 61959, 61960, 61961, 61962, 61963, 61964, 61965, 61966, 61967, 61968, 61969

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4001 South K Street
Tulare, CA 93274
(559) 688-7688 office
(559) 688-7801 fax

Water Supply Well Field Activity Report

SAMPLE LOCATION:	Irr Well #9	DATE:	4/14/11
SAMPLE TIME:	10:17am		

PROJECT NAME:	J&A Dairy	PROJECT MANAGER:	Sherri King
ADDRESS:	12212 Ave 176	FIELD PERSONNEL:	Tania Ribeiro/MEC
CITY, STATE:	Tulare, CA	SIGNATURE:	Tania Ribeiro
SITE CONTACT:	Jeff Kampen		
CONSULTANT:	Tina Macedo		

WEATHER: ☒ Clear ☐ Cloudy ☐ Overcast ☐ Rain ☐ Wet ☐ Cold ☒ Warm ☐ Hot
GPS COORDINATES: na

WELL PURGE TIME	TIME	EC (UmMHOS)	TEMP °C
> 30 Minutes	na	na	na

ANALYSIS PERFORMED:	SEE CHAIN OF CUSTODY
SAMPLE CONTAINERS:	2 POLY CONTAINERS
PRESERVATIVES:	H_2SO_4
ESTIMATED AMT. OF WATER REMOVED	1000cc
COLLECTING TECHNIQUE:	☒ GRAB ☐ COMP.
LAB. ANALYSIS BY:	A&L WESTERN LABS.
COLLECTED FROM:	☐ SPIGOT ☒ STANDPIPE OPEN DISCHARGE
COLLANT USED FOR ICE CHEST:	☒ BLUE ICE ☒ CRUSHED ICE

COMMENTS: Project #07-012. .

LON

Dairy 36-15:
Well Design Justifications,
Well Completion Designs,
Geologic Logs,
and Well Completion Reports

Well Design Justification For Well 36-15-MW1A, B, C

The well design is based on professional assessment of the geologic log and the E-log. The depth to water table is 85' in MW1B and 87' in MW1C. Depending on climate conditions, the water table could drop up to 20 feet in the next 2.5 years of this project. The well design needs to accommodate for sampling first encountered groundwater even if water level drops to 110 ft. As such, we need to design the well with at least 10-20 ft of aquifer depth below 110 ft to make sure that we are able to collect sufficient sample volume of first encountered groundwater.

In an auger-constructed borehole, used to collect undisturbed soil samples from the land surface to the water table, a well was constructed using non-SWRCB funding (36-15-MW1A). This well will allow for measuring perched water table conditions or first encountered water under future higher water table conditions. The well is screened from 64 ft. to 84 ft. and intersects sand layers above the water table. It is currently dry.

A separate mud-rotary constructed borehole, placed 10 feet from the augered borehole, was used to collect undisturbed core samples from a depth of 84 ft. to the bottom of the borehole. In this borehole, two screened well casings were constructed to allow for sampling first encountered groundwater (aquifer units) even if water levels vary from current conditions:

36-15-MW1B: Screened from 93 - 113 ft
36-15-MW1C: Screened from 123 – 138 ft

The first screen is placed to intersect a sequence of major sand layers near the current water table. The second screen is placed within the first significant sand unit below 110ft., where 110 ft. is the maximum depth to water for which this well is designed. The borehole is sealed between the two screens and above 90 ft. On September 26th, 2007, the depth to water table was 85 ft. and 87 ft. in the two wells MW1B and MW1C, respectively, indicating a vertical downward gradient of 2 ft. per 10 ft. between the two wells. The strong vertical gradient is thought to be due to a pumping well that is less than 1500 ft. north of this monitoring well site. It may also be due to recharge from a nearby irrigation canal.

The two casings are necessary so that we are able to sample first encountered groundwater (FEGW) (Item 2.2.5) recharged from the adjacent upgradient corral (Item 2.2.4) regardless of the depth of the water table.

In order to be able to distinguish FEGW from deeper water when the water table is above 90 ft., separate samples are needed from the sand layers at 90 - 115 ft. and from the sandy layers below 120 ft. to identify the FEGW representing recharge from the upgradient corral. It is unclear from the information we have now whether FEGW sampled from the adjacent corral (Task 2.2.4) is represented by 90 - 115 ft or from 90 to well below 140 ft if the water level is at 90 ft or above (but below 80 ft). Based on calculations using typical hydraulic conductivity values, it is most likely that the first option represents FEGW recharged from the adjacent corral for water table depths of above 90 ft, but below 80 ft. To make sure that we can later differentiate FEGW based on depth to the water table and water quality from collected samples, screen lengths are chosen to capture a representative sample of FEGW recharged by the adjacent corral. Screen lengths and depths also accommodate the local geology. Both, the first and second screen are opposite intermediate yielding sand aquifer units. The calculated length to represent FEGW from the adjacent upgradient corral (Item 2.2.4.), given the local geology, is therefore 15 - 20 feet. The location of the screens also conforms to the elevation of sandy layers identified in the E-log.

Well Design Justification For Well 36-15-MW2A, B, C

The well design is based on professional assessment of the geologic log and the E-log. The depth to water table is 83.5' in MW2B and 83.6' in MW2C. Depending on climate conditions, the water table could drop up to 20 feet in the next 2.5 years of this project. The well design needs to accommodate for sampling first encountered groundwater even if water level drops to 105 ft. As such, we need to design the well with at least 10-20 ft. of aquifer depth below 105 ft. to make sure that we are able to collect sufficient sample volume of first encountered groundwater.

In an auger-constructed borehole, used to collect undisturbed soil samples from the land surface to the water table, a well was constructed using non-SWRCB funding (36-15-MW2A). This well will allow for measuring perched water table conditions or first encountered water under future higher water table conditions. The well is screened from 65 ft. to 90 ft. and intersects mostly silty fine sand layers above the current water table. It is currently dry.

A separate mud-rotary constructed borehole, placed 10 feet from the augered borehole, was used to collect undisturbed core samples from a depth of 90 ft. to the bottom of the borehole. In this borehole, two screened well casings were constructed to allow for sampling first encountered groundwater (aquifer units) even if water levels vary from current conditions:

36-15-MW2B: Screened from 96 - 106 ft
36-15-MW2C: Screened from 115 – 125 ft

The first screen is placed to intersect a sequence of major sand layers near the current water table. The second screen is placed within the first significant sand unit below 110ft., where 110 ft. is the maximum depth to water for which this well is designed. The borehole is sealed between the two screens and above 92 ft. On October 2nd, 2007, the depth to water table was 83.5 ft. and 83.6 ft. in the two wells MW1B and MW1C, respectively, indicating nearly no vertical downward gradient.

The two casings are necessary so that we are able to sample first encountered groundwater (FEGW) (Item 2.2.5) recharged from the adjacent upgradient lagoon (Item 2.2.4) regardless of the depth of the water table.

In order to be able to distinguish FEGW from deeper water when the water table is above 92 ft., separate samples are needed from the sand layers at 90 - 110 ft. and from the sandy layers below 115 ft. to identify the FEGW representing recharge from the upgradient lagoon. It is unclear from the information we have now whether FEGW sampled from the adjacent lagoon (Task 2.2.4) is represented by 90 - 110 ft or from 90 to well below 140 ft if the water level is at 90 ft or above (but below 78 ft). Based on calculations using typical hydraulic conductivity values, it is most likely that the first option represents FEGW recharged from the adjacent lagoon for water table depths of above 90 ft, but below 78 ft. To make sure that we can later differentiate FEGW based on depth to the

water table and water quality from collected samples, screen lengths are chosen to capture a representative sample of FEGW recharged by the adjacent lagoon. Screen lengths and depths also accommodate the local geology. Both, the first and second screen are opposite intermediate yielding sand aquifer units. The calculated length to represent FEGW from the adjacent upgradient lagoon (Item 2.2.4.), given the local geology, is therefore 15 - 20 feet. The deeper screen is only 10 ft. long, because no sandy aquifer layers were found between 125' and 145'. Due to budget restrictions, drilling was terminated at that depth. The location of the screens also conforms to the elevation of sandy layers identified in the E-log.

Well Design Justification For Well 36-15-MW3A, B, C

The well design is based on professional assessment of the geologic log and the E-log. The depth to water table is 84.0' in MW3B and 83.8' in MW3C. Depending on climate conditions, the water table could drop up to 20 feet in the next 2.5 years of this project. The well design needs to accommodate for sampling first encountered groundwater even if water level drops to 105 ft. As such, we need to design the well with at least 10-20 ft. of aquifer depth below 105 ft. to make sure that we are able to collect sufficient sample volume of first encountered groundwater.

In an auger-constructed borehole, used to collect undisturbed soil samples from the land surface to the water table, a well was constructed using non-SWRCB funding (36-15-MW3A). This well will allow for measuring perched water table conditions or first encountered water under future higher water table conditions. The well is screened from 65 ft. to 85 ft. and intersects several sand layers above the current water table. It is currently dry.

A separate mud-rotary constructed borehole, placed 10 feet from the augered borehole, was used to collect undisturbed core samples from a depth of 85 ft. to the bottom of the borehole. In this borehole, two screened well casings were constructed to allow for sampling first encountered groundwater (aquifer units) even if water levels vary from current conditions:

36-15-MW3B: Screened from 115 - 130 ft
36-15-MW3C: Screened from 130 – 140 ft

The borehole is sealed above 110 ft. No seal was constructed between the two casing screens as there is no clay layer to seal against (as indicated by the E-log).

Immediately below the current water table, a significant confining unit occurs, as observed in both, the geologic log and the E-log, from approximately 90 ft to 110 ft. below ground surface. The first screen is placed to intersect the first sequence of major sand layers that occurs below the current water table. The second screen is placed immediately below the first screen and intersects several feet of medium to coarse sand, estimated to have relatively high hydraulic conductivity.

The two casings are necessary so that we are able to sample first encountered groundwater (FEGW) (Item 2.2.5) recharged from the adjacent upgradient lagoon (Item 2.2.4) regardless of the depth of the water table.

In order to be able to distinguish FEGW from deeper water when the water table is above 115 ft., separate samples are needed from the sand layers at 115 - 130 ft. and from the sand layers between 130ft and 140 ft. to identify the FEGW representing recharge from the upgradient lagoon. It is unclear from the information we have now whether FEGW sampled from the adjacent lagoon (Task 2.2.4) is represented by 115-130 ft, 115-140 ft, or from 115 to well below 140 ft if the water level is at 115 ft or above (but below 80 ft).

Based on calculations using typical hydraulic conductivity values, it is most likely that the first option represents FEGW recharged on the adjacent lagoon for water table depths of above 115 ft, but below 80 ft. To make sure that even after well construction we can differentiate FEGW based on depth to the water table and water quality from collected samples, screen lengths are chosen to capture a representative sample of FEGW recharged by the adjacent lagoon. Screen lengths and depths also accommodate the local geology. The shallower screen is opposite intermediate yielding sand aquifer units, the deeper screen is opposite intermediate to high yielding sand aquifer units. The calculated length to represent FEGW from the adjacent upgradient lagoon (Item 2.2.4.), given the local geology, is therefore 10-15 feet. To make sure that we can differentiate FEGW based on depth to the water table and water quality from collected samples, we installed two separate screened well casings rather than a single 25 ft screen.

Well Design Justification For Well 36-15-MW-4A, B, C, D

The well design is based on professional assessment of the geologic log and the E-log. The depth to water table is 86.9' in MW4B, 87.6' in MW4C, and 87.7' in MW4D. Nearby wells monitored by the California Department of Water Resources have had depth to water table of 110 ft. or more in recent years. Depending on climate conditions, the water table could drop up to 20-25 feet in the next 2.5 years of this project. The well design needs to accommodate for sampling first encountered groundwater even if water level drops to 110 – 120 ft. As such, we need to design the well with at least 20 ft. of aquifer depth below 120 ft. to make sure that we are able to collect sufficient sample volume of first encountered groundwater.

In an auger-constructed borehole, used to collect undisturbed soil samples from the land surface to the water table, a well was constructed using non-SWRCB funding (36-15-MW4A). This well will allow for measuring perched water table conditions or first encountered water under future higher water table conditions. The well is screened from 60 ft. to 90 ft. and intersects several sand layers above the current water table. It is currently dry.

A separate mud-rotary constructed borehole, placed 10 feet from the augered borehole, was used to collect undisturbed core samples from a depth of 90 ft. to the bottom of the borehole. In this borehole, three screened well casings were constructed to allow for sampling first encountered groundwater (aquifer units) even if water levels vary from current conditions:

36-15-MW4B: Screened from 105 - 115 ft
36-15-MW4C: Screened from 130 – 140 ft
36-15-MW4D: Screened from 140 – 150 ft

The borehole is sealed above 95 ft. No seal was constructed between the two lower casing screens as there is no clay layer to seal against (as indicated by the E-log).

The first screen is placed to intersect a sequence of major sand layers near the current water table. The second screen and third screen are placed within the first significant sand unit below 120ft., where 120 ft. is the maximum depth to water for which this well is designed. The borehole is sealed between the uppermost and middle screens and above 100 ft. On September 26th, 2007, the depth to water table was 86.9 ft., 87.6 ft., and 87.7 ft. in the three wells MW4B, MW4C, and MW4D, respectively, indicating a small vertical downward gradient.

The three casings are necessary so that we are able to sample first encountered groundwater (FEGW) (Item 2.2.5) recharged from the adjacent upgradient field (Item 2.2.4) regardless of the depth of the water table.

In order to be able to distinguish FEGW from deeper water when the water table is above 105 ft., separate samples are needed from the sand layers at 105 - 115 ft. and from the

sandy layers below 120 ft. to identify the FEGW representing recharge from the upgradient field. It is unclear from the information we have now whether FEGW sampled from the adjacent field (Task 2.2.4) is represented by 105 - 115 ft. or by 105 to 140 ft. or by 105 ft. to well below 150 ft if the water level is at 105 ft or above (but below 85 ft). Based on calculations using typical hydraulic conductivity values, it is most likely that the first option represents FEGW recharged from the adjacent field for water table depths of above 105 ft., but below 85 ft. To make sure that we can later differentiate FEGW based on depth to the water table and water quality from collected samples, screen lengths are chosen to capture a representative sample of FEGW recharged by the adjacent field. Screen lengths and depths also accommodate the local geology. All three screens are opposite intermediate yielding sand aquifer units. The calculated length to represent FEGW from the adjacent upgradient field (Item 2.2.4.), given the local geology, is therefore 10 - 20 feet. The upper screen is separated from the lower two screens by a clay layer that is sealed off.

The lower two screens are used when the water table falls to 110 ft. or lower. The 130 – 150 ft. sand layer was screened by two separate ten-foot long screens. This construction was chosen, because it is not clear, whether FEGW sampled from the adjacent field (Task 2.2.4) is represented by 130 - 140 ft. or by 130 to well below 150 ft. if the water level is at 130 ft. or above (but below 110 ft.). To make sure that we can later differentiate FEGW based on depth to the water table and water quality from collected samples, we installed two separate screened well casings rather than a single 20 ft. screen.

The location of all screens also conforms to the elevation of sandy layers identified in the E-log.

Well Design Justification For Well 36-15-MW-5A, B, C

The well design is based on professional assessment of the geologic log and the E-log. The depth to water table is 91.5' in MW5B and 91.8' in MW5C. Depending on climate conditions, the water table could drop up to 20-25 feet in the next 2.5 years of this project. The well design needs to accommodate for sampling first encountered groundwater even if water level drops to 110 ft. As such, we need to design the well with at least 10 - 20 ft. of aquifer depth below 110 ft. to make sure that we are able to collect sufficient sample volume of first encountered groundwater.

In an auger-constructed borehole, used to collect undisturbed soil samples from the land surface to the water table, a well was constructed using non-SWRCB funding (36-15-MW5A). This well will allow for measuring perched water table conditions or first encountered water under future higher water table conditions. The well is screened from 66 ft. to 96 ft. and intersects several sand layers above the current water table. It is currently dry.

A separate mud-rotary constructed borehole, placed 10 feet from the augered borehole, was used to collect undisturbed core samples from a depth of 96 ft. to the bottom of the borehole. In this borehole, two screened well casings were constructed to allow for sampling first encountered groundwater (aquifer units) even if water levels vary from current conditions:

36-15-MW5B: Screened from 100 - 110 ft
36-15-MW5C: Screened from 118 – 128 ft

The borehole is sealed above 93 ft. Between 90 ft. and 140 ft. below ground surface, the geologic log and the E-log indicate two zones of coarser-textured, sandy sediments, which are screened by two separate ten-foot long screens. On September 26, 2007, the water table in the two screens was 91.5 ft. and 91.8 ft. below ground surface, indicating a slight downward gradient across the sealed 8 ft. vertical separation between the two screens.

The two casings are necessary so that we are able to sample first encountered groundwater (FEGW) (Item 2.2.5) recharged from the adjacent upgradient field (Item 2.2.4) regardless of the depth of the water table.

In order to be able to distinguish FEGW from deeper water when the water table is above 100 ft., separate samples are needed from the sand layers at 100 - 110 ft. and from the sandy layers below 118 ft. to identify the FEGW representing recharge from the upgradient field. It is unclear from the information we have now whether FEGW sampled from the adjacent field (Task 2.2.4) is represented by groundwater from 100 - 110 ft. or by groundwater from 100 to well below 130 ft. if the water level is at 100 ft or above (but below 85 ft). Based on calculations using typical hydraulic conductivity values, it is most likely that the second option represents FEGW recharged from the adjacent field for water table depths of above 100 ft, but below 85 ft. To make sure that we can later

differentiate FEGW based on depth to the water table and water quality from collected samples, screen lengths are chosen to capture a representative sample of FEGW recharged by the adjacent field. Screen lengths and depths also accommodate the local geology. Both, the first and second screen are opposite intermediate yielding sand aquifer units. The calculated length to represent FEGW from the adjacent upgradient field (Item 2.2.4.), given the local geology, is therefore 15 - 20 feet. However, sandy layers were not sufficiently thick between significant confining units and a smaller screen length (ten feet) was selected. Coring was terminated at 140 ft. below ground surface. The location of the screens also conforms to the elevation of sandy layers identified in the E-log.

Well Design Justification For Well 36-15-MW-6A, B, C

The well design is based on professional assessment of the geologic log and the E-log. The depth to water table is 93.2' in MW6B and 94.3' in MW6C. Depending on climate conditions, the water table could drop up to 20-25 feet in the next 2.5 years of this project. The well design needs to accommodate for sampling first encountered groundwater even if water level drops to 110 ft. As such, we need to design the well with at least 10 - 20 ft. of aquifer depth below 110 ft. to make sure that we are able to collect sufficient sample volume of first encountered groundwater.

In an auger-constructed borehole, used to collect undisturbed soil samples from the land surface to the water table, a well was constructed using non-SWRCB funding (36-15-MW6A). This well will allow for measuring perched water table conditions or first encountered water under future higher water table conditions. The well is screened from 85 ft. to 95 ft. and intersects several sand layers above the current water table. Depth to water at the time of drilling was 87 ft. below ground surface.

A separate mud-rotary constructed borehole, placed 10 feet from the augered borehole, was used to collect undisturbed core samples from a depth of 90 ft. to the bottom of the borehole. In this borehole, two screened well casings were constructed to allow for sampling first encountered groundwater (aquifer units) even if water levels vary from current conditions:

36-15-MW6B: Screened from 95 - 110 ft
36-15-MW6C: Screened from 120 – 130 ft

The borehole is sealed above 90 ft. Between 90 ft. and 140 ft. below ground surface, the geologic log and the E-log indicate two zones of coarser-textured, sandy sediments, which are screened by two separate fifteen-foot and ten-foot long screens. On September 18, 2007, the water table in the two screens was 93.2 ft. and 94.3 ft. below ground surface, indicating a slight downward gradient across the sealed 10 ft. vertical separation between the two screens.

The two casings are necessary so that we are able to sample first encountered groundwater (FEGW) (Item 2.2.5) recharged from the adjacent upgradient field (Item 2.2.4) regardless of the depth of the water table.

In order to be able to distinguish FEGW from deeper water when the water table is above 95 ft., separate samples are needed from the sand layers at 95 - 110 ft. and from the sandy layer below 120 ft. to identify the FEGW representing recharge from the upgradient field. It is unclear from the information we have now whether FEGW sampled from the adjacent field (Task 2.2.4) is represented by groundwater at 95 - 110 ft. or by groundwater at 95 to well below 130 ft. if the water level is at 95 ft or above (but below 90 ft). Based on calculations using typical hydraulic conductivity values, it is most likely that the first option represents FEGW recharged from the adjacent field for water table depths of above 95 ft, but below 90 ft. To make sure that we can later differentiate

FEGW based on depth to the water table and water quality from collected samples, screen lengths are chosen to capture a representative sample of FEGW recharged by the adjacent field. Screen lengths and depths also accommodate the local geology. Both, the first and second screen are opposite intermediate yielding sand aquifer units. The calculated length to represent FEGW from the adjacent upgradient field (Item 2.2.4.), given the local geology, is therefore 15 - 20 feet. However, sandy layers were not sufficiently thick below 120 ft. and a smaller screen length (ten feet) was selected. Coring was terminated at 140 ft. below ground surface. The location of the screens also conforms to the elevation of sandy layers identified in the E-log.

Well Design Justification For Well 36-15-MW7A, B, C, D

The well design is based on professional assessment of the geologic log and the E-log. The depth to water table is 84.8' in MW7C and 85.1' in MW7D. Depending on climate conditions, the water table could drop up to 20 feet in the next 2.5 years of this project. The well design needs to accommodate for sampling first encountered groundwater even if water level drops to 105 ft. As such, we need to design the well with at least 10-20 ft. of aquifer depth below 105 ft. to make sure that we are able to collect sufficient sample volume of first encountered groundwater.

In an auger-constructed borehole, used to collect undisturbed soil samples from the land surface to the water table, a well was constructed using non-SWRCB funding (36-15-MW7A). This well will allow for measuring perched water table conditions or first encountered water under future higher water table conditions. The well is screened from 42 ft. to 52 ft. and intersects a wet sand layer that supported a perched water table at the time of drilling. The well is currently dry.

A separate mud-rotary constructed borehole, placed 10 feet from the augered borehole, was used to collect undisturbed core samples from a depth of 50 ft. to the bottom of the borehole. In this borehole, three screened well casings were constructed to allow for sampling first encountered groundwater (aquifer units) even if water levels vary from current conditions:

36-15-MW7B: Screened from 68 - 78 ft.
36-15-MW7C: Screened from 88 – 98 ft.
36-15-MW7C: Screened from 108 – 128 ft.

The first screen is placed to intersect a sequence of major sand layers near the current water table. The second screen is placed into a separate major sand layer near the current water table, sealed from both, the screen above and the screen below. The third screen is placed within the first significant sand unit below 110 ft., where 110 ft. is the maximum depth to water for which this well is designed. The borehole is sealed between all three screens and above 65 ft. On September 12th, 2007, the depth to water table was 84.8 ft. and 85.1 ft. in the two wells MW7C and MW7D, respectively, indicating a small vertical downward gradient across the sealed ten-foot vertical separation distance between the two screens.

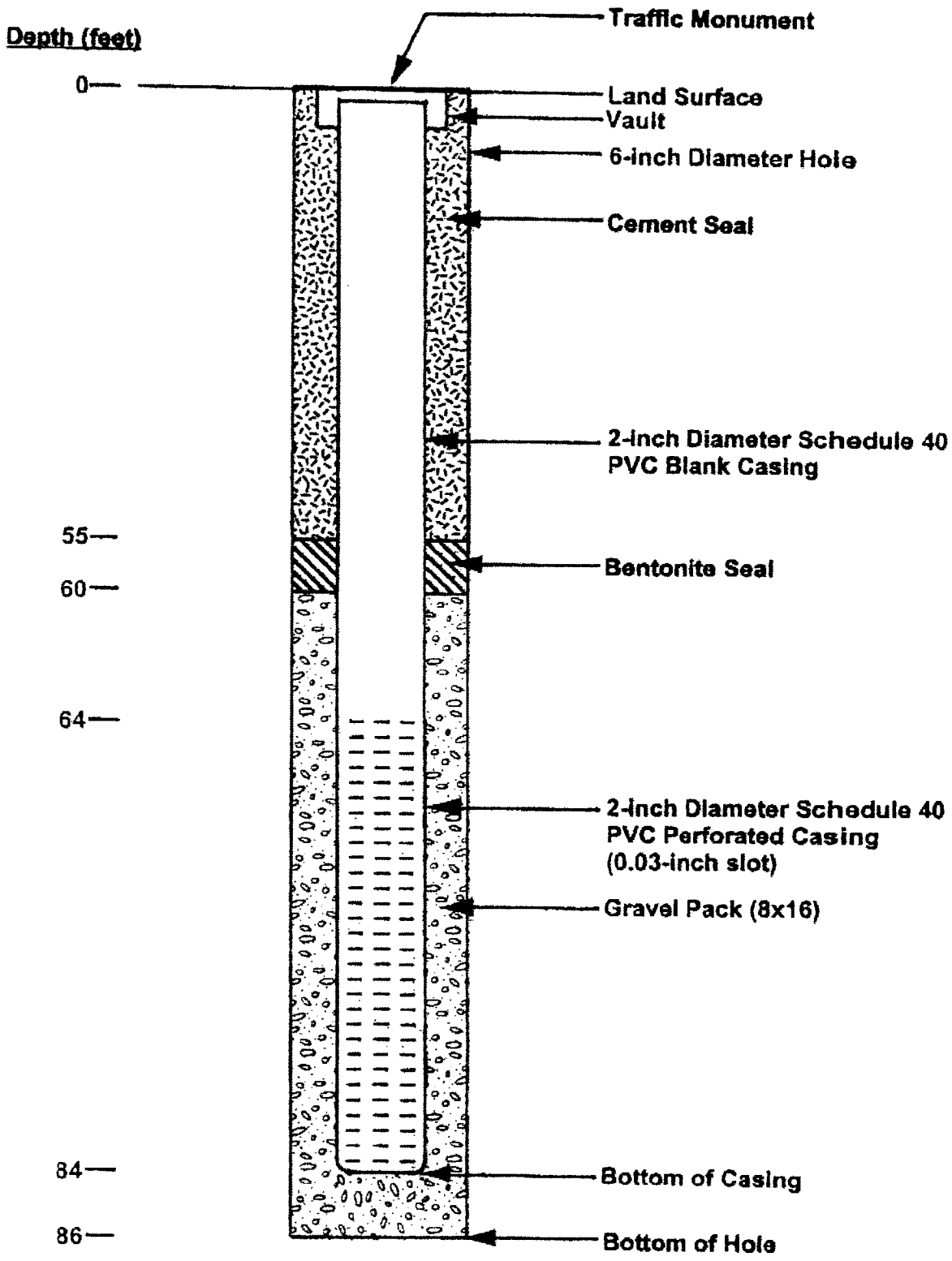
The three casings are necessary so that we are able to sample first encountered groundwater (FEGW) (Item 2.2.5) recharged from the adjacent upgradient lagoon (Item 2.2.4) regardless of the depth of the water table.

The first screen (MW7B) was placed immediately above the current water table in order to sample FEGW, if the water table rises to 73' or higher over the next 2.5 years, because MW7A was completed at a higher elevation where it intersects an intermittent perched water table.

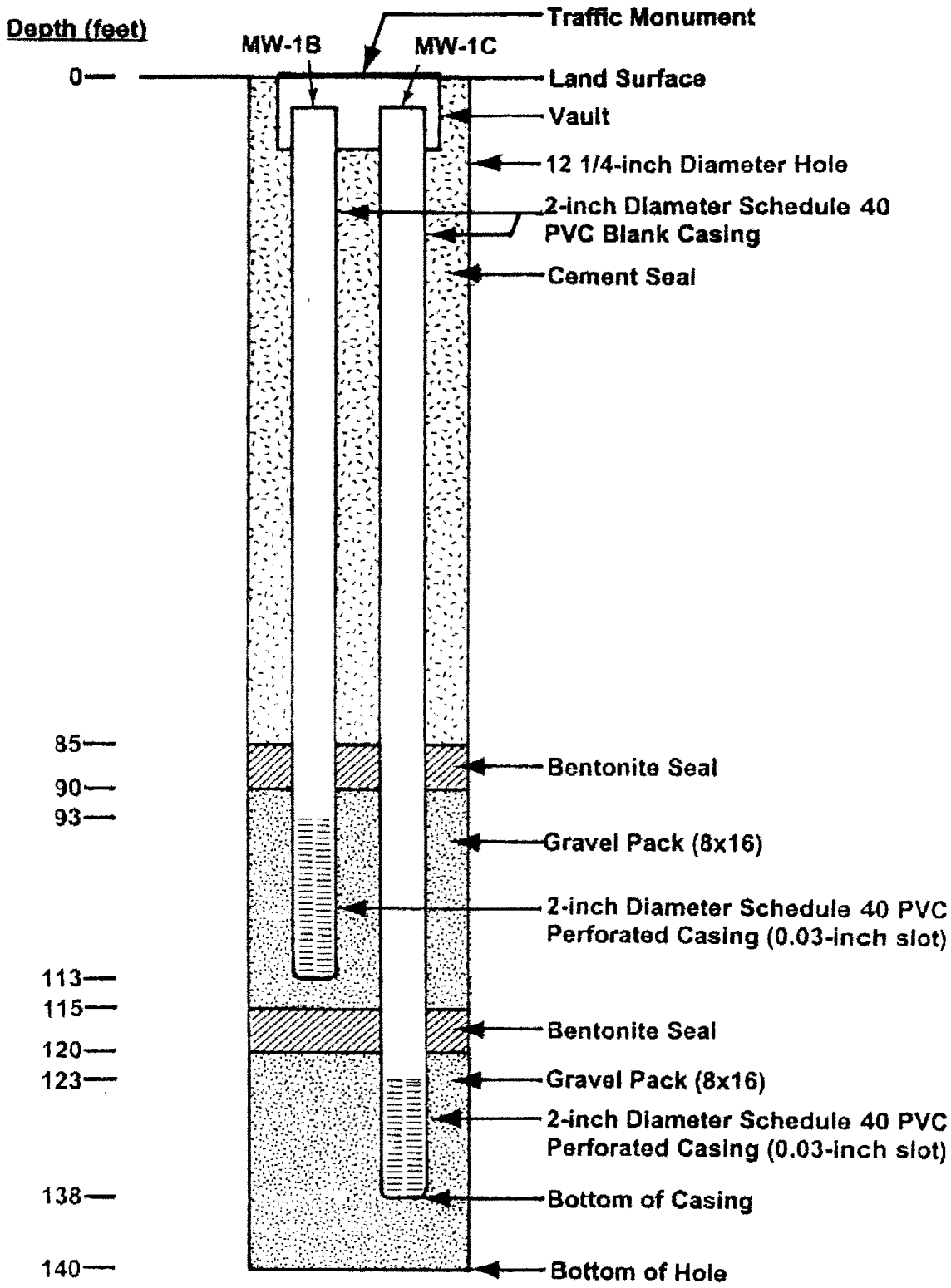
In order to be able to distinguish FEGW from deeper water when the water table is above 88 ft., separate samples are needed from the sand layers at 88 - 98 ft. and from the sandy layers below 108 ft. to identify the FEGW representing recharge from the upgradient lagoon. It is unclear from the information we have now whether FEGW sampled from the adjacent lagoon (Task 2.2.4) is represented by groundwater at depths of 88- 98 ft or by groundwater at depths from 88 to well below 130 ft if the water level is at 88 ft or above (but below 73 ft). Based on calculations using typical hydraulic conductivity values, it is most likely that the first option represents FEGW recharged from the adjacent lagoon for water table depths of above 88 ft, but below 73 ft. To make sure that we can later differentiate FEGW based on depth to the water table and water quality from collected samples, screen lengths are chosen to capture a representative sample of FEGW recharged by the adjacent lagoon. Screen lengths and depths also accommodate the local geology. Both, the second and third screen are opposite intermediate yielding sand aquifer units. The calculated length to represent FEGW from the adjacent upgradient lagoon (Item 2.2.4.), given the local geology, is therefore 15 - 20 feet. The location of the screens also conforms to the elevation of sandy layers identified in the E-log.

APPENDIX 1:

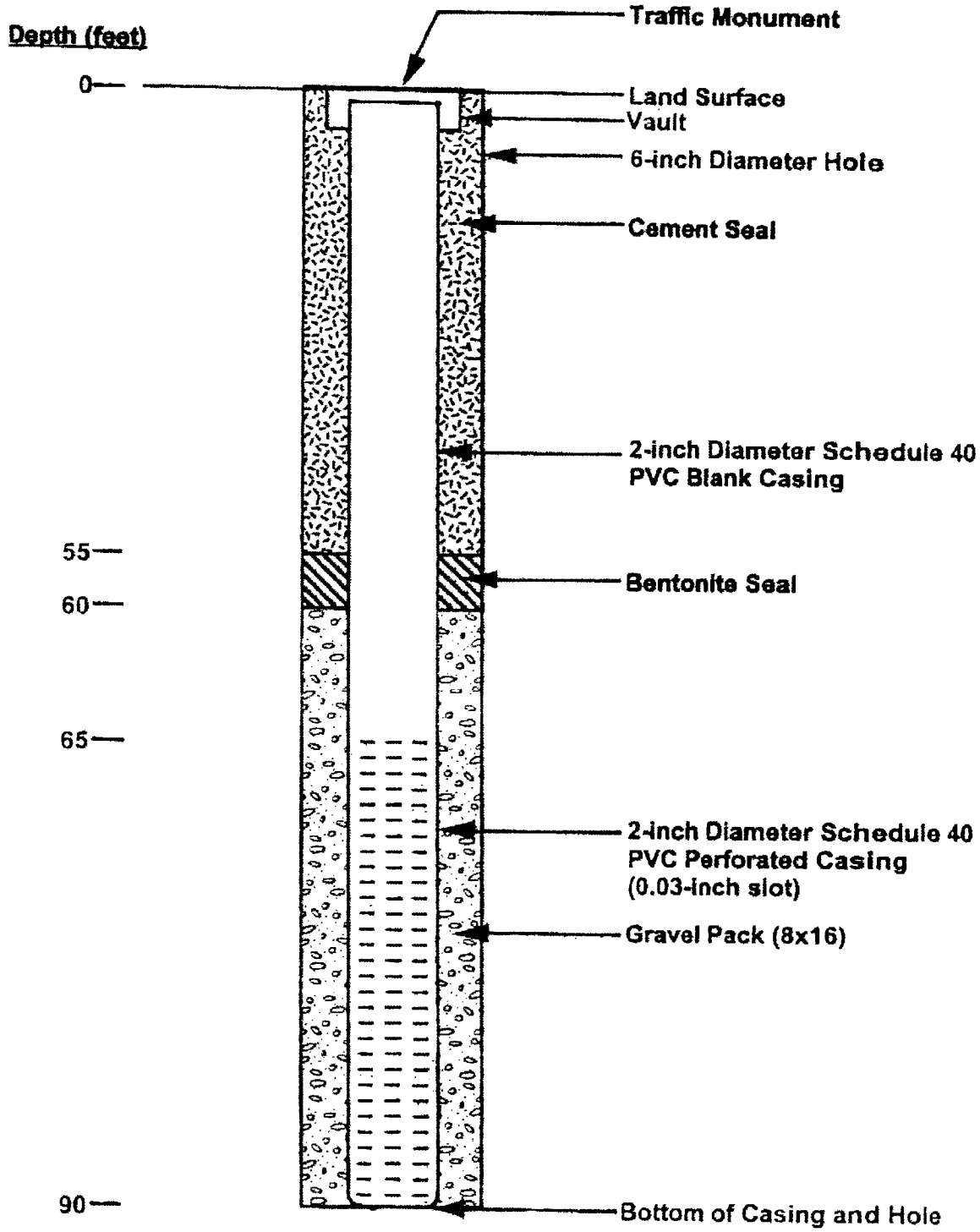
Well Completion Designs for Monitoring Wells
36-15-MW1A, -MW1B,C,
36-15-MW2A, -MW2B,C,
36-15-MW3A, -MW3B,C,
36-15-MW4A, -MW4B,C,D
36-15-MW5A, -MW5B,C,
36-15-MW6A, -MW6B,C,
36-15-MW7A, -MW7B,C,D



COMPLETION DIAGRAM FOR LONGFELLOW DAIRY MW-1A



COMPLETION DIAGRAM FOR LONGFELLOW DAIRY MW-1B & 1C



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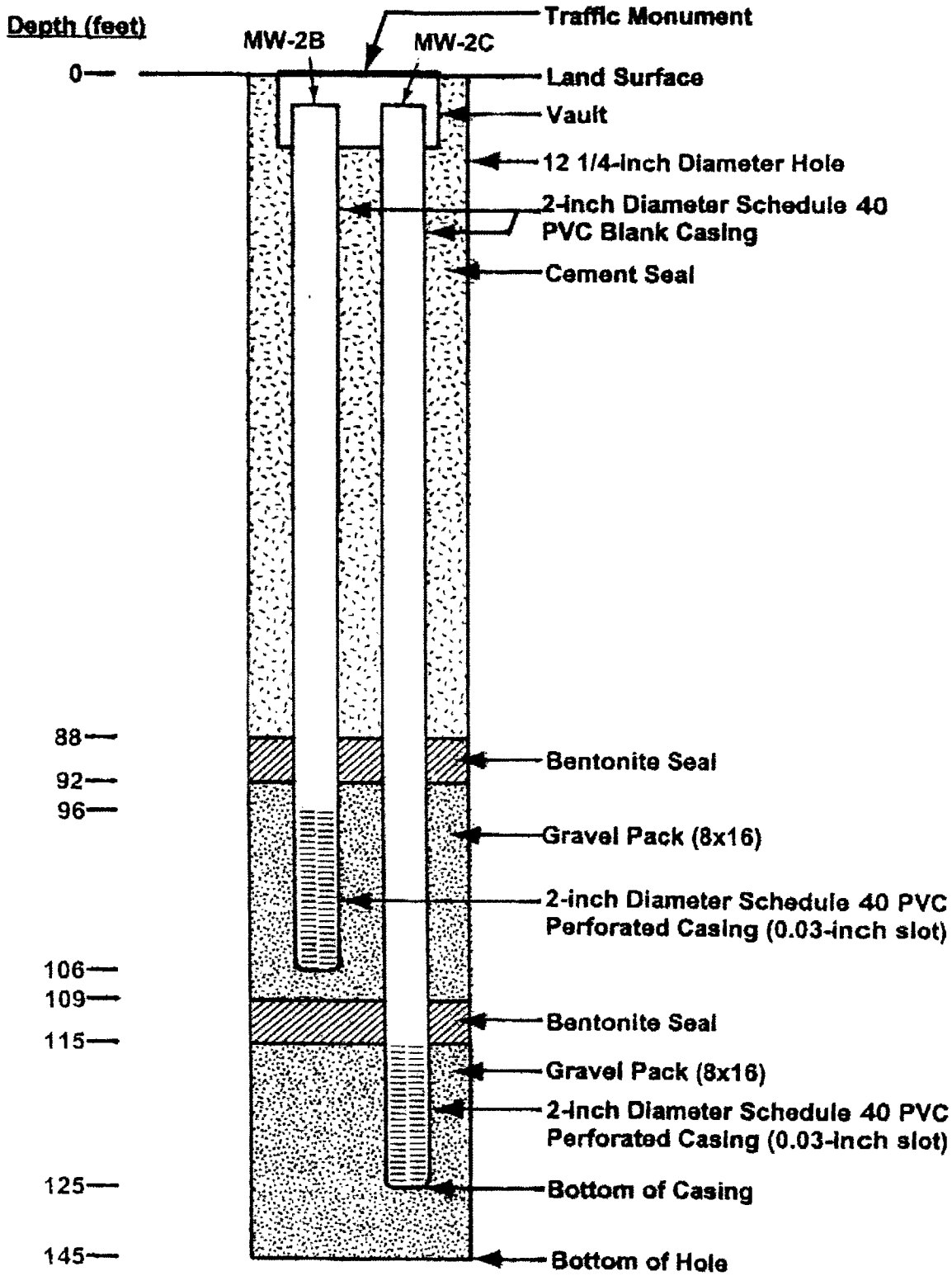

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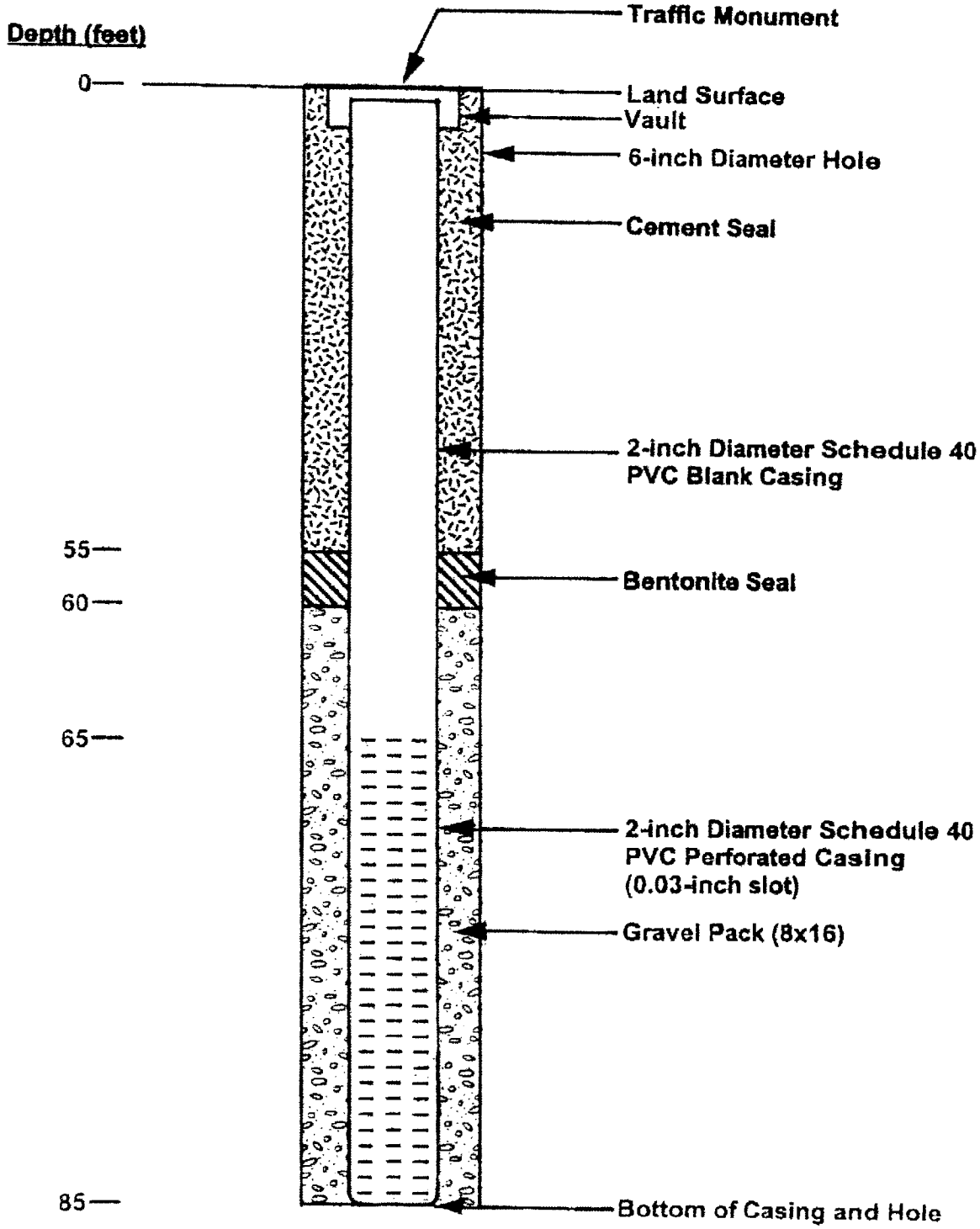
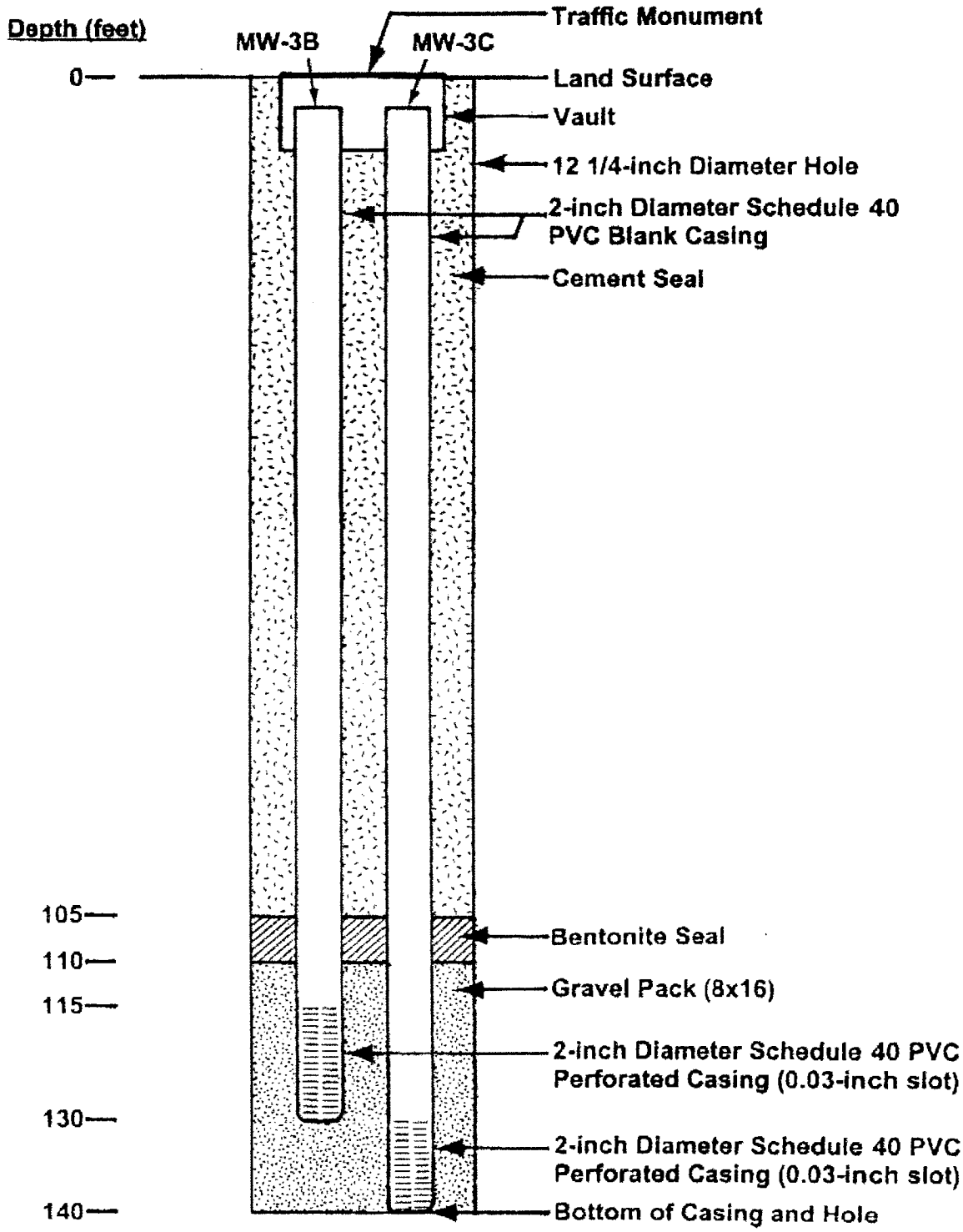
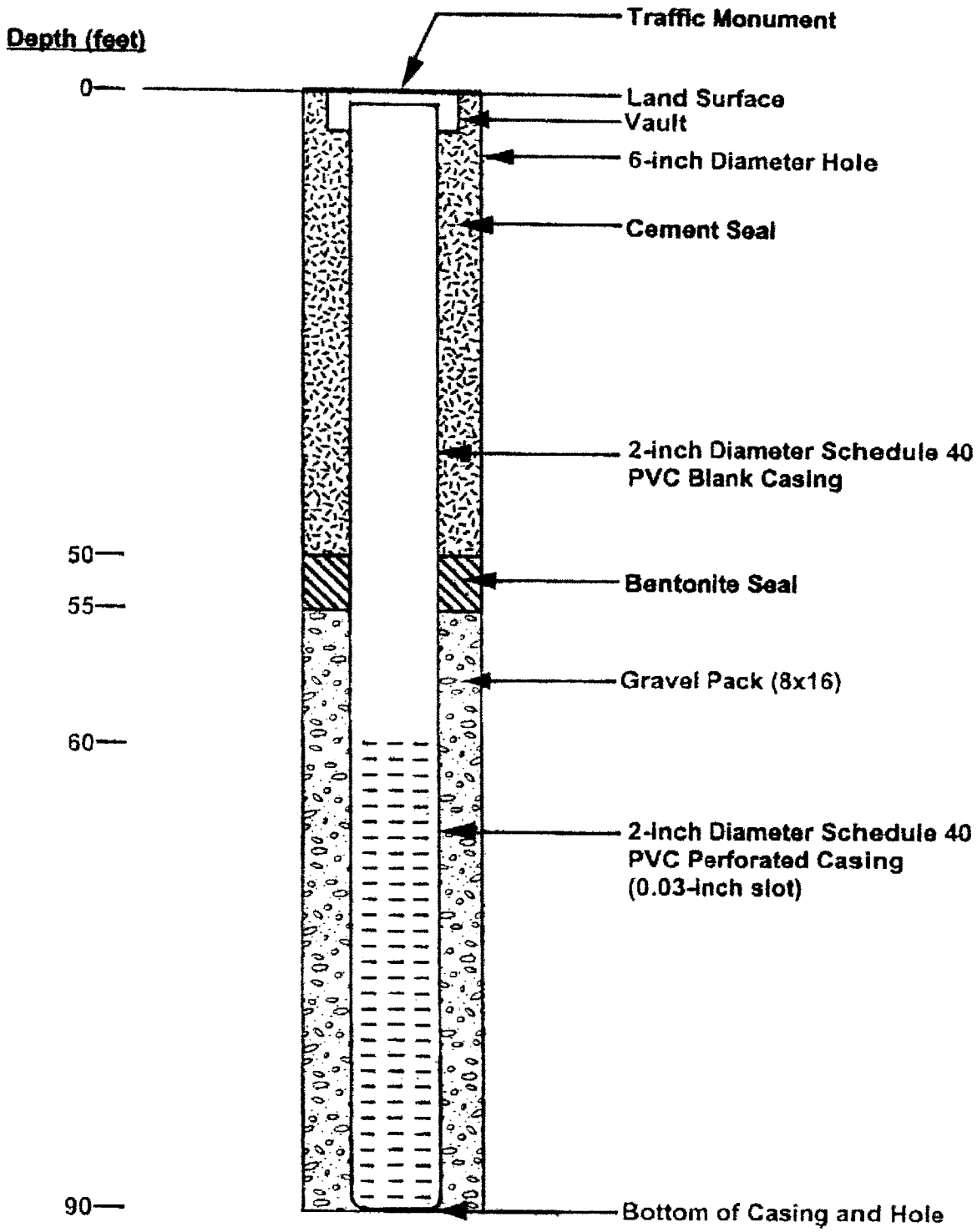


COMPLETION DIAGRAM FOR LONGFELLOW DAIRY MW-3A



COMPLETION DIAGRAM FOR LONGFELLOW DAIRY MW-3B & 3C



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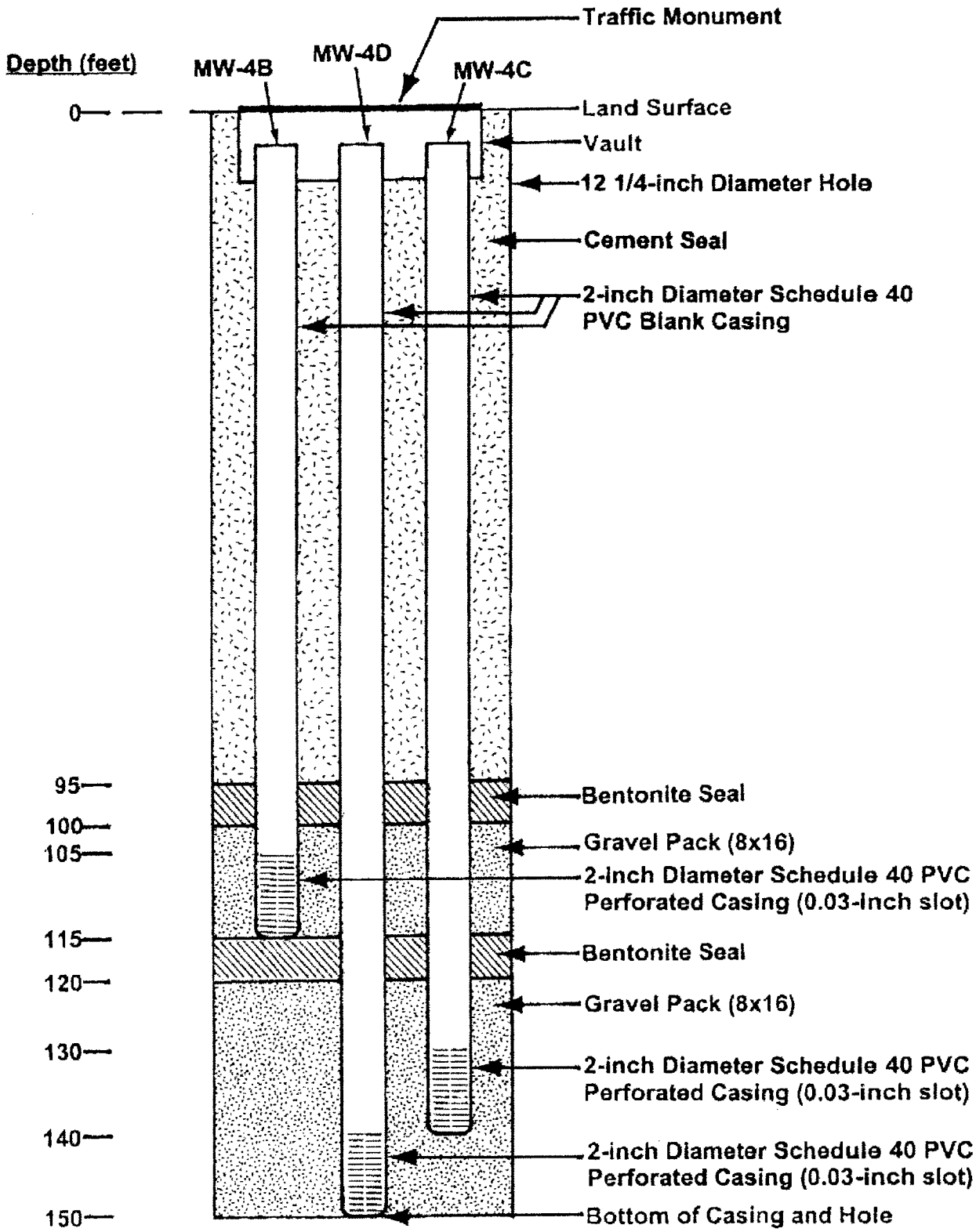
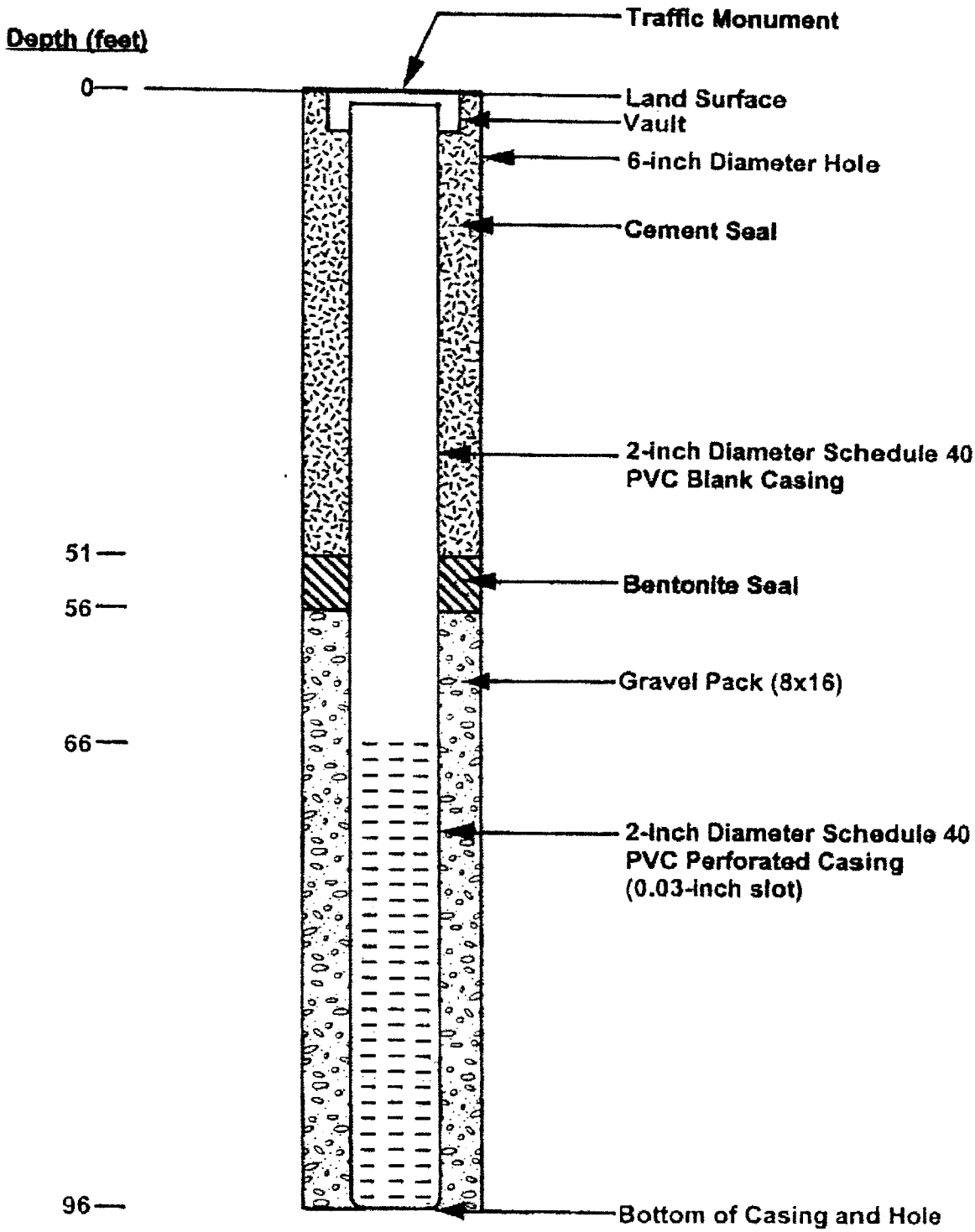
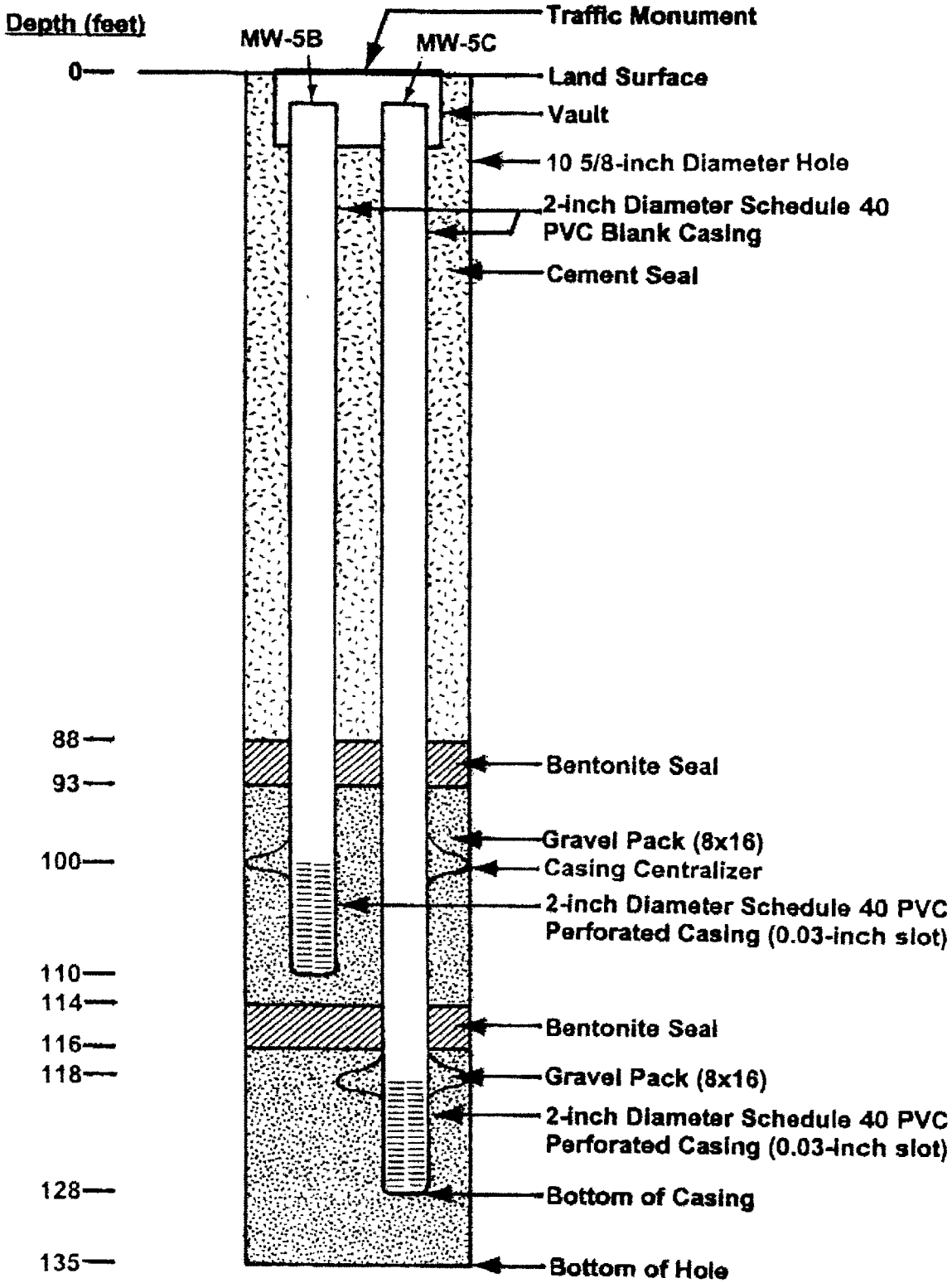


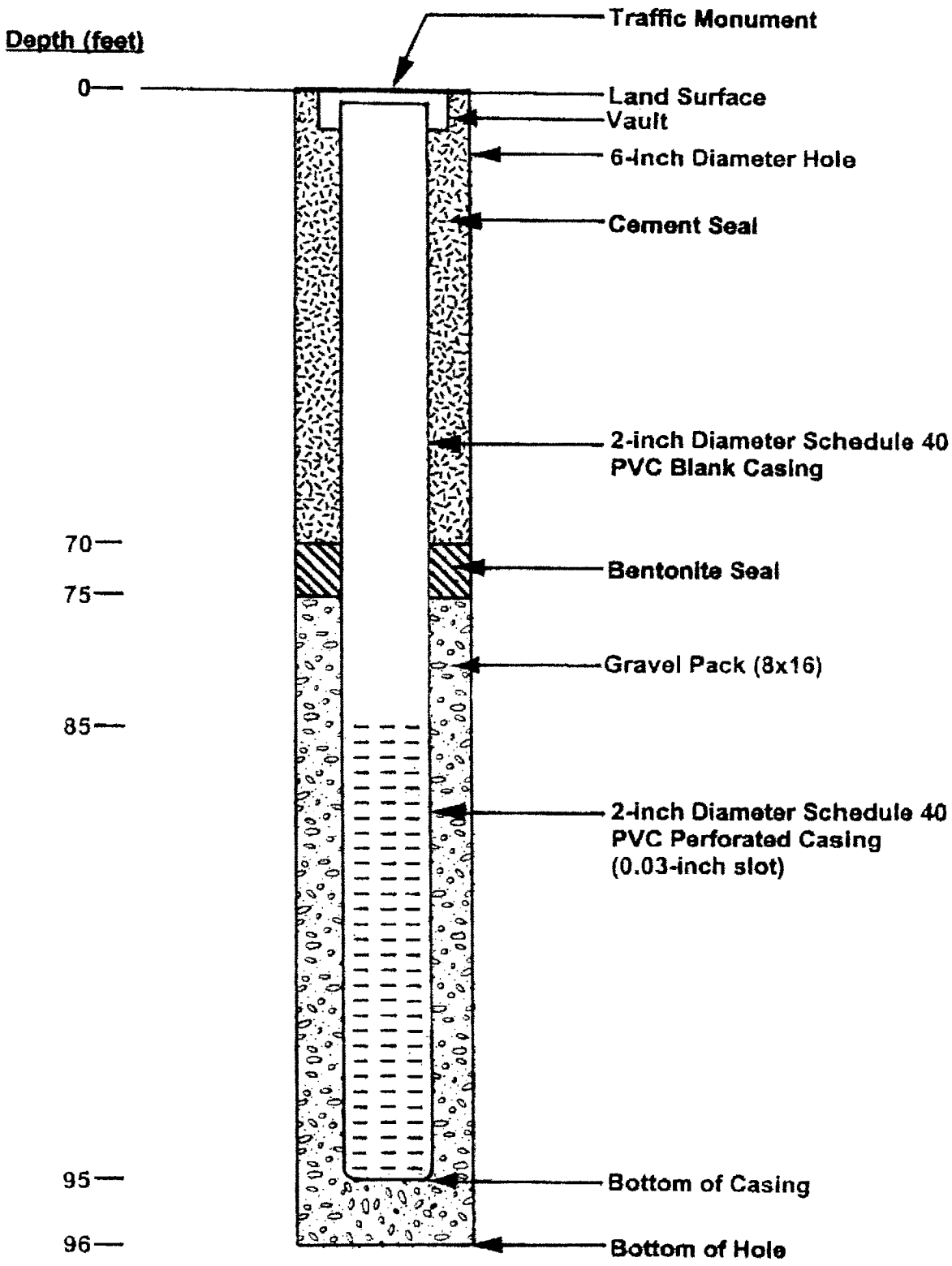
COMPLETION DIAGRAM FOR LONGFELLOW DAIRY MW-4B, 4C & 4D



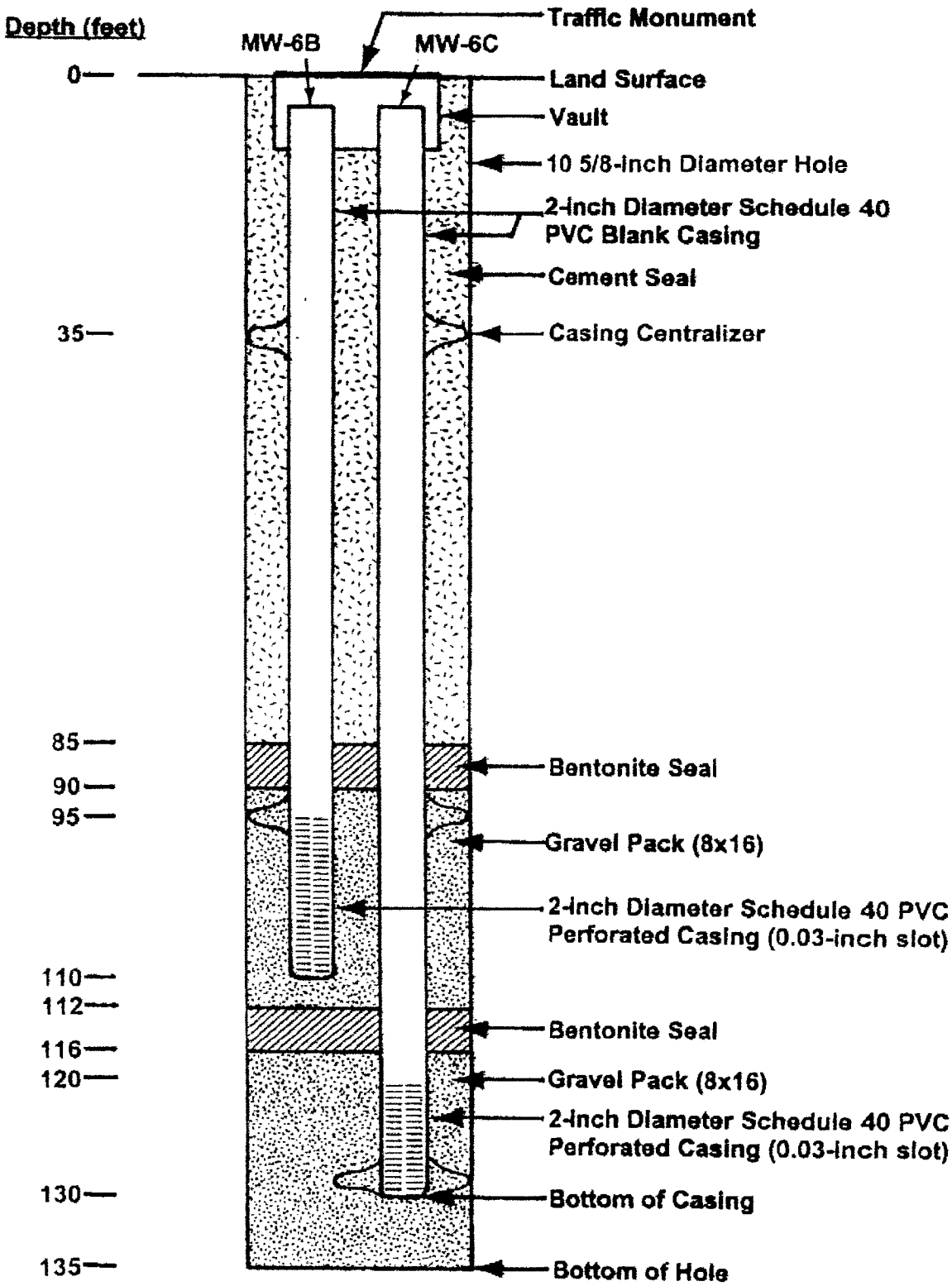
COMPLETION DIAGRAM FOR LONGFELLOW DAIRY MW-5A



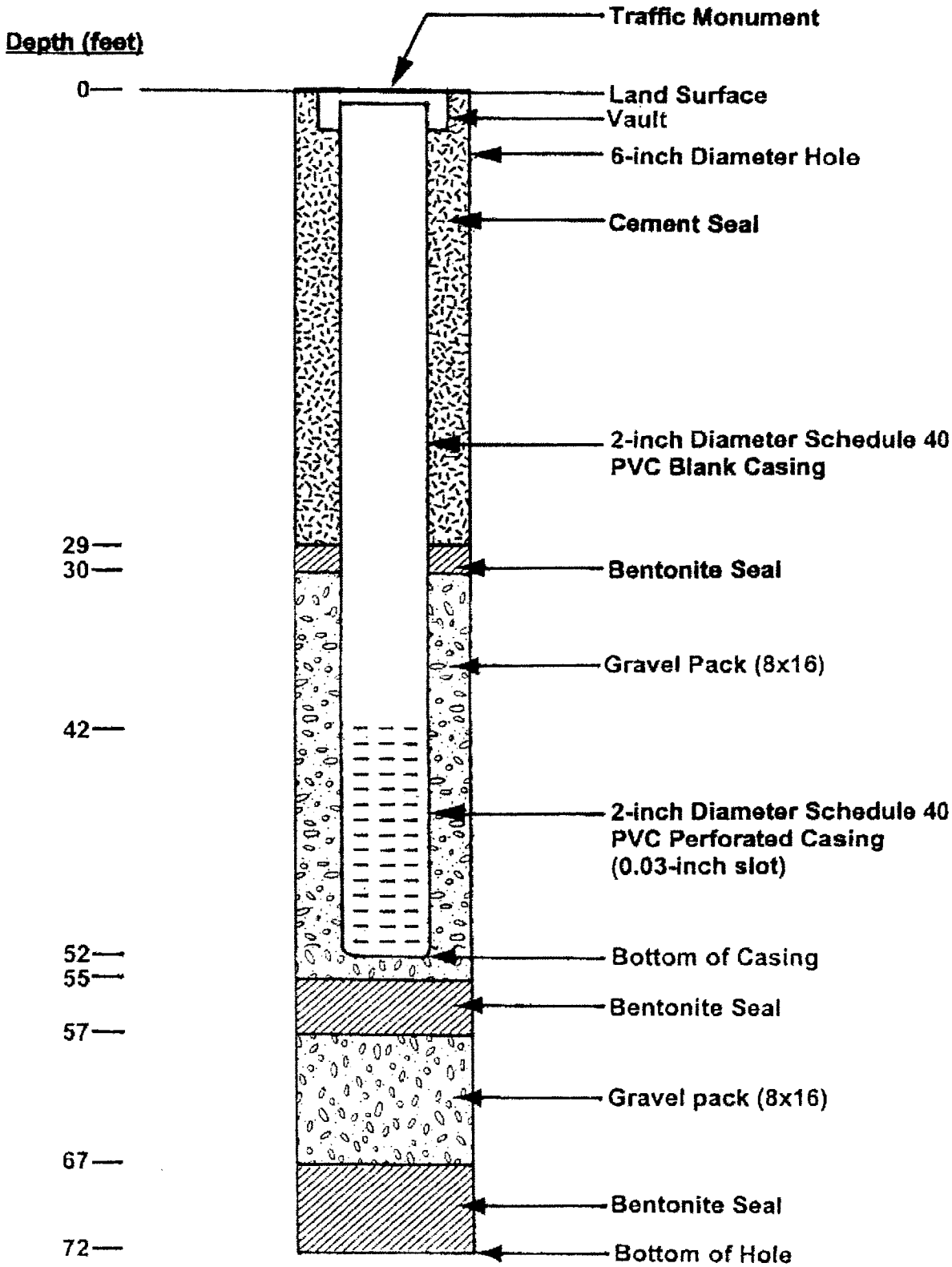
COMPLETION DIAGRAM FOR LONGFELLOW DAIRY MW-5B & 5C



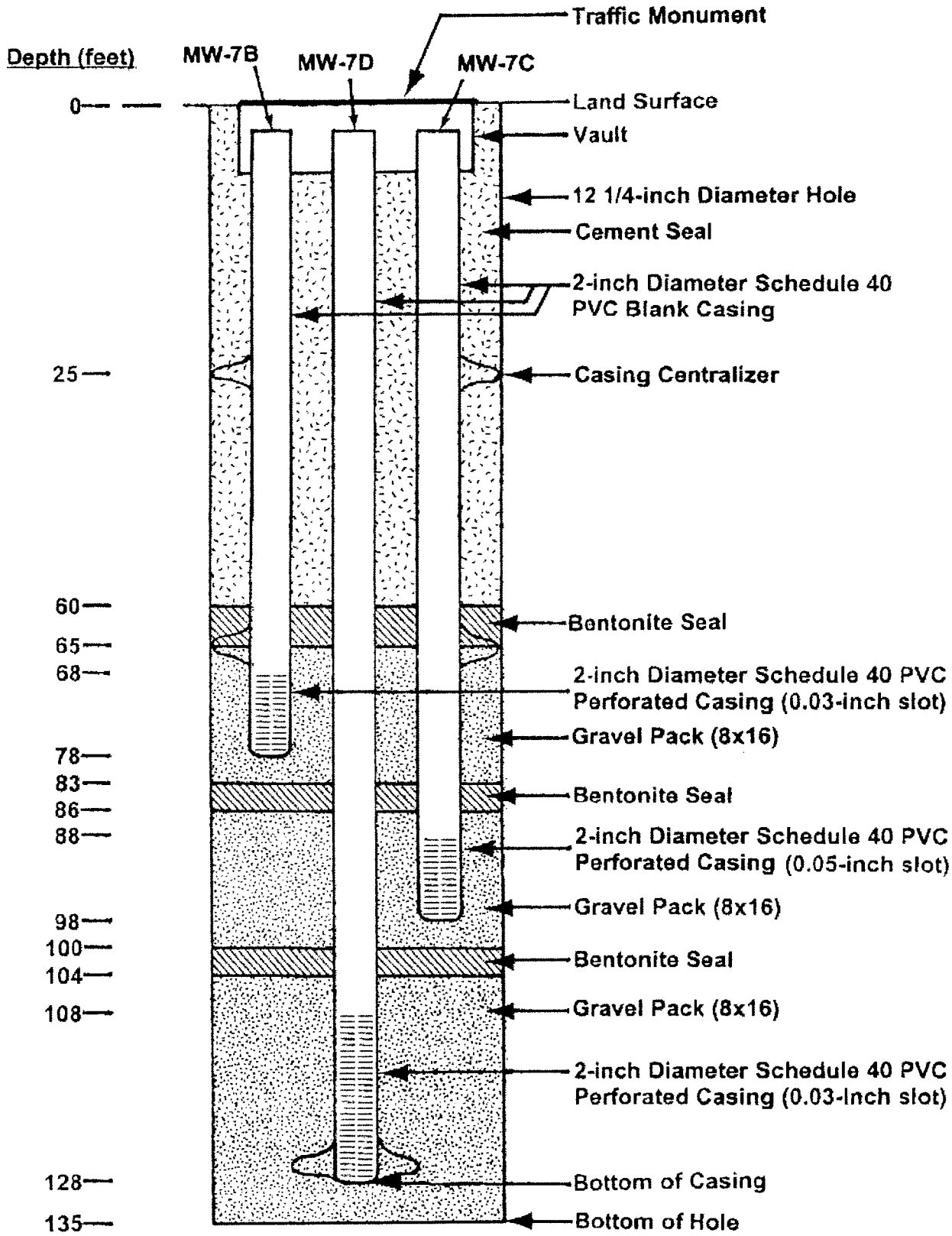
COMPLETION DIAGRAM FOR LONGFELLOW DAIRY MW-6A



COMPLETION DIAGRAM FOR LONGFELLOW DAIRY MW-6B & 6C



COMPLETION DIAGRAM FOR LONGFELLOW DAIRY MW-7A



COMPLETION DIAGRAM FOR LONGFELLOW DAIRY MW-7B, 7C & 7D

APPENDIX 2:

Certified Geologic Logs for Monitoring Well Sites
36-15-MW1A, -MW1B,C,
36-15-MW2A, -MW2B,C,
36-15-MW3A, -MW3B,C,
36-15-MW4A, -MW4B,C,D
36-15-MW5A, -MW5B,C,
36-15-MW6A, -MW6B,C,
36-15-MW7A, -MW7B,C,D

GEOLOGIC LOG FOR
LONGFELLOW DAIRY MW-1A

Depth (feet)	Description	USC
0-3.4	Light brown silty fine to medium sand, dry	SC
3.4-3.7	Dark brown sandy clay, moist	SC
3.7-6.0	Brown medium sand, moist	SP
6.0-10.0	Light brown silty clay, dry	CL
10.0-14.5	Yellow silt, dry	ML
14.5-19.0	Gray silty clay, dry	CL
19.0-25.6	Light gray and brown silty clay, dry	CL
25.6-28.5	Gray silty clay, moist	CL
28.5-31.6	Light brown and gray sandy silty, moist	ML
31.6-32.7	Yellow-brown silty very fine sand, moist	SM
32.7-37.4	Yellow-brown very fine sand, dry	SM
37.4-40.9	Dark gray silty fine sand, moist	SM
40.9-41.2	Light gray very fine sand	SM
41.2-43.2	Light gray fine sand with gravel	SP
43.2-45.4	Gray very fine sand	SM
45.4-47.4	Light brown silty fine sand	SM
47.4-49.6	Light brown clayey and sandy silt	ML
49.6-51.1	Brown medium to coarse sand	SP
51.1-52.0	Light brown sandy clay, moist	SC
52.0-52.6	Brown clayey silt	ML
52.6-54.0	Brown clay, moist	CL
54.0-57.2	Light brown silty clay	CL
57.2-59.2	Light brown silty very fine sand	SM
59.2-60.0	Brown clayey silty, moist	ML
60.0-70.0	Brown silty clay with orange streaks, moist	CL
70.0-71.7	Brown silty clay, moist	CL
71.7-74.0	Light brown sandy silt, moist	ML
74.0-76.4	Gray fine to medium sand, dry	SM
76.4-80.0	Brown clayey silty, moist	ML
80.0-82.7	Brown silty clay, dry	CL
82.7-83.4	Gray sandy and clayey silty, moist	ML
83.4-84.7	Gray silty fine sand, wet	SM
84.7-86.0	Gray sandy silty, wet	ML

Depth to Water: 83.28 feet, September 26, 2007
Date Drilled: July 17, 2007

Cheryl R. Lassotovitch
Cheryl R. Lassotovitch
Geologist No. 7689

September 20, 2007
September 20, 2007

GEOLOGIC LOG FOR
LONGFELLOW DAIRY
MW-1B AND 1C

Depth (feet)	Description	USC
80-90	Gray silty clay	CL
90-97	Gray very fine sand	SM
97-102	Gray-brown silty clay	CL
102-108	Orange-brown medium to coarse sand	SP
108-111	Orange-brown fine sand	SM
111-116	Orange-brown medium to coarse sand	SP
116-120	Light brown silty clay	CL
120-124	Brown very fine silty sand	SM
124-129	Light brown silty clay	CL
129-140	Brown medium to coarse sand	SP

Depth to Water: MW-1B 84.7 feet, September 26, 2007
MW-1C 87.0 feet, September 26, 2007
Date Drilled: August 15, 2007

For shallower conditions, use geologic log for adjacent MW-1A, which was based on core samples.

Cheryl R. Lassotovitch
Cheryl R. Lassotovitch
Geologist No. 7589

September 20, 2007
September 20, 2007

GEOLOGIC LOG FOR
LONGFELLOW DAIRY MW-2A

Depth (feet)	Description	USC
0-20.0	Light brown silty very fine to fine sand, dry	SM
20.0-26.7	Light gray fine sand, dry	SM
26.7-32.9	Light gray fine to medium sand, wet	SM
32.9-34.0	Green-gray sandy clay, dry	SC
34.0-40.0	Gray-brown medium sand, dry	SP
40.0-43.1	Green-gray silty fine sand, moist	SM
43.1-48.0	Gray-brown silty clay, moist	CL
48.0-48.6	Gray medium sand, moist	SP
48.6-49.4	Green-gray silty very fine sand, moist	SM
49.4-50.9	Blue-gray sandy clay, moist	SC
50.9-52.7	Blue-gray clayey very fine sand, moist	SC
52.7-54.0	Blue-gray sandy silt, dry	ML
54.0-57.1	Blue-gray silty fine sand, moist	SM
57.1-58.0	Brown silty clay, moist	CL
58.0-63.5	Brown silty very fine sand, moist	SM
63.5-64.4	Brown clayey fine sand, dry	SC
64.4-68.0	Brown-gray silty fine sand, dry	SM
68.0-69.8	Brown silty fine sand, moist	SM
69.8-72.0	Brown sandy silt, dry	ML
72.0-73.3	Brown clayey sand, wet	SC
73.3-73.7	Light brown sandy silt, dry	ML
73.7-75.6	Orange-brown sandy clay, wet	SC
75.6-78.0	Gray very fine sand, dry	SM
78.0-81.1	Gray-brown sandy silt, wet	ML
81.1-90.0	Gray silty clay, wet	CL

Depth to Water: 81 feet
Date Drilled: June 25, 2007

Cheryl R. Lassotovitch
Cheryl R. Lassotovitch
Geologist No. 7689

July 20, 2007
July 20, 2007

GEOLOGIC LOG FOR
LONGFELLOW DAIRY MW-2B AND 2C

Depth (feet)	Description	USC
90-95	Gray silty clay	CL
95-100	Gray-brown clayey very fine sand	SC
100-108	Gray-brown fine to medium sand	SM
108-113	Gray-brown very fine sand	SM
113-115	Gray-brown sandy clay	SC
115-120	Light gray clayey silt	ML
120-124	Gray-brown fine sand	SM
124-134	Brown silty clay	CL
134-137	Brown sandy silt	ML
137-142	Brown sandy clay	SC
142-144	Gray-brown silty fine sand	SM
144-145	Brown sandy silty	ML

Depth to Water: MW-2B 83.5 feet, October 2, 2007
MW-2C 83.6 feet, October 2, 2007
Date Drilled: June 16, 2007

Cheryl R. Lassotovitch
Cheryl R. Lassotovitch
Geologist No. 7689

July 20, 2007
July 20, 2007

GEOLOGIC LOG FOR
LONGFELLOW DAIRY MW-3A

Depth (feet)	Description	USC
0-3.1	Light brown sandy silt, dry	SC
3.1-3.3	Light brown clayey silt, dry	ML
3.3-6.6	Brown silty fine sand, dry	SM
6.6-10.0	Light brown clayey silt	ML
10.0-11.2	Light brown silty fine sand, dry	SM
11.2-12.0	Light brown clayey fine sand	SC
12.0-16.4	Gray brown clayey silty, moist	ML
16.4-17.1	Gray silt, moist	ML
17.1-22.0	Light brown clayey silt, moist	ML
22.0-23.0	Light brown fine to medium sand, dry	SM
23.0-34.0	Gray silty clay, moist	CL
34.0-35.1	Light brown sandy silt, dry	ML
35.1-35.7	Brown very fine sand, moist	SM
35.7-40.0	Gray very fine sand, dry	SM
40.0-42.0	Light brown sandy clay, moist	SC
42.0-44.3	Light gray fine sand, dry	SM
44.3-46.6	Gray-brown silty clay, moist	CL
46.6-47.0	Gray-brown silty fine to medium sand, moist	SM
47.0-50.0	Gray sandy clay, moist	SC
50.0-60.0	Brown and gray silty clay, moist	CL
60.0-61.0	Red-brown clay, moist	CL
61.0-63.8	Gray very fine sand	SM
63.8-70.0	Light brown silty clay, moist	CL
70.0-72.9	Light brown silty fine to medium sand, moist	SM
72.9-75.1	Light brown sandy clay	SC
75.1-76.5	Light gray fine sand	SM
76.5-77.9	Light gray medium to coarse sand, dry	SP
77.9-80.0	Light gray silty clay, moist	CL
80.0-82.0	Light gray silty fine to medium sand	SM
82.0-84.0	Light gray medium to coarse sand	SP

Depth to Water: Dry
Date Drilled: July 16, 2007

Cheryl R. Lassotovitch
Cheryl R. Lassotovitch
Geologist No. 7689

September 20, 2007
September 20, 2007

GEOLOGIC LOG FOR
LONGFELLOW DAIRY
MW-3B AND 3C

Depth (feet)	Description	USC
80-90	Brown medium to coarse sand	SP
90-108	Brown silty clay	CL
108-114	Brown clayey fine sand	SC
114-120	Brown fine to medium sand	SM
120-126	Brown very fine sand with some clay	SM
126-135	Brown medium to coarse sand	SP
135-140	Brown fine sand	SM

Depth to Water: MW-3B 84.0 feet, October 2, 2007
MW-3C 83.8 feet, October 2, 2007
Date Drilled: August 17, 2007

Depth to Water:
Date Drilled:

For shallower conditions, use log for adjacent MW-3A, which was based on core sampling.

Cheryl R. Lassotovitch
Cheryl R. Lassotovitch
Geologist No. 7689

September 20, 2007
September 20, 2007

GEOLOGIC LOG FOR
LONGFELLOW DAIRY MW-4A

Depth (feet)	Description	USC
0-12.5	Light brown sandy silt, dry	ML
12.5-16.0	Yellow-brown sandy clay, moist	SC
16.0-16.9	Brown very fine sand, moist	SM
16.9-19.3	Brown clayey sand, moist	SC
19.3-24.4	Light brown fine to medium sand, dry	SM
24-4-32.0	Light gray very fine sand, dry	SM
32.0-40.0	Gray-brown silty clay, moist	CL
40.0-42.0	Gray silty very fine sand, moist	SM
42.0-44.0	Yellow-brown clayey fine sand, moist	SC
44.0-45.7	Yellow-brown very fine sand	SM
45.7-48.0	Yellow-gray sandy clay	SC
48.0-48.5	Yellow-brown silty clay	CL
48.5-50.0	Gray very fine sand, moist	SM
50.0-55.5	Light brown sandy clay, moist	SC
55.5-56.4	Light brown sandy silt, moist	ML
56.4-58.0	Light brown sandy clay, moist	SC
58.0-60.5	Gray fine sand, moist	SM
60.5-63.2	Yellow-gray fine to medium sand, moist	SM
63.2-68.2	Gray-brown silty clay, moist	CL
68.2-70.0	Yellow-brown sandy silt, moist	ML
70.0-71.1	Gray-brown sandy clay, moist	SC
71.1-74.0	Brown sandy clay, moist	SC
74.0-76.6	Brown clayey silt, moist	ML
76.6-77.3	Brown clayey sand, moist	SC
77.3-78.0	Brown silty clay, moist	CL
78.0-80.0	Brown silty fine sand, wet	SM
80.0-81.2	Brown fine to medium sand, dry	SM
81.2-82.0	Brown sandy clay, moist	SC
82.0-84.0	Brown silty very fine sand, moist	SM
84.0-85.6	Brown clayey silt, wet	ML
85.6-86.0	Brown very fine silty sand, wet	SM
86.0-88.0	No core retrieved	
88.0-90.0	Gray very fine sand, wet	SM

Depth to Water: Dry
Date Drilled: July 5, 2007

Cheryl R. Lassotovitch
Cheryl R. Lassotovitch
Geologist No. 7689

September 20, 2007
September 20, 2007

GEOLOGIC LOG FOR
LONGFELLOW DAIRY
MW-4B, 4C AND 4D

Depth (feet)	Description	USC
90-93	Brown fine to medium sand	SM
93-97	Brown clayey fine to medium sand	SC
97-100	Brown silty fine to medium sand	SM
100-108	Brown sandy clay	SC
108-112	Brown fine to medium sand	SM
112-120	Brown sandy clay	SC
120-123	Brown clayey fine sand	SC
123-130	Brown fine to medium sand	SM
130-141	Brown medium sand	SP
141-154	Gray-brown fine to medium silty sand	SM

Depth to Water: MW-4B 86.9 feet, September 26, 2007
MW-4C 87.62 feet, September 26, 2007
MW-4D 87.7 feet, September 26, 2007
Date Drilled: July 11, 2007

For shallower conditions, use the log for adjacent MW-4A, which was based on core samples.

Cheryl R. Lassotovitch
Cheryl R. Lassotovitch
Geologist No. 7689

September 20, 2007
September 20, 2007

GEOLOGIC LOG FOR
LONGFELLOW DAIRY MW-5A

Depth (feet)	Description	USC
0-6	Brown silty fine sand, moist	SM
6-10	Brown clayey silt, moist	ML
10-15.6	Brown silty very fine sand, moist	SM
15.6-16.9	Gray very fine sand, moist	SP
16.9-18.0	Brown silty clay	CL
18.0-19.4	Gray very fine to coarse sand, moist	SP
19.4-22.0	Gray silty clay, moist	CL
22.0-24.0	Gray sandy clay with silt, moist	CL
24.0-32.7	Brown silty very fine sand, dry	SM
32.7-33.4	Gray fine sand with some silt, moist	SM
33.4-37.3	Gray silty clay, moist	CL
37.3-38.0	Gray sandy silt, moist	SM
38.0-41.6	Gray very fine sand, dry	SP
41.6-42.2	Gray fine sand, moist	SP
42.2-44.0	Brown silty clay, moist	CL
44.0-47.0	Brown silty very fine sand, moist	SM
47.0-48.0	Gray very fine sand, moist	SP
48.0-50.0	Gray-brown silty fine sand, moist	SM
50.0-56.0	Brown silty clay, moist	CL
56.0-57.1	Gray very fine sand, moist	SP
57.1-60.0	Brown-gray clay and sandy clay, moist	CL
60.0-62.9	Gray fine sand, moist	SP
62.9-65.7	Gray-orange silty clay, moist	CL
65.7-66.7	Gray-orange very fine sandy silt, moist	ML
66.7-68.0	Gray-orange clayey silt, moist	ML
68.0-70.0	Brown-orange silty clay with very fine sand, moist	CL
70.0-71.5	Gray very fine sand, dry	SP
71.5-73.7	Brown very fine sandy silt, moist	ML
73.7-78.7	Brown silty fine sand, moist	SM
78.7-80.0	Gray very fine sand with silt, moist	SP
80.0-80.7	Brown silty clay, moist	CL
80.7-82.0	Brown very fine sand, moist	SP
82.0-87.1	Gray-brown clayey silt	ML
87.1-88.0	Brown silty fine sand, moist	SM
88.0-88.9	Brown fine sand, moist	SP

Continued:

GEOLOGIC LOG FOR
LONGFELLOW DAIRY MW-5A
(Continued:)

Depth (feet)	Description	USC
88.9-92.8	Gray-brown sandy clay, moist	CL
92.8-96.0	Gray-brown clayey very fine sand, moist	SC

Depth to Water: 96.1 feet (09/26/07)
Date Drilled: July 24, 2007

Cheryl R. Lassotovitch
Cheryl R. Lassotovitch
Geologist No. 7689

October 16, 2007
October 16, 2007

GEOLOGIC LOG FOR
LONGFELLOW DAIRY MW-5B AND 5C

Depth (feet)	Description	USC
90-93	Gray-brown clayey silt	ML
93-97	Gray fine to medium sand	SM
97-101	Gray clayey silt	ML
101-112	Brown fine to coarse sand with some gravel	SM
112-120	Brown clayey silt	ML
120-123	Brown fine sand	SM
123-132	Gray-brown fine sandy clay	CL
132-137	Gray-brown silty clay	CL
137-140	Gray-brown clayey fine sand	SM/SC

See log for adjacent MW-5A for description of shallower deposits.

Date Drilled: September 14, 2007
Depth to Water: MW-5B 91.5 feet (09/26/07)
MW-5C 91.8 feet (09/26/07)

Cheryl R Lassotovitch
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Geologist No. 7689

October 2, 2007
October 2, 2007

GEOLOGIC LOG FOR
LONGFELLOW DAIRY MW-6A

Depth (feet)	Description	USC
0-8.0	Brown clayey silty and silty clay, moist	ML/CL
8.0-15.8	Brown silty clay, moist	CL
15.8-20.0	Orange-gray very fine sand, moist	SP
20.0-22.0	Brown sandy clay	CL
22.0-30.0	Gray fine sand, dry	SP
30.0-32.0	Gray medium sand, dry	SP
32.0-33.3	Gray clayey sand, moist	SC
33.3-34.6	Gray silty clay, moist	CL
34.6-36.0	Gray silt, moist	ML
36.0-40.0	Gray very fine clayey sand, moist	SC
40.0-42.6	Brown clay silt, moist	ML
42.6-48.0	Brown-gray silty fine sand, dry	SM
48.0-52.0	Gray fine sand, moist	SP
52.0-53.3	Gray silty fine sand, moist	SM
53.3-60.0	Gray silty clay, moist	CL
60.0-62.0	Brown sandy silty clay, moist	CL
62.0-64.0	Brown clayey silt, moist	ML
64.0-77.5	Brown-gray very fine sand, moist	SP
77.5-84.0	Brown-gray silty clay and clayey silt, moist	CL/ML
84.0-87.3	Gray-brown clayey very fine sand, moist	SC
87.3-94	Gray medium sand, wet	SP

Depth to Water: 87 feet
Date Drilled: July 25, 2007

Cheryl R. Lassotovitch
Cheryl R. Lassotovitch
Geologist No. 7689

October 16, 2007
October 16, 2007

GEOLOGIC LOG FOR
LONGFELLOW DAIRY MW-6B AND 6C

Depth (feet)	Description	USC
77-84	Gray-brown silty clay	CL
84-102	Gray fine to medium sand	SP
102-114	Gray medium sandy clay	CL
114-117	Brown silty clay	CL
117-120	Brown medium sandy clay	CL
120-128	Gray fine sand	SW
128-140	Brown silty clay	CL

See log for adjacent MW-6A for description of shallower deposits.

Date Drilled: September 18, 2007
Depth to Water: MW-6B 93.2 feet (09/26/07)
MW-6C 94.3 feet (09/26/07)

Cheryl R. Lassotovitch
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Geologist No. 7689

October 2, 2007
October 2, 2007

GEOLOGIC LOG FOR
LONGFELLOW DAIRY MW-7A

Depth (feet)	Description	USC
4-8.9	Brown silty clay and clayey silt, moist	CL/ML
8.9-11.6	Brown sandy clay, moist	CL
11.6-14.0	Brown fine sand, dry	SP
14.0-16.0	Brown silty fine sand, moist	SM
16.0-19.2	Gray-brown fine sand, moist	SP
19.2-23.5	Gray-brown silty clay and clayey silt, moist	CL/ML
23.5-26.0	Brown very fine sandy silt with clay, moist	ML
26.0-36.0	Gray-brown fine sand, moist	SP
36.0-40.0	Gray-brown clayey silty very fine sand, moist	SC
40.0-45.8	Gray-orange very fine to medium sand, moist	SP
45.8-48.0	Brown sandy clay, moist	CL
48.0-50.0	Brown silty fine sand, moist	SM
50.0-50.9	Gray silty fine sand, wet	SM
50.9-58.0	Brown silty clay, wet	CL
58.0-63.0	Brown-gray fine sandy clay with silt, wet	CL
63.0-68.0	Brown silty clay and clayey silt, moist	CL/ML
68.0-70.0	Brown silty clayey fine sand, wet	CL
70.0-72.0	Brown-red sandy silty clay, moist	CL

Depth to Water: 50 feet
Date Drilled: August 28, 2007

Cheryl R. Lassotovitch
Cheryl R. Lassotovitch
Geologist No. 7689

October 16, 2007
October 16, 2007

GEOLOGIC LOG FOR
LONGFELLOW DAIRY
MW-7B, 7C, AND 7D

Depth (feet)	Description	USC
49-53	Brown silty clay	CL
53-62	Brown clayey fine sand	SC
62-64	Brown silty clay	CL
64-67	Brown clayey fine sand	SC
67-78	Gray very fine to fine sand	SP
78-80	Gray clayey silt	CL
80-84	Brown silty fine sand	SC
84-89	Brown silty clay	CL
89-100	Gray fine to medium sand	SP
100-104	Gray silty clay	CL
104-109	Brown silty fine sand	SM
109-114	Brown fine sand	SW
114-118	Gray fine sand	SW
118-120	Gray-brown fine sand	SW
120-127	Brown fine to medium sand	SP
127-140	Brown silty clay	CL

See log for adjacent MW-7A for description of shallower deposits.

Date Drilled: September 12, 2007
Depth to Water: MW-7B Dry (09/26/07)
MW-7C 84.8 feet (09/26/07)
MW-7D 85.1 feet (09/26/07)

Cheryl R. Lassotovitch
Cheryl R. Lassotovitch
Geologist No. 7689

October 2, 2007
October 2, 2007

APPENDIX 3:

Well Completion Reports for Monitoring Wells
36-15-MW1A, -MW1B,C,
36-15-MW2A, -MW2B,C,
36-15-MW3A, -MW3B,C,
36-15-MW4A, -MW4B,C,D
36-15-MW5A, -MW5B,C,
36-15-MW6A, -MW6B,C,
36-15-MW7A, -MW7B,C,D

TRIPLICATE
Owner's Copy

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. **EO67220**

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO / STATION NO
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. W-1A
Date Work Began 7/9/2007, Ended 7/17/2007
Local Permit Agency KINGS CTY PLANNING AGENCY
Permit No. W0707-009 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft	to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*
0	3.4	LIGHT BROWN SILTY FINE TO MEDIUM SAND, DRY
3.4	3.7	DARK BROWN SANDY CLAY, MOIST
3.7	6.0	BROWN MEDIUM SAND, DRY
6.0	10.0	LIGHT BROWN SILTY CLAY, DRY
10.0	14.5	YELLOW SILT, DRY
14.5	19.0	GRAY SILTY CLAY, DRY
19.0	25.6	LIGHT GRAY AND BROWN SILTY CLAY, DRY
25.6	28.5	GRAY SILTY CLAY, MOIST
28.5	31.6	LIGHT BROWN AND GRAY SANDY SILTY, MOIST
31.6	32.7	YELLOW-BROWN SILTY VERY FINE SAND, MOIST
32.7	37.4	YELLOW-BROWN VERY FINE SAND, DRY
37.4	40.9	DARK GRAY SILTY FINE SAND, MOIST
40.9	41.2	LIGHT GRAY VERY FINE SAND
41.2	43.2	LIGHT GRAY FINE SAD WITH GRAVEL
43.2	45.4	GRAY VERY FINE SAND
45.4	47.4	LIGHT BROWN SILTY FINE SAND
47.4	49.6	LIGHT BROWN CLAYEY AND SANDY SILT
49.6	51.1	BROWN MEDIUM TO COARSE SAND
51.1	52.0	LIGHT BROWN SANDY CLAY, MOIST
52.0	52.6	BROWN CLAYEY SILT
52.6	54.0	BROWN CLAY, MOIST
54.0	57.2	LIGHT BROWN SILTY CLAY
57.2	59.2	LIGHT BROWN SILTY VERY FINE SAND
59.2	60.0	BROWN CLAYEY SILTY, MOIST
60.0	70.0	BROWN SILTY CLAY WITH ORANGE STREAKS, MOIST
70.0	71.7	BROWN SILTY CLAY, MOIST

TOTAL DEPTH OF BORING 140 (Feet)
TOTAL DEPTH OF COMPLETED WELL 140 (Feet)

WELL OWNER

Name EDITH LONGFELLOW
Mailing Address 14782 8TH AVE.
HANFORD (CITY) CA (STATE) 93230 (ZIP)

WELL LOCATION

Address 14782 8TH STREET
City HANFORD CA 93230
County TULARE
APN Book 028 Page 040 Parcel 016
Township 19 Range 22 Section 20
Latitude ___ DEG. ___ MIN ___ SEC. ___ DEG. ___ MIN. ___ SEC

LOCATION SKETCH

NORTH
WEST EAST
SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
— Deepen
— Other (Specify)
— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
— Domestic — Public
— Irrigation — Industrial
MONITORING ✓
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) —

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 83.28 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 83.28 (Ft.) & DATE MEASURED 9/26/2007
ESTIMATED YIELD * ___ (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN ___ (Ft.)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft	to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	64	6"	✓				PVC	2"	SCH 40	
64	84	6"					PVC	2"	SCH 40	0.03

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft	to Ft	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
55	60		✓		GRAVEL 8X16

ATTACHMENTS (✓)

— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3625 S. HIGHLAND (ADDRESS) DEL REY (CITY) CA (STATE) 93616 (ZIP)
Signed ___ (WELL DRILLER/AUTHORIZED REPRESENTATIVE) 01/21/08 (DATE SIGNED) 414178 (C-57 LICENSE NUMBER)

DWR 188 REV 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. EO67220

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./ STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. W-1A
Date Work Began 7/9/2007, Ended 7/17/2007
Local Permit Agency KINGS CTY PLANNING AGENCY
Permit No. W0707-009 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft	to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*
71.7	74.0	LIGHT BROWN SANDY SILT, MOIST
74.0	76.4	GRAY FINE TO MEDIUM SAND, DRY
76.4	80.0	BROWN CLAYEY SILTY, MOIST
80.0	82.7	BROWN SILTY CLAY, DRY
82.7	83.4	GRAY SANDY AND CLAYEY SILTY, MOIST
83.4	84.7	GRAY SILTY FINE SAND, WET
84.7	86.0	GRAY SANDY SILTY, WET

TOTAL DEPTH OF BORING 140 (Feet)
TOTAL DEPTH OF COMPLETED WELL 140 (Feet)

WELL OWNER

Name EDITH LONGFELLOW
Mailing Address 14782 8TH AVE.
HANFORD (CITY) CA (STATE) 93230 (ZIP)

WELL LOCATION

Address 14782 8TH STREET
City HANFORD CA 93230
County TULARE
APN Book 028 Page 040 Parcel 016
Township 19 Range 22 Section 20
Latitude ___ DEG. ___ MIN. ___ SEC. ___ DEG. ___ MIN. ___ SEC.

LOCATION SKETCH

NORTH
WEST
EAST
SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
— Deepen
— Other (Specify)
— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)

WATER SUPPLY
— Domestic — Public
— Irrigation — Industrial
MONITORING ✓
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) —

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 83.28 (Ft) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 83.28 (Ft) & DATE MEASURED 9/26/2007
ESTIMATED YIELD * ___ (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN ___ (Ft)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft	to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	64	6"	✓				PVC	2"	SCH 40	
64	84	6"					PVC	2"	SCH 40	0.03

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft	to Ft	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
55	60		✓		GRAVEL 8X16

ATTACHMENTS (✓)

— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3625 S. HIGHLAND (ADDRESS) DEL REY (CITY) CA (STATE) 93616 (ZIP)
Signed ___ (WELL DRILLER/AUTHORIZED REPRESENTATIVE) 01/21/08 (DATE SIGNED) 414178 (C-57 LICENSE NUMBER)

DWR 188 REV 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy
Page 1 of 2

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. EO67268

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. W-1B, 1C
Date Work Began 7/9/2007, Ended 8/15/2007
Local Permit Agency KINGS CTY PLANNING AGENCY
Permit No. W0707-009 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft	to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*
0	3.4	LIGHT BROWN SILTY FINE TO MEDIUM SAND, DRY
3.4	3.7	DARK BROWN SANDY CLAY, MOIST
3.7	6.0	BROWN MEDIUM SAND, DRY
6.0	10.0	LIGHT BROWN SILTY CLAY, DRY
10.0	14.5	YELLOW SILT, DRY
14.5	19.0	GRAY SILTY CLAY, DRY
19.0	25.6	LIGHT GRAY AND BROWN SILTY CLAY, DRY
25.6	28.5	GRAY SILTY CLAY, MOIST
28.5	31.6	LIGHT BROWN AND GRAY SANDY SILTY, MOIST
31.6	32.7	YELLOW-BROWN SILTY VERY FINE SAND, MOIST
32.7	37.4	YELLOW-BROWN VERY FINE SAND, DRY
37.4	40.9	DARK GRAY SILTY FINE SAND, MOIST
40.9	41.2	LIGHT GRAY VERY FINE SAND
41.2	43.2	LIGHT GRAY FINE SAD WITH GRAVEL
43.2	45.4	GRAY VERY FINE SAND
45.4	47.4	LIGHT BROWN SILTY FINE SAND
47.4	49.6	LIGHT BROWN CLAYEY AND SANDY SILT
49.6	51.1	BROWN MEDIUM TO COARSE SAND
51.1	52.0	LIGHT BROWN SANDY CLAY, MOIST
52.0	52.6	BROWN CLAYEY SILT
52.6	54.0	BROWN CLAY, MOIST
54.0	57.2	LIGHT BROWN SILTY CLAY
57.2	59.2	LIGHT BROWN SILTY VERY FINE SAND
59.2	60.0	BROWN CLAYEY SILTY, MOIST
60.0	70.0	BROWN SILTY CLAY WITH ORANGE STREAKS, MOIST
70.0	71.7	BROWN SILTY CLAY, MOIST

TOTAL DEPTH OF BORING 140 (Feet)
TOTAL DEPTH OF COMPLETED WELL 140 (Feet)

WELL OWNER

Name EDITH LONGFELLOW
Mailing Address 14782 8TH AVE.
HANFORD CA 93230
CITY STATE ZIP

WELL LOCATION

Address 14782 8TH STREET
City HANFORD CA 93230
County TULARE
APN Book 028 Page 040 Parcel 016
Township 19 Range 22 Section 20
Latitude DEG. MIN. SEC DEG MIN. SEC

LOCATION SKETCH

NORTH
WEST EAST
SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
— Deepen
— Other (Specify)
— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
— Domestic — Public
— Irrigation — Industrial
MONITORING ✓
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) —

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 84.7 (Ft) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 87.0 (Ft) & DATE MEASURED 9/26/2007
ESTIMATED YIELD * (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN (Ft)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft	to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	64	6"	✓				PVC	2"	SCH 40	
64	84	6"					PVC	2"	SCH 40	0.03
0	93	12 1/4"	✓				PVC	2"	SCH 40	
93	113	12 1/4"					PVC	2"	SCH 40	0.03

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft	to Ft	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
55	60		✓		GRAVEL 8X16
85	90		✓		GRAVEL 8X16
115	120		✓		GRAVEL 8 X 1

ATTACHMENTS (✓)

— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3625 S. HIGHLAND DEL REY CA 93616
ADDRESS CITY STATE ZIP
Signed
WELL DRILLER/AUTHORIZED REPRESENTATIVE
01/21/08 414178
DATE SIGNED C-57 LICENSE NUMBER

DWR 188 REV. 11-97
IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. EO67268

Owner's Well No. W-1B, 1C
Date Work Began 7/9/2007, Ended 8/15/2007
Local Permit Agency KINGS CTY PLANNING AGENCY
Permit No. W0707-009 Permit Date 7/9/2007

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO / STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain, size, color, etc.*
71.7	74.0	LIGHT BROWN SANDY SILT, MOIST
74.0	76.4	GRAY FINE TO MEDIUM SAND, DRY
76.4	80.0	BROWN CLAYEY SILTY, MOIST
80.0	82.7	BROWN SILTY CLAY, DRY
82.7	83.4	GRAY SANDY AND CLAYEY SILTY, MOIST
83.4	84.7	GRAY SILTY FINE SAND, WET
84.7	86.0	GRAY SANDY SILTY, WET
		LOGS FOR MW1B AND MW1C
80	90	GRAY SILTY CLAY
90	97	GRAY VERY FINE SAND
97	102	GRAY-BROWN SILTY CLAY
102	108	ORANGE/BROWN MEDIUM TO COARSE SAND
108	111	ORANGE/BROWN FINE SAND
111	116	ORANGE/BROWN MEDIUM TO COARSE SAND
116	120	LIGHT BROWN SILTY CLAY
120	124	BROWN VERY FINE SILTY SAND
124	129	LIGHT BROWN SILTY CLAY
129	140	BROWN MEDIUM TO COARSE SAND

TOTAL DEPTH OF BORING 140 (Feet)
TOTAL DEPTH OF COMPLETED WELL 140 (Feet)

WELL OWNER
Name EDITH LONGFELLOW
Mailing Address 14782 8TH AVE.
HANFORD (CITY) CA (STATE) 93230 (ZIP)

WELL LOCATION
Address 14782 8TH STREET
City HANFORD CA 93230
County TULARE
APN Book 028 Page 040 Parcel 016
Township 19 Range 22 Section 20
Latitude DEG. MIN. SEC. DEG. MIN. SEC.

LOCATION SKETCH
NORTH
WEST EAST
SOUTH
Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)
✓ NEW WELL
MODIFICATION/REPAIR
— Deepen
— Other (Specify)
— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
— Domestic — Public
— Irrigation — Industrial
MONITORING ✓
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) —

WATER LEVEL & YIELD OF COMPLETED WELL
DEPTH TO FIRST WATER 84.7 (Ft) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 87.0 (Ft) & DATE MEASURED 9/26/2007
ESTIMATED YIELD * — (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs) TOTAL DRAWDOWN — (Ft)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	123	12 1/4"	✓				PVC	2"	SCH 40	
123	138	12 1/4"					PVC	2"	SCH 40	0.03

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
55	60		✓		GRAVEL 8X16
85	90		✓		GRAVEL 8X16
115	120		✓		GRAVEL 8 X 1

ATTACHMENTS (✓)
— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT
I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3625 S. HIGHLAND (ADDRESS) DEL REY (CITY) CA (STATE) 93616 (ZIP)
Signed _____ (WELL DRILLER/AUTHORIZED REPRESENTATIVE) 01/21/08 (DATE SIGNED) 414178 (C-57 LICENSE NUMBER)

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. EO67269

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./ STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. MW-2A
Date Work Began 7/9/2007, Ended 6/25/2007
Local Permit Agency KINGS CTY PLANNING AGENCY
Permit No. W0707-009 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft	to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*
		MW-2A
0	20.0	LIGHT BROWN SILTY VERY FINE TO FINE SAND, DRY
20.0	26.7	LIGHT GRAY FINE SAND, DRY
26.7	32.9	LIGHT GRAY FINE TO MEDIUM SAND, WET
32.9	34.0	GREEN/GRAY SANDY CLAY, DRY
34.0	40.0	GRAY/BROWN MEDIUM SAND, DRY
40.0	43.1	GREEN/GRAY SILTY FINE SAND, MOIST
43.1	48.0	GRAY/BROWN SILTY CLAY, MOIST
48.0	48.6	GRAY MEDIUM SAND, MOIST
48.6	49.4	GREEN/GRAY SILTY VERY FINE SAND, MOIST
49.4	50.9	BLUE/GRAY SANDY CLAY, MOIST
50.9	52.7	BLUE/GRAY CLAYEY VERY FINE SAND, MOIST
52.7	54.0	BLUE/GRAY SANDY SILT, DRY
54.0	57.1	BLUE/GRAY SILTY FINE SAND, MOIST
57.1	58.0	BROWN SILTY CLAY, MOIST
58.0	63.5	BROWN SILTY VERY FINE SAND, MOIST
63.5	64.4	BROWN CLAYEY FINE SAND, DRY
64.4	68.0	BROWN/GRAY SILTY FINE SAND, DRY
68.0	69.8	BROWN SILTY FINE SAND, MOIST
69.8	72.0	BROWN SANDY SILT, DRY
72.0	73.3	BROWN CLAYEY SAND, WET
73.3	73.7	LIGHT BROWN SANDY SILT, DRY
73.7	75.6	ORANGE/BROWN SANDY FLAY, WET
75.6	78.0	GRAY VERY FINE SAND, DRY
78.0	81.1	GRAY/BROWN SANDY SILT, WET
81.1	90.0	GRAY SILTY CLAY, WET

TOTAL DEPTH OF BORING 145 (Feet)
TOTAL DEPTH OF COMPLETED WELL 145 (Feet)

WELL OWNER

Name EDITH LONGFELLOW
Mailing Address 14782 8TH AVE.
HANFORD (CITY) CA (STATE) 93230 (ZIP)

WELL LOCATION

Address 14782 8TH STREET
City HANFORD CA 93230
County TULARE
APN Book 028 Page 040 Parcel 016
Township 19 Range 22 Section 20
Latitude DEG. MIN. SEC. DEG MIN. SEC.

LOCATION SKETCH

NORTH
WEST EAST
SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
— Deepen
— Other (Specify)
— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
— Domestic — Public
— Irrigation — Industrial
MONITORING ✓
TEST WELL
CATHODIC PROTECTION
HEAT EXCHANGE
DIRECT PUSH
INJECTION
VAPOR EXTRACTION
SPARGING
REMEDIATION
OTHER (SPECIFY)

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 81 (Ft) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 81 (Ft) & DATE MEASURED 6/25/2007
ESTIMATED YIELD * (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs) TOTAL DRAWDOWN (Ft)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft	to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	65	6"	✓				PVC	2"	SCH 40	
65	90	6"					PVC	2"	SCH 40	0.03

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft	to Ft	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
55	60		✓		GRAVEL 8X16

ATTACHMENTS (✓)

— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3625 S. HIGHLAND (ADDRESS) DEL REY (CITY) CA (STATE) 93616 (ZIP)
Signed (WELL DRILLER/AUTHORIZED REPRESENTATIVE) 01/21/08 (DATE SIGNED) 414178 (C-57 LICENSE NUMBER)

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. EO67269

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO / STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. MW-2A
Date Work Began 7/9/2007, Ended 6/25/2007
Local Permit Agency KINGS CTY PLANNING AGENCY
Permit No. W0707-009 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft. to Ft.	DESCRIPTION *Describe material, grain, size, color, etc.*

TOTAL DEPTH OF BORING 145 (Feet)
TOTAL DEPTH OF COMPLETED WELL 145 (Feet)

WELL OWNER

Name EDITH LONGFELLOW
Mailing Address 14782 8TH AVE.
HANFORD CA 93230
CITY STATE ZIP

WELL LOCATION

Address 14782 8TH STREET
City HANFORD CA 93230
County TULARE
APN Book 028 Page 040 Parcel 016
Township 19 Range 22 Section 20
Latitude DEG MIN. SEC. DEG. MIN. SEC.

LOCATION SKETCH

NORTH
WEST EAST
SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
— Deepen
— Other (Specify)
— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
— Domestic — Public
— Irrigation — Industrial
MONITORING ✓
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) —

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 81 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 81 (Ft.) & DATE MEASURED 6/25/2007
ESTIMATED YIELD * (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN (Ft.)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft. to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft. to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
55 60		✓		GRAVEL 8X16

ATTACHMENTS (✓)

— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

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3625 S. HIGHLAND DEL REY CA 93616
ADDRESS CITY STATE ZIP
Signed WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED 01/21/08 C-57 LICENSE NUMBER 414178

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. EO66714

Owner's Well No. MW-2B & 2C

Date Work Began 7/9/2007, Ended 6/16/2007

Local Permit Agency KINGS CTY PLANNING AGENCY

Permit No. W0707-009 Permit Date 7/9/2007

DWR USE ONLY — DO NOT FILL IN

STATE WELL NO / STATION NO

LATITUDE LONGITUDE

APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)

DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft	to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*
		MW-2A
0	20.0	LIGHT BROWN SILTY VERY FINE TO FINE SAND, DRY
20.0	26.7	LIGHT GRAY FINE SAND, DRY
26.7	32.9	LIGHT GRAY FINE TO MEDIUM SAND, WET
32.9	34.0	GREEN/GRAY SANDY CLAY, DRY
34.0	40.0	GRAY/BROWN MEDIUM SAND, DRY
40.0	43.1	GREEN/GRAY SILTY FINE SAND, MOIST
43.1	48.0	GRAY/BROWN SILTY CLAY, MOIST
48.0	48.6	GRAY MEDIUM SAND, MOIST
48.6	49.4	GREEN/GRAY SILTY VERY FINE SAND, MOIST
49.4	50.9	BLUE/GRAY SANDY CLAY, MOIST
50.9	52.7	BLUE/GRAY CLAYEY VERY FINE SAND, MOIST
52.7	54.0	BLUE/GRAY SANDY SILT, DRY
54.0	57.1	BLUE/GRAY SILTY FINE SAND, MOIST
57.1	58.0	BROWN SILTY CLAY, MOIST
58.0	63.5	BROWN SILTY VERY FINE SAND, MOIST
63.5	64.4	BROWN CLAYEY FINE SAND, DRY
64.4	68.0	BROWN/GRAY SILTY FINE SAND, DRY
68.0	69.8	BROWN SILTY FINE SAND, MOIST
69.8	72.0	BROWN SANDY SILT, DRY
72.0	73.3	BROWN CLAYEY SAND, WET
73.3	73.7	LIGHT BROWN SANDY SILT, DRY
73.7	75.6	ORANGE/BROWN SANDY FLAY, WET
75.6	78.0	GRAY VERY FINE SAND, DRY
78.0	81.1	GRAY/BROWN SANDY SILT, WET
81.1	90.0	GRAY SILTY CLAY, WET
		MW-2B AND 2C
90	95	GRAY SILTY CLAY
95	100	GRAY/BROWN CLAYEY VERY FINE SAND

TOTAL DEPTH OF BORING 145 (Feet)

TOTAL DEPTH OF COMPLETED WELL 145 (Feet)

WELL OWNER

Name EDITH LONGFELLOW

Mailing Address 14782 8TH AVE.

HANFORD CA 93230

CITY STATE ZIP

WELL LOCATION

Address 14782 8TH STREET

City HANFORD CA 93230

County TULARE

APN Book 028 Page 040 Parcel 016

Township 19 Range 22 Section 20

Latitude DEG. MIN. SEC. DEG. MIN. SEC.

LOCATION SKETCH

NORTH

WEST EAST

SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

✓ NEW WELL

MODIFICATION/REPAIR
— Deepen
— Other (Specify)

— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)

WATER SUPPLY
— Domestic — Public
— Irrigation — Industrial

MONITORING ✓
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) —

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 83.5 (Ft.) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL 83.5 (Ft.) & DATE MEASURED 10/2/2007

ESTIMATED YIELD * (GPM) & TEST TYPE AIR LIFT

TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN (Ft.)

May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft	to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	65	6"	✓				PVC	2"	SCH 40	
65	90	6"					PVC	2"	SCH 40	0.03
							MW-2B			MW-2B
0	96	12 1/4"	✓				PVC	2"	SCH 40	
96	106	12 1/4"					PVC	2"	SCH 40	0.03
		MW-2C					MW-2C			MW-2C

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft	to Ft	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
55	60		✓		GRAVEL 8X16
96	106		✓		GRAVEL 8X16
115	125		✓		GRAVEL 8X16

ATTACHMENTS (✓)

— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

3625 S. HIGHLAND DEL REY CA 93616
ADDRESS CITY STATE ZIP

Signed
WELL DRILLER/AUTHORIZED REPRESENTATIVE

01/21/08
DATE SIGNED

414178
C-57 LICENSE NUMBER

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy
Page 2 of 2

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. EO66714

Owner's Well No. MW-2B & 2C
Date Work Began 7/9/2007, Ended 6/16/2007
Local Permit Agency KINGS CTY PLANNING AGENCY
Permit No. W0707-009 Permit Date 7/9/2007

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft	to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*
100	108	GRAY/BROWN FINE TO MEDIUM SAND
108	113	GRAYBROWN VERY FINE SAND
113	115	GRAY/BROWN SANDY CLAY
115	120	LIGHT GRAY CLAYEY SILT
120	124	GRAY/BROWN FINE SAND
124	134	BROWN SILTY CLAY
134	137	BROWN SANDY SILT
137	142	BROWN SANDY CLAY
142	144	GRAY/BROWN SILTY FINE SAND
144	145	BROWN SANDY SILTY

TOTAL DEPTH OF BORING 145 (Feet)
TOTAL DEPTH OF COMPLETED WELL 145 (Feet)

WELL OWNER

Name EDITH LONGFELLOW
Mailing Address 14782 8TH AVE.
HANFORD CA 93230
CITY STATE ZIP

WELL LOCATION

Address 14782 8TH STREET
City HANFORD CA 93230
County TULARE
APN Book 028 Page 040 Parcel 016
Township 19 Range 22 Section 20
Latitude DEG MIN SEC DEG. MIN. SEC

LOCATION SKETCH

NORTH
WEST EAST
SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
___ Domestic ___ Public
___ Irrigation ___ Industrial
MONITORING ✓
TEST WELL ___
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 83.5 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 83.5 (Ft.) & DATE MEASURED 10/2/2007
ESTIMATED YIELD * ___ (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN ___ (Ft.)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft	to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	115	12 1/4"	✓				PVC	2"	SCH 40	
115	125	12 1/4"					PVC	2"	SCH 40	0.03

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft	to Ft	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
55	60		✓		GRAVEL 8X16
96	106		✓		GRAVEL 8X16
115	125		✓		GRAVEL 8X16

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analysis
___ Other ___
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3625 S. HIGHLAND DEL REY CA 93616
ADDRESS CITY STATE ZIP
Signed ___ 01/21/08 414178
WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED C-57 LICENSE NUMBER

DWR 188 REV. 11-97 IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy
Page 1 of 2

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. EO67270

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO / STATION NO
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. MW-3A
Date Work Began 7/9/2007, Ended 7/16/2007
Local Permit Agency KINGS CTY PLANNING AGENCY
Permit No. W0707-009 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft	to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*
		MW-3A
0	3.1	LIGHT BROWN SANDY SILT, DRY
3.1	3.3	LIGHT BROWN CLAYEY SILT, DRY
3.3	6.6	BROWN SILTY FINE SAND, DRY
6.6	10.0	LIGHT BROWN CLAYEY SILT
10.0	11.2	LIGHT BROWN SILTY FINE SAND, DRY
11.2	12.0	LIGHT BROWN CLAYEY FINE SAND
12.0	16.4	GRAY BROWN CLAYEY SILTY, MOIST
16.4	17.1	GRAY SILT, MOIST
17.1	22.0	LIGHT BROWN CLAYEY SILT, MOIST
22.0	23.0	LIGHT BROWN FINE TO MEDIUM SAND, DRY
23.0	34.0	GRAY SILTY CLAY, MOIST
34.0	35.1	LIGHT BROWN SANDY SILT, DRY
35.1	35.7	BROWN VERY FINE SAND, MOIST
35.7	40.0	GRAY VERY FINE SAND, DRY
40.0	42.0	LIGHT BROWN SANDY CLAY, MOIST
42.0	44.3	LIGHT GRAY FINE SAND, DRY
44.3	46.6	GRAY/BROWN SILTY CLAY, MOIST
46.6	47.0	GRAY/BROWN SILTY FINE TO MEDIUM SAND, MOIST
47.0	50.0	GRAY SANDY CLAY, MOIST
50.0	60.0	BROWN AND GRAY SILTY CLAY, MOIST
60.0	61.0	RED/BROWN CLAY, MOIST
61.0	63.8	GRAY VERY FINE SAND
63.8	70.0	LIGHT BROWN SILTY CLAY, MOIST
70.0	72.9	LIGHT BROWN SILTY FINE TO MEDIUM SAND, MOIST
72.9	75.1	LIGHT BROWN SANDY CLAY
75.1	76.5	LIGHT GRAY FINE SAND
76.5	77.9	LIGHT GRAY MEDIUM TO COARSE SAND, DRY

TOTAL DEPTH OF BORING 140 (Feet)
TOTAL DEPTH OF COMPLETED WELL 140 (Feet)

WELL OWNER
Name EDITH LONGFELLOW
Mailing Address 14782 8TH AVE.
HANFORD (CITY) CA (STATE) 93230 (ZIP)

WELL LOCATION
Address 14782 8TH STREET
City HANFORD CA 93230
County TULARE
APN Book 028 Page 040 Parcel 016
Township 19 Range 22 Section 20
Latitude DEG MIN SEC. DEG MIN. SEC

LOCATION SKETCH
NORTH
WEST EAST
SOUTH
Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)
✓ NEW WELL
MODIFICATION/REPAIR
— Deepen
— Other (Specify)
— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
— Domestic — Public
— Irrigation — Industrial
MONITORING ✓
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) —

WATER LEVEL & YIELD OF COMPLETED WELL
DEPTH TO FIRST WATER DRY (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL DRY (Ft.) & DATE MEASURED
ESTIMATED YIELD * (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN (Ft.)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft	to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	65	6"	✓				PVC	2"	SCH 40	
65	85	6"					PVC	2"	SCH 40	0.03

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft	to Ft	TYPE: CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
55	60		✓		GRAVEL 8X16

ATTACHMENTS (✓)
— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT
I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3625 S. HIGHLAND (ADDRESS) DEL REY (CITY) CA (STATE) 93616 (ZIP)
Signed _____ (WELL DRILLER/AUTHORIZED REPRESENTATIVE) 01/21/08 (DATE SIGNED) 414178 (C-57 LICENSE NUMBER)

DWR 188 REV. 11-97
IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. EO67270

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. MW-3A
Date Work Began 7/9/2007, Ended 7/16/2007
Local Permit Agency KINGS CTY PLANNING AGENCY
Permit No. W0707-009 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain, size, color, etc.*
77.9	80.0	LIGHT GRAY SILTY CLAY, MOIST
80.0	82.0	LIGHT GRAYSILTY FINE TO MEDIUM SAND
82.0	84.0	LIGHT GRAY MEDIUM TO COARSE SAND

TOTAL DEPTH OF BORING 140 (Feet)
TOTAL DEPTH OF COMPLETED WELL 140 (Feet)

WELL OWNER

Name EDITH LONGFELLOW
Mailing Address 14782 8TH AVE.
HANFORD CA 93230
CITY STATE ZIP

WELL LOCATION

Address 14782 8TH STREET
City HANFORD CA 93230
County TULARE
APN Book 028 Page 040 Parcel 016
Township 19 Range 22 Section 20
Latitude ___ DEG MIN. SEC ___ DEG MIN. SEC

LOCATION SKETCH

NORTH
WEST EAST
SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
___ Domestic ___ Public
___ Irrigation ___ Industrial
MONITORING ✓
TEST WELL ___
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER DRY (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL DRY (Ft.) & DATE MEASURED
ESTIMATED YIELD * ___ (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN ___ (Ft.)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
55	60		✓		GRAVEL 8X16

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analysis
___ Other ___
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3625 S. HIGHLAND DEL REY CA 93616
ADDRESS CITY STATE ZIP
Signed ___ 01/21/08 414178
WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED C-57 LICENSE NUMBER

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. EO67271

DWR USE ONLY — DO NOT FILL IN

STATE WELL NO / STATION NO.

LATITUDE LONGITUDE

APN/TRS/OTHER

Owner's Well No. MW-3B & 3C

Date Work Began 7/9/2007, Ended 8/17/2007

Local Permit Agency KINGS CTY PLANNING AGENCY

Permit No. W0707-009 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)

DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft	to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*
		MW-3A
0	3.1	LIGHT BROWN SANDY SILT, DRY
3.1	3.3	LIGHT BROWN CLAYEY SILT, DRY
3.3	6.6	BROWN SILTY FINE SAND, DRY
6.6	10.0	LIGHT BROWN CLAYEY SILT
10.0	11.2	LIGHT BROWN SILTY FINE SAND, DRY
11.2	12.0	LIGHT BROWN CLAYEY FINE SAND
12.0	16.4	GRAY BROWN CLAYEY SILTY, MOIST
16.4	17.1	GRAY SILT, MOIST
17.1	22.0	LIGHT BROWN CLAYEY SILT, MOIST
22.0	23.0	LIGHT BROWN FINE TO MEDIUM SAND, DRY
23.0	34.0	GRAY SILTY CLAY, MOIST
34.0	35.1	LIGHT BROWN SANDY SILT, DRY
35.1	35.7	BROWN VERY FINE SAND, MOIST
35.7	40.0	GRAY VERY FINE SAND, DRY
40.0	42.0	LIGHT BROWN SANDY CLAY, MOIST
42.0	44.3	LIGHT GRAY FINE SAND, DRY
44.3	46.6	GRAY/BROWN SILTY CLAY, MOIST
46.6	47.0	GRAY/BROWN SILTY FINE TO MEDIUM SAND, MOIST
47.0	50.0	GRAY SANDY CLAY, MOIST
50.0	60.0	BROWN AND GRAY SILTY CLAY, MOIST
60.0	61.0	RED/BROWN CLAY, MOIST
61.0	63.8	GRAY VERY FINE SAND
63.8	70.0	LIGHT BROWN SILTY CLAY, MOIST
70.0	72.9	LIGHT BROWN SILTY FINE TO MEDIUM SAND, MOIST
72.9	75.1	LIGHT BROWN SANDY CLAY
75.1	76.5	LIGHT GRAY FINE SAND
76.5	77.9	LIGHT GRAY MEDIUM TO COARSE SAND, DRY

TOTAL DEPTH OF BORING 140 (Feet)

TOTAL DEPTH OF COMPLETED WELL 140 (Feet)

WELL OWNER

Name EDITH LONGFELLOW

Mailing Address 14782 8TH AVE.

HANFORD (CITY) CA (STATE) 93230 (ZIP)

WELL LOCATION

Address 14782 8TH STREET

City HANFORD CA 93230

County TULARE

APN Book 028 Page 040 Parcel 016

Township 19 Range 22 Section 20

Latitude DEG MIN SEC DEG MIN SEC

LOCATION SKETCH

NORTH

WEST EAST

SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

✓ NEW WELL

MODIFICATION/REPAIR
— Deepen
— Other (Specify)

— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)

WATER SUPPLY
— Domestic — Public
— Irrigation — Industrial

MONITORING ✓
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) —

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 84.0 (Ft) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL 83.8 (Ft.) & DATE MEASURED 10/2/2007

ESTIMATED YIELD * (GPM) & TEST TYPE AIR LIFT

TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN (Ft)

May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft	to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	65	6"	✓				PVC	2"	SCH 40	
65	85	6"					PVC	2"	SCH 40	0.03
		MW-3B					MW-3B			MW-3B
0	115	12 1/4"	✓				PVC	2"	SCH 40	
115	130	12 1/4"					PVC	2"	SCH 40	0.03

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft	to Ft	TYPE CE-MENT (✓)	BEN-TONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
55	60		✓		GRAVEL 8X16
105	110		✓		GRAVEL 8X16
105	110		✓		GRAVEL 8 X 1

ATTACHMENTS (✓)

— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

3625 S. HIGHLAND (ADDRESS) DEL REY (CITY) CA (STATE) 93616 (ZIP)

Signed (WELL DRILLER/AUTHORIZED REPRESENTATIVE) 01/21/08 (DATE SIGNED) 414178 (C-57 LICENSE NUMBER)

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. EO67271

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO / STATION NO.
LATITUDE ° LONGITUDE
APN/TRS/OTHER

Owner's Well No. MW-3B & 3C
Date Work Began 7/9/2007, Ended 8/17/2007
Local Permit Agency KINGS CTY PLANNING AGENCY
Permit No. W0707-009 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft	to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*
77.9	80.0	LIGHT GRAY SILTY CLAY, MOIST
80.0	82.0	LIGHT GRAYSILTY FINE TO MEDIUM SAND
82.0	84.0	LIGHT GRAY MEDIUM TO COARSE SAND
		MW-3B AND 3C
80	90	BROWN MEDIUM TO COARSE SAND
90	108	BROWN SILTY CLAY
108	114	BROWN CLAYEY FINE SAND
114	120	BROWN FINE TO MEDIUM SAND
120	126	BROWN VERY FINE SAND WITH SOME CLAY
126	135	BROWN MEDIUM TO COARSE SAND
135	140	BROWN FINE SAND

TOTAL DEPTH OF BORING 140 (Feet)
TOTAL DEPTH OF COMPLETED WELL 140 (Feet)

WELL OWNER

Name EDITH LONGFELLOW
Mailing Address 14782 8TH AVE.
HANFORD (CITY) CA (STATE) 93230 (ZIP)

WELL LOCATION

Address 14782 8TH STREET
City HANFORD CA 93230
County TULARE
APN Book 028 Page 040 Parcel 016
Township 19 Range 22 Section 20
Latitude DEG. MIN. SEC. DEG. MIN SEC.

LOCATION SKETCH

NORTH
WEST EAST
SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
— Deepen
— Other (Specify)
— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
— Domestic — Public
— Irrigation — Industrial
MONITORING ✓
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) —

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 84.0 (Ft) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 83.8 (Ft) & DATE MEASURED 10/2/2007
ESTIMATED YIELD * — (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs) TOTAL DRAWDOWN — (Ft)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft	to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
		MW-3C					MW-3C			MW-3C
0	130	12 1/4"	✓				PVC	2"	SCH 40	
130	140	12 1/4"					PVC	2"	SCH 40	0.03

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft	to Ft	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
55	60		✓		GRAVEL 8X16
105	110		✓		GRAVEL 8X16
105	110		✓		GRAVEL 8 X 1

ATTACHMENTS (✓)

— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3625 S. HIGHLAND (ADDRESS) DEL REY (CITY) CA (STATE) 93616 (ZIP)
Signed — WELL DRILLER/AUTHORIZED REPRESENTATIVE
01/21/08 (DATE SIGNED) 414178 (C-57 LICENSE NUMBER)

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. EO67274

Owner's Well No. MW-4A

Date Work Began 7/9/2007, Ended 7/25/2007

Local Permit Agency KINGS CTY PLANNING AGENCY

Permit No. W0707-009 Permit Date 7/9/2007

DWR USE ONLY — DO NOT FILL IN

STATE WELL NO / STATION NO.

LATITUDE LONGITUDE

APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)

DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain, size, color, etc.*
		MW-4A
0	12.5	LIGHT BROWN SANDY SILT, DRY
12.5	16.0	YELLOW/BROWN SANDY CLAY, MOIST
16.0	16.9	BROWN VERY FINE SAND, MOIST
16.9	19.3	BROWN CLAYEY SAND, MOIST
19.3	24.4	LIGHT BROWN FINE TO MEDIUM SAND, DRY
24.4	32.0	LIGHT GRAY VERY FINE SAND, DRY
32.0	40.0	GRAY/BROWN SILTY CLAY, MOIST
40.0	42.0	GRAY SILTY VERY FINE SAND, MOIST
42.0	44.0	YELLOW/BROWN CLAYEY FINE SAND, MOIST
44.0	45.7	YELLOW/BROWN VERY FINE SAND
45.7	48.0	YELLOW/GRAY SANDY CLAY
48.0	48.5	YELLOW/BROWN SILTY CLAY
48.5	50.0	GRAY VERY FINE SAND, MOIST
50.0	55.5	LIGHT BROWN SANDY CLAY, MOIST
55.5	56.4	LIGHT BROWN SANDY SILT, MOIST
56.4	58.0	LIGHT BROWN SANDY CLAY, MOIST
58.0	60.5	GRAY FINE SAND, MOIST
60.5	63.2	YELLOW/GRAY FINE TO MEDIUM SAND, MOIST
63.2	68.2	GRAY/BROWN SILTY CLAY, MOIST
68.2	70.0	YELLOW/BROWN SANDY SILT, MOIST
70.0	71.1	GRAY BROWN SANDY CLAY, MOIST
71.1	74.0	BROWN SANDY CLAY, MOIST
74.0	76.6	BROWN CLAYEY SILT, MOIST
76.6	77.3	BROWN CLAYEY SAND, MOIST
77.3	78.0	BROWN SILTY CLAY, MOIST
78.0	80.0	BROWN SILTY FINE SAND, WET
80.0	81.2	BROWN FINE TO MEDIUM SAND, DRY
81.2	82.0	BROWN SANDY CLAY, MOIST
82.0	84.0	BROWN SILTY VERY FINE SAND, MOIST

TOTAL DEPTH OF BORING 154 (Feet)

TOTAL DEPTH OF COMPLETED WELL 154 (Feet)

WELL OWNER

Name EDITH LONGFELLOW

Mailing Address 14782 8TH AVE.

HANFORD (CITY) CA (STATE) 93230 (ZIP)

WELL LOCATION

Address 14782 8TH STREET

City HANFORD CA 93230

County TULARE

APN Book 028 Page 040 Parcel 016

Township 19 Range 22 Section 20

Latitude ___ DEG. ___ MIN. ___ SEC. ___ DEG. ___ MIN ___ SEC.

LOCATION SKETCH

NORTH

WEST EAST

SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

✓ NEW WELL

MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)

___ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)

WATER SUPPLY
___ Domestic ___ Public
___ Irrigation ___ Industrial

MONITORING ✓
TEST WELL ___
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER DRY (Ft.) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL DRY (Ft.) & DATE MEASURED 7/5/2007

ESTIMATED YIELD * ___ (GPM) & TEST TYPE AIR LIFT

TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN ___ (Ft.)

May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
										MW-4A
0	60	6"	✓				PVC	2"	SCH 40	
60	90	6"					PVC	2"	SCH 40	0.03

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
50	55		✓		GRAVEL 8X16

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analysis
___ Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

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(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

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IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy
Page 2 of 2

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. EO67274

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. MW-4A
Date Work Began 7/9/2007, Ended 7/25/2007
Local Permit Agency KINGS CTY PLANNING AGENCY
Permit No. W0707-009 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft	to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*
84.0	85.6	BROWN CLAYEY SILT, WET
85.6	86.0	BROWN VERY FINE SILTY SAND, WET
86.0	88.0	NO CORE RETRIEVED
88.0	90.0	GRAY VERY FINE SAND, WET

TOTAL DEPTH OF BORING 154 (Feet)
TOTAL DEPTH OF COMPLETED WELL 154 (Feet)

WELL OWNER

Name EDITH LONGFELLOW
Mailing Address 14782 8TH AVE.
HANFORD (CITY) CA (STATE) 93230 (ZIP)

WELL LOCATION

Address 14782 8TH STREET
City HANFORD CA 93230
County TULARE
APN Book 028 Page 040 Parcel 016
Township 19 Range 22 Section 20
Latitude DEG MIN SEC DEG MIN SEC

LOCATION SKETCH

NORTH
WEST EAST
SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
— Deepen
— Other (Specify)
— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
— Domestic — Public
— Irrigation — Industrial
MONITORING ✓
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) —

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER DRY (Ft) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL DRY (Ft) & DATE MEASURED 7/5/2007
ESTIMATED YIELD * (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN (Ft)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft	to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft	to Ft	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)

ATTACHMENTS (✓)
— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief
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DWR 188 REV. 11-97
IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. EO67275

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO / STATION NO
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. MW-4B, 4C & 4D

Date Work Began 7/9/2007, Ended 7/11/2007

Local Permit Agency KINGS CTY PLANNING AGENCY

Permit No. W0707-009 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)

DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft	to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*
		MW-4A
0	12.5	LIGHT BROWN SANDY SILT, DRY
12.5	16.0	YELLOW/BROWN SANDY CLAY, MOIST
16.0	16.9	BROWN VERY FINE SAND, MOIST
16.9	19.3	BROWN CLAYEY SAND, MOIST
19.3	24.4	LIGHT BROWN FINE TO MEDIUM SAND, DRY
24.4	32.0	LIGHT GRAY VERY FINE SAND, DRY
32.0	40.0	GRAY/BROWN SILTY CLAY, MOIST
40.0	42.0	GRAY SILTY VERY FINE SAND, MOIST
42.0	44.0	YELLOW/BROWN CLAYEY FINE SAND, MOIST
44.0	45.7	YELLOW/BROWN VERY FINE SAND
45.7	48.0	YELLOW/GRAY SANDY CLAY
48.0	48.5	YELLOW/BROWN SILTY CLAY
48.5	50.0	GRAY VERY FINE SAND, MOIST
50.0	55.5	LIGHT BROWN SANDY CLAY, MOIST
55.5	56.4	LIGHT BROWN SANDY SILT, MOIST
56.4	58.0	LIGHT BROWN SANDY CLAY, MOIST
58.0	60.5	GRAY FINE SAND, MOIST
60.5	63.2	YELLOW/GRAY FINE TO MEDIUM SAND, MOIST
63.2	68.2	GRAY/BROWN SILTY CLAY, MOIST
68.2	70.0	YELLOW/BROWN SANDY SILT, MOIST
70.0	71.1	GRAY BROWN SANDY CLAY, MOIST
71.1	74.0	BROWN SANDY CLAY, MOIST
74.0	76.6	BROWN CLAYEY SILT, MOIST
76.6	77.3	BROWN CLAYEY SAND, MOIST
77.3	78.0	BROWN SILTY CLAY, MOIST
78.0	80.0	BROWN SILTY FINE SAND, WET
80.0	81.2	BROWN FINE TO MEDIUM SAND, DRY
81.2	82.0	BROWN SANDY CLAY, MOIST
82.0	84.0	BROWN SILTY VERY FINE SAND, MOIST

TOTAL DEPTH OF BORING 154 (Feet)

TOTAL DEPTH OF COMPLETED WELL 154 (Feet)

WELL OWNER

Name EDITH LONGFELLOW

Mailing Address 14782 8TH AVE.

HANFORD (CITY) CA (STATE) 93230 (ZIP)

WELL LOCATION

Address 14782 8TH STREET

City HANFORD CA 93230

County TULARE

APN Book 028 Page 040 Parcel 016

Township 19 Range 22 Section 20

Latitude ___ DEG ___ MIN ___ SEC. ___ DEG. ___ MIN ___ SEC.

LOCATION SKETCH

NORTH

WEST EAST

SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

✓ NEW WELL

MODIFICATION/REPAIR
— Deepen
— Other (Specify)

— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)

WATER SUPPLY
— Domestic — Public
— Irrigation — Industrial

MONITORING ✓
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) —

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 86.9 (Ft.) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL 87.62 (Ft.) & DATE MEASURED 9/26/2007

ESTIMATED YIELD * ___ (GPM) & TEST TYPE AIR LIFT

TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN ___ (Ft.)

May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft	to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
										MW-4A
0	60	6"	✓				PVC	2"	SCH 40	
60	90	6"					PVC	2"	SCH 40	0.03
		MW-4B					MW-4B			MW-4B
0	105	12 1/4"	✓				PVC	2"	SCH 40	
105	115	12 1/4"					PVC	2"	SCH 40	0.03

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft	to Ft	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
50	55		✓		GRAVEL 8X16
95	100		✓		GRAVEL 8X16
115	120		✓		GRAVEL 8 X 1

ATTACHMENTS (✓)

— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

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DWR 188 REV. 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. EO67275

DWR USE ONLY — DO NOT FILL IN

STATE WELL NO / STATION NO

LATITUDE LONGITUDE

APN/TRS/OTHER

Owner's Well No. MW-4B, 4C & 4D

Date Work Began 7/9/2007, Ended 7/11/2007

Local Permit Agency KINGS CTY PLANNING AGENCY

Permit No. W0707-009 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)

DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft	to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*
84.0	85.6	BROWN CLAYEY SILT, WET
85.6	86.0	BROWN VERY FINE SILTY SAND, WET
86.0	88.0	NO CORE RETRIEVED
88.0	90.0	GRAY VERY FINE SAND, WET
		MW-4B, 4C AND 4D
90	93	BROWN FINE TO MEDIUM SAND
93	97	BROWN CLAYEY FINE TO MEDIUM SAND
97	100	BROWN SILTY FINE TO MEDIUM SAND
100	108	BROWN SANDY CLAY
108	112	BROWN FINE TO MEDIUM SAND
112	120	BROWN SANDY CLAY
120	123	BROWN CLAYEY FINE SAND
123	130	BROWN FINE TO MEDIUM SAND
130	141	BROWN MEDIUM SAND
141	154	GRAY/BROWN FINE TO MEDIUM SILTY SAND

TOTAL DEPTH OF BORING 154 (Feet)

TOTAL DEPTH OF COMPLETED WELL 154 (Feet)

WELL OWNER

Name EDITH LONGFELLOW

Mailing Address 14782 8TH AVE.

HANFORD (CITY) CA (STATE) 93230 (ZIP)

WELL LOCATION

Address 14782 8TH STREET

City HANFORD CA 93230

County TULARE

APN Book 028 Page 040 Parcel 016

Township 19 Range 22 Section 20

Latitude DEG MIN SEC. DEG. MIN SEC

LOCATION SKETCH

NORTH

WEST EAST

SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

✓ NEW WELL

MODIFICATION/REPAIR
— Deepen
— Other (Specify)

— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)

WATER SUPPLY
— Domestic — Public
— Irrigation — Industrial

MONITORING ✓
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) —

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 86.9 (Ft.) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL 87.62 (Ft.) & DATE MEASURED 9/26/2007

ESTIMATED YIELD * — (GPM) & TEST TYPE AIR LIFT

TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN — (Ft.)

May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft	to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
		MW-4C					MW-4C			MW-4C
0	130	12 1/4"	✓				PVC	2"	SCH 40	
130	140	12 1/4"					PVC	2"	SCH 40	0.03
		MW-4D					MW-4D			MW-4D
0	140	12 1/4"	✓				PVC	2"	SCH 40	
140	150	12 1/4"					PVC	2"	SCH 40	0.03

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft	to Ft	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
115	120		✓		GRAVEL 8X16

ATTACHMENTS (✓)

— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

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(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

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01/21/08 (DATE SIGNED) 414178 (C-57 LICENSE NUMBER)

DWR 188 REV 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy
Page 1 of 2

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. E067277

Owner's Well No. W-5A
Date Work Began 7/9/2007, Ended 7/24/2007
Local Permit Agency KINGS COUNTY PLANNING
Permit No. W0707-009 Permit Date 7/9/2007

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./ STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain, size, color, etc.*
		MW-5A
0	6	BROWN SILTY FINE SAND, MOIST
6	10	BROWN CLAYEY SILT, MOIST
10	15.6	BROWN SILTY VERY FINE SAND, MOIST
15.6	16.9	GRAY VERY FINE SAND, MOIST
16.9	18.0	BROWN SILTY CLAY
18.0	19.4	GRAY VERY FINE TO COARSE SAND, MOIST
19.4	22.0	GRAY SILTY CLAY, MOIST
22.0	24.0	GRAY SANDY CLAY WITH SILT, MOIST
24.0	32.7	BROWN SILTY VERY FINE SAND, DRY
32.7	33.4	GRAY FINE SAND WITH SOME SILT, MOIST
33.4	37.3	GRAY SILTY CLAY, MOIST
37.3	38.0	GRAY SANDY SILT, MOIST
38.0	41.6	GRAY VERY FINE SAND, DRY
41.6	42.2	GRAY FINE SAND, MOIST
42.2	44.0	BROWN SILTY CLAY, MOIST
44.0	47.0	BROWN SILTY VERY FINE SAND, MOIST
47.0	48.0	BROWN SILTY VERY FINE SAND, MOIST
48.0	50.0	GRAY/BROWN SILTY FINE SAND, MOIST
50.0	56.0	BROWN SILTY CLAY, MOIST
56.0	57.1	GRAY VERY FINE SAND, MOIST
57.1	60.0	BROWN/GRAY CLAY AND SANDY CLAY, MOIST
60.0	62.9	GRAY FINE SAND, MOIST
62.9	65.7	GRAY/ORANGE SILTY CLAY, MOIST
65.7	66.7	GRAY/ORANGE VERY FINE SANDY SILT, MOIS
66.7	68.0	GRAY/ORANGE CLAYEY SILT, MOIST
68.0	70.0	BROWN/ORANGE SILTY CLAY WITH VERY FINE SAND , MOIST
70.0	71.5	GRAY VERY FINE SAND, DRY
71.5	73.7	BROWN VERY FINE SANDY SILT, MOIST

TOTAL DEPTH OF BORING 140 (Feet)
TOTAL DEPTH OF COMPLETED WELL 140 (Feet)

WELL OWNER
Name EDITH LONGFELLOW
Mailing Address 14782 8TH AVE.
HANFORD (CITY) CA (STATE) 93230 (ZIP)

WELL LOCATION
Address 14782 8TH AVE
City HANFORD CA 93230
County TULARE
APN Book 028 Page 040 Parcel 016
Township 19 Range 22 Section 20
Latitude DEG. MIN. SEC. DEG. MIN. SEC.

LOCATION SKETCH
NORTH
WEST EAST
SOUTH
Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)
✓ NEW WELL
MODIFICATION/REPAIR
— Deepen
— Other (Specify)
— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
— Domestic — Public
— Irrigation — Industrial
MONITORING ✓
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) —

WATER LEVEL & YIELD OF COMPLETED WELL
DEPTH TO FIRST WATER 96.1 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 96.1 (Ft.) & DATE MEASURED 9/26/2007
ESTIMATED YIELD * (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN (Ft.)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	66	6"	✓				PVC	2"	SCH 40	MW-5A
66	96	6"					PVC	2"	SCH 40	0.03

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
51	56		✓		GRAVEL 8X16

ATTACHMENTS (✓)
— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT
I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3625 S. HIGHLAND (ADDRESS) DEL REY (CITY) CA (STATE) 93616 (ZIP)
Signed (WELL DRILLER/AUTHORIZED REPRESENTATIVE) 01/21/08 (DATE SIGNED) 414178 (C-57 LICENSE NUMBER)

DWR 188 REV. 11-97
IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy
Page 2 of 2

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. E067277

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./ STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. W-5A
Date Work Began 7/9/2007, Ended 7/24/2007
Local Permit Agency KINGS COUNTY PLANNING
Permit No. W0707-009 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain, size, color, etc.*
73.7	78.7	BROWN SILTY FINE SAND, MOIST
78.7	80.0	GRAY WVERY FINE SAND WITH SILT
80.0	80.7	BROWN SILTY CLAY, MOIST
80.7	82.0	BROWN VERY FINE SAND, MOIST
82.0	87.1	GRAY/BROWN CLAYEY SILT
87.1	88.0	BROWN SILTY FINE SAND, MOIST
88.0	88.9	BROWN FINE SAND, MOIST
88.9	92.8	GRAY/BROWN SANDY CLAY, MOIST
92.8	96.0	GRAY/BROWN CLAYEY VERY FINE SAND, MOIS

TOTAL DEPTH OF BORING 140 (Feet)
TOTAL DEPTH OF COMPLETED WELL 140 (Feet)

WELL OWNER

Name EDITH LONGFELLOW
Mailing Address 14782 8TH AVE.
HANFORD (CITY) CA (STATE) 93230 (ZIP)

WELL LOCATION

Address 14782 8TH AVE
City HANFORD CA 93230
County TULARE
APN Book 028 Page 040 Parcel 016
Township 19 Range 22 Section 20
Latitude ___ DEG. ___ MIN. ___ SEC. ___ DEG. ___ MIN. ___ SEC.

LOCATION SKETCH

NORTH
WEST EAST
SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
— Deepen
— Other (Specify)
— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
— Domestic — Public
— Irrigation — Industrial
MONITORING ✓
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) —

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 96.1 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 96.1 (Ft.) & DATE MEASURED 9/26/2007
ESTIMATED YIELD * ___ (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN ___ (Ft.)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	66	6"	✓				PVC	2"	SCH 40	MW-5A
66	96	6"					PVC	2"	SCH 40	0.03

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CE-MENT (✓)	BEN-TONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
51	56		✓		GRAVEL 8X16

ATTACHMENTS (✓)

— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3625 S. HIGHLAND (ADDRESS) DEL REY (CITY) CA (STATE) 93616 (ZIP)
Signed ___ (WELL DRILLER/AUTHORIZED REPRESENTATIVE) 01/21/08 (DATE SIGNED) 414178 (C-57 LICENSE NUMBER)

DWR 188 REV. 11-97
IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. E067278

Owner's Well No. MW-5B & 5C

Date Work Began 7/9/2007, Ended 9/14/2007

Local Permit Agency KINGS COUNTY PLANNING

Permit No. W0707-009 Permit Date 7/9/2007

DWR USE ONLY — DO NOT FILL IN

STATE WELL NO / STATION NO

LATITUDE LONGITUDE

APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)

DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain, size, color, etc.*
		MW-5A
0	6	BROWN SILTY FINE SAND, MOIST
6	10	BROWN CLAYEY SILT, MOIST
10	15.6	BROWN SILTY VERY FINE SAND, MOIST
15.6	16.9	GRAY VERY FINE SAND, MOIST
16.9	18.0	BROWN SILTY CLAY
18.0	19.4	GRAY VERY FINE TO COARSE SAND, MOIST
19.4	22.0	GRAY SILTY CLAY, MOIST
22.0	24.0	GRAY SANDY CLAY WITH SILT, MOIST
24.0	32.7	BROWN SILTY VERY FINE SAND, DRY
32.7	33.4	GRAY FINE SAND WITH SOME SILT, MOIST
33.4	37.3	GRAY SILTY CLAY, MOIST
37.3	38.0	GRAY SANDY SILT, MOIST
38.0	41.6	GRAY VERY FINE SAND, DRY
41.6	42.2	GRAY FINE SAND, MOIST
42.2	44.0	BROWN SILTY CLAY, MOIST
44.0	47.0	BROWN SILTY VERY FINE SAND, MOIST
47.0	48.0	BROWN SILTY VERY FINE SAND, MOIST
48.0	50.0	GRAY/BROWN SILTY FINE SAND, MOIST
50.0	56.0	BROWN SILTY CLAY, MOIST
56.0	57.1	GRAY VERY FINE SAND, MOIST
57.1	60.0	BROWN/GRAY CLAY AND SANDY CLAY, MOIST
60.0	62.9	GRAY FINE SAND, MOIST
62.9	65.7	GRAY/ORANGE SILTY CLAY, MOIST
65.7	66.7	GRAY/ORANGE VERY FINE SANDY SILT, MOIST
66.7	68.0	GRAY/ORANGE CLAYEY SILT, MOIST
68.0	70.0	BROWN/ORANGE SILTY CLAY WITH VERY FINE SAND, MOIST
70.0	71.5	GRAY VERY FINE SAND, DRY
71.5	73.7	BROWN VERY FINE SANDY SILT, MOIST

TOTAL DEPTH OF BORING 140 (Feet)

TOTAL DEPTH OF COMPLETED WELL 140 (Feet)

WELL OWNER

Name EDITH LONGFELLOW

Mailing Address 14782 8TH AVE.

HANFORD (CITY) CA (STATE) 93230 (ZIP)

WELL LOCATION

Address 14782 8TH AVE

City HANFORD CA 93230

County TULARE

APN Book 028 Page 040 Parcel 016

Township 19 Range 22 Section 20

Latitude DEG. MIN. SEC. DEG. MIN. SEC

LOCATION SKETCH

NORTH

WEST EAST

SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

✓ NEW WELL

MODIFICATION/REPAIR
— Deepen
— Other (Specify)

— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)

WATER SUPPLY
— Domestic — Public
— Irrigation — Industrial

MONITORING ✓
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) —

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 91.5 (Ft.) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL 91.8 (Ft.) & DATE MEASURED 9/26/2007

ESTIMATED YIELD * (GPM) & TEST TYPE AIR LIFT

TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN (Ft.)

May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	66	6"	✓				PVC	2"	SCH 40	MW-5A
66	96	6"					PVC	2"	SCH 40	0.03
							MW-5B			MW-5B
0	100	10 5/8"	✓				PVC	2"	SCH 40	
100	110	10 5/8"					PVC	2"	SCH 40	0.03
							MW-5C			MW-5C

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
51	56		✓		GRAVEL 8X16
88	93		✓		GRAVEL 8X16
114	116		✓		GRAVEL 8X16

ATTACHMENTS (✓)

— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

3625 S. HIGHLAND (ADDRESS) DEL REY (CITY) CA (STATE) 93616 (ZIP)

Signed _____ (WELL DRILLER/AUTHORIZED REPRESENTATIVE) 01/21/08 (DATE SIGNED) 414178 (C-57 LICENSE NUMBER)

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. E067278

Owner's Well No. MW-5B & 5C

Date Work Began 7/9/2007, Ended 9/14/2007

Local Permit Agency KINGS COUNTY PLANNING

Permit No. W0707-009 Permit Date 7/9/2007

DWR USE ONLY — DO NOT FILL IN

STATE WELL NO / STATION NO

LATITUDE LONGITUDE

APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)

DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain, size, color, etc.*
73.7	78.7	BROWN SILTY FINE SAND, MOIST
78.7	80.0	GRAY WVERY FINE SAND WITH SILT
80.0	80.7	BROWN SILTY CLAY, MOIST
80.7	82.0	BROWN VERY FINE SAND, MOIST
82.0	87.1	GRAY/BROWN CLAYEY SILT
87.1	88.0	BROWN SILTY FINE SAND, MOIST
88.0	88.9	BROWN FINE SAND, MOIST
88.9	92.8	GRAY/BROWN SANDY CLAY, MOIST
92.8	96.0	GRAY/BROWN CLAYEY VERY FINE SAND, MOIS
		MW-5B AND 5C
90	93	GRAY/BROWN CLAYEY SILT
93	97	GRAY FINE TO MEDIUM SAND
97	101	GRAY CLAYEY SILT
101	112	BROWN FINE TO COARSE SAND WITH SOME GRAVEL
112	120	BROWN CLAYEY SILT
120	123	BROWN FINE SAND
123	132	GRAY/BROWN FINE SANDY CLAY
132	137	GRAY/BROWN SILTY CLAY
137	140	GRAY/BROWN CLAYEY FINE SAND

TOTAL DEPTH OF BORING 140 (Feet)

TOTAL DEPTH OF COMPLETED WELL 140 (Feet)

WELL OWNER

Name EDITH LONGFELLOW

Mailing Address 14782 8TH AVE.

HANFORD (CITY) CA (STATE) 93230 (ZIP)

WELL LOCATION

Address 14782 8TH AVE

City HANFORD CA 93230

County TULARE

APN Book 028 Page 040 Parcel 016

Township 19 Range 22 Section 20

Latitude DEG. MIN SEC. DEG. MIN. SEC.

LOCATION SKETCH

NORTH

WEST EAST

SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

✓ NEW WELL

MODIFICATION/REPAIR
— Deepen
— Other (Specify)

— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)

WATER SUPPLY
— Domestic — Public
— Irrigation — Industrial

MONITORING - ✓
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) —

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 91.5 (Ft.) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL 91.8 (Ft.) & DATE MEASURED 9/26/2007

ESTIMATED YIELD * — (GPM) & TEST TYPE AIR LIFT

TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN — (Ft.)

May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	118	10 5/8"	✓				PVC	2"	SCH 40	
118	128	10 5/8"					PVC	2"	SCH 40	0.03

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
51	56		✓		GRAVEL 8X16
68	93		✓		GRAVEL 8X16
114	116		✓		GRAVEL 8X16

ATTACHMENTS (✓)

— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

3625 S. HIGHLAND (ADDRESS) DEL REY (CITY) CA (STATE) 93616 (ZIP)

Signed _____ (WELL DRILLER/AUTHORIZED REPRESENTATIVE) 01/21/08 (DATE SIGNED) 414178 (C-57 LICENSE NUMBER)

DWR 188 REV. 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. EO67272

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. MW-6A
Date Work Began 7/9/2007, Ended 7/25/2007
Local Permit Agency KINGS CTY PLANNING AGENCY
Permit No. W0707-009 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft	to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*
		MW-6A
0	8.0	BROWN CLAYEY SILTY AND SILTY CLAY, MOIS
8.0	15.8	BROWN SILTY CLAY, MOIST
15.8	20.0	ORANGE/GRAY VERY FINE SAND, MOIST
20.0	22.0	BROWN SANDY CLAY
22.0	30.0	GRAY FINE SAND, DRY
30.0	32.0	GRAY MEDIUM SAND, DRY
32.0	33.3	GRAY CLAYEY SAND, MOIST
33.3	34.6	GRAY SILTY CLAY, MOIST
34.6	36.0	GRAY SILT, MOIST
36.0	40.0	GRAY VERY FINE CLAYEY SAND, MOIST
40.0	42.6	BROWN CLAY SILT, MOIST
42.6	48.0	BROWN/GRAY SILTY FINE SAND, DRY
48.0	52.0	GRAY FINE SAND, MOIST
52.0	53.3	GRAY SILTY FINE SAND, MOIST
53.3	60.0	GRAY SILTY CLAY, MOIST
60.0	62/0	BROWN SANDY SILTY CLAY, MOIST
62.0	64.0	BROWN CLAYEY SILT, MOIST
64.0	77.5	BROWN/GRAY VERY FINE SAND, MOIST
77.5	84.0	BROWN/GRAY SILTY CLAY AND CLAYEY
		SILT, MOIST
84.0	87.3	GRAY/BROWN CLAYEY VERY FINE SAND, MOIS
87.3	94	GRAY MEDIUM SAND, WET

TOTAL DEPTH OF BORING 140 (Feet)
TOTAL DEPTH OF COMPLETED WELL 140 (Feet)

WELL OWNER

Name EDITH LONGFELLOW
Mailing Address 14782 8TH AVE.
HANFORD CA 93230
CITY STATE ZIP

WELL LOCATION

Address 14782 8TH STREET
City HANFORD CA 93230
County TULARE
APN Book 028 Page 040 Parcel 016
Township 19 Range 22 Section 20
Latitude DEG. MIN. SEC. DEG. MIN. SEC

LOCATION SKETCH

NORTH
WEST EAST
SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
— Deepen
— Other (Specify)
— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
— Domestic — Public
— Irrigation — Industrial
MONITORING ✓
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) —

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 87 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 87 (Ft.) & DATE MEASURED 10/16/2007
ESTIMATED YIELD * (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN (Ft.)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft	to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
										MW-6A
0	85	6"	✓				PVC	2"	SCH 40	
85	95	6"					PVC	2"	SCH 40	0.03

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft	to Ft	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
70	75		✓		GRAVEL 8X16

ATTACHMENTS (✓)

— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3825 S. HIGHLAND DEL REY CA 93616
ADDRESS CITY STATE ZIP
Signed
WELL DRILLER/AUTHORIZED REPRESENTATIVE
01/21/08
DATE SIGNED
414178
C-57 LICENSE NUMBER

DWR 188 REV 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. EO67272

DWR USE ONLY — DO NOT FILL IN

STATE WELL NO./STATION NO.

LATITUDE LONGITUDE

APN/TRS/OTHER

Owner's Well No. MW-6A

Date Work Began 7/9/2007, Ended 7/25/2007

Local Permit Agency KINGS CTY PLANNING AGENCY

Permit No. W0707-009 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)

DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*

TOTAL DEPTH OF BORING 140 (Feet)

TOTAL DEPTH OF COMPLETED WELL 140 (Feet)

WELL OWNER

Name EDITH LONGFELLOW

Mailing Address 14782 8TH AVE.

HANFORD (CITY) CA (STATE) 93230 (ZIP)

WELL LOCATION

Address 14782 8TH STREET

City HANFORD CA 93230

County TULARE

APN Book 028 Page 040 Parcel 016

Township 19 Range 22 Section 20

Latitude ___ DEG. ___ MIN. ___ SEC. ___ DEG. ___ MIN. ___ SEC.

LOCATION SKETCH

NORTH

WEST EAST

SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

✓ NEW WELL

MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)

___ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)

WATER SUPPLY
___ Domestic ___ Public
___ Irrigation ___ Industrial

MONITORING ✓
TEST WELL ___
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 87 (Ft.) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL 87 (Ft.) & DATE MEASURED 10/16/2007

ESTIMATED YIELD * ___ (GPM) & TEST TYPE AIR LIFT

TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN ___ (Ft.)

May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft to Ft	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analysis
___ Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

3625 S. HIGHLAND (ADDRESS) DEL REY (CITY) CA (STATE) 93616 (ZIP)

Signed ___ (WELL DRILLER/AUTHORIZED REPRESENTATIVE) 01/21/08 (DATE SIGNED) 414178 (C-57 LICENSE NUMBER)

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. EO67273

Owner's Well No. MW-6B & 6C

Date Work Began 7/9/2007, Ended 9/18/2007

Local Permit Agency KINGS CTY PLANNING AGENCY

Permit No. W0707-009 Permit Date 7/9/2007

DWR USE ONLY — DO NOT FILL IN

STATE WELL NO./ STATION NO

LATITUDE LONGITUDE

APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)

DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft	to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*
		MW-6A
0	8.0	BROWN CLAYEY SILTY AND SILTY CLAY, MOIS
8.0	15.8	BROWN SILTY CLAY, MOIST
15.8	20.0	ORANGE/GRAY VERY FINE SAND, MOIST
20.0	22.0	BROWN SANDY CLAY
22.0	30.0	GRAY FINE SAND, DRY
30.0	32.0	GRAY MEDIUM SAND, DRY
32.0	33.3	GRAY CLAYEY SAND, MOIST
33.3	34.6	GRAY SILTY CLAY, MOIST
34.6	36.0	GRAY SILT, MOIST
36.0	40.0	GRAY VERY FINE CLAYEY SAND, MOIST
40.0	42.6	BROWN CLAY SILT, MOIST
42.6	48.0	BROWN/GRAY SILTY FINE SAND, DRY
48.0	52.0	GRAY FINE SAND, MOIST
52.0	53.3	GRAY SILTY FINE SAND, MOIST
53.3	60.0	GRAY SILTY CLAY, MOIST
60.0	62/0	BROWN SANDY SILTY CLAY, MOIST
62.0	64.0	BROWN CLAYEY SILT, MOIST
64.0	77.5	BROWN/GRAY VERY FINE SAND, MOIST
77.5	84.0	BROWN/GRAY SILTY CLAY AND CLAYEY SILT, MOIST
84.0	87.3	GRAY/BROWN CLAYEY VERY FINE SAND, MOIS
87.3	94	GRAY MEDIUM SAND, WET
		MW-6B AND 6C
77	84	GRAY/BROWN SILTY CLAY
84	102	GRAY FINE TO MEDIUM SAND
102	114	GRAY MEDIUM SANDY CLAY
114	117	BROWN SILTY CLAY
117	120	BROWN MEDIUM SANDY CLAY
120	128	GRAY FINE SAND

TOTAL DEPTH OF BORING 140 (Feet)

TOTAL DEPTH OF COMPLETED WELL 140 (Feet)

WELL OWNER

Name EDITH LONGFELLOW

Mailing Address 14782 8TH AVE.

HANFORD (CITY) CA (STATE) 93230 (ZIP)

WELL LOCATION

Address 14782 8TH STREET

City HANFORD CA 93230

County TULARE

APN Book 028 Page 040 Parcel 016

Township 19 Range 22 Section 20

Latitude DEG MIN SEC DEG MIN. SEC

LOCATION SKETCH

NORTH

WEST EAST

SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

✓ NEW WELL

MODIFICATION/REPAIR
— Deepen
— Other (Specify)

— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)

WATER SUPPLY
— Domestic — Public
— Irrigation — Industrial

MONITORING ✓
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) —

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 93.2 (Ft.) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL 94.3 (Ft.) & DATE MEASURED 9/26/2007

ESTIMATED YIELD * (GPM) & TEST TYPE AIR LIFT

TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN (Ft.)

May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft	to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
										MW-6A
0	85	6"	✓				PVC	2"	SCH 40	
85	95	6"					PVC	2"	SCH 40	0.03
							MW-6B			MW-6B
0	95	10 5/8"	✓				PVC	2"	SCH 40	
95	110	10 5/8"					PVC	2"	SCH 40	0.03

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft	to Ft	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
70	75		✓		GRAVEL 8X16
85	90		✓		GRAVEL 8X16
112	116		✓		GRAVEL 8X16

ATTACHMENTS (✓)

— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

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Signed _____ (WELL DRILLER/AUTHORIZED REPRESENTATIVE) 01/21/08 (DATE SIGNED) 414178 (C-57 LICENSE NUMBER)

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TRIPLICATE
Owner's Copy

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. EO67273

DWR USE ONLY — DO NOT FILL IN

STATE WELL NO / STATION NO

LATITUDE LONGITUDE

APN/TRS/OTHER

Owner's Well No. MW-6B & 6C

Date Work Began 7/9/2007, Ended 9/18/2007

Local Permit Agency KINGS CTY PLANNING AGENCY

Permit No. W0707-009 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)

DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft	to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*
128	140	BROWN SILTY CLAY

TOTAL DEPTH OF BORING 140 (Feet)

TOTAL DEPTH OF COMPLETED WELL 140 (Feet)

WELL OWNER

Name EDITH LONGFELLOW

Mailing Address 14782 8TH AVE.

HANFORD (CITY) CA (STATE) 93230 (ZIP)

WELL LOCATION

Address 14782 8TH STREET

City HANFORD CA 93230

County TULARE

APN Book 028 Page 040 Parcel 016

Township 19 Range 22 Section 20

Latitude DEG. MIN. SEC DEG MIN. SEC

LOCATION SKETCH

NORTH

WEST EAST

SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

✓ NEW WELL

MODIFICATION/REPAIR
— Deepen
— Other (Specify)

— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)

WATER SUPPLY
— Domestic — Public
— Irrigation — Industrial

MONITORING ✓
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) —

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 93.2 (Ft) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL 94.3 (Ft) & DATE MEASURED 9/26/2007

ESTIMATED YIELD * (GPM) & TEST TYPE AIR LIFT

TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN (Ft)

May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft	to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
							MW-6C			MW-6C
0	120	10 5/8"	✓				PVC	2"	SCH 40	
120	130	10 5/8"					PVC	2"	SCH 40	0.03

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft	to Ft	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)

ATTACHMENTS (✓)

— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS

CERTIFICATION STATEMENT

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DWR 188 REV 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy
Page 1 of 2

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. E067279

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. MW-7A
Date Work Began 7/9/2007, Ended 8/28/2007
Local Permit Agency KINGS COUNTY PLANNING
Permit No. W0707-009 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft	to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*
		MW-5A
0	6	BROWN SILTY FINE SAND, MOIST
6	10	BROWN CLAYEY SILT, MOIST
10	15.6	BROWN SILTY VERY FINE SAND, MOIST
15.6	16.9	GRAY VERY FINE SAND, MOIST
16.9	18.0	BROWN SILTY CLAY
18.0	19.4	GRAY VERY FINE TO COARSE SAND, MOIST
19.4	22.0	GRAY SILTY CLAY, MOIST
22.0	24.0	GRAY SANDY CLAY WITH SILT, MOIST
24.0	32.7	BROWN SILTY VERY FINE SAND, DRY
32.7	33.4	GRAY FINE SAND WITH SOME SILT, MOIST
33.4	37.3	GRAY SILTY CLAY, MOIST
37.3	38.0	GRAY SANDY SILT, MOIST
38.0	41.6	GRAY VERY FINE SAND, DRY
41.6	42.2	GRAY FINE SAND, MOIST
42.2	44.0	BROWN SILTY CLAY, MOIST
44.0	47.0	BROWN SILTY VERY FINE SAND, MOIST
47.0	48.0	BROWN SILTY VERY FINE SAND, MOIST
48.0	50.0	GRAY/BROWN SILTY FINE SAND, MOIST
50.0	56.0	BROWN SILTY CLAY, MOIST
56.0	57.1	GRAY VERY FINE SAND, MOIST
57.1	60.0	BROWN/GRAY CLAY AND SANDY CLAY, MOIST
60.0	62.9	GRAY FINE SAND, MOIST
62.9	65.7	GRAY/ORANGE SILTY CLAY, MOIST
65.7	66.7	GRAY/ORANGE VERY FINE SANDY SILT, MOIST
66.7	68.0	GRAY/ORANGE CLAYEY SILT, MOIST
68.0	70.0	BROWN/ORANGE SILTY CLAY WITH VERY FINE SAND, MOIST
70.0	71.5	GRAY VERY FINE SAND, DRY
71.5	73.7	BROWN VERY FINE SANDY SILT, MOIST

TOTAL DEPTH OF BORING 140 (Feet)
TOTAL DEPTH OF COMPLETED WELL 140 (Feet)

WELL OWNER
Name EDITH LONGFELLOW
Mailing Address 14782 8TH AVE.
HANFORD (CITY) CA (STATE) 93230 (ZIP)

WELL LOCATION
Address 14782 8TH AVE
City HANFORD CA 93230
County TULARE
APN Book 028 Page 040 Parcel 016
Township 19 Range 22 Section 20
Latitude ___ DEG ___ MIN ___ SEC. ___ DEG ___ MIN. ___ SEC

LOCATION SKETCH
NORTH
WEST EAST
SOUTH
Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)
✓ NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
___ Domestic ___ Public
___ Irrigation ___ Industrial
MONITORING ✓
TEST WELL ___
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL
DEPTH TO FIRST WATER 50 (Ft) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 50 (Ft) & DATE MEASURED 8/28/2007
ESTIMATED YIELD * ___ (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN ___ (Ft)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft	to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	42	6"	✓				PVC	2"	SCH 40	
42	52	6"					PVC	2"	SCH 40	0.03

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft	to Ft	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
29	30		✓		GRAVEL 8X16

ATTACHMENTS (✓)
___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analysis
___ Other ___
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT
I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
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DWR 188 REV. 11-97
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TRIPLICATE
Owner's Copy

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. E067279

DWR USE ONLY — DO NOT FILL IN

STATE WELL NO./STATION NO.

LATITUDE LONGITUDE

APN/TRS/OTHER

Owner's Well No. MW-7A

Date Work Began 7/9/2007, Ended 8/28/2007

Local Permit Agency KINGS COUNTY PLANNING

Permit No. W0707-009 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)

DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft	to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*
73.7	78.7	BROWN SILTY FINE SAND, MOIST
78.7	80.0	GRAY WVERY FINE SAND WITH SILT
80.0	80.7	BROWN SILTY CLAY, MOIST
80.7	82.0	BROWN VERY FINE SAND, MOIST
82.0	87.1	GRAY/BROWN CLAYEY SILT
87.1	88.0	BROWN SILTY FINE SAND, MOIST
88.0	88.9	BROWN FINE SAND, MOIST
4	8.9	BROWN SILTY CLAY AND CLAYEY SILT, MOIST
8.9	11.6	BROWN SANDY CLAY, MOIST
11.6	14.0	BROWN FINE SAND, DRY
14.0	16.0	BROWN SILTY FINE SAND, MOIST
16.0	19.2	GRAY/BROWNFINE SAND, MOIST
19.2	23.5	GRAY/BROWN SILTY CLAY AND CLAYEY SILT MOIST
23.5	26.0	BROWN VERY FINE SANDY SILT WITH CLAY, MOIST
26.0	36.0	GRAY/BROWN FINE SAND, MOIST
36.0	40.0	GRAY/BROWN CLAYEY SILTY VERY FINE SAND MOIST
40.0	45.8	GRAY/ORANGE VERY FINE TO MEDIUM SAND, MOIST
45.8	48.0	BROWN SANDY CLAY, MOIST
48.0	50.0	BROWN SILTY FINE SAND, MOIST
50.0	50.9	GRAY SIOLTY FINE SAND, WET
50.9	58.0	BROWN SILTY CLAY, WET
58.0	63.0	BROWN/GRAY FINE SANDY CLAY WITH SILT, WET
63.0	68.0	BROWN SILTY CLAY AND CLAYEY SILT, MOIST
68.0	70.0	BROWN SILTY CLAYEY FINE SAND, WET
70.0	72.0	BROWN/RED SANDY SILTY CLAY, MOIST

TOTAL DEPTH OF BORING 140 (Feet)

TOTAL DEPTH OF COMPLETED WELL 140 (Feet)

WELL OWNER

Name EDITH LONGFELLOW

Mailing Address 14782 8TH AVE.

HANFORD (CITY) CA (STATE) 93230 (ZIP)

WELL LOCATION

Address 14782 8TH AVE

City HANFORD CA 93230

County TULARE

APN Book 028 Page 040 Parcel 016

Township 19 Range 22 Section 20

Latitude ___ DEG ___ MIN ___ SEC. ___ DEG ___ MIN ___ SEC.

LOCATION SKETCH

NORTH

WEST EAST

SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

✓ NEW WELL

MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)

___ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)

WATER SUPPLY
___ Domestic ___ Public
___ Irrigation ___ Industrial

MONITORING ✓
TEST WELL ___
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 50 (Ft.) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL 50 (Ft.) & DATE MEASURED 8/28/2007

ESTIMATED YIELD * ___ (GPM) & TEST TYPE AIR LIFT

TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN ___ (Ft.)

May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft	to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft	to Ft	TYPE CE-MENT (✓)	BEN-TONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
29	30		✓		GRAVEL 8X16

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analysis
___ Other

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

3825 S. HIGHLAND (ADDRESS) DEL REY (CITY) CA (STATE) 93616 (ZIP)

Signed ___ (WELL DRILLER/AUTHORIZED REPRESENTATIVE) 01/21/08 (DATE SIGNED) 414178 (C-57 LICENSE NUMBER)

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TRIPLICATE
Owner's Copy

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. **E067359**

DWR USE ONLY — DO NOT FILL IN

STATE WELL NO / STATION NO

LATITUDE LONGITUDE

APN/TRS/OTHER

Owner's Well No. MW-7B, 7C, 7D

Date Work Began 7/9/2007, Ended 9/12/2007

Local Permit Agency KINGS COUNTY PLANNING

Permit No. W0707-009 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)

DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft	to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*
		MW-3A
0	6	BROWN SILTY FINE SAND, MOIST
6	10	BROWN CLAYEY SILT, MOIST
10	15.6	BROWN SILTY VERY FINE SAND, MOIST
15.6	16.9	GRAY VERY FINE SAND, MOIST
16.9	18.0	BROWN SILTY CLAY
18.0	19.4	GRAY VERY FINE TO COARSE SAND, MOIST
19.4	22.0	GRAY SILTY CLAY, MOIST
22.0	24.0	GRAY SANDY CLAY WITH SILT, MOIST
24.0	32.7	BROWN SILTY VERY FINE SAND, DRY
32.7	33.4	GRAY FINE SAND WITH SOME SILT, MOIST
33.4	37.3	GRAY SILTY CLAY, MOIST
37.3	38.0	GRAY SANDY SILT, MOIST
38.0	41.6	GRAY VERY FINE SAND, DRY
41.6	42.2	GRAY FINE SAND, MOIST
42.2	44.0	BROWN SILTY CLAY, MOIST
44.0	47.0	BROWN SILTY VERY FINE SAND, MOIST
47.0	48.0	BROWN SILTY VERY FINE SAND, MOIST
48.0	50.0	GRAY/BROWN SILTY FINE SAND, MOIST
50.0	56.0	BROWN SILTY CLAY, MOIST
56.0	57.1	GRAY VERY FINE SAND, MOIST
57.1	60.0	BROWN/GRAY CLAY AND SANDY CLAY, MOIST
60.0	62.9	GRAY FINE SAND, MOIST
62.9	65.7	GRAY/ORANGE SILTY CLAY, MOIST
65.7	66.7	GRAY/ORANGE VERY FINE SANDY SILT, MOIST
66.7	68.0	GRAY/ORANGE CLAYEY SILT, MOIST
68.0	70.0	BROWN/ORANGE SILTY CLAY WITH VERY FINE SAND, MOIST
70.0	71.5	GRAY VERY FINE SAND, DRY
71.5	73.7	BROWN VERY FINE SANDY SILT, MOIST

TOTAL DEPTH OF BORING 140 (Feet)

TOTAL DEPTH OF COMPLETED WELL 140 (Feet)

WELL OWNER

Name EDITH LONGFELLOW

Mailing Address 14782 8TH AVE.

HANFORD (CITY) CA (STATE) 93230 (ZIP)

WELL LOCATION

Address 14782 8TH AVE

City HANFORD CA 93230

County TULARE

APN Book 028 Page 040 Parcel 016

Township 19 Range 22 Section 20

Latitude ___ DEG ___ MIN. ___ SEC. ___ DEG. ___ MIN. ___ SEC.

LOCATION SKETCH

NORTH

WEST EAST

SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

✓ NEW WELL

MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)

___ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)

WATER SUPPLY
___ Domestic ___ Public
___ Irrigation ___ Industrial

MONITORING ✓
TEST WELL ___
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) ___ 7B-DRY, 7C-84.8

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 7C-85 (Ft.) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL 85 (Ft.) & DATE MEASURED 9/26/2007

ESTIMATED YIELD * ___ (GPM) & TEST TYPE AIR LIFT

TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN ___ (Ft.)

May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft	to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	42	6"	✓				PVC	2"	SCH 40	
42	52	6"					PVC	2"	SCH 40	0.03
0	68	12 1/4	✓				PVC	2"	SCH 40	MW-7B
68	78	12 1/4					PVC	2"	SCH 40	0.03

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft	to Ft	TYPE CE-MENT (✓)	BEN-TONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
29	30		✓		GRAVEL 8X16
60	65		✓		GRAVEL 8X16
83	86		✓		GRAVEL 8X16

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analysis
___ Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

3825 S. HIGHLAND (ADDRESS) DEL REY (CITY) CA (STATE) 93616 (ZIP)

Signed ___ (WELL DRILLER/AUTHORIZED REPRESENTATIVE) 01/21/08 (DATE SIGNED) 414178 (C-57 LICENSE NUMBER)

DWR 188 REV 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy
Page 2 of 6

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. E067359

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO / STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. MW-7B, 7C, 7D
Date Work Began 7/9/2007, Ended 9/12/2007
Local Permit Agency KINGS COUNTY PLANNING
Permit No. W0707-009 Permit Date 7/9/2007

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft	to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*
73.7	78.7	BROWN SILTY FINE SAND, MOIST
78.7	80.0	GRAY WVERY FINE SAND WITH SILT
80.0	80.7	BROWN SILTY CLAY, MOIST
80.7	82.0	BROWN VERY FINE SAND, MOIST
82.0	87.1	GRAY/BROWN CLAYEY SILT
87.1	88.0	BROWN SILTY FINE SAND, MOIST
88.0	88.9	BROWN FINE SAND, MOIST
4	8.9	BROWN SILTY CLAY AND CLAYEY SILT, MOIST
8.9	11.6	BROWN SANDY CLAY, MOIST
11.6	14.0	BROWN FINE SAND, DRY
14.0	16.0	BROWN SILTY FINE SAND, MOIST
16.0	19.2	GRAY/BROWNFINE SAND, MOIST
19.2	23.5	GRAY/BROWN SILTY CLAY AND CLAYEY SILT MOIST
23.5	26.0	BROWN VERY FINE SANDY SILT WITH CLAY, MOIST
26.0	36.0	GRAY/BROWN FINE SAND, MOIST
36.0	40.0	GRAY/BROWN CLAYEY SILTY VERY FINE SAND MOIST
40.0	45.8	GRAY/ORANGE VERY FINE TO MEDIUM SAND, MOIST
45.8	48.0	BROWN SANDY CLAY, MOIST
48.0	50.0	BROWN SILTY FINE SAND, MOIST
50.0	50.9	GRAY SIOLTY FINE SAND, WET
50.9	58.0	BROWN SILTY CLAY, WET
58.0	63.0	BROWN/GRAY FINE SANDY CLAY WITH SILT, WET
63.0	68.0	BROWN SILTY CLAY AND CLAYEY SILT, MOIST
68.0	70.0	BROWN SILTY CLAYEY FINE SAND, WET
70.0	72.0	BROWN/RED SANDY SILTY CLAY, MOIST

TOTAL DEPTH OF BORING 140 (Feet)
TOTAL DEPTH OF COMPLETED WELL 140 (Feet)

WELL OWNER
Name EDITH LONGFELLOW
Mailing Address 14782 8TH AVE.
HANFORD CA 93230
CITY STATE ZIP

WELL LOCATION
Address 14782 8TH AVE
City HANFORD CA 93230
County TULARE
APN Book 028 Page 040 Parcel 016
Township 19 Range 22 Section 20
Latitude DEG. MIN. SEC. DEG. MIN. SEC.

LOCATION SKETCH
NORTH
WEST EAST
SOUTH
Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)
✓ NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
___ Domestic ___ Public
___ Irrigation ___ Industrial
MONITORING ✓
TEST WELL ___
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) 7B-DRY, 7C-84.8

WATER LEVEL & YIELD OF COMPLETED WELL
DEPTH TO FIRST WATER 7C-85 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 85 (Ft.) & DATE MEASURED 9/26/2007
ESTIMATED YIELD * ___ (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN ___ (Ft.)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft	to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
										MW-7C
0	88	12 1/4	✓				PVC	2"	SCH 40	
88	98	12 1/4					PVC	2"	SCH 40	0.03
										MW-7D
0	108	12 1/4	✓				PVC	2"	SCH 40	
108	128	12 1/4					PVC	2"	SCH 40	0.03

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft	to Ft	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
100	104		✓		GRAVEL 8X16

ATTACHMENTS (✓)
___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analysis
___ Other ___
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS

CERTIFICATION STATEMENT
I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3625 S. HIGHLAND DEL REY CA 93616
ADDRESS CITY STATE ZIP
Signed ___ 01/21/08 414178
WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED C-57 LICENSE NUMBER

DWR 188 REV. 11-97
IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. **E067359**

Owner's Well No. MW-7B, 7C, 7D
Date Work Began 7/9/2007, Ended 9/12/2007
Local Permit Agency KINGS COUNTY PLANNING
Permit No. W0707-009 Permit Date 7/9/2007

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DRILLING METHOD ROTARY FLUID WATER

DEPTH FROM SURFACE Ft	to Ft	DESCRIPTION *Describe material, grain, size, color, etc.*
		MW-7B, 7C AND 7D
49	53	BROWN SILTY CLAY
53	62	BROWN CLAYEY FINE SAND
62	64	BROWN SILTY CLAY
64	67	BROWN CLAYEY FINE SAND
67	78	GRAY VERY FINE TO FINE SAND
78	80	GRAY CLAYEY SILT
80	84	BROWN SILTY FINE SAND
84	89	BROWN SILTY CLAY
89	100	GRAY FINE TO MEDIUM SAND
100	104	GRAY SILTY CLAY
104	109	BROWN SILTY FINE SAND
109	114	BROWN FINE SAND
114	118	GRAY FINE SAND
118	120	GRAY/BROWN FINE SAND
120	127	BROWN FINE TO MEDIUM SAND
127	140	BROWN SILTY CLAY

TOTAL DEPTH OF BORING 140 (Feet)
TOTAL DEPTH OF COMPLETED WELL 140 (Feet)

WELL OWNER
Name EDITH LONGFELLOW
Mailing Address 14782 8TH AVE.
HANFORD CA 93230
CITY STATE ZIP

WELL LOCATION
Address 14782 8TH AVE
City HANFORD CA 93230
County TULARE
APN Book 028 Page 040 Parcel 016
Township 19 Range 22 Section 20
Latitude DEG. MIN. SEC. DEG. MIN. SEC.

LOCATION SKETCH
NORTH
WEST EAST
SOUTH
Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)
✓ NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
___ Domestic ___ Public
___ Irrigation ___ Industrial
MONITORING ✓
TEST WELL ___
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) ___
7B-DRY, 7C-84.8

WATER LEVEL & YIELD OF COMPLETED WELL
DEPTH TO FIRST WATER 7C-85 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 85 (Ft.) & DATE MEASURED 9/26/2007
ESTIMATED YIELD * ___ (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN ___ (Ft.)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft	to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	42	6"	✓				PVC	2"	SCH 40	
42	52	6"					PVC	2"	SCH 40	0.03
										MW-7B
0	68	12 1/4	✓				PVC	2"	SCH 40	
68	78	12 1/4					PVC	2"	SCH 40	0.03

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft	to Ft	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
29	30		✓		GRAVEL 8X16
60	65		✓		GRAVEL 8X16
83	86		✓		GRAVEL 8X16

ATTACHMENTS (✓)
___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analysis
___ Other ___
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT
I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME BRADLEY & SONS
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
3625 S. HIGHLAND DEL REY CA 93616
ADDRESS CITY STATE ZIP
Signed ___ 01/21/08 414178
WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED C-57 LICENSE NUMBER

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

KINGS COUNTY PLANNING AGENCY

BUILDING DIVISION

1400 W. LACEY BLVD, BUILDING 6, HANFORD, CA 93230
TELEPHONE (559)582-3211 Ext. 2670 Fax (559)584-8989

WELL PERMIT

Permit Number: **W0707-009**

Permit Date Issued

Contractor
Name: **BRADLEY & SONS**
Address: **3625 S HIGHLAND AVE**
City, State Zip: **DEL RAY, CA 93616-**
Phone: **(559) 441-1401**

Description of Well
Monitoring
6 MONITORING WELLS/VARTING DEPTH

Property Owner
Name: **LONGFELLOW, EDITH I LIVING TRU**
Address: **14782 8TH AVE**
City, State Zip **HANFORD CA 93230**
Telephone:

Location of Well
Site Address: **14782 8TH AVE**
Parcel #: **028-040-016**
Township: **19** Range: **22** Section: **20**

All work shall be done in conformance with the California Well Standards and the Kings County Water Well Ordinance. In case of conflict between laws or regulations, the more restrictive laws or regulations shall apply. The owner or contractor shall notify the Kings County Planning Department within forty-eight (48) hours of the placement of the annular seal for the purpose of inspection. The annular seal shall not be tremied or placed unless the Building Official or his designated officer is present and/or notice has been given to proceed. If the Building Official or his designated officer is not present at the time the annular seal is to be tremied or placed, the contractor shall seal the well in accordance with the standards prescribed above. The owner or contractor shall notify the Kings County Planning Department within seven (7) days from the completion of the well for final inspection of the proposed work.

The owner and contractor agree to defend and save harmless Kings County from all losses or damages resulting from injury or death of any person and/or damage to property, and any fine which occasioned by or arises out of any breach of applicable laws, ordinances, regulations or conditions of approval governing the construction and inspection of water wells. Said losses or damages shall include, but not be limited to, the cost of any required or necessary repair, cleanup, or detoxification and the preparation of any closure or cleanup plans attributable, directly or indirectly, to the work under this permit.

Additional permits (electrical, plumbing, building, etc.) for the development of the property associated with this permit may be required. This permit does not waive any requirements for other permits which may be needed from this office.

A permit for a dairy well shall not be valid unless the applicant has a letter from the Tulare County Health Department approving the location of the well.

Domestic wells serving five (5) or more service connections or serving twenty-five (25) or more people at least sixty (60) days out of the year require a permit from the Kings County Health Department.

The permittee shall be responsible for the safe and appropriate handling and disposal of drilling fluids and other drilling materials used in connection with the work specified under this permit.

As a condition of a construction or reconstruction permit, any abandoned wells located on the subject property shall be destroyed in accordance with the California Well Standards and the Kings County Water Well Ordinance.

It shall be the responsibility of the permittee to maintain a copy of this permit on the drilling site during all phases of the well construction or destruction.

This permit is not valid within the limits of any city.

This permit is valid for 180 days from the date of issuance and shall expire if the work is not completed within that time period.

BUILDING DEPARTMENT APPROVAL **DATE** **W0707-009**

APPENDIX B.2
Groundwater Quality Analysis

Dairy 36-15

GROUNDWATER
Cooperative Extension Program

Data Report for Sampling in September 2008

ANALYTICAL LAB INFORMATION:
ANALYTICAL LAB: ANR Analytical Laboratory, University of California, Davis, CA 95616, http://danranlab.ucanr.org
DATE RECEIVED: 09/26/08
DATE REPORTED: 12/11/08
SAMPLE PRESERVATION: freezing

Sample Type: GROUNDWATER Date Sampled: September 14, 15, 16, 2008

SAMPLE #	MW	TKN [SOP 850.01] mg/L	NH4-N [SOP 847.02] mg/L	NO3-N [SOP 847.02] mg/L	P (Sol ICP) [SOP 835.02] mg/L	Cl (IC) [SOP 880.02] mg/L	SO4 (IC) [SOP 880.02] mg/L	B (Soluble) [SOP 835.02] mg/L	Zn (Soluble) [SOP 835.02] mg/L	Fe (Soluble) [SOP 835.02] mg/L	HCO3 [SOP 920.03] meq/L	Se (Total) ug/L	Cu (Soluble) ug/L	Mn (Soluble) [SOP 835.02] ug/L	K (Soluble) [SOP 835.02] mg/L
3	36-15-MW 1B	0.3	<0.05	7.41	<0.05	131.34	52.8	0.04	<0.02	<0.1	4.9	2.0	<MDL	3	0.66
4	36-15-MW 1C	0.3	<0.05	21.93	<0.05	116.25	52.8	0.04	<0.02	<0.1	5.1	3.8	<MDL	2	0.66
5	36-15-MW 2B	0.8	<0.05	0.95	<0.05	410.90	18.4	0.12	<0.02	<0.1	14.8	0.7	0.5	57	1.36
6	36-15-MW 2C	0.7	<0.05	0.77	<0.05	349.84	19.1	0.11	<0.02	<0.1	13.9	0.7	0.4	304	1.28
7	36-15-MW 3B	0.2	<0.05	1.68	<0.05	45.16	42.6	0.03	<0.02	<0.1	2.8	<MDL	0.2	36	0.40
8	36-15-MW 3C	0.2	<0.05	1.75	<0.05	42.65	39.0	0.02	<0.02	<0.1	2.8	2.0	<MDL	33	0.37
9	36-15-MW 4B	<0.1	<0.05	39.53	<0.05	147.17	83.5	0.06	<0.02	<0.1	9.4	4.7	<MDL	3	0.93
10	36-15-MW 4C	0.2	<0.05	33.74	<0.05	301.24	143.9	0.05	<0.02	<0.1	8.3	7.4	<MDL	56	1.12
11	36-15-MW 4D	0.5	<0.05	30.45	<0.05	415.26	186.4	0.05	<0.02	<0.1	7.4	7.9	<MDL	141	1.15
15	36-15-MW 5B	0.5	<0.05	21.23	<0.05	227.49	115.7	0.07	<0.02	<0.1	7.5	2.9	<MDL	2	1.06
16	36-15-MW 5C	0.3	<0.05	21.29	<0.05	223.18	116.0	0.07	<0.02	<0.1	7.3	10.6	<MDL	<1	1.05
17	36-15-MW 6B	0.4	<0.05	15.45	<0.05	422.15	66.7	0.09	<0.02	<0.1	6.6	11.5	<MDL	<1	1.23
18	36-15-MW 6C	0.3	<0.05	15.04	<0.05	404.03	68.1	0.09	<0.02	<0.1	5.9	10.6	<MDL	<1	1.25
16	36-15-MW 7C	0.7	<0.05	37.02	<0.05	310.62	114.3	0.12	0.04	<0.1	9.8	1.6	0.3	675	2.23
19	36-15-MW 7D	1.0	<0.05	24.32	<0.05	236.75	168.8	0.05	0.02	<0.1	8.2	7.0	<MDL	1	0.97
36	36-15-DW	0.1	<0.05	2.12	<0.05	135.53	56.4	0.04	<0.02	<0.1	1.4	1.6	0.5	16	0.51
Analysis Date:		10/9/2008	10/1/2008	10/1/2008	10/6/2008	10/9/2008	10/9/2008	10/3/2008	10/3/2008	10/3/2008	10/10/2008			10/3/2008	10/9/2008
Method Detection Limit:		0.1	0.05	0.05	0.05	0.25	0.5	0.02	0.02	0.1	0.1	-	-	1	0.05
Blank Concentration:		0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.1	-	-	0	0.00
Standard Ref as Tested:		31.9	15.88	2.85	4.25	38.8	59.2	0.34	0.48	0.95	2.0	-	-	20	16.0
Standard Ref Acceptable:		30.0±5.8	15.4±2.05	3.02±0.35	4.11±0.39	39.6±2.5	59.2±4.2	0.34±0.02	0.50±0.04	1.00±0.10	2.1±0.2	-	-	20±2	15.9±2.2
Standard Reference:		COMPLEX	SIMPLE E	SIMPLE E	SIMPLE E	PW 34C	PW 34C	UCD 006A	0.5 mg/L	1 mg/L	UCD 006A	-	-	20 ug/L	PW 34C

Ca (Soluble) [SOP 835.02] mg/L	Mg (Soluble) [SOP 835.02] mg/L	Na (Soluble) [SOP 835.02] mg/L	pH [SOP 805.02]	EC [SOP 815.02] dS/m	CATION-ANION BALANCE ERROR %	Computed TDS mg/L	Temp [YSI 556] °C	Field Elect. Cond. [YSI 556] µS/cm	DO [YSI 556] %Saturation	Field pH [YSI 556]	Eh [YSI 556] mV	Depth to Water ft	Date sampled
102.0	7.3	108.9	7.7	1.02	2.02%	709.41	22.41	1085	23	7.12	-89.4	91.80	9/17/2008
130.6	7.8	117.6	7.7	1.10	10.14%	758.84	21.96	1159	20.7	7.15	-19.1	90.95	9/18/2008
317.9	18.1	266.8	7.0	2.48	7.41%	1937.51	21.12	2655	0.5	6.25	-58.4	90.28	9/14/2008
281.1	15.9	250.0	7.2	2.26	7.70%	1766.17	21	2400	0.2	6.33	-62.7	90.54	9/14/2008
47.7	2.3	65.4	8.1	0.52	6.33%	376.1	21.66	541	0.6	7.74	-50.5	90.42	9/14/2008
45.0	2.1	64.2	8.1	0.50	5.37%	365.93	21.44	521	0.2	7.78	-76.1	90.32	9/14/2008
91.3	10.1	309.8	7.6	1.77	4.10%	1255.92	20.82	1837	44.8	7.04	14.8	91.11	9/15/2008
197.1	14.2	288.5	7.7	2.17	5.85%	1486.27	20.87	2238	29.6	6.97	-18.5	91.89	9/15/2008
263.8	17.0	276.8	7.5	2.43	5.49%	1642.41	21.2	2576	15.8	6.94	-38.4	91.90	9/15/2008
100.2	9.6	275.6	7.7	1.70	-0.21%	1208.53	20.88	1827	33.7	7.02	-66	96.35	9/15/2008
99.2	9.4	278.0	7.6	1.69	1.75%	1193.57	21.15	1807	28.5	7.02	-73.1	96.75	9/15/2008
221.7	16.8	216.9	7.5	2.03	4.16%	1363.66	20.7	2168	13.2	6.9	-92.5	97.54	9/15/2008
211.3	15.7	211.8	7.6	1.98	6.13%	1287.24	21.16	2124	10.5	6.9	-93.5	98.80	9/15/2008
218.2	28.0	244.3	7.7	2.23	1.21%	1552.67	20.38	2208	23.2	6.82	-0.6	91.30	9/11/2008
181.3	13.6	253.6	7.6	1.89	5.15%	1379.7	20.94	1989	35.4	6.8	47	91.60	9/14/2008
49.7	1.2	91.8	8.0	0.72	0.55%	422.69	20.68	738	51.3	8.26	-56.7	0.00	9/18/2008
10/3/2008	10/3/2008	10/9/2008	10/10/2008	10/10/2008									
0.1	0.1	0.1	0.1	0.01									
0.0	0.0	0.0	-	-									
8.4	10.2	37.0	6.46	0.28									
8.8±0.8	10.2±0.7	36.3±2.3	6.45±0.06	0.28±0.02									
UCD 006A	UCD 006A	UCD 006A	UCD 004	UCD 006A									

NOTE: The SOP # (Standard Operating Procedure number) is a reference to the laboratory method used.
The SOP heading in this Excel file is linked to the method summary on the Laboratory website.

NOTE: No result within this report is accurate to more than 3 significant figures. More figures may be present due to software rounding rules.

NOTE: [YSI 556] refers to measurements taken with a YSI 556 multiparameter water quality probe immediately prior to collecting the sample in the field

NOTE: Depth to water is measured from top of casing using an electrical sounder marked to 1/100th of a foot

NOTE: The SOP # (Standard Operating Procedure number) is a reference to the laboratory method used.
The SOP heading in this Excel file is linked to the method summary on the La http://danranlab.ucanr.org

NOTE: No result within this report is accurate to more than 3 significant figures. More figures may be present due to software rounding rules.

NOTE: ISM indicates there was insufficient sample material to perform the requested analysis.

NOTE: Nitrate and/or salt in large quantities cause a negative bias to the TKN tests.

DENELE ANALYTICAL, INC.

1232 South Ave. • Turlock, CA 95380 • Ph. (209) 634-9055 • Fax (209) 634-9057 • www.denelelab.com

DAIRY COMPLIANCE ANALYSIS REPORT

LONGFELLOW
14782 8TH AVE
HANFORD CA 93230

Date Reported: 12/23/2008
Submitted By: JARED HUTCHINGS
Project ID: IAG# 2783

Analysis Performed: H3 PROCESSED WATER

Sample ID	Lab ID	Analyte	Amount	Units
		EC	5.33	mmhos/cm
		K	810	mg/L
LAGOON	1200137A	TKN	802	mg/L
		NH4-N	342	mg/L
		P	60	mg/L

			QC BATCH #119			
	MDL mg/L	MS%	MSD%	LCS%	LCSD%	BLANK
TKN	0.1	90	90	92	91	N.D
K	1.0	97	98	100	98	N.D
P	0.5	84	86	85	87	N.D
NH4-N	0.1	88	86	89	87	N.D

MDL = Method Detection Limit
MS = Matrix Spike
MSD = Matrix Spike Duplicate
LCS = Lab Control Spike
LCSD = Lab Control Spike Duplicate

Liability Limits:

The warranty of Denele Analytical is limited to the accuracy of the analyses of the sampeles ar received. Denele Analytical assumes no responsibilty for which the customer uses our test results, nor liablity for any other warranties, expressed or implied.

These terms and conditions shall supercede any conflicting terms and conditions submitted on customer purchase orders or other forms submitted for work.

DENELE ANALYTICAL, INC.

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DAIRY COMPLIANCE ANALYSIS REPORT

Customer/Results To:
Innovative Ag
25221 Road 68
Tulare, CA
93274

Grower
Longfellow Farming Co
14782 8th Ave
Hanford, CA
93230

PURCHASE ORDER: 2937
RECEIVED DATE: 1/16/2009 8:00:00 AM
SUBMITTED BY: Jared Hutchings

Processed Water / Irr. Water (H9)
SOURCE: Lagoon Water

Customer Sample	Lab ID	Analyte	Code	Amount	Units
Lagoon	09010061A	Electrical Conductivity	EC	5.3	mmhos/cm
		Nitrate Nitrogen	NO3-N	3.2	mg/L
		Calcium	Ca	187	mg/L
		Magnesium	Mg	123	mg/L
		Sodium	Na	135	mg/L
		Potassium	K	728	mg/L
		Chloride	Cl	611	mg/L
		Total Kjeldahl Nitrogen	TKN	785	mg/L
		Ammonium Nitrogen	NH4-N	372	mg/L
		Phosphorus	P	69	mg/L
		Sulfur	S	790	mg/L

Extended Quality Control	LCS %	LCSD %	MS %	MSD %
Nitrate Nitrogen (NO3-N)	86	89	87	89
Calcium (Ca)	89	90	88	87
Magnesium (Mg)	89	89	85	86
Sodium (Na)	94	90	89	92
Potassium (K)	97	101	100	92
Chloride (Cl)	97	94	90	92
Total Kjeldahl Nitrogen (TKN)	91	90	87	90
Ammonium Nitrogen (NH4-N)	89	92	90	90
Phosphorus (P)	86	88	84	87
Sulfur (S)	88	85	82	84

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APPENDIX B.3
Soil Classification Report

SOILS REPORT
PROPOSED WASTE PROCESS LAGOON No. 3
LONGFELLOW DAIRY

Prepared for:

LONGFELLOW FARMING COMPANY
HANFORD, CALIFORNIA

Prepared by:

VECTOR ENGINEERING, INC.
143E Spring Hill Drive
Grass Valley, CA 95945
(530) 272-2448

Job No. 091207.0000
September 2009

1.0 INTRODUCTION

This report presents the results of the soil evaluation by Vector Engineering, Inc. (Vector) for the proposed Lagoon #3 at the Longfellow Dairy located in Hanford, California. This report summarizes our field activities, laboratory test results and the surface soil exposures that were observed.

1.1 Site Description

The dairy is located approximately five miles south of Hanford along Highway 43 in Kings County (Appendix A, Figure A-1 of the Design and Work Report). It is located within the southern portion of the San Joaquin Valley, in an area characterized by extremely flat topography with land use predominantly agricultural. The proposed Lagoon #3 will receive animal waste from surrounding feed lots. It is located immediately south of the existing unlined waste water storage pond #2 (Appendix A, Figure A-2 in the Design and Work Plan). The lagoon was reportedly excavated a few years ago but has never been used to store waste. As shown on Figure A-2, the excavation is 240 ft by 350 ft and approximately 25 ft deep. The sides of the pond excavation are sloped 2:1 (horizontal to vertical) except for the southern slope which is about 3:1. During excavation, soil that appeared to have high clay content was stockpiled two stockpiles adjacent to the excavation; a larger one (about 2,200 cubic yards) on the west side of the pond and a smaller one (about 400 cubic yards) on the east side of the pond.

1.2 Previous Work

There has been two recent investigative efforts at the Longfellow Dairy by the University or California at Davis (UCD, Appendix B.1) and the National Resource Conservation Service (NRCS, Appendix I, pp 32-35 of the Design and Work Plan). University of California Davis personnel have installed several nested wells on and adjacent to the Longfellow Dairy in 2007 as part of on-going research into the impacts of the dairy industry on the groundwater resources of the Central Valley. Seven clustered and nested monitoring wells were installed as part of their investigation. The well

designation 'A' was given to the shallow wells with 'B' and 'C' given to an intermediate and deep wells. MW-1, MW-2 and MW-3 are located within the close proximity (within 10s to 100s of feet based on UCD's site plan) of the proposed lagoon. MW-7 is located in the northwest corner of the Longfellow Dairy property and MW-4, MW-5 and MW-6 are located 0.25, 0.75 and 1 mile north of the dairy respectively. The well locations are located at the end of the UCD Report in Appendix B.1 of the Design and Work Plan.

MW-1A, located about 300 feet southeast of the lagoon, was drilled on July 17, 2007. The boring log shows a surface sand to a depth of six feet underlain by a interbedded silt and clay to a depth of 28.5 feet, which is in-turn underlain by sands to a depth of about 50 feet. Groundwater was reported to be 83.28 feet deep on September 26, 2007. MW-2A is located just to the north of the Lagoon 3 and was drilled on June 25, 2007. The boring log shows sandy soil from the surface to 32.9 feet below ground surface followed by a relatively thin layer of clay from 32.9 to 34 feet bgs underlain by sandy soil to a depth of 49.4 feet below ground surface. Groundwater is reported to be 81 feet below ground surface in MW-1A, no date was given for when the water level was measured.

The NRCS report titled 'Longfellow Dairy Animal Waste Facility' (Appendix I of the Design and Work Plan) contains drawings and specifications and is dated September, 2008. A Soil Investigation Report is included within the NRCS Report. It included two test pits in the vicinity of the proposed lagoon. The soils were logged using the USDA soil classification system with clay content approximated. The test pit logs indicate that the upper 10 feet of soils contain between 8 and 30 percent clay. From about 10 feet to about 20 feet below ground surface a clean sand with less than 10 percent clay was encountered, which was underlain by a more clayey soils to about 26 feet, the maximum depth of NRCS's investigation. Because of the clean sand layer encountered from about 10 to 20 feet below ground surface, the NRCS recommended that the lagoon be lined and that soil above and below the sand layer may have sufficient clay content for use in lining.

2.0 FIELD INVESTIGATION

Peter Holland, CEG of Vector performed the field investigation on June 22, 2009. This involved inspecting, describing and classifying soils exposed in the Lagoon #3, the stockpiles adjacent to the lagoon and surface soils in the immediate area. Grab samples were also collected. The lagoon was reportedly excavated about 3 to 4 years ago and the soils are well exposed. Only negligible vegetation cover exists within the excavation and there was no obvious fill which created favorable conditions for stratigraphic measurement and documentation of the soils. The soils were described according to the Uniform Soils Classification System Description and Identification of Soils Visual-Manual Procedure ASTM Designation D2488. The distribution of soils types was mapped on a topographic base map of the lagoon. The thickness of the native soils exposed in the sides of the excavated lagoon was measured using leveling sight and measuring stick.

2.1 Soil Sampling

Several soil types were identified onsite. A representative sample was collected from each soil type and stockpile. Samples were collected after approximately the upper 1 foot of soil was cleared using a shovel or hand tool. Samples were labeled based on the sample location and type of soil. For example "bottom clay" refers to the clay layer that exists at the bottom of the excavation.

The soil samples were logged by Vector personnel at each sampling interval while drilling, according the Uniform Soils Classification System Description and Identification of Soils Visual-Manual Procedure ASTM Designation D2488. The soil boring logs are included in Appendix I. Soils encountered during drilling included loose to dense sands underlain by clay in the southern, upland portion of the site and silty sands, silt and clay in the shallow, northern borings on the site.

2.2. Laboratory Testing

Representative soil samples were obtained from the exposed soils and samples were returned to our laboratory in Grass Valley, California for further evaluation and testing. Laboratory testing of selected soil samples was conducted to evaluate the Atterberg Limits and sieve analysis with hydrometer of the samples. The laboratory results are included as Attachment B of this report. A graphic presentation of the sieve and hydrometer analysis and Atterberg Limits test and soil classifications are presented in the Attachment A of this report.

2.2. Soil Conditions

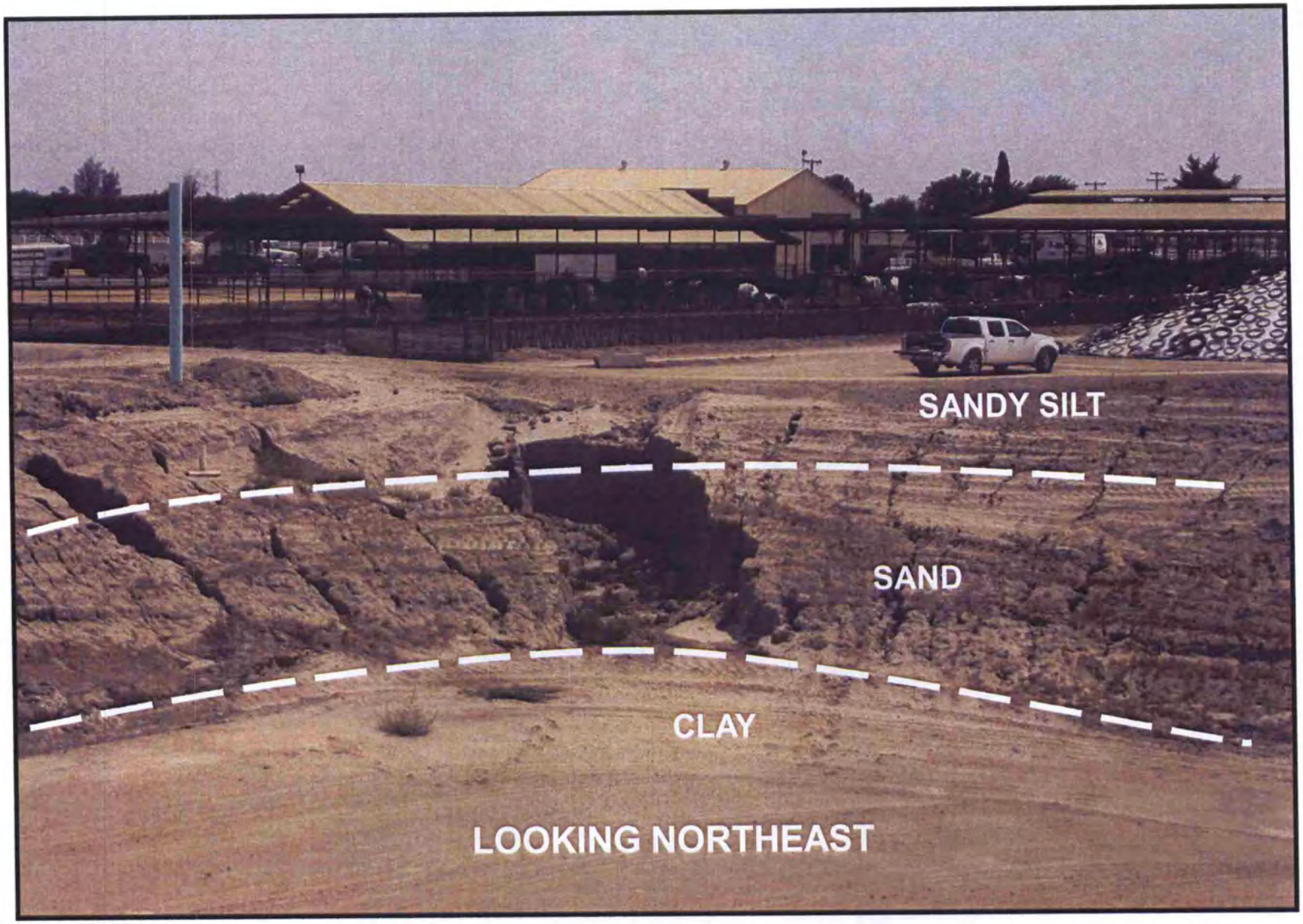
There are three distinct soil units exposed within the lagoon excavation: an upper silty soil, a middle sandy soil, and a lower clayey soil. The vertical distribution of these soils is shown on Figure 3 Cross Section. In addition, the distribution is also shown on the attached photos in Attachment B. The surficial layer of sandy silt from ground surface to about 10 feet below ground surface. A sieve and hydrometer test was conducted on a sample from this unit indicates the soil is a sandy silt with 29% clay content. A sand layer was measured from about 10 feet below grade to about 25 feet below grade. This unit is clean sand with little to no cohesion as evidenced by numerous erosion features that have formed in the few years since the lagoon was excavated from exposure to the elements. Below the sand is the 'bottom clay' which is only exposed at the bottom of the excavation. A sieve analysis and hydrometer test on this material indicates it is a sandy clay with a 37% clay content. An Atterburg Limits test on this material shows that it has a liquid limit of 41 and a plastic index of 24. A representative soil sample from the stockpile on the west side of the proposed lagoon was tested for a sieve analysis and gradation. The test results show that this soil is a silty sand with 16% clay content (see laboratory test results in Attachment A of this report).

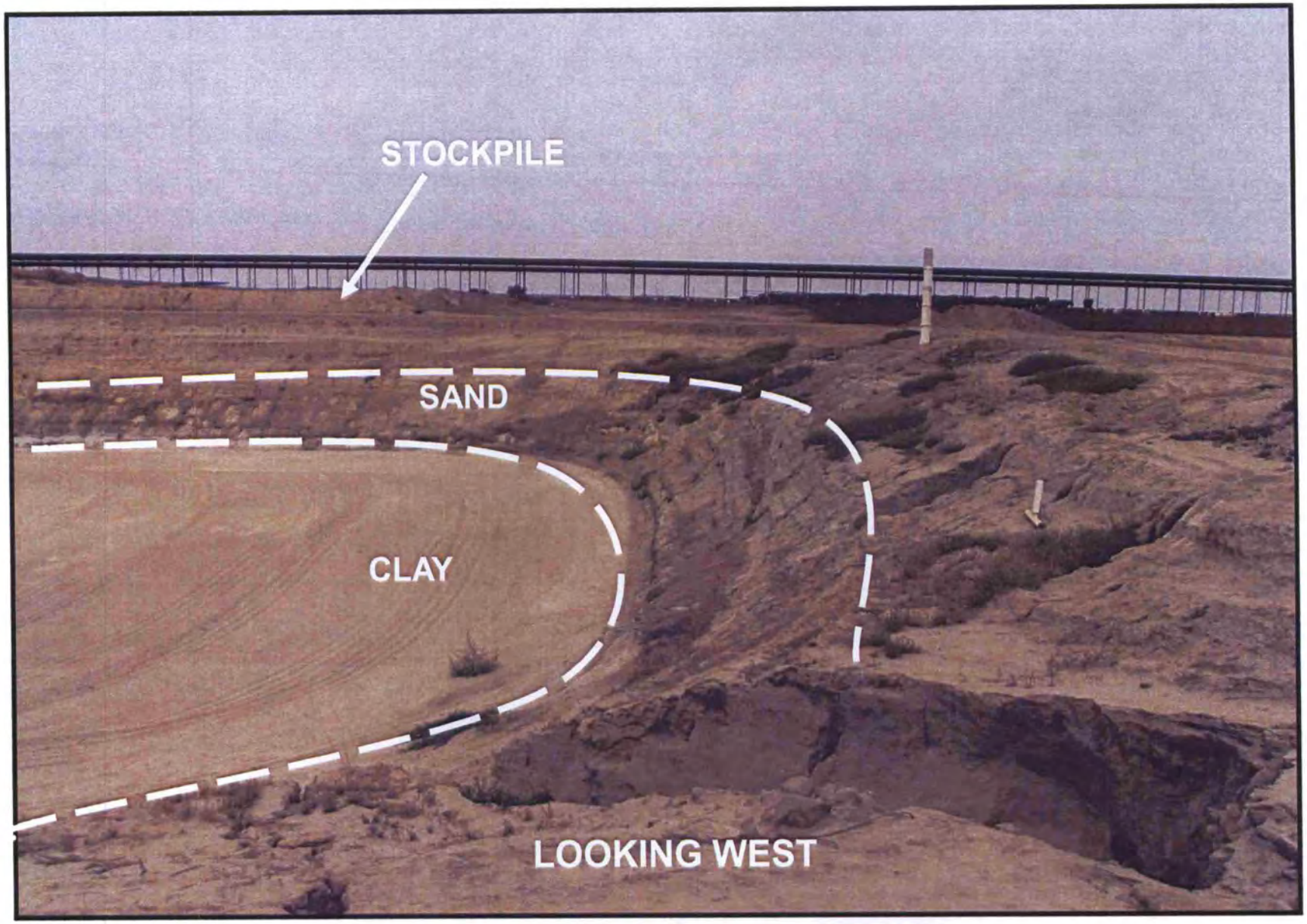
Groundwater is approximately 80 feet deep at the Site based on review of the U.C. Davis boring logs.

3.0 DISCUSSION

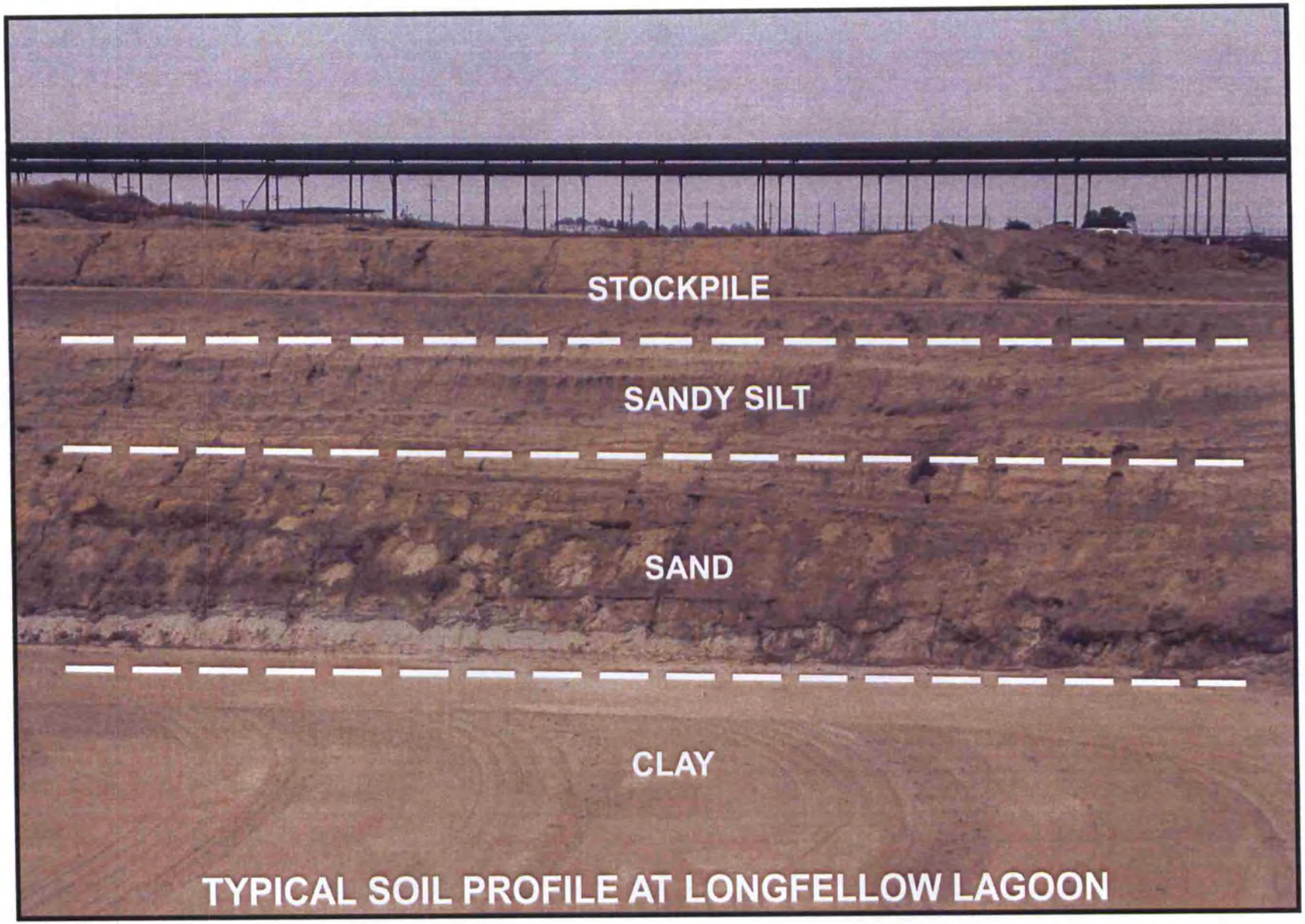
Based on the results of our soils evaluation, laboratory testing and our current understanding of the project, it is our professional opinion that the site is suitable for a composite liner design. The bottom clay layer is classified as a lean clay using laboratory test results. Most lean clays in this region have permeability of 1x10^-6 cm/s and we expect this clay to have a similar permeability. The middle sand layer is a potential pathway for migration of waste from the pond into surrounding native soils. To isolate the waste from the sand layer, the silty soil from the stockpiles or clay material from the bottom clay layer should be placed on top of the sandy soils in such a way that the geosynthetic liner rests directly upon silt or clay soils.

Attachment 1
Site Photos


SANDY SILT
SAND
CLAY
LOOKING NORTHEAST


STOCKPILE
SAND
CLAY
LOOKING WEST

TYPICAL EXPOSURE OF SAND LAYER



TYPICAL SOIL PROFILE AT LONGFELLOW LAGOON

Attachment 2
Soil Test Results

VECTOR
ENGINEERING, INC.
An **Ausenco** group company

DATE: July 7, 2009

TO: Richard Erickson, Pete Holland

JOB NO: 091207.0000
LAB LOG: 2812.0

e-mail: rerickson@vectoreng.com, holland@vectoreng.com 7/7 EOF

RE: **Lab Report: Longfellow Dairy Waste Process Pond No. 3**

Enclosed are results for: Samples Received - June 17, 2009

Code	Item	Quantity
19526	Sieve Analysis, ASTM D-422 w/ Hydrometer	3
19534	Atterberg Limits, ASTM D-4318	1

Thank you for consulting Vector Engineering for your material testing requirements. We look forward to working with you again. If you have any questions or require any additional information, please call us at 1-530-272-2448.

Sincerely,

Prepared By: Erik Olhoffer
Laboratory Manager

Reviewed By: Duane Nava
Laboratory Manager

This testing is based up on accepted industry practice as well as the test method listed. These results apply only to the samples supplied and tested for the above referenced job. The data and information are proprietary and can not be released without authorization of Vector Engineering Inc. By accepting the data and results represented on this page, client agrees to limit the liability of Vector Engineering, Inc. from Client and all other parties claims arising out of the use of this data to the cost for the respective test(s) represented here, and Client agrees to indemnify and hold harmless Vector from and against all liability in excess of the aforementioned limit.

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The Americas • Asia • Australia

VECTOR ENGINEERING, INC.

An **Ausenco** group company

PARTICLE SIZE ANALYSIS

Test Report

ASTM D-422

Client: LONGFELLOW DAIRY

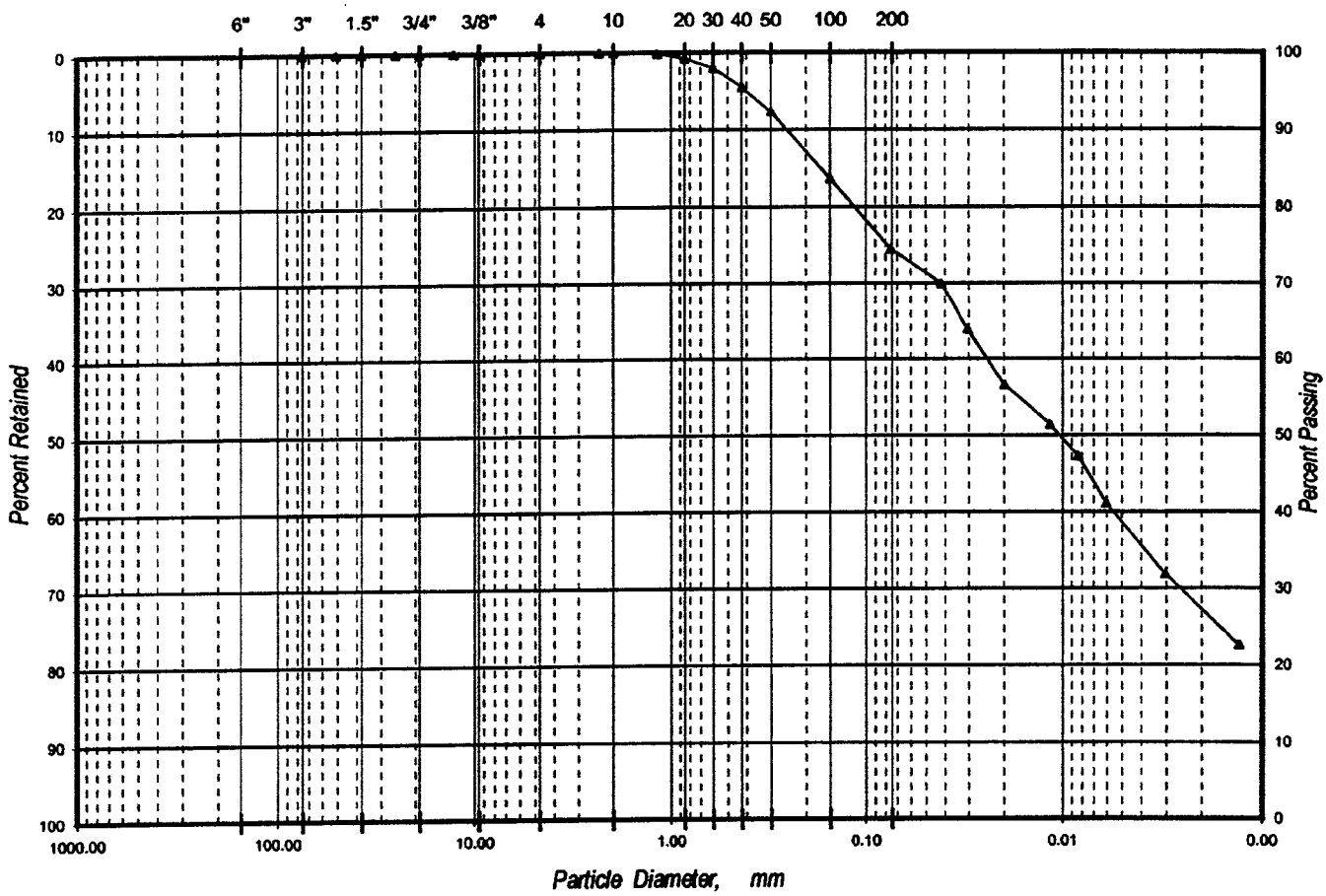
Project No: 091207.0000

Lab Sample No: 2812A

Project Name: LONGFELLOW DAIRY WASTE PROCESS POND NO. 3

Report Date: July 7, 2009

BOULDERS	COBBLES	GRAVEL		SAND			SILT AND CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	
US SIEVE SIZE, INCHES				US STANDARD SIEVE SIZE No.			HYDROMETER



Symbol	Sample ID	Description	% Gravel	% Sand	% Silt - Clay
▲	Bottom clay (Rec'd 6/17/09)	Brown Lean Clay w/ Sand (CL)	0.0	25.5	74.5

Size Passing, mm D_{60} = 0.02 D_{30} = 0.00 D_{10} = N/A 5 micron (%) = 37

Coefficient of Curvature, C_c: N/A Coefficient of Uniformity, C_u: N/A Fineness Modulus = 0.26

Note: * Percentages are +/- 0.1% based on computer rounding as allowed by ASTM D-6026-01 Section 5.2.3.

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VECTOR ENGINEERING, INC.

An **Ausenco** group company

PARTICLE SIZE ANALYSIS

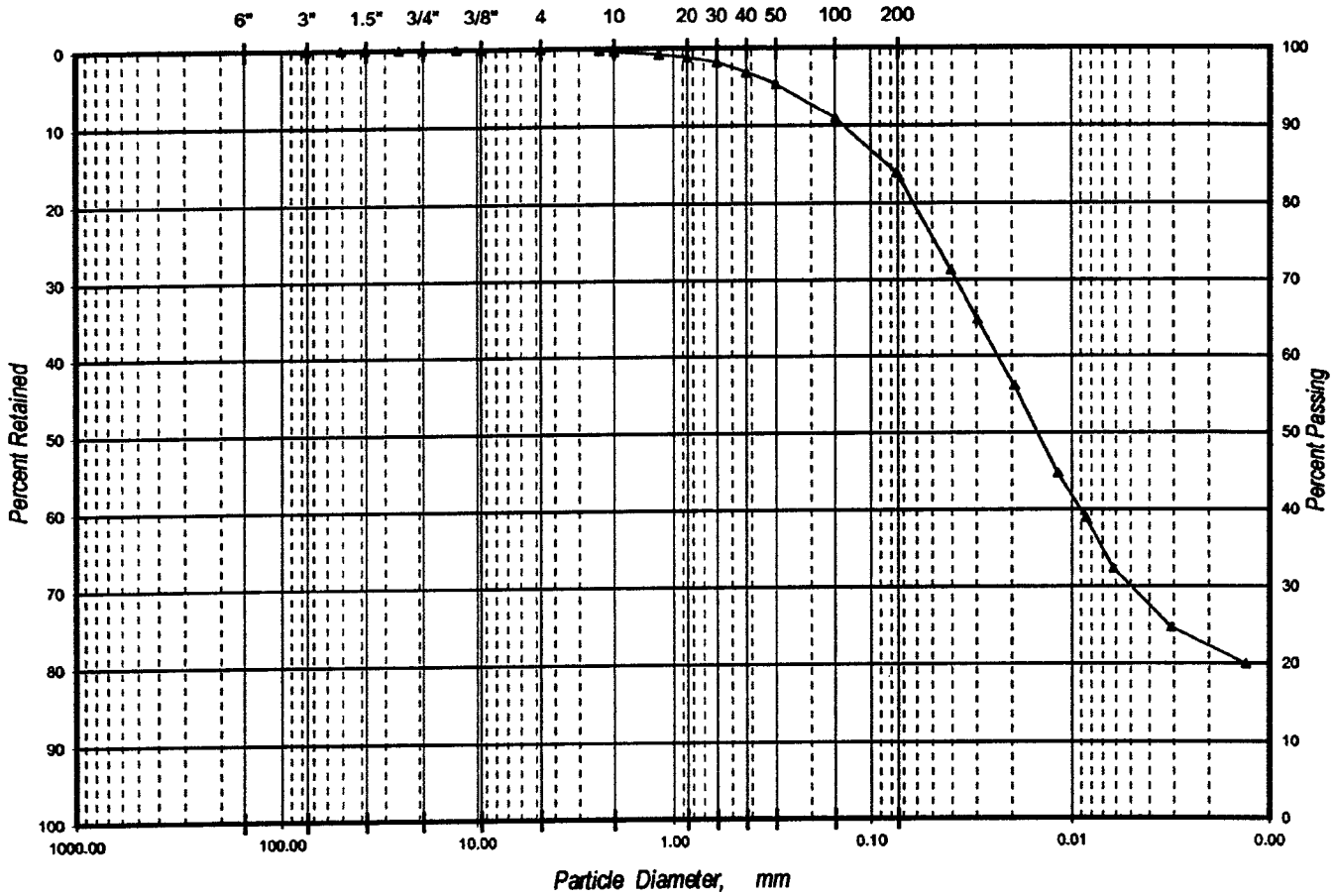
Test Report

ASTM D-422

Client:	Project No:	Lab Sample No:
LONGFELLOW DAIRY	091207.0000	2812D

Project Name:	Report Date:
LONGFELLOW DAIRY WASTE PROCESS POND NO. 3	July 7, 2009

BOULDERS	COBBLES	GRAVEL		SAND			SILT AND CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	
US SIEVE SIZE, INCHES				US STANDARD SIEVE SIZE No.			HYDROMETER



Symbol	Sample ID	* Description	% Gravel	% Sand	% Silt - Clay
▲	Topsoil (Rec'd 6/17/09)	Lt. Gray Brn. Silty Clay w/ Sand	0.0	16.1	83.9

Size Passing, mm D_{60} = 0.02 D_{30} = 0.01 D_{10} = N/A 5 micron (%) = 29

Coefficient of Curvature, C_c: N/A Coefficient of Uniformity, C_u: N/A Fineness Modulus = 0.17

* Visual Classification based on ASTM D-2488

Note: * Percentages are +/- 0.1% based on computer rounding as allowed by ASTM D-6026-01 Section 5.2.3.

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VECTOR ENGINEERING, INC.

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PARTICLE SIZE ANALYSIS

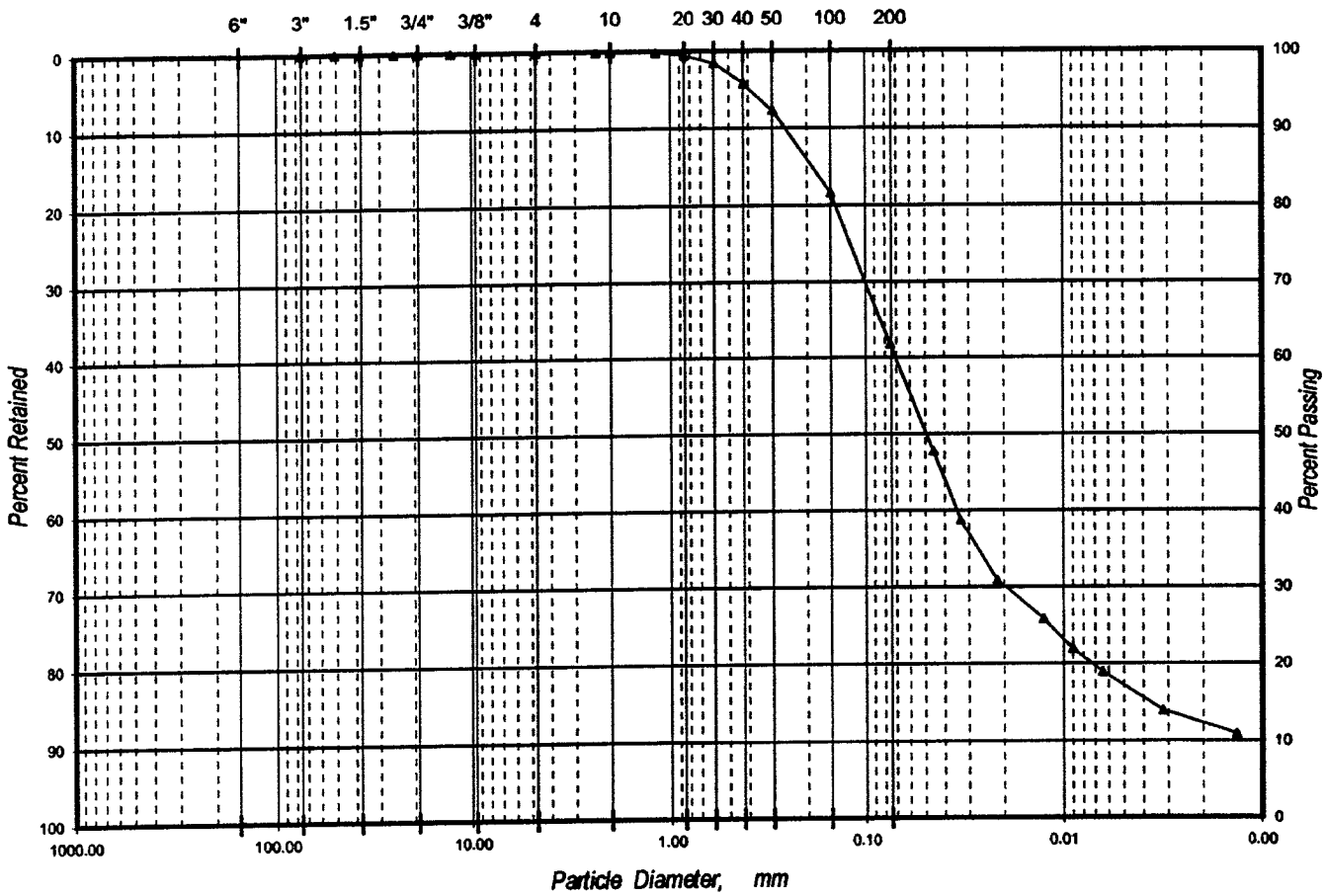
Test Report

ASTM D-422

Client:	Project No:	Lab Sample No:
LONGFELLOW DAIRY	091207.0000	2812F

Project Name:	Report Date:
LONGFELLOW DAIRY WASTE PROCESS POND NO. 3	July 7, 2009

BOULDERS	COBBLES	GRAVEL		SAND			SILT AND CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	
US SIEVE SIZE, INCHES				US STANDARD SIEVE SIZE No.			HYDROMETER



Symbol	Sample ID	* Description	% Gravel	% Sand	% Silt - Clay
▲	West stockpile #1 (Rec'd 6/17/09)	Lt. Brown Sandy Silt	0.0	38.3	61.7

Size Passing, mm D_{60} = 0.07 D_{30} = 0.02 D_{10} = N/A 5 micron (%) = 16

Coefficient of Curvature, C_c: N/A Coefficient of Uniformity, C_u: N/A Fineness Modulus = 0.28

* Visual Classification based on ASTM D-2488

Note: * Percentages are +/- 0.1% based on computer rounding as allowed by ASTM D-6026-01 Section 5.2.3.

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VECTOR
ENGINEERING, INC.
An Ausenco group company

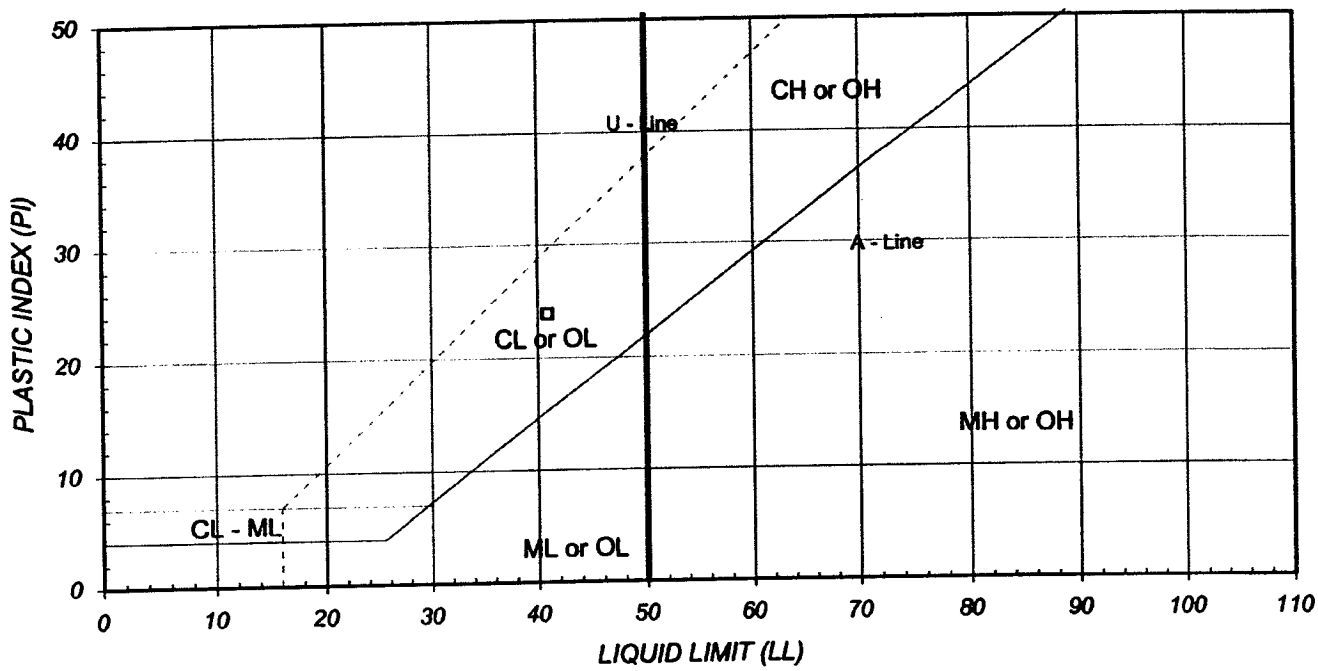
ATTERBERG LIMITS
Summary Report
ASTM D-4318

Client: Longfellow Dairy
Project No: 091207.0000
Lab Log No.: 2812A
Project Name: Longfellow Dairy Waste Process Pond No. 3
Report Date: June 25, 2009

LSN	SYMBOL	SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	PLASTIC INDEX
2812A	□	Bottom clay (Rec'd 6/17/09)	Brown Lean Clay w/ Sand (CL)	41	17	24

* Visual Classification based on ASTM D-2488

PLASTICITY CHART



These results apply only to the above listed samples. The data and information are proprietary and can not be released without authorization of Vector Engineering Inc.
By accepting the data and results represented on this page, client agrees to limit the liability of Vector Engineering, Inc. from Client and all other parties claims arising out of the use of this data to the cost for the respective test(s) represented here, and Client agrees to indemnify and hold harmless Vector from and against all liability in excess of the aforementioned limit.

APPENDIX B.4
Seepage Calculations

SEEPAGE CALCULATIONS

The following describes the procedures and related assumption utilized to calculate the estimated seepage through assumed defects in the installed 60 mil HDPE single sided textured geomembrane bottom liner in Wastewater Process Lagoon No. 3.

This analysis is focused strictly on advective leakage through geomembrane defects. Given the geomembrane is essentially impermeable and seepage due to water vapor transmission (WVT) through the membrane will be negligible when compared with seepage through holes in the geomembrane.

Leakage Through Defects in the Geomembrane

For seepage through defects, the leakage rate was derived utilizing Giroud's Leakage Equation for leakage through a circular hole in the geomembrane with an underlying low permeability soil layer for hydraulic heads greater than 10 feet (3 m). From Thiel et al. (2001), the leakage is defined as follows:

$$Q=C[1+0.1(h_w/t)^{0.9375}]a^{0.1}h_w^{0.9}k_s^{0.74}$$

[For $h_w \geq 10$ ft (3 m), and defect diameter $a \leq 1.0$ in (25 mm = 5×10^{-4} m^2)]

where:

Q = rate of leakage through a defect (m^3/s);

C = a constant related to the quality of the intimate contact between the geomembrane and underlying soil layer (0.21 for "'good" contact, 1.15 for "bad" contact);

h_w = head of liquid on top of the geomembrane (m);

t = thickness of the soil component of the composite liner (m);

a = area of defect in geomembrane (m^2); and

k_s= hydraulic conductivity of the underlying soil foundation layer (m/s).

The thickness t of the low permeability Soil Foundation Layer was assumed to be an average 1 foot (0.3 m) with permeability, k_s = 1 x 10^{-6} cm/sec.

The frequency of defects was assumed to be one per acre based on the USBR (Report DS-13, Ch. 20 – Geomembranes) assumption of one effect per 4,000 m^2 for installed geomembranes with proper construction quality assurance (CQA). Therefore, a total of two defects for the 84,650 ft^2 (1.94 ac) lagoon was assumed. The size of the defects in the geomembrane were assumed to be 0.04 in (40 mil, 1.0 mm). The defect size was based on the assumption that the prescribed Geoelectric leak survey conducted after the geomembrane installation and soil covering would be effective in locating and repairing holes larger than 40 mil diameter.

The geomembrane installed on the floor of the lagoon is to be covered by a 1.5-foot thick protective soil ballast layer with an assumed permeability of 10^{-4} cm/sec, typical of sand. For this leakage analysis, one hole was assumed to be on the floor under the protective soil layer, with the maximum lagoon water depth of 22.5 ft (6.86 m), and the second hole assumed to be on the slope just above the upper limit of the protective soil ballast layer [wastewater depth of 19.5 feet (5.95 m)].

The contact between the geomembrane and the underlying Soil Foundation Layer was assumed to be "good" (contact factor C=0.21) on the lagoon floor (given the soil cover), and "poor" contact factor (C=1.15) between the geomembrane and the Soil Foundation Layer on the lagoon slopes (primary contact derived from hydrostatic pressure).

For comparison, the geomembrane defect leakage analysis on the lagoon floor was performed for liquid migration though defects in a geomembrane overlain and underlain by permeable media. The leakage is defined as follows (Giroud, Khire, & Soderman, 1997):

$$h=\{(aq_i/2k_{OMII})+(Q/2k_{OMII})[\ln(Q/aq_i)-1]+(1/4g^2)(Q/0.6a)^4\}^{1/2}$$

The resulting leakage rate of the lagoon floor for the overlying soil condition (58.6 gal/day/defect) over -estimates seepage through the low permeability soil foundation layer (25.1 gal/day/defect). Therefore, the standard Giroud Leakage Equation controls the leakage calculations.

Total Estimated Leakage

From Table 1 of this report, the resulting seepage rate on the slope defect was determined to be 110.3 gal/day (14.7 ft^3/day). The leakage from a floor defect was estimated to be 25.1 gal/day (3.4 ft^3/day). Thus, the total estimated leakage from the two 40 mil diameter defects was determined to be 135.4 gal/day (18.1 ft^3/day).

SUMMARY

From the groundwater monitoring program established in 2007 by the University of California at Davis, included as Appendix B.1 in the Design and Work Plan for Process Lagoon No. 3, the groundwater quality test results (Appendix B.2) have shown essentially a negligible effect on groundwater quality. The location of the monitoring wells in the research program is included at the end of Appendix B.1.

Both the upstream (north) and downstream (south) monitoring well have provided water quality data that is indicative that the existing Longfellow Farming Co. dairy has been prudent in managing discharges and pollutants. This includes a dairy that began operations dating back to the mid 1900's, , and with two existing wastewater process lagoons.

From the leakage analysis performed for the Longfellow Farming Co. proposed No. 3 Wastewater Process Lagoon, it is apparent the lined lagoon will have a negligible effect on the groundwater quality and provided continued environmental containment at the dairy. Given the proposed geomembrane/low permeability soil lining system, combined with the geomembrane Geoelectric leak survey, and specified high level of CQA oversight during construction of the Lagoon No. 3 expansion , it is Vector's professional opinion that the Lagoon No. 3 expansion, as

designed, will not degrade the groundwater quality. The lagoon expansion will facilitate continued environmental protection during dairy operations in the Central Valley of California.

REFERENCES

Giroud, J. P., Khire, M. V., & Soderman, K. L. (1997). Liquid Migration Through Defects in a Geomembrane Overlain and Underlain by Permeable Media. *Geosynthetics International* , 293-299.

Thiel, R., Daniel, D. E., Erickson, R. B., Kavazanjan, E. J., & Giroud, J. P. (2001). *The GSE GundSeal GCL Design Manual.* Houston: GSE.

Table 1. Wastewater Process Lagoon No. 3 Seepage Calculations
Longfellow Farming Co.

VECTOR ENGINEERING, INC.

Dairy Waste Process Pond No. 3 Design			
Producer: Longfellow Farming Co.			
For flow through geomembrane with underlying low permeability soil foundation layer	Hole ID	Hole #1	Hole #2
$Q = C[1+0.1(h_w/t)^{0.95}]a^{0.1} h_w^{0.9} k_s^{0.74}$	Quality of Intimate Contact	Good Contact	Poor Contact
Thiel et al., 2001	Location of Defect	Floor	Slope
Input Parameters			
C Note 1		0.21	1.15
h_w (ft) Note 2		22.5	19.5
t (ft) Note 3		1	1
dia (mm) Note 4		1	1
k_s (cm/s) Note 5		1.0E-06	1.0E-06
h_w (m)		6.86	5.95
t (m)		0.305	0.305
a (m^2)		7.9E-07	7.9E-07
k_s (m/s)		1.0E-08	1.0E-08
$C[1+0.1(h_w/t)^{0.95}]a^{0.1} h_w^{0.9} k_s^{0.74}$ (m^3/s)		1.1E-06	4.8E-06
Q (gal/day)		25.14	110.32

Notes:

(1) Constant related to the quality of intimate contact between the geomembrane and underlying Soil Foundation Layer

(2) Maximum head of liquid on top geomembrane (ft) in lagoon

(3) Thickness of Soil Foundation Layer (ft)

(4) Diameter of defect (mm)

(5) Permeability of Soil Foundation Layer (cm/s)

For Impeded Flow through geomembrane with overlying soil cover and free draining underlying soil	Hole ID	Hole #1
$h=\{(aq_i/2k_{OM}\pi)+(Q/2k_{OM}\pi)[\ln(Q/aq_i)-1]+(1/4g^2)(Q/0.6a)^4\}^{1/2}$	Location of Defect	Floor
Giroud, Khire, and Soderman, 1997		
Input Parameters		
h_w (m) Note 6		6.9
t_{OM} (m) Note 7		0.457
a (m^2) Note 8		7.9E-07
k_{OM} (m/s) Note 7		1.0E-06
q_i (m/s)		1.5E-05
g (m/s^2)		9.81
Q (m^3/s)		2.6E-06
gal/m^3		264.17
s/day		86400
Q (gal/day) Note 9		58.6

Notes:

(6) Flowrate is solved for maximum height of water in lagoon

(7) Overlying material has thickness of 1.5 ft (0.5 m) and permeability, k, of $1x10^{-4}$ cm/s

(8) Area of defect in geomembrane under overlying material (m^2)

Hole ID	Flowrate
Flow Through Hole #1 (gal/day) Note 9	25.1
Flow Through Hole #2 (gal/day) Note 9	110.3
Total leakage through defects (gal/day)	**135.46**

Notes:

(9) Giroud Equation for Underlying Low Permeability Soil Controls

APPENDIX B.5
Slope Stability Analyses Report

VECTOR
ENGINEERING, INC.
An Ausenco group company

MEMORANDUM

TO: George Longfellow, Longfellow Farming Co.

FROM: Kristin Sample, Vector Engineering, Inc.

DATE: September 28, 2009

RE: Stability Analysis for Waste Water Process Lagoon No. 3

Analysis Overview

This memorandum presents the results of the stability analysis performed by Vector Engineering, Inc. (Vector) for the proposed Waste Water Process Lagoon N. 3 at the Longfellow Farming Co. (the Facility), Kings County, California. The purpose of the stability analysis was to identify the factors of safety and long term stability of the excavated sideslopes in the lagoon.

Earthworks Excavation and Lagoon Slopes

The lagoon side slopes will be excavated to a grade of approximately 2.5 horizontal to 1 vertical (2.5H:1V, 21.8°). Based on Vector's grading plan (Figure 1 of this report), the crest of the slopes will generally be graded to the current ground surface elevation of 110 ft above mean sea level (MSL). The deepest part of the lagoon, located at the north end at the toe of slope will be excavated to 80 ft MSL, providing a maximum lagoon depth of approximately 30 ft.

Location of Analysis Cross Section

As shown in Figure 1, stability analyses were performed for two locations designated Cross Section A-A' (north end of the lagoon) and Cross Section B-B' (west end of the lagoon). Both areas represent what are the critical slope locations regarding pond depth and. Cross Section A-A' includes the maximum pond depth (30 ft), and Section B-B' includes a lagoon depth of 28 ft with a 15 ft tall soil stockpile adjacent to the crest of slope on the west side of the lagoon.

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Site Soil Classification and Strength Parameters.

A field investigation was performed by Vector commencing on June 22, 2009 to classify the soil types in Lagoon No. 3. The Soil Classification Report is included in Design and Work Plan, Appendix B.3. During the investigation, soils from the lagoon area and adjacent stockpiles on the east and west side of the pond were sampled and classified based on ASTM D 2488 (Identification of Soils Visual-Manual Procedure). The soil samples were subsequently tested at Vector's laboratory in Grass Valley, CA Geotechnical Laboratory. The soil samples were further classified utilizing Unified Soil Classification System (USCS).

The upper 10 ft soil layer at the site (from the crest of slope down to 100 ft msl), as well as the soil stockpiles, consists of clayey sand (SC) and lean clay (CL). From approximately elevation 100 ft msl to88 ft msl, the soil was determined to be erodible, poorly-graded sand (SP). Below88 ft msl, the soil was determined to be lean clay (CL). Groundwater at the site is approximately 80 ft below the crest of the pond (e.g. 50 ft below the floor of the lagoon), and therefore was not included in the stability analysis. Further details about the site geology, field investigation and recommendations are provided in the Geotechnical Report in Appendix B.3 of the Lagoon No. 3 Design and Work Plan.

As the soil samples were classified to determine their physical properties, , soil strength testing was not required. From the three soil tested and classified above, typical strength properties were assumed for these stability analyses based on published literature (e.g. NAVFAC 1986; Lambe and Whitman 1969, etc.) and Vector's previous experience. The material properties utilized for these analyses are summarized in Table 1.

Table 1. Material Properties Used in the Analyses

Material	Unit Weight, γ (pcf)	Effective Friction Angle, ϕ' (°)	Cohesion, c (psf)
Upper Clayey Sand/Lean Clay (SC/CL)	125	30	50
Poorly Graded Sand (SP)	125	35	0
Lower Clay Layer (CL)	115	28	200

Stability Analysis

The slope stability analysis was performed using the program SLIDE 5.0 (Rocscience, 2009), which conducts limit equilibrium calculations by a variety of methods. Spencer's method of slices was used, as this procedure satisfies both force and moment equilibrium, thereby yielding a more rigorous solution relative to other commonly used methods. Lagoon excavation slopes were analyzed for circular and block failure surfaces running through the native materials. Since the pond will be lined and the groundwater at the site is approximately 50 feet below the lagoon floor, no seepage or groundwater was included in the these analyses.

Results

The results of the static slope stability analysis are summarized in Table 2. The proposed lagoon excavation slopes are considered statically stable since the minimum factors of safety are greater than 1.5. The output from the computer stability analyses are included in Attachment 1 of this Report.

Table 2. Results of the Stability Analysis

Cross-Section	Factor of Safety	
	Circular Failure	Block Failure
Section A-A'	1.75	1.78
Section B-B'	1.75	1.81

A seismic event with a probability of exceedance of 2% in 50 years (2,475-year event) was also considered for the pond design. Based on USGS (2009), this event would cause a ground motion of 0.27 g at the site. The yield acceleration of the critical pond cross-section is approximately 0.24 g, which results in shallow surface failures in the sand layer. Seismic displacements due to the design event would be less than 12 inches, which is considered acceptable.

References

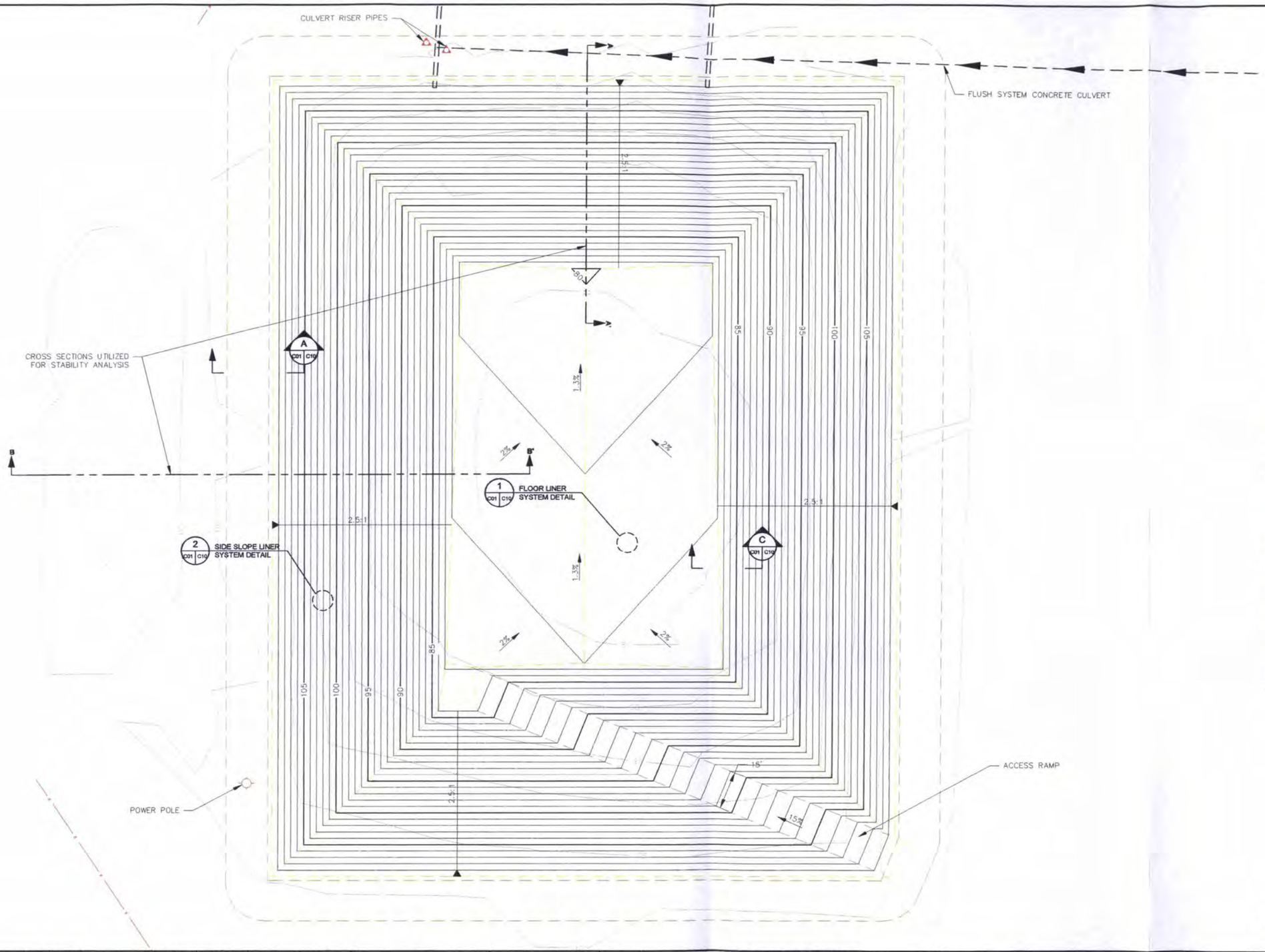
Lambe, W., and Whitman, R. (1969), *Soil Mechanics*, John Wiley & Sons, Inc.

NAVFAC (1986), *Design Manuals 7.01 & 7.02 - Soil Mechanics, Foundations and Earth Structures,* Washington D.C.

Rocscience Inc. (2009), SLIDE Version 5.039, Toronto, Ontario, Canada.

USGS (2009), *Ground Motion Parameter Calculator, Version 5.0.9,* Earthquake Hazards Program, http://earthquake.usgs.gov/research/hazmaps/design/

Attachment 1
Stability Analysis



GRAPHIC SCALE

LEGEND

- EXISTING 5 FT CONTOUR
- EXISTING 1 FT CONTOUR
- 110 — PROPOSED 5 FT EXCAVATION CONTOUR
- PROPOSED 1 FT EXCAVATION CONTOUR
- HINGE LINE
- PROPOSED UNPAVED ACCESS/PERIMETER ROAD
- EXISTING FENCE
- EXISTING FLUSH SYSTEM CONCRETE CULVERT
- EXISTING INFLUENT TRANSFER PIPE
- CULVERT RISER PIPE
- POWER POLE

QUANTITIES

LAGOON GRADING VOLUMES		
CUT	= -4,800 CY	
FILL	= 3,400 CY	
1 FT SOIL FOUNDATION FLOOR/ SIDESLOPE LAYER	= 2,800 CY	
SOIL STOCKPILES	= -2,600 CY	
VOLUME OF LAGOON 1.5 FT BALLAST	= 1,400 CY	(25,000 SF x 1.5')
NET	= 0 CY	
TOTAL VOLUME OF PROCESS LAGOON	= 42,532 CY	(8,590,359 Gal.)
BALLAST VOLUME	= -1,400 CY	(282,764 Gal.)
2 FT FREEBOARD	= -5,258 CY	(1,061,979 Gal.)
TOTAL LAGOON CAPACITY	= 35,874 CY	(7,245,616 Gal.)

NOTES:
1. EXISTING SURVEY CONDUCTED BY THE NRCS IN SEPTEMBER 2008.

REV. NO.	DATE	DESCRIPTION	DRAWN BY	DESIGNED BY	CHECKED BY	APPROVED BY
A	05/11/09	ISSUED FOR REVIEW	JCT	RBE	RBE	RST
B	08/14/09	ISSUED FOR REVIEW	RPB	RBE	RBE	RST
	09/21/09	ISSUED FOR REVIEW	RPB	RBE	RBE	RST

DATE OF ISSUE: 09/21/2009
DESIGNED BY: RBE
DRAWN BY: RPB
CHECKED BY: RBE
APPROVED BY: RST

REGISTERED PROFESSIONAL ENGINEER RICHARD S. THYEL No. C 44222 Exp. CIVIL STATE OF CALIFORNIA

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LONGFELLOW FARMING COMPANY
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LONGFELLOW DAIRY
WASTE WATER PROCESS
LAGOON NO. 3
KINGS COUNTY, CA

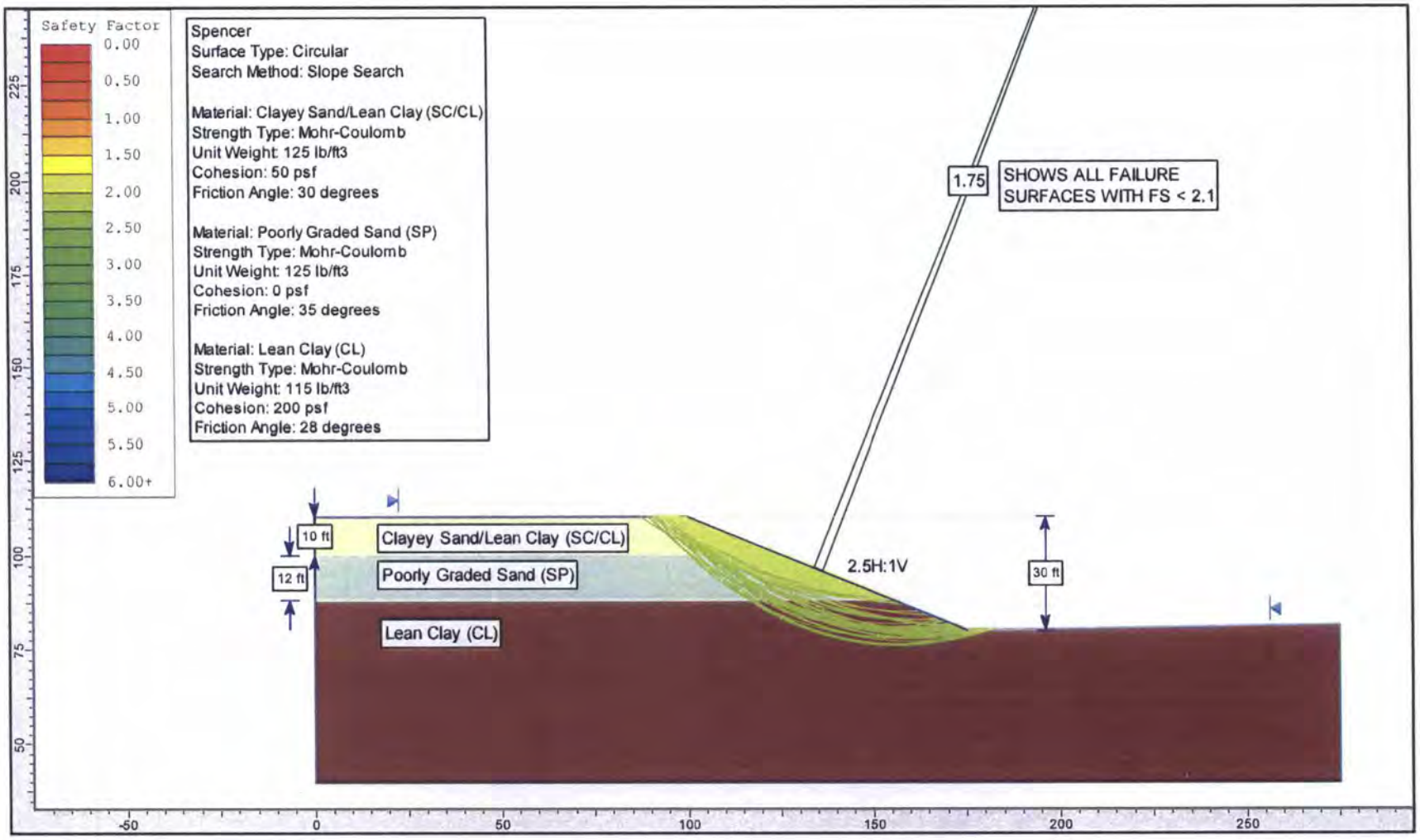
GRADING PLAN/STABILITY ANALYSIS

FIGURE NO. 01

PROJECT NO. 09120700.00

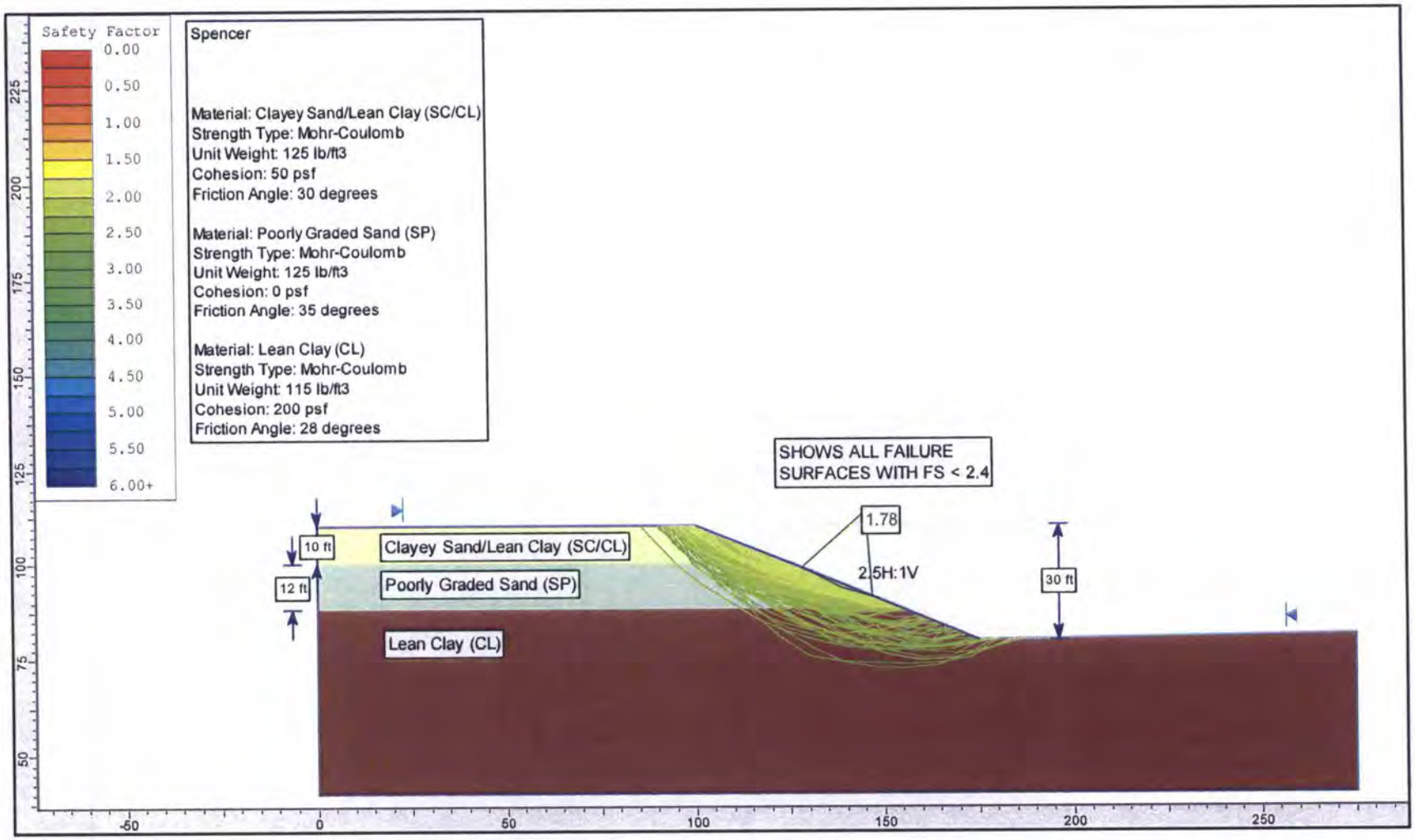
This drawing has not been published but rather has been prepared by Vector Engineering, Inc. for use by the client named in the title block, solely in respect of the construction operation, and maintenance of the facility named in the title block. Vector Engineering, Inc. shall not be liable for the use of this drawing on any other facility or for any other purpose.

ISSUED FOR REVIEW



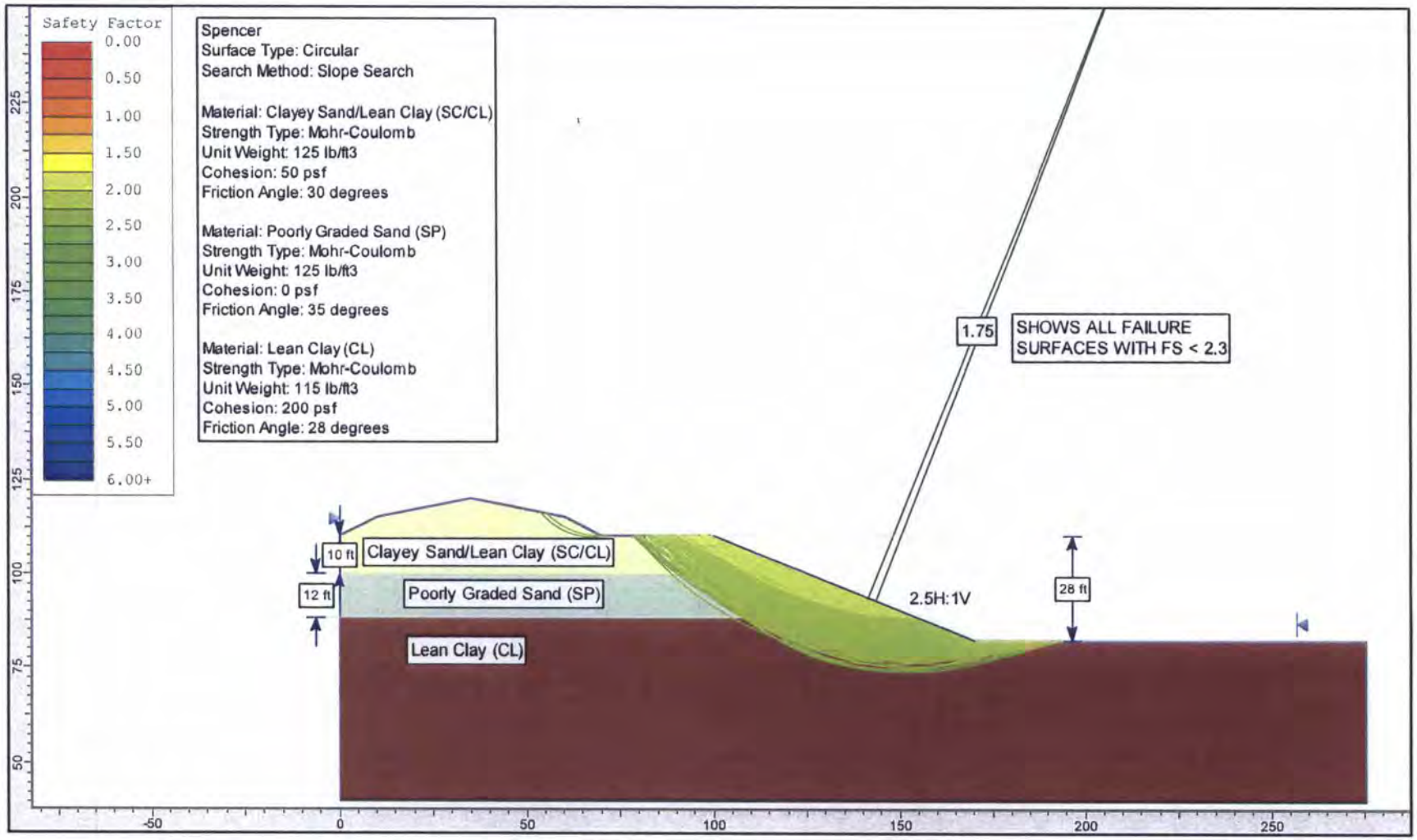
Lagoon #3 - Cut Slope

Section A (North End): Circular Failure, Static Conditions



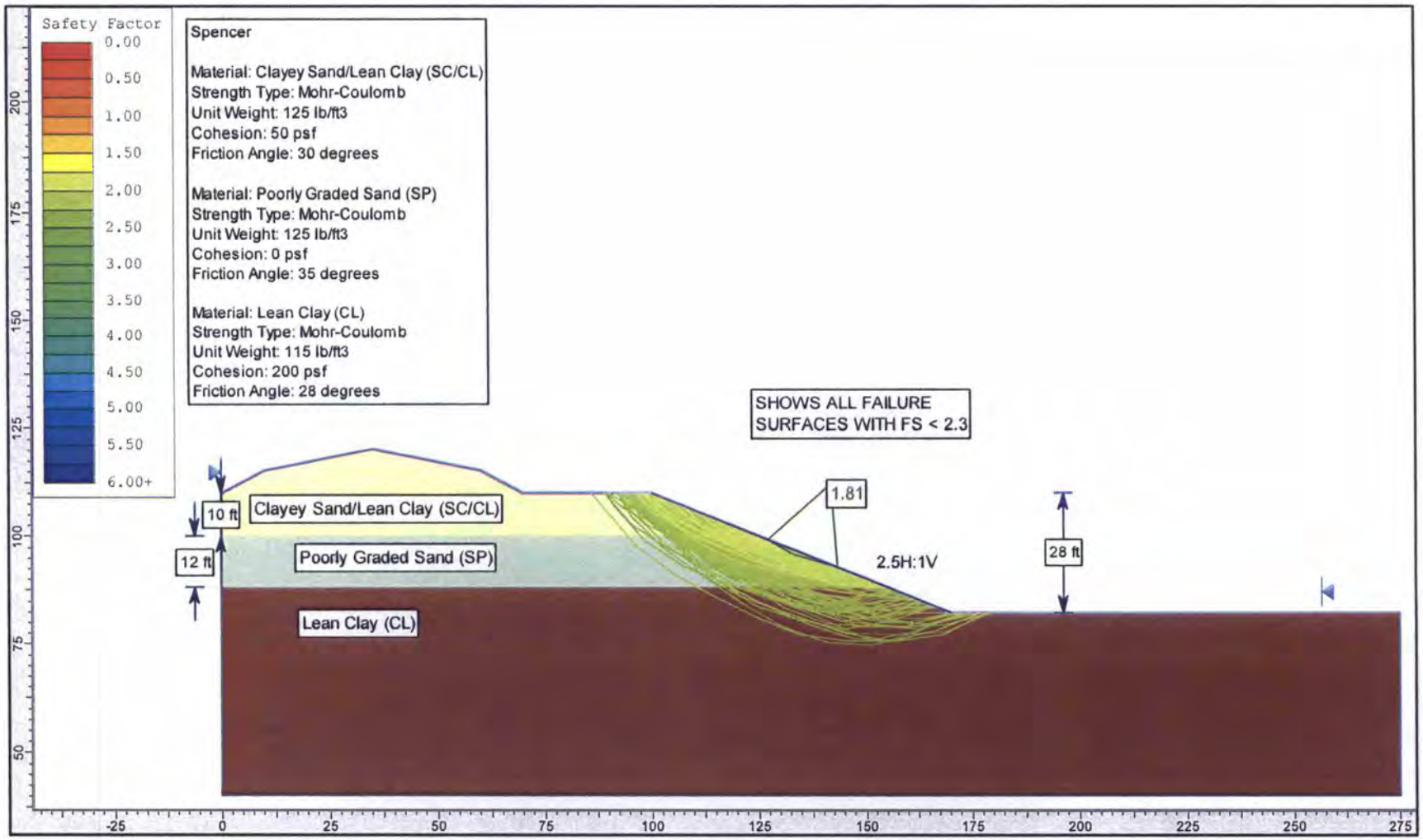
Lagoon #3 - Cut Slope

Section A (North End): Block Failure, Static Conditions



Lagoon #3 - Cut Slope with Stockpile

Section B (West End): Circular Failure, Static Conditions



Lagoon #3 - Cut Slope with Stockpile

Section B (West End): Block Failure, Static Conditions

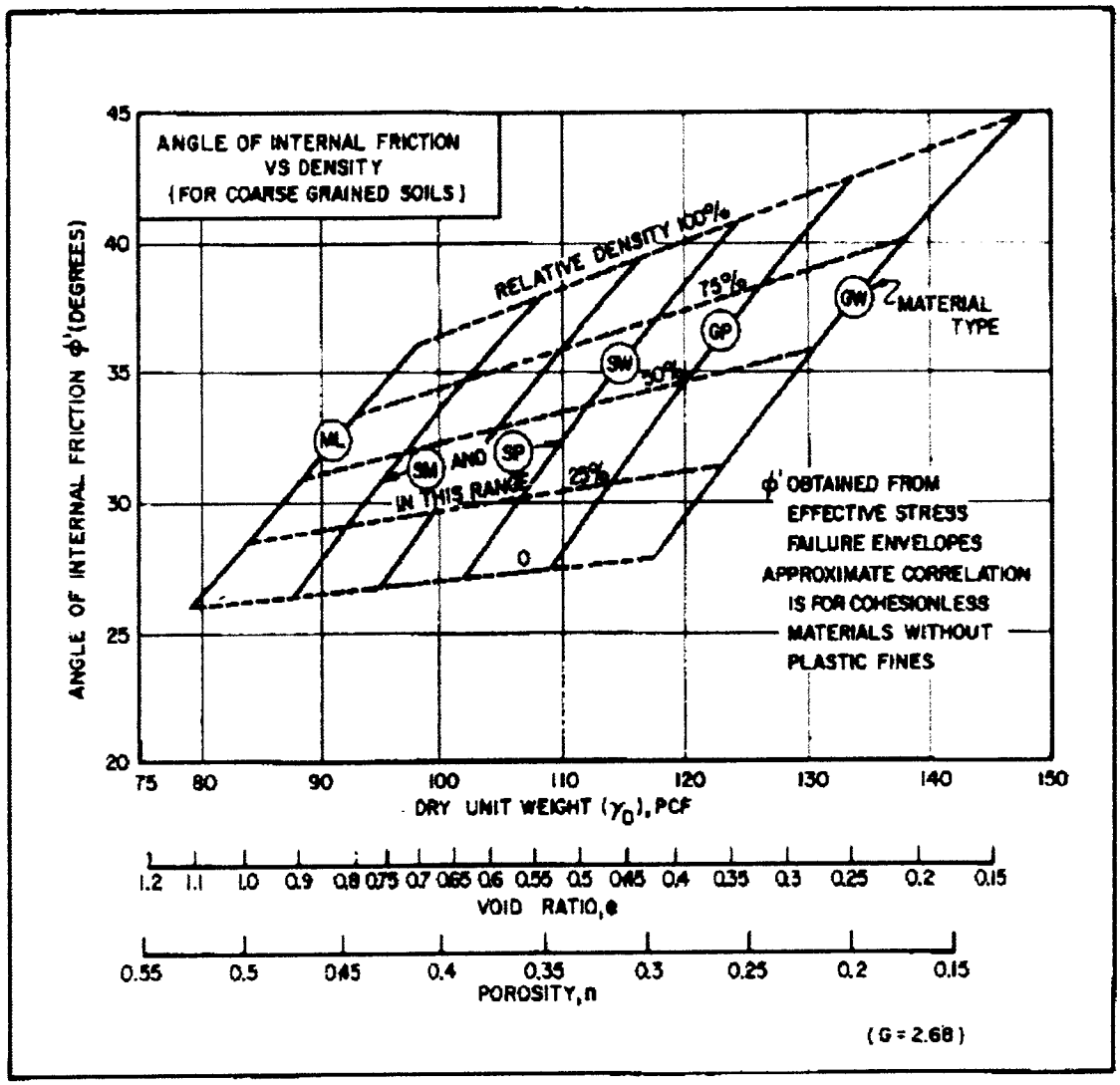


FIGURE 7
Correlations of Strength Characteristics for Granular Soils

Source: NAVFAC (1986), Soil Mechanics DM 7.01

TYPICAL PROPERTIES OF COMPACTED SOILS (NAVFAC DM 7.2, Table 1, p7.2-39)

Group Symbol	Soil Type	Range of Maximum Dry Unit Weight, pcf	Range of Optimum Moisture, Percent	Typical Value of Compression		Typical Strength Characteristics				Typical Coefficient of Permeability ft/min.	Range of CBR Values	Range of Subgrade Modulus k lbs/cu in
				At 1.4 tsf (20 psi)	At 3.6 tsf (50 psi)	Cohesion (as compacted) psf	Cohesion (saturated) psf	PHI (Effective Stress Friction Angle Degrees)	Tan PHI			
				Percent of Original Height								
GW	Well-graded clean gravels, gravel-sand mixture	125 - 135	11 - 8	0.3	0.6	0	0	>38	>0.79	5×10^{-4}	40 - 80	300 - 500
GP	Poorly graded clean gravels, gravel-sand mix	115 - 125	14 - 11	0.4	0.9	0	0	>37	>0.74	10^{-1}	30 - 60	250 - 400
GM	Silty gravels, poorly graded gravel-sand-silt	120 - 135	12 - 8	0.5	1.1	--	--	>34	>0.67	$>10^{-6}$	20 - 60	100 - 400
GC	Clayey gravels, poorly graded gravel-sand-clay	115 - 130	14 - 9	0.7	1.6	--	--	>31	>0.60	$>10^{-7}$	20 - 40	100 - 300
SW	Well graded clean sands, gravelly sands	110 - 130	16 - 9	0.6	1.2	0	0	38	0.79	$>10^{-5}$	20 - 40	200 - 300
SP	Poorly graded clean sands, sand-gravel mix	100 - 120	21 - 12	0.8	1.4	0	0	37	0.74	$>10^{-5}$	10 - 40	200 - 300
SM	Silty sands, poorly graded sand-silt mix	110 - 125	16 - 11	0.8	1.6	1050	420	34	0.67	5×10^{-5}	10 - 40	100 - 300
SM-SC	Sand-silt clay mix with slightly plastic fines.	110 - 130	15 - 11	0.8	1.4	1050	300	33	0.66	2×10^{-6}	5 - 30	100 - 300
SC	Clayey sands, poorly graded sand-clay-mix	105 - 125	19 - 11	1.1	2.2	1550	230	31	0.60	5×10^{-7}	5 - 20	100 - 300
ML	Inorganic silts and clayey silts	95 - 120	24 - 12	0.9	1.7	1400	190	32	0.62	$>10^{-5}$	15 or less	100 - 200
ML-CL	Mixture of inorganic silt and clay	100 - 120	22 - 12	1.0	2.2	1350	460	32	0.62	5×10^{-7}	--	--
CL	Inorganic clays of low to medium plasticity	95 - 120	24 - 12	1.3	2.5	1800	270	28	0.54	$>10^{-7}$	15 or less	50 - 200
OL	Organic silts and silt-clays, low plasticity	80 - 100	33 - 21	--	--	--	--	--	--	--	5 or less	50 - 100
MH	Inorganic clayey silts, plastic silts	70 - 95	40 - 24	2.0	3.8	1500	420	25	0.47	5×10^{-7}	10 or less	50 - 100
CH	Inorganic clays of high plasticity	75 - 105	36 - 19	2.6	3.9	2150	230	19	0.35	$>10^{-7}$	15 or less	50 - 150
OH	Organic clays and silty clays	65 - 100	45 - 21	--	--	--	--	--	--	--	5 or less	25 - 100

Notes: All properties are for Conditions of Standard Proctor maximum density, except values of k and CBR, which are for Modified Proctor maximum density. Typical strength values are effective strengths from USBR data. Compression values are for vertical loading with complete lateral confinement.

MAL

WZI INC.

MONITORING WELL INSTALLATION REPORT
KENT AVENUE FAMILY DAIRY
SECTIONS 3 & 4,
TOWNSHIP 20 SOUTH, RANGE 21 EAST
KINGS COUNTY, CALIFORNIA

October 2005

Prepared for:
Kent Avenue Family Dairy
12871 Kent Avenue
Hanford, California 93230-9587

Prepared by:
WZI Inc.
4700 Stockdale Highway,
Suite 120
Bakersfield, California 93309

CERTIFIED HYDROGEOLOGIST
JAMES ALLEN WAGGONER
No. HG 724
Exp. 3/31/07
STATE OF CALIFORNIA

James Allen Waggoner
Certified Hydrogeologist
State of California No. 724
Expiration Date: 03/31/07

RECEIVED
OCT 11 2011
RWQCB-CVR
FRESNO, CA

APPROVED
Supervising Engineer

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2.0 MONITORING WELL INSTALLATION 1
3.0 WELL SURVEYING 2
4.0 MONITORING WELL DEVELOPMENT 2
5.0 SAMPLING PROGRAM 2
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6.0 GROUNDWATER ELEVATIONS 3
7.0 LABORATORY ANALYSIS 3
8.0 ONSITE WATER WELLS 4

EXHIBITS

Exhibit 1 Location Map
Exhibit 2 Well Location Map
Exhibit 3 Groundwater Surface Elevation Map

APPENDICES

Appendix 1 Borehole Logs
Appendix 2 Schematic Well Construction Diagrams
Appendix 3 Surveyors Plat Map
Appendix 4 Well Development and Sampling Field Monitoring Records
Appendix 5 Laboratory Analytical Reports
Appendix 6 Department of Water Resources Water Well Completion Reports

1.0 INTRODUCTION

The Kent Avenue Family Dairy is located approximately 8 miles south of the city of Hanford on the south side of Kent Avenue between 12th and 14th Avenues, in Kings County, California (**Exhibit 1**). The dairy facility and associated crop land include a total of approximately 616 acres in Sections 3 and 4, Township 20 South, Range 21 East, MDB&M. The project is being constructed in accordance with the requirements of Site Plan Review No. 04-02 which was approved by the Kings County Planning Agency in March, 2004.

A water quality monitoring plan was prepared for the facility in November 2003 by Kleinfelder, Inc. The plan, which was submitted to the California Regional Water Quality Control Board Central Valley Region (RWQCB) in December 2003 as part of a Report of Waste Discharge, proposed the installation of three groundwater monitoring wells at the dairy site. According to the 2003 Water Quality Monitoring Plan, the three original monitoring well locations were selected to monitor groundwater up-gradient and down-gradient with respect to the lagoons, corrals, and cropland.

In June 2005, WZI proposed that three additional wells be added to the groundwater monitoring network. Two of the additional wells were sited adjacent to the wastewater ponds for the purpose of better monitoring of shallow groundwater conditions around the ponds since localized groundwater flow directions may vary. An additional monitoring well was sited along the southern property boundary in a generally down-gradient position to monitor groundwater exiting the site that may primarily be impacted by on-site irrigation.

The groundwater monitoring plan was approved by the RWQCB in correspondence dated July 1, 2005. In accordance with the requirements of the RWQCB, the following report summarizes the installation and construction details of the monitoring wells and the results of the initial groundwater sampling for the site. In addition, analytical results for samples collected from the supply well located at the dairy facility and two agricultural irrigation wells located on the property are presented.

2.0 MONITORING WELL INSTALLATION

A total of six monitoring wells were installed on the property. One of the wells was placed to the north of the dairy facility adjacent to Kent Avenue and three of the wells were located adjacent to the wastewater treatment lagoon and main storage pond. A fifth well was located to the southeast of the dairy facility and the sixth well was installed near the southern property boundary. The locations of the monitoring wells, the water supply well for the dairy, and the agricultural wells located on the property are depicted on **Exhibit 2**.

The groundwater monitoring wells were drilled by Consolidated Testing Laboratories, Inc. of Porterville, California using a Failing hollow stem auger drilling rig equipped with eight–inch diameter hollow–stem augers. Drill cuttings were examined and logged during drilling operations and borehole logs were prepared for each of the well borings. The borehole logs are included as **Appendix 1**. All geologic work was conducted under the supervision of a California Registered Geologist.

The monitoring wells were constructed using flush–jointed, two–inch diameter, schedule 40 (PVC) casing. No chemical cement, glue, or solvent was used in the well construction. The base of each well was fitted with a PVC plug. The screened portion of the wells consisted of schedule 40 factory–perforated casing with 0.020 inch-wide slots. The well screens were set through the augers and extended from the total depth of each monitoring well to approximately 2 to 3 feet above the static water level at the time the well was installed. The annular space of each well was packed with #3 Monterey sand to a point approximately one foot above the top of the perforated casing. A two–foot thick plug consisting of bentonite chips was placed above the sand to prevent cement from entering the sand pack and to insure annular integrity. The remaining annulus was backfilled to the surface with concrete. All wells were completed with a concrete pad at the surface and each wellhead was enclosed within a surface monument consisting of an eight-inch diameter metal pipe which was set within the concrete pad. Four metal poles were set at the corners of the concrete pads to protect the well casings at each location. The wells were secured with a locking well cap to reduce the possibility of vandalism and disturbance of the well. Schematic diagrams depicting the as built construction details of each well are included as **Appendix 2**.

3.0 WELL SURVEYING

Upon completion, the well locations and the elevations of the tops of the PVC casing were surveyed by Landmark Surveying and Engineering of Bakersfield, California. A copy of the surveyors plat map is included in **Appendix 3** and a summary of the well construction information and wellhead elevations is presented in **Table 1**.

4.0 MONITORING WELL DEVELOPMENT

Upon completion of drilling and well installation, the wells were allowed to stand for approximately 72 hours prior to development. Each monitoring well was developed by Consolidated Testing Laboratories, Inc. Prior to development, the static water level was measured in each well. The wells were then developed by purging over 50 gallons of groundwater (approximately 20 to 25 well volumes) with a submersible pump. Groundwater temperature, pH, and electrical conductivity were measured with field instruments during purging to insure that water conditions had stabilized and the purged water contained a minimum of suspended material. Field monitoring records of the well development process are included in **Appendix 4**.

5.0 SAMPLING PROGRAM

5.1 Monitoring Wells

Groundwater samples were collected from each of the monitoring wells on August 3, 2005 in accordance with the approved groundwater monitoring plan. Prior to sampling, the depth to groundwater was measured from a datum on the top of the well casing with a sounding tape and the measurement recorded to the nearest 0.01 foot.

Prior to sample collection, a minimum of four well volumes were purged from each well and temperature, pH, electrical conductivity and dissolved oxygen measurements recorded to confirm stable conditions. Groundwater from each well was then sampled using a submersible pump and the water placed in appropriate sample containers obtained from the analytical laboratory. Upon completion of the sample collection, a final depth to groundwater measurement was recorded and the wellhead secured. Field monitoring records for the well sampling process are included in **Appendix 4**.

5.2 Water Supply Wells

Water samples were also collected from the water supply well located at the dairy facility and from the two agricultural irrigation wells located on the property. The sample from the supply well at the dairy was collected from a sampling port located on the flow line adjacent to the wellhead. The water samples from the two agricultural wells were collected from the flow lines adjacent to the wells. All of the water supply wells were observed to be in operation on the day the samples were collected. The wells reportedly cycle on and off as water for the dairy or for irrigation is needed. Consequently, no purging of the wells was deemed necessary.

6.0 GROUNDWATER ELEVATIONS

Depth to groundwater was measured from a datum on the top of each well casing to the nearest 0.01 foot with a Solinst Model 101 water level meter. The depth to groundwater and corresponding groundwater elevations recorded at the time of sampling are summarized on **Table 2** for each monitoring well. A contour map of the groundwater surface elevation and flow direction is included as **Exhibit 3**.

7.0 LABORATORY ANALYSIS

After collection, each sample container was labeled, placed in a cooler, and transported to BSK Analytical Laboratories of Fresno, California for chemical analysis with proper chain of custody documentation. BSK Analytical Laboratories is a California certified laboratory for chemical analysis. The samples from the monitoring wells, the dairy supply well, and the agricultural irrigation wells were analyzed for the following:

Analysis	Method
Ammonia	SM 4500-NH_3 F
Bicarbonate	SM 2320 B
Calcium	EPA 200.7
Carbonate	SM 2320 B
Chloride	EPA 300.0
Iron	EPA 200.7
Magnesium	EPA 200.7
Manganese	EPA 200.7
Nitrate	EPA 300.0
Nitrite	EPA 300.0
Nitrogen – Total Kjeldahl (TKN)	EPA 351.2
pH	SM 4500-H+ B

Phosphorus	EPA 365.4
Potassium	EPA 200.7
Sodium	EPA 200.7
Sulfate	EPA 300.0
Total Dissolved Solids (TDS)	SM 2540 C
Total Coliform	SM 9221-B
Fecal Coliform	SM 9221-B

The results of the laboratory analyses are summarized on **Table 3** and copies of the laboratory analytical reports are included in **Appendix 5.**

8.0 ONSITE WATER WELLS

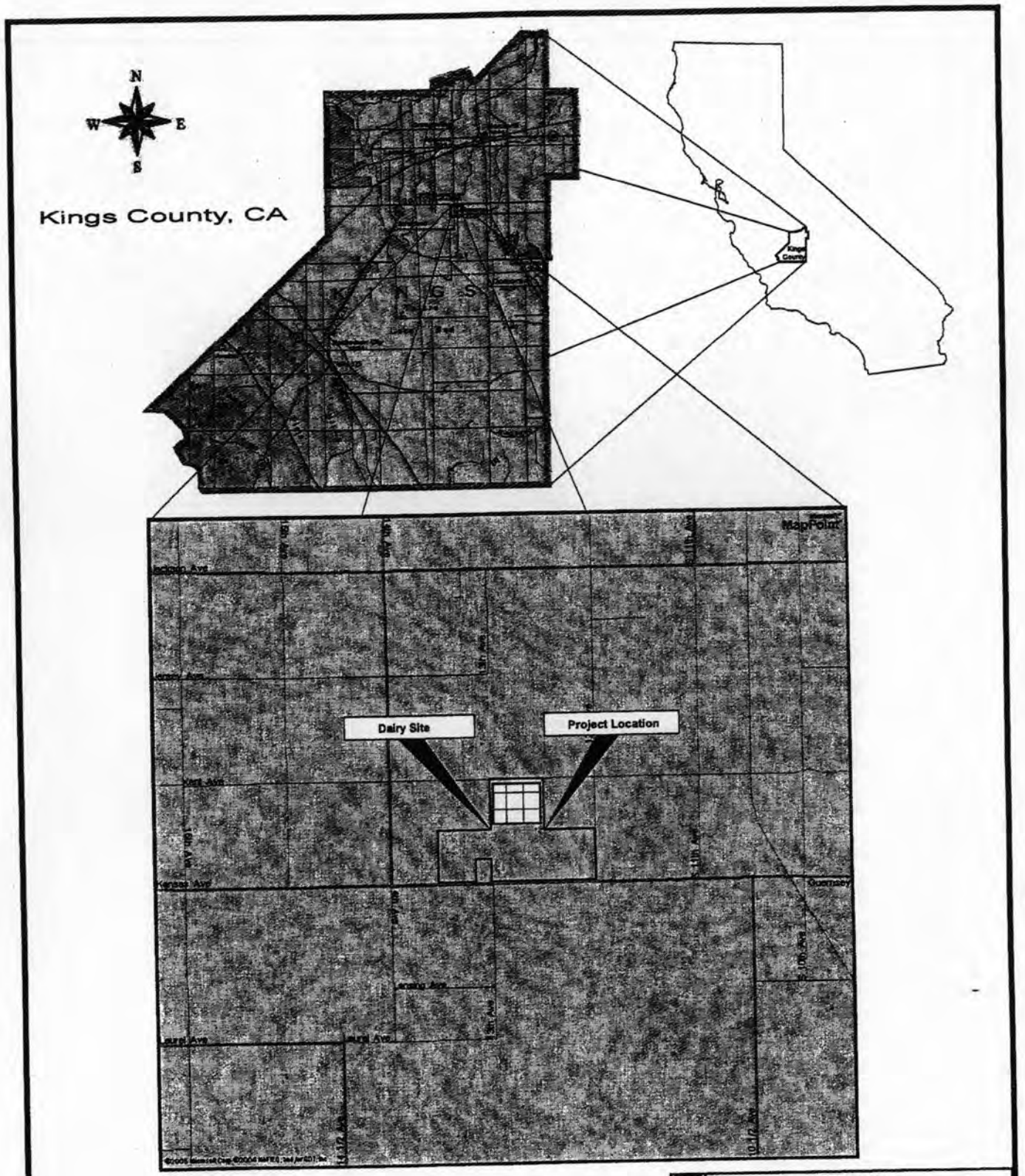
A water supply well for the dairy facility and two agricultural irrigation wells are also located on the property. The locations of the wells are shown on **Exhibit 2.** Well completion reports for the onsite water wells are included in **Appendix 6.** The following summarizes the onsite water wells:

Well	Location	Date Drilled	Total Depth	Surface Seal
Dairy Well (3D-1)	Sec3-T20S-R21E	March 2005	945'	0-50'
East Well (3A-1)	Sec3-T20S-R21E	November 1995	900'	0-50'
West Well (4K-1)	Sec4-T20S-R21E	April 1974	900'	unknown

The wells have all been constructed with elevated concrete pads at the surface and with pumps flush mounted to the pads. According to the completion reports, the Dairy Well and the East Well were both completed with sanitary seals extending from the surface to a depth of 50 feet. The depth of the sanitary seal for the West Well was not documented and is not known.

Since it is not known if an adequate sanitary seal is present in the West Well, a 100 foot buffer zone will be established between the well and any adjacent areas receiving wastewater. Additionally, the well will be segregated from areas receiving wastewater by a soil berm.

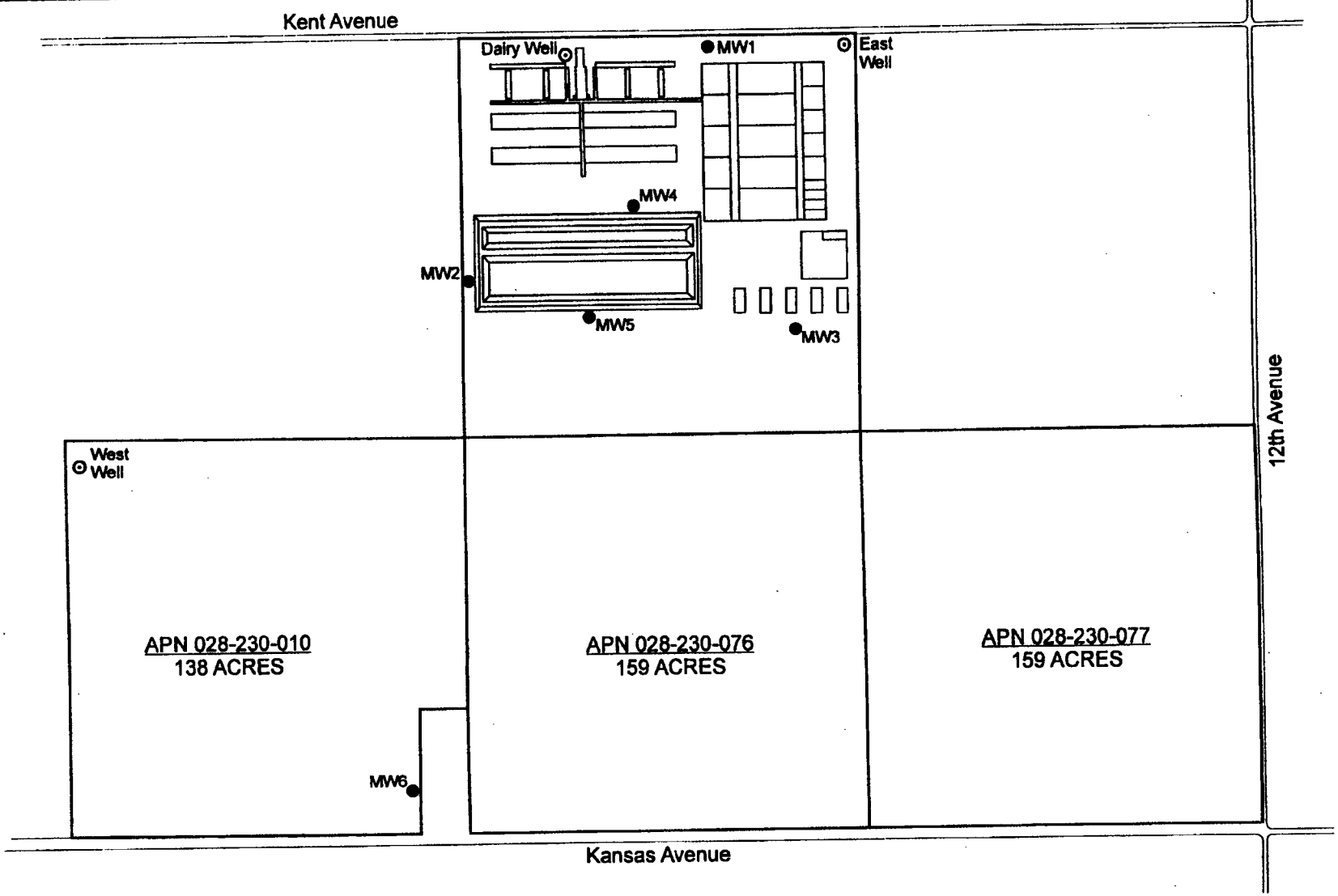
EXHIBITS



SCALE IN MILES

0 1 2

	WZI INC. BAKERSFIELD, CALIFORNIA
	KENT AVENUE FAMILY DAIRY, LLC
	Location Map
DATE 9/05	1100480010	EXHIBIT 1



Legend

- ● Monitoring Well Location
- ⊙ ProductionWell Location

N

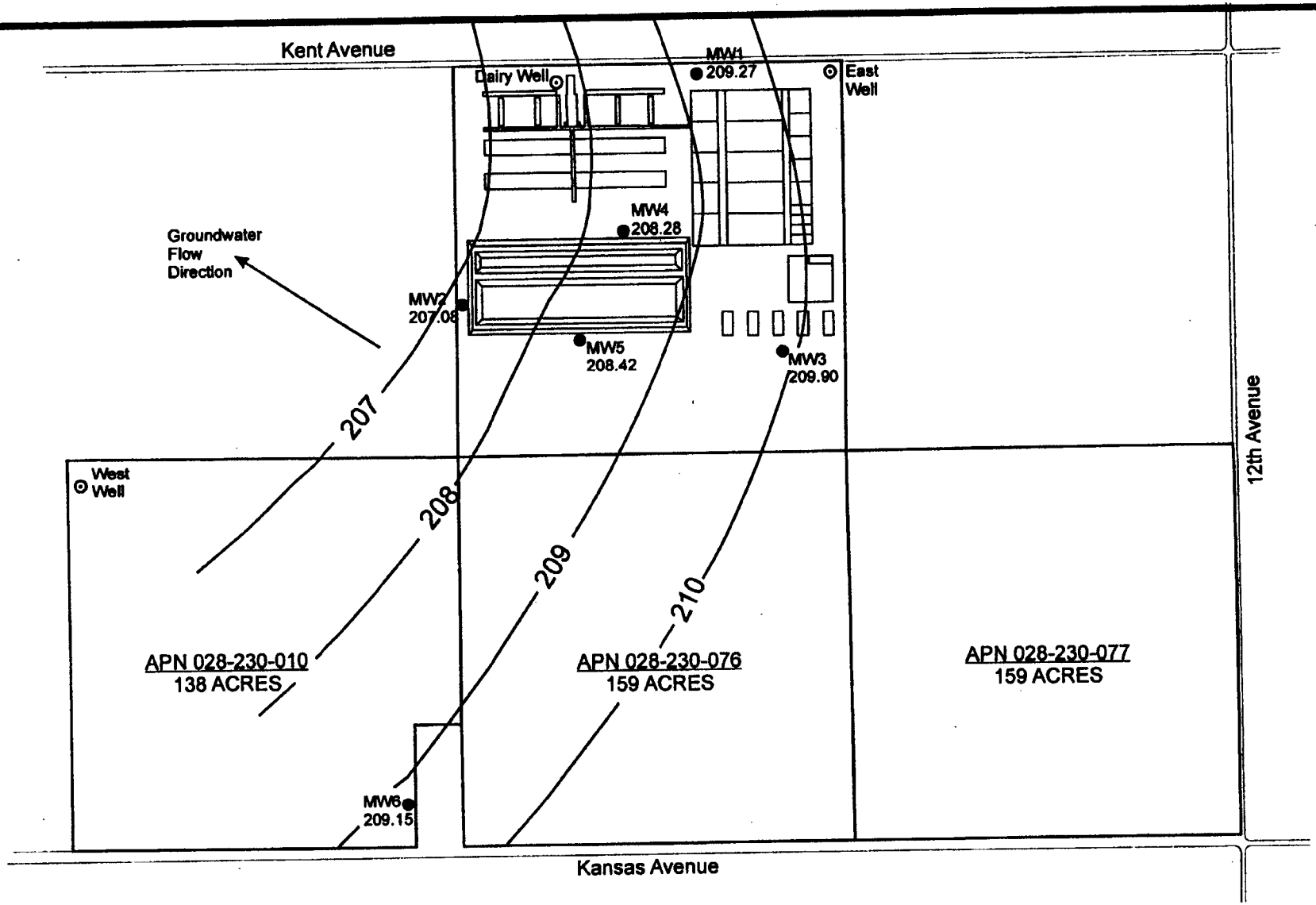
SCALE: 1"= 1000FT

WZI INC.
BAKERSFIELD, CALIFORNIA

KENT AVENUE FAMILY DAIRY, LLC

Well Location Map

DATE		EXHIBIT
9/05	1100480010	2



Legend

- ● Monitoring Well Location
- ⊙ ProductionWell Location

N

SCALE: 1"= 1000FT

WZI INC.
BAKERSFIELD, CALIFORNIA

KENT AVENUE FAMILY DAIRY, LLC

Groundwater Surface Elevation Map

DATE		EXHIBIT
9/05	1100480010	3

TABLES

KENT AVENUE FAMILY DAIRY
MONITORING WELL CONSTRUCTION DATA

TABLE 1

Well #	Location	Date Drilled	Boring Diameter (in)	Total Well Depth (ft)	Casing Depth (ft)	Casing Size (in)	Casing Type	Screen Type	Screen Interval	TOC Elevation (ft amsl)
MW-1	20S-21E-SEC3	7/18/2005	8	24	24	2	sch.40 PVC	sch.40 PVC	9'-24'	220.65
MW-2	20S-21E-SEC3	7/21/2005	8	25	25	2	sch.40 PVC	sch.40 PVC	10'-25'	219.03
MW-3	20S-21E-SEC3	7/18/2005	8	19	19	2	sch.40 PVC	sch.40 PVC	19'-4'	218.35
MW-4	20S-21E-SEC3	7/18/2005	8	22	22	2	sch.40 PVC	sch.40 PVC	7'-22'	218.90
MW-5	20S-21E-SEC3	7/21/2005	8	24	24	2	sch.40 PVC	sch.40 PVC	9'-24'	217.90
MW-6	20S-21E-SEC4	7/21/2005	8	23	23	2	sch.40 PVC	sch.40 PVC	8'-23'	217.00

TOC: Top of casing datum

KENT AVENUE FAMILY DAIRY
SUMMARY OF GROUNDWATER LEVELS

TABLE 2

Sample Date	MW-1			MW-2			MW-3		
	Depth to GW (ft)	Datum Elevation	GW Elev. (ft)	Depth to GW (ft)	Datum Elevation	GW Elev. (ft)	Depth to GW (ft)	Datum Elevation	GW Elev. (ft)
08/03/05	11.38	220.65	209.27	11.95	219.03	207.08	8.5	218.35	209.90

Sample Date	MW-4			MW-5			MW-6		
	Depth to GW (ft)	Datum Elevation	GW Elev. (ft)	Depth to GW (ft)	Datum Elevation	GW Elev. (ft)	Depth to GW (ft)	Datum Elevation	GW Elev. (ft)
08/03/05	10.62	218.90	208.28	9.48	217.90	208.42	7.85	217.00	209.15

Note: Water levels measured from top of casing datum

APPENDIX 1

LOG OF MW #1

Soil Description	Depth (feet)	Lithology	Casing/Liner	u.s.c.s. desig.	Remarks
Brown, silty SAND, moist, loose, fine grained.	0		2" Sch.40 Blank	SM	
	5				BENTONITE SAND PACK
	10		2" Sch.40 Slotted	SM	
					Water Contact 11.5'.
Brown, silty SAND, moist to wet, loose, fine grained.	15				
	20			SG	
Brown, clayey SAND, wet, dense, fine grained.					T. D. 24'
	25				
	30				
	35				

Surface Elevation: 220.65' (Top Csg)
Total Depth: 24'
Date Drilled:7/18/05
Logged By: A. Waggoner
Supervised By:
Diameter of Boring: 8"
Water Encountered At: ± 11.5'

Location: Kent Avenue Family Dairy

WZI

Project #: 1100480010

LOG OF MW #2

Soil Description	Depth (feet)	Lithology	Casing/Liner	u.s.c.s. desig.	Remarks
Light brown, silty SAND, moist, loose, clayey, fine grained.	0		2" Sch.40 Blank	SM	
Brown SAND, moist, loose to medium dense, silty, fine to medium grained.	5			SP	
Brown silty SAND, moist to wet, fine grained, clayey.	10		2" Sch.40 Slotted	SM	Water Contact 13.25'
	15				
Brown, clayey SAND, wet, dense, fine grained.				SC	
Brown silty SAND, wet, dense, fine to medium grained.	20			SM	
Gray to brown, sandy CLAY, wet, dense.				MH	T. D. 25'
	25				
	30				
	35				

Surface Elevation: 219.03' (Top Csg)
Total Depth: 25'
Date Drilled: 7/21/05
Logged By: A. Waggoner
Supervised By:
Diameter of Boring: 8"
Water Encountered At: ± 13.25'

Location: Kent Avenue Family Dairy

WZI

Project #: 1100480010

LOG OF MW #3

Soil Description	Depth (feet)	Lithology	Casing/Liner	u.s.c.s. desig.	Remarks
Brown, silty SAND, moist, loose, fine grained, clayey.	0		2" Sch.40 Blank	SM	
	5		2" Sch.40 Slotted		Water Contact 5.65'.
Brown clayey SAND, wet, loose, fine grained.	10			SL	
	15				
Brown SAND, wet, medium dense, fine to medium grained, silty.				SP	T. D. 19'
	20				
	25				
	30				
	35				

Surface Elevation: 218.35' (Top Csg)
Total Depth: 19'
Date Drilled:7/18/05
Logged By: A. Waggoner
Supervised By:
Diameter of Boring: 8"
Water Encountered At: ± 5.65'

Location: Kent Avenue Family Dairy

WZI

Project #: 1100480010

LOG OF MW #4

Soil Description	Depth (feet)	Lithology	Casing/Liner	u.s.c.s. desig.	Remarks
Brown, sandy SILT, moist, loose, fine grained.	0 5		2" Sch.40 Blank	ML	
Brown clayey SAND, moist, medium dense, fine grained.			2" Sch.40 Slotted	SC	Water Contact 8.5'.
Brown SAND, wet, dense, silty.	10 15			SM	
Brown very clayey SAND, wet, dense, fine grained.	20			SC	T. D. 22'
	25 30 35				

Surface Elevation: 218.90' (Top Csg)
Total Depth: 22'
Date Drilled:7/18/05
Logged By: A. Waggoner
Supervised By:
Diameter of Boring: 8"
Water Encountered At: ± 8.5'

Location: Kent Avenue Family Dairy

WZI

Project #: 1100480010

LOG OF MW #5

Soil Description	Depth (feet)	Lithology	Casing/Liner	u.s.c.s. desig.	Remarks
Brown, silty SAND, moist, loose, fine grained, clayey.	0		2" Sch.40 Blank	SM	
Brown clayey SAND, moist, medium dense.	5 10 15		2" Sch.40 Slotted	SL	Water Contact 11.25'
Brown sandy CLAY, wet, dense, fine grained sand.	20			CL	T. D. 24'
	25 30 35				

Surface Elevation: 217.90' (Top Csg)
Total Depth: 24'
Date Drilled:7/21/05
Logged By: A. Waggoner
Supervised By:
Diameter of Boring: 8"
Water Encountered At: ± 11.25'

Location: Kent Avenue Family Dairy

WZI

Project #: 1100480010

LOG OF MW #6

Soil Description	Depth (feet)	Lithology	Casing/Liner	u.s.c.s. desig.	Remarks
Brown, silty SAND, moist, loose, fine grained.	0		2" Sch.40 Blank	SM	
	5				2" Sch.40 Slotted
					Water Contact 9.4'.
Brown silty SAND, moist, medium dense, fine grained, clayey.	10				
Brown clayey SAND, wet, dense, fine grained.	15			SL	
Brown silty SAND, wet, medium dense, fine to medium grained.	20			SM	
Brown sandy CLAY, wet, dense, fine grained.				CL	T. D. 23'
	25				
	30				
	35				

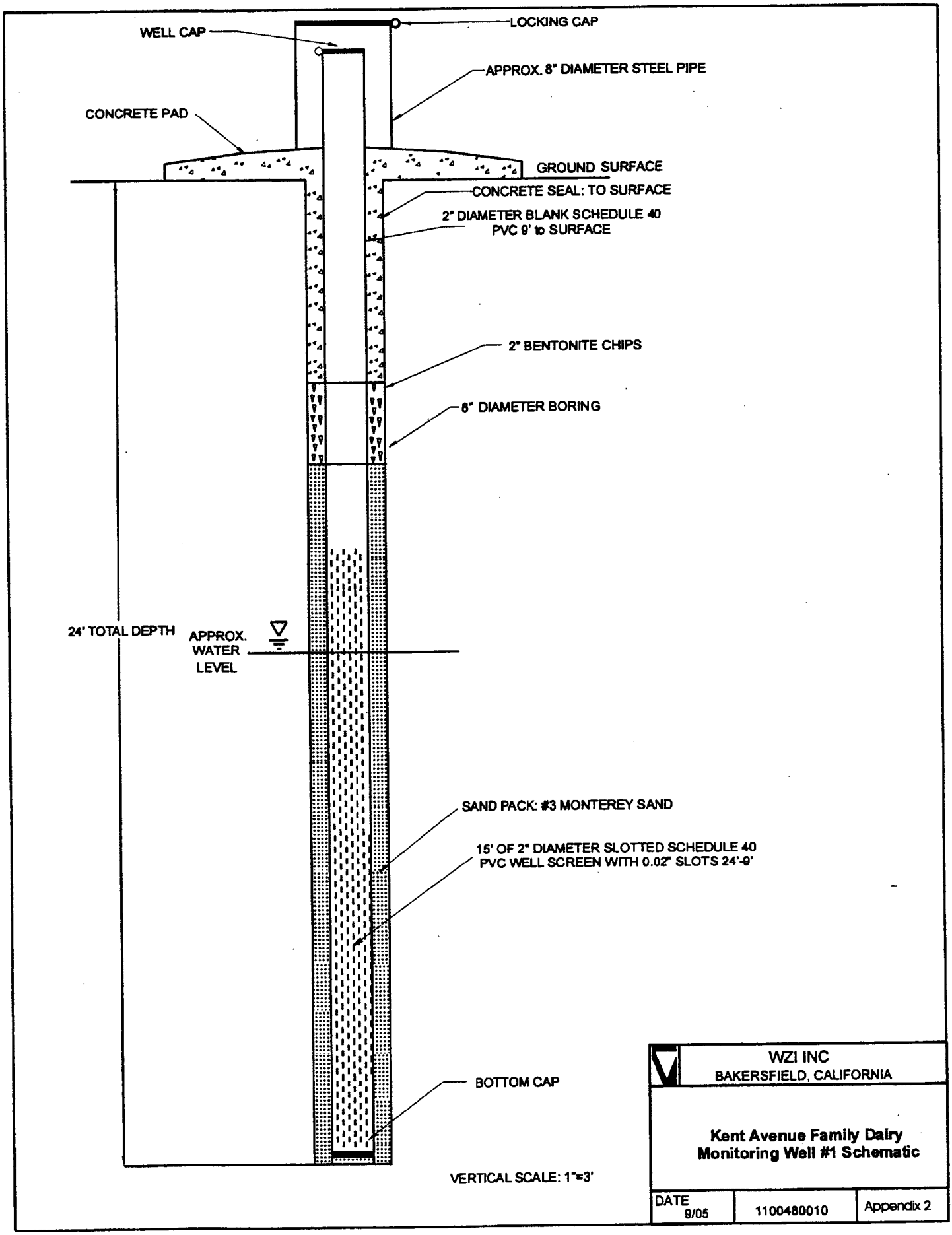
Surface Elevation: 217.00' (Top Csg)
Total Depth: 23'
Date Drilled:7/21/05
Logged By: A. Waggoner
Supervised By:
Diameter of Boring: 8"
Water Encountered At: ± 9.4'

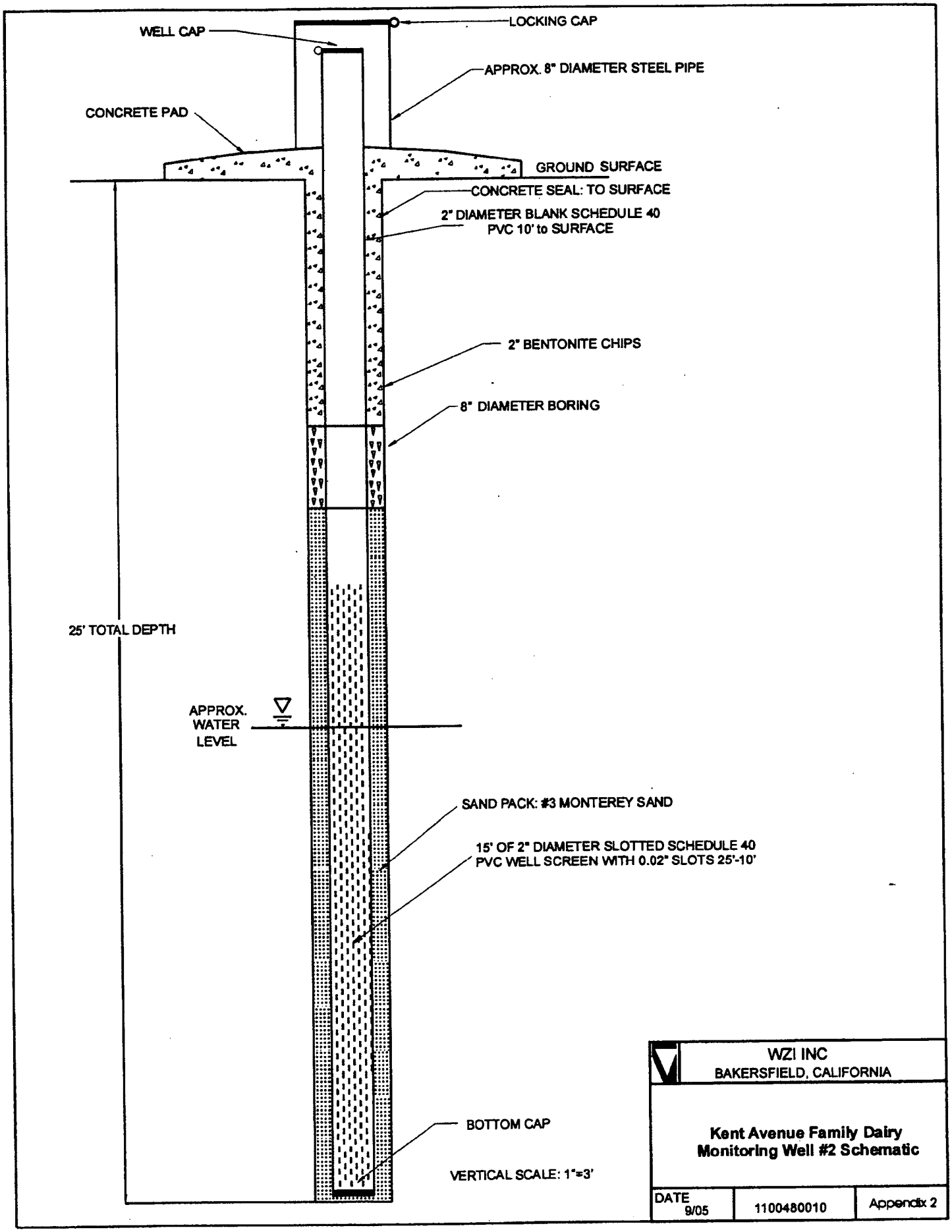
Location: Kent Avenue Family Dairy

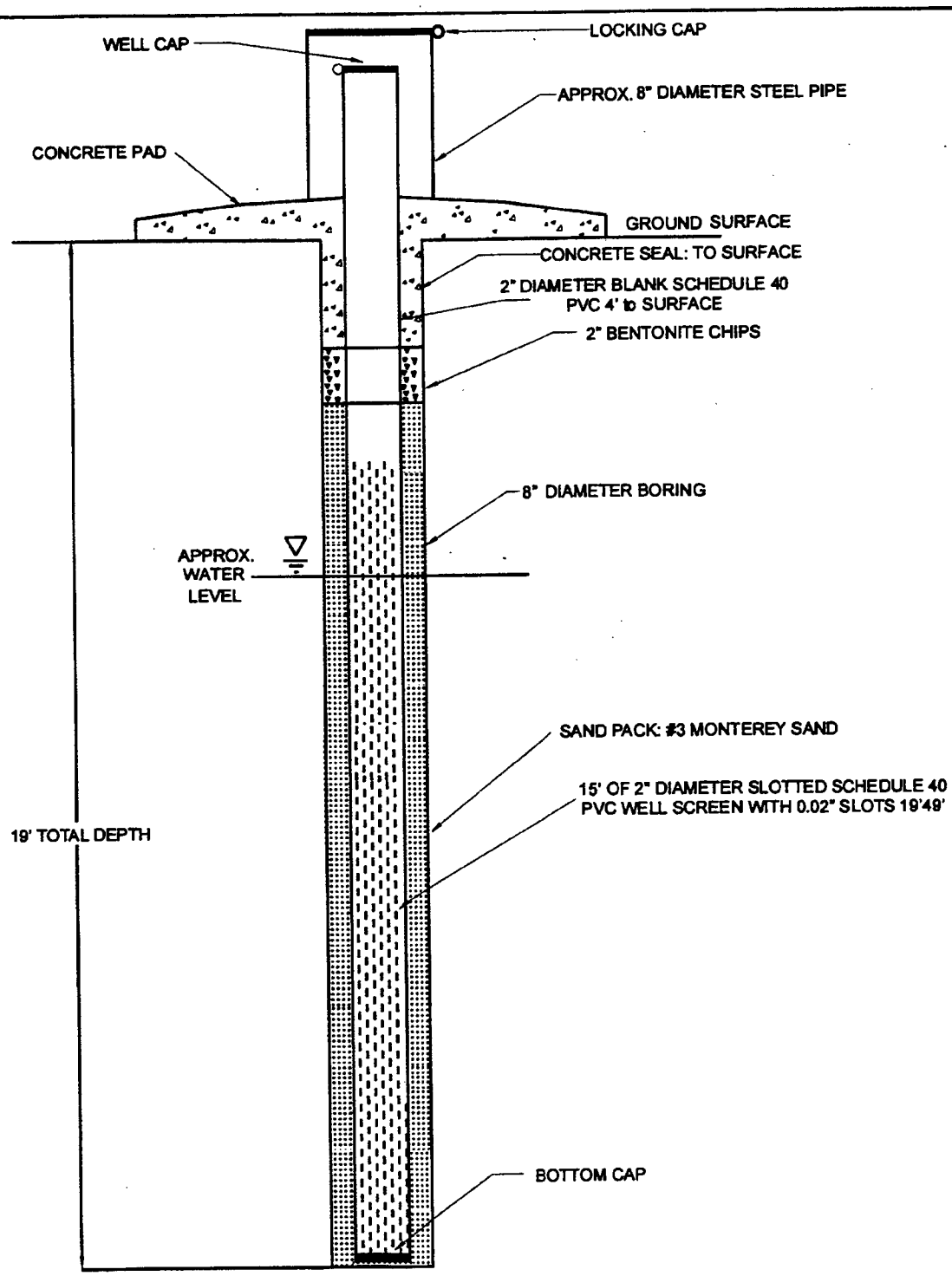
WZI

Project #: 1100480010

APPENDIX 2

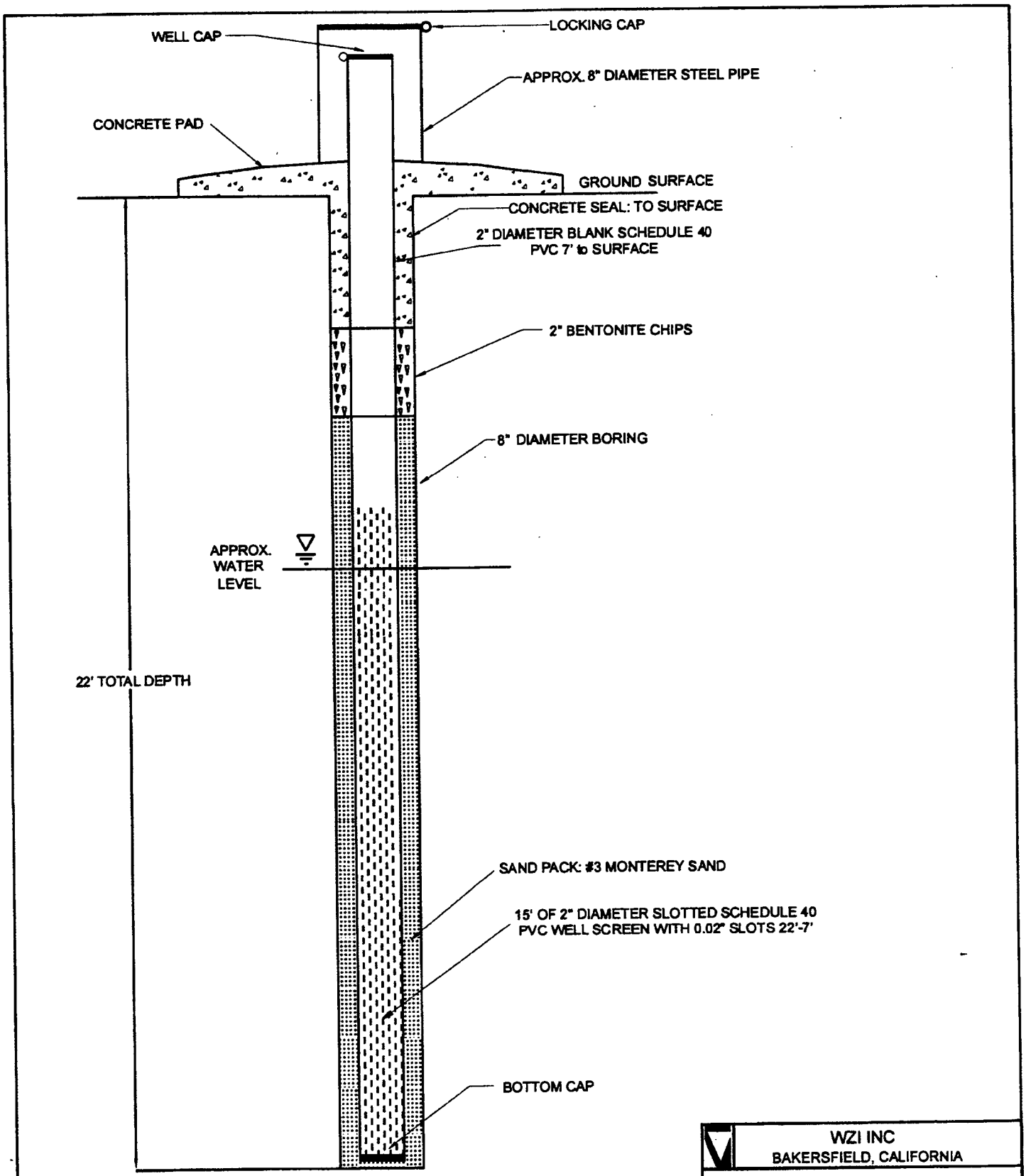

WELL CAP
LOCKING CAP
APPROX. 8" DIAMETER STEEL PIPE
CONCRETE PAD
GROUND SURFACE
CONCRETE SEAL: TO SURFACE
2" DIAMETER BLANK SCHEDULE 40
PVC 9' to SURFACE
2" BENTONITE CHIPS
8" DIAMETER BORING
24' TOTAL DEPTH
APPROX.
WATER
LEVEL
SAND PACK: #3 MONTEREY SAND
15' OF 2" DIAMETER SLOTTED SCHEDULE 40
PVC WELL SCREEN WITH 0.02" SLOTS 24'-9'
BOTTOM CAP
VERTICAL SCALE: 1"=3'
WZI INC
BAKERSFIELD, CALIFORNIA
Kent Avenue Family Dairy
Monitoring Well #1 Schematic
DATE
9/05
1100480010
Appendix 2


WELL CAP
LOCKING CAP
APPROX. 8" DIAMETER STEEL PIPE
CONCRETE PAD
GROUND SURFACE
CONCRETE SEAL: TO SURFACE
2" DIAMETER BLANK SCHEDULE 40
PVC 10' to SURFACE
2" BENTONITE CHIPS
8" DIAMETER BORING
25' TOTAL DEPTH
APPROX.
WATER
LEVEL
SAND PACK: #3 MONTEREY SAND
15' OF 2" DIAMETER SLOTTED SCHEDULE 40
PVC WELL SCREEN WITH 0.02" SLOTS 25'-10'
BOTTOM CAP
VERTICAL SCALE: 1"=3'
WZI INC
BAKERSFIELD, CALIFORNIA
Kent Avenue Family Dairy
Monitoring Well #2 Schematic
DATE
9/05
1100480010
Appendix 2



VERTICAL SCALE: 1"=3'

WZI INC BAKERSFIELD, CALIFORNIA	
Kent Avenue Family Dairy **Monitoring Well #3 Schematic**	
DATE 9/05	1100480010	Appendix 2

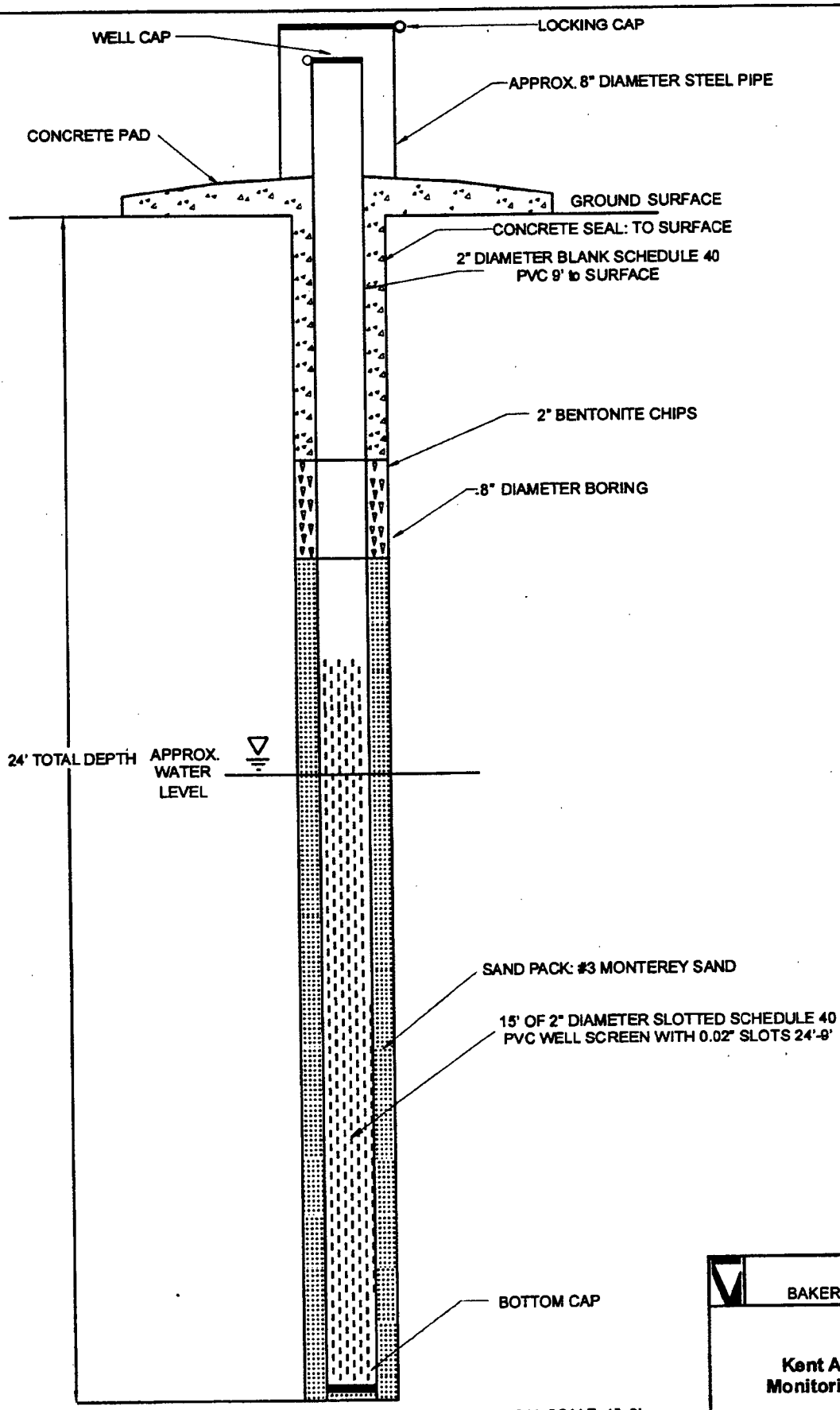


VERTICAL SCALE: 1"=3'

WZI INC
BAKERSFIELD, CALIFORNIA

Kent Avenue Family Dairy
Monitoring Well #4 Schematic

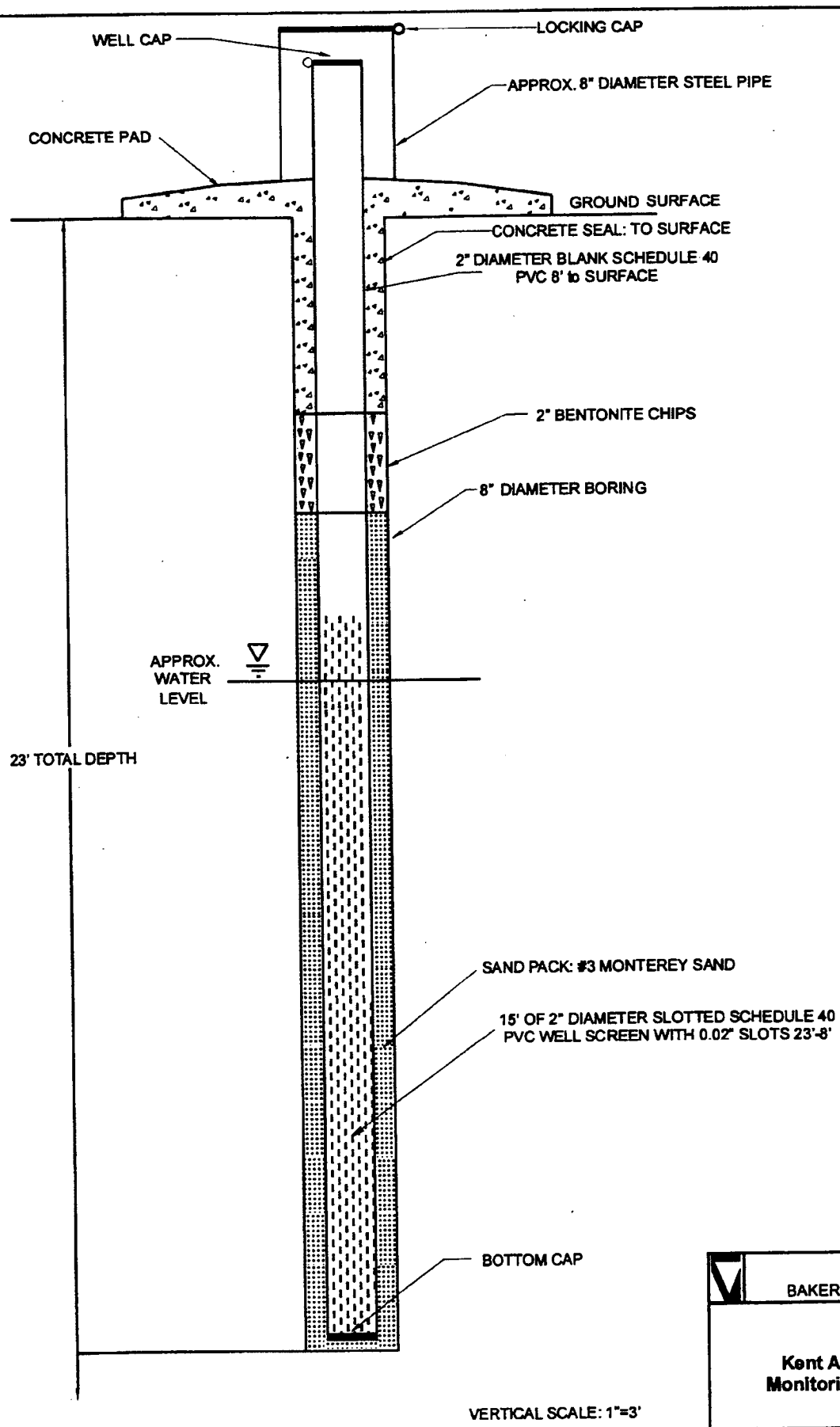
DATE 9/05	1100480010	Appendix 2



WZI INC
BAKERSFIELD, CALIFORNIA

Kent Avenue Family Dairy
Monitoring Well #5 Schematic

DATE		
9/05	1100480010	Appendix 2



WZI INC
BAKERSFIELD, CALIFORNIA

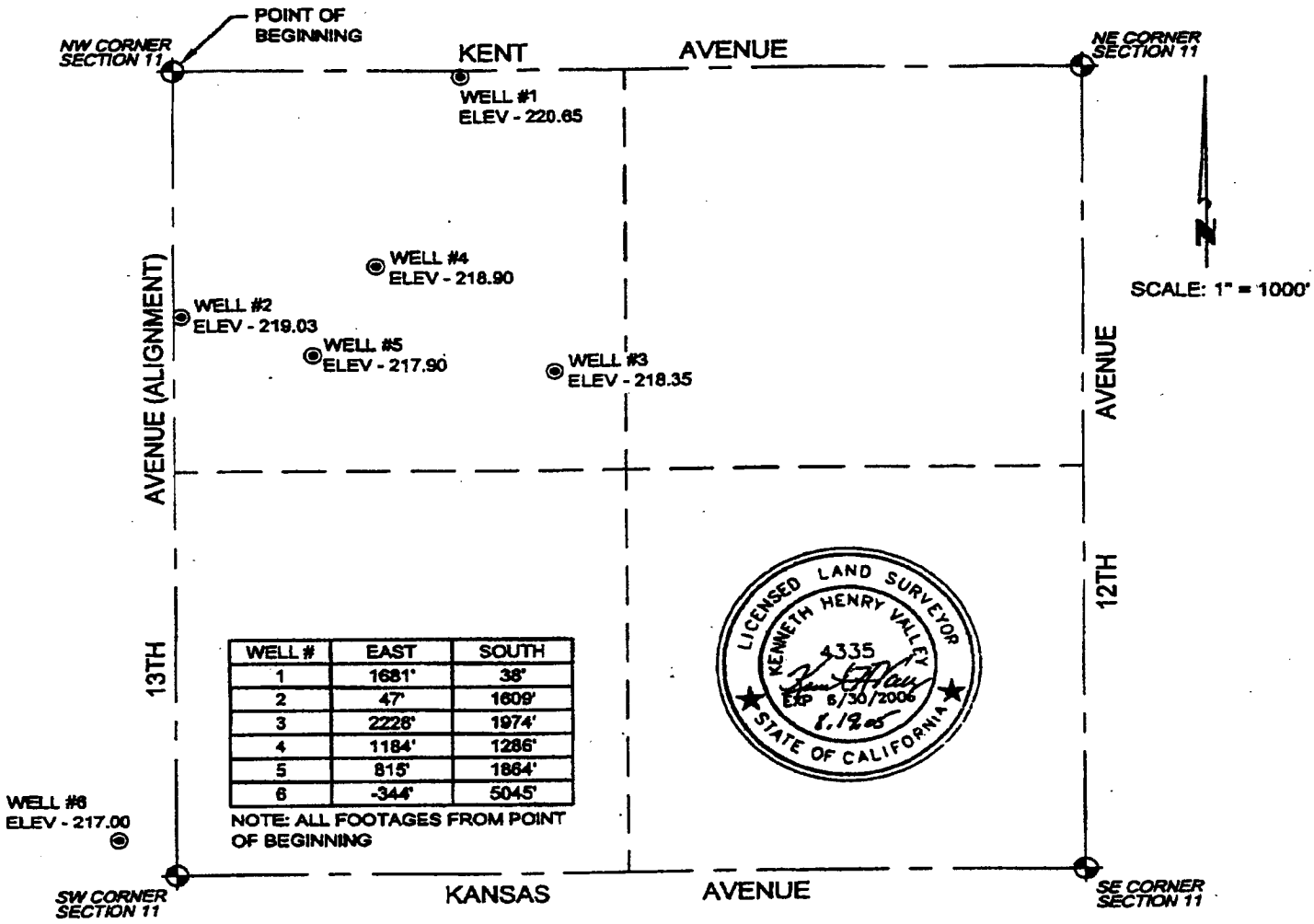
Kent Avenue Family Dairy
Monitoring Well #6 Schematic

DATE		
9/05	1100480010	Appendix 2

APPENDIX 3

KINGS COUNTY, CALIFORNIA

SECTION 3, T20S, R21E MDB&M



WELL #	EAST	SOUTH
1	1681'	38'
2	47'	1609'
3	2228'	1974'
4	1184'	1286'
5	815'	1864'
6	-344'	5045'

NOTE: ALL FOOTAGES FROM POINT OF BEGINNING

SCALE: 1"=1000'	DATE: 08.19.05	LANDMARK SURVEYING & ENGINEERING	EXHIBIT "A"
DRAWN: MED	Sheet 1 of 1		DRAWING NUMBER / REV. 0
PROJECT NUMBER	LOCATION		

MONITORING WELL LOCATIONS
MARTELLA DAIRY

KINGS COUNTY SECTION 3, T20S, R21E, MDB&M CALIFORNIA

MAP and ZON

CSS

Environmental Engineering Services

June 2006 Groundwater Monitoring Event Report
Maple Avenue Dairy
Laton, Fresno County, California

August 7, 2006

Prepared for: California Regional Water Quality Control Board
by: CSS Environmental Engineering Services
on Behalf of: Zonneveld Dairies, Inc.,

CSS PROJECT 05-010

CSS

Environmental Engineering Services
1505 North Wishon, Ave.
Fresno, CA 93728

C. Scott Smith, P.E
CE 40118
Office: (559) 442-0520
Cellular: (559) 347-8242
Facsimile: (559) 442-0520
E-Mail: cssenviro@aol.com

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AUG - 9 2006
RWQCB-CVR
FRESNO, CALIF.

August 7, 2006

CSS Project 05-010

Mr. Steve Hulbert, Environmental Scientist
California Regional Water Quality Control Board,
Central Valley Region
1685 E Street
Fresno, California 93706

SUBJECT: First 2006 Semi-Annual Groundwater Monitoring Event Report
Maple Avenue Dairy
Layton, Fresno County, California

Dear Mr. Hulbert:

On behalf of Zonneveld Dairies, Inc.(Zonneveld), CSS Environmental Engineering Services (CSS) has prepared this report documenting the findings of the subject monitoring event.

The findings support the proposal to reduce the monitoring frequency to annual. A meeting to further discuss this proposal withe the California Regional Water Quality Control Board is requested. Please advise the undersigned of your availability for the meeting.

Zonneveld has reviewed, and concurs with, the findings and recommendations presented in this report. If you have questions, and/or are in need of addition information, please call me at 559.442.0527.

Sincerely,
CSS Environmental Engineering Services

REGISTERED PROFESSIONAL ENGINEER
C. SCOTT SMITH
No. 040118
Exp. 3/31/09
CIVIL
STATE OF CALIFORNIA

C. Scott Smith, P.E.
Owner/Principal

C:\CSS\05\010 Zonneveld\June 06 event- Maple\cvr let.wpd

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- Figure 2 Site Plan
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- Appendix B Analytical Laboratory Reports
- Appendix C Well Hydrographs
- Appendix D Time Versus Concentration Graphs

FIRST 2006 SEMI-ANNUAL GROUNDWATER MONITORING EVENT REPORT
MAPLE AVENUE DAIRY
LATON, FRESNO COUNTY, CALIFORNIA

1.0 INTRODUCTION

This report summarizes the findings of the First 2006 Semi-Annual Groundwater Monitoring Event conducted at the Zonneveld Maple Avenue Dairy (Maple). The Maple facility is located about five miles northwest of Laton as shown on Figure 1. Also shown is the location of the Zonneveld Dairy Complex (Complex) which is also owned by Zonneveld Dairies, Inc. The management of manure from the Complex and Maple are integrated to maximize the benefit of manure nutrient usage.

The monitoring event was conducted in substantial conformance with the California Regional Water Quality Control Board (CRWQCB)-approved *Groundwater Investigation Workplan, Zonneveld Dairy Complex* (Workplan), dated May 7, 2002 (BSK Associates).

2.0 GROUNDWATER MONITORING NETWORK

The Maple monitoring network currently includes three wells. The locations of the wells are shown on Figure 2 and their screened intervals are summarized in Table 1.

3.0 BACKGROUND

3.1 Groundwater Monitoring and Assessments

Monitoring and assessment activities at the then proposed Maple Avenue Dairy commenced in 2002. In addition, the framework for a Nutrient Management Plan (NMP) for the Complex and Maple was developed and implemented by Livingston Dairy Consulting (LDC).

The Fall 2005 Groundwater Monitoring Event Report (CSS Environmental Engineering Services, *Fall 2005 Groundwater Monitoring Event Report, Zonneveld Dairies Complex, Laton, Fresno County, California*, February 11, 2006) presented the salient findings of the various assessments and groundwater monitoring events. Based on monitoring and assessment activities, it was concluded that (1) pre-existing NO3-N concentrations in groundwater have impaired the beneficial use of the water and (2) the higher NO3-N concentration upgradient of the site may be related to an upgradient source.

3.2 Nutrient Management

The NMP has been developed which address manure application at the Complex and Maple facilities. The application program maximizes the beneficial use of the manure at both dairies through

integration/use of the irrigation pipeline system. The overall objectives of the NMP are to maintain and regularly evaluate records of manure application practices toward (1) optimizing the beneficial use of the manure and (2) addressing crop nutrient requirements in concert with minimizing substantial vertical migration of the nutrients beyond the crop root zone. Evaluation of the effectiveness of the NMP is an ongoing process to assess potentially needed modifications in manure application practices to accomplish the objective. NMP implementation for the Complex and Maple facilities is an iterative process which is regularly evaluated as it evolves. The next monitoring Report will include a summary of pertinent findings of NMP monitoring, updating those presented in the Fall 2005 monitoring report, and any recommended changes in manure application practices.

4.0 MONITORING METHODOLOGIES

The monitoring event was conducted in substantial conformance with the Workplan, including:

- measurement of water levels;
- measurement of field parameters;
- well purging and water sample collection;
- water sample preservation, shipment; and chain-of custody protocol; and
- laboratory analytical procedures.

The field phase of the monitoring event was conducted by Del-Tech Geotechnical Services. Appendix A contains the field logs which include documentation of purge volumes and measurement of field parameters (EC, temperature, dissolved oxygen and turbidity).

In addition, at the request of the CRWQCB, the monitoring event included sampling and analyses of the lagoon water. Samples of the discharge from the pump at the lagoon were collected by Dellavalle Laboratories, Inc. (Dellavalle). Sample preservation, shipment; and chain-of custody protocol and laboratory analytical procedures were similarly in accordance with the Workplan.

5.0 MONITORING EVENT FINDINGS

The following subsections summarize the findings of the monitoring event.

5.1 Groundwater Levels and Flow Directions

Table 1 summarizes measured depths and associated groundwater elevations for the subject event and for the events since commencement of the monitoring program. Figure 3 presents a groundwater

contour elevation map for the subject monitoring event. Groundwater level data for the Complex is incorporated into the contour map.

5.2 Groundwater Sample Laboratory Analytical Results

The laboratory analytical reports for the subject event are included as Appendix B. Appendix B also includes the CRWQCB-requested cation/anion balance. Table 2 summarizes the laboratory analytical results for the subject event and for the events since commencement of the monitoring program.

The CRWQCB requested that water samples be analyzed for phosphorus. The request was inadvertently overlooked and future water sample analyses will include total phosphorous and orthophosphate.

5.3 Lagoon Water Sample Laboratory Analytical Results

The analytical results are included in Appendix B. Based on the analytical results, nitrogen compounds in the effluent are largely as ammonia (reported as ammonia nitrogen, NH4-N) and organic nitrogen (difference of Total Kjeldahl Nitrogen [TKN] and NH4-N). Future monitoring reports will include tabular summaries of historical results.

6.0 EVALUATION OF GROUNDWATER MONITORING FINDINGS

6.1 Groundwater Levels and Flow Directions

From Figure 3, the groundwater flow direction beneath the Complex and Maple facilities varied from westerly to northwesterly, as with previous monitoring events.

Well hydrographs for each Maple well are presented in Appendix C. From the well hydrographs, an over declining trend with time is seen at wells MW-8 and -9 with moderate rises occurring for the most-recent event.

6.2 Groundwater Analytical Results

Appendix D includes time versus concentration graphs for Electrical Conductivity and NO3-N, which are the key constituents in the assessment. Review of the graphs reveals the following:

- MW-8: No significant changes in NO3-N and a recent rise in EC. Comparison of laboratory reported EC (1002 umhos/cm), against the final field-measured EC (406 umhos) finds a significant disparity. Laboratory-reported EC levels are typically substantially close to field-measured levels. The source of the disparity is not clear and furture events will assist in evaluation of the validity of the data.

- *MW-9*: No significant changes in EC and NO3-N.
- *SW-1*: Increasing trend in EC and NO3-N (though last event in December 2003).

7.0 SUMMARY AND RECOMMENDATIONS

Comparison of the findings of the subject monitoring event to those of the previous events at Maple provides no indication of groundwater degradation associated with manure management practices at Maple. A trend of rising EC and NO3-N was observed in upgradient well SW-1 through December 2003 and the well has since been dry. A workplan for a new well to replace SW-1 will be submitted to provide for construction of the well prior to the forthcoming event.

Based on the findings of this report, it is recommended that groundwater monitoring be conducted annually at wells MW-8 and -9 and that semi-annual monitoring be conducted at the replacement upgradient well until for three consecutive events. Should trends of increasing concentrations be evident, then an increased monitoring frequency may be in order at selected wells.

8.0 LIMITATIONS

This monitoring report has been prepared for the exclusive use of Zonneveld Dairies, Inc., Livingston Dairy Consulting, and regulatory agencies overseeing the Complex. It has been prepared in accordance with current generally accepted standards for engineering practice in the area. The findings are valid as of the present and may change with changes in Complex conditions and/or regulatory requirements. No other warranty is implied.

TABLE 1
SUMMARY OF MONITORING WELL SCREENED INTERAVALS AND HISTORIC WATER LEVEL MEASUREMENTS AND ELEVATIONS
MAPLE AVENUE DAIRY

Well No.	Screened Interval (depth[1])	Screened Interval (elevation[2])	Date	Reference Elevation[2]	Groundwater Depth[1]	Groundwater Elevation[2]
MW 8	65.0-95.0	175.6-145.6	09/14/02	240.63	71.72	168.91
			01/31/03	240.63	71.77	168.86
			05/13/03	240.63	73.26	167.37
			12/17/03	240.63	77.58	163.05
			07/28/04	240.63	83.80	156.83
			11/17/04	240.63	86.47	154.16
			10/05/05	240.63	87.42	153.21
			06/16/06	**240.63**	**83.86**	**156.77**
MW 9	65.0-95.0	175.2-145.2	09/14/02	240.19	72.44	167.75
			01/31/03	240.19	71.69	168.50
			05/13/03	240.19	73.71	166.48
			12/17/03	240.19	77.83	162.36
			07/28/04	240.19	82.60	157.59
			11/17/04	240.19	85.69	154.50
			10/05/05	240.19	86.84	153.35
			06/16/06	**240.19**	**83.72**	**156.47**
SW 1	73.0-82	171.6-162.6	06/21/01	244.56	67.00	177.56
			09/17/01	244.56	68.21	176.35
			10/01/01	244.56	68.43	176.13
			04/19/02	244.56	68.65	175.91
			06/05/02	244.56	71.67	172.89
			11/13/02	244.56	74.15	170.41
			01/31/03	244.56	74.04	170.52
			05/13/02	244.56	76.63	167.93
			12/17/03	244.56	79.51	165.05
			10/05/05	244.56	(dry)	
			06/16/06	**244.56**	**(dry)**	

NOTES

1 feet measured from top of casing
2 feet above mean sea level
ob wells are open bottom; screened interval not established

CSS

TABLE 2
SUMMARY OF GROUNDWATER SAMPLE ANALTICAL RESULTS
MAPLE AVENUE DAIRY

WELL NO.	DATE	pH[1]	EC[2]	TDS[3]	NO3-N[4]	NO2-N[5]	NH4-N[6]	TKN[7]	K[8]	Ca[9]	Mg[10]	Na[11]	SO4[12]	Cl[13]	Alk[14]	HCO3[15]	CO3[16]	OH[17]
MW 8	11/14/02	7.4	590	360	12	<0.25	<1	<1	<2	23	1.7	100	16	19	220	220	<1	<1
	01/31/03	7.5	590	370	11	<0.10	<1	<1	<2	29	1.4	91	12	8	220	220	<1	<1
	05/13/03	7.3	490	310	14	<0.10	<1	2	<2	31	0.6	68	15	7	170	170	<1	<1
	12/17/03	8.1	580	400	9.5	<0.10	<1	<1	<2	30	1	90	13	9	260	260	<1	<1
	07/28/04	8.1	610	390	12	na	<1	<1	<2	43	0.8	100	16	15	260	260	<1	<1
	11/17/04	8	530	340	11	<0.05	<1	<1	<2	40	0.7	87	12	10	230	230	<1	<1
	10/06/05	7.7	513	324	9.9	<0.1	0.1	<1	0.8	42.4	0.7	80.4	10.6	10.2	223	223	<1	<1
MW 9	11/14/02	8.2	480	310	9.7	<0.25	<1	<1	<2	14	0.9	84	32	10	170	170	<1	<1
	01/31/03	8.1	540	50	8.2	<0.05	<1	<5	<2	34	1	83	28	5	210	210	<1	<1
	05/13/03	7.7	490	320	8	<0.10	<1	3	<2	27	0.7	76	25	6	200	200	<1	<1
	12/17/03	8.1	490	320	7.7	<0.10	<1	<1	<2	30	0.8	70	28	7	200	200	<1	<1
	07/28/04	8.2	510	330	8.1	na	<1	<1	<2	34	0.8	86	35	6	200	200	<1	<1
	11/17/04	8.1	540	360	8.4	<0.05	<1	<1	<2	39	0.9	94	35	6	240	240	<1	<1
	10/06/05	8.1	518	386	8.8	<0.1	0.2	<1	0.6	31.5	0.6	87.5	36.5	8.8	195	195	<1	<1
SW 1	10/01/01	7	520	320	13	<0.25	<1	<1	<2	57	4.4	52	17	11	180	180	<1	<1
	04/19/02	8	570	360	16	<0.2	<1	<1	<2	47	5.6	57	16	23	180	180	<1	<1
	11/13/02	6.9	630	380	19	<0.25	<1	<1	<2	62	3.9	59	18	25	200	200	<1	<1
	01/31/03	7.2	670	410	19	<0.1	<1	1	<2	66	4.6	57	17	27	210	210	<1	<1
	05/13/03	7.1	710	430	22	<0.1	<1	<1	<2	76	5.2	63	16	27	220	220	<1	<1
	12/17/03	7.9	760	480	23	<0.1	<1	<1	<2	63	4.1	78	22	39	240	240	<1	<1

NOTES

1 standard units
2 Specific Electrical Conductance in micromhos/centimeter
3 Total Dissolved Solids in milligrams/liter (mg/l)
4 Nitrate Nitrogen in mg/l
5 Nitrite Nitrogen in mg/l
6 Ammonia Nitrogen
7 Total Kjeldahl Nitrogem in mg/l
8 Potassium in mg/l
9 Calcium in mg/l
10 Magnesium in mg/l
11 Sodium in mg/l
12 Sulfate in mg/l
13 Chloride in mg/l
14 Alkalinity in mg/l
15 Bicarbonate in mg/l
16 Carbonate in mg/l
17 Hydroxide in mg/l
18 Indicated constituent was not chemically analyzed

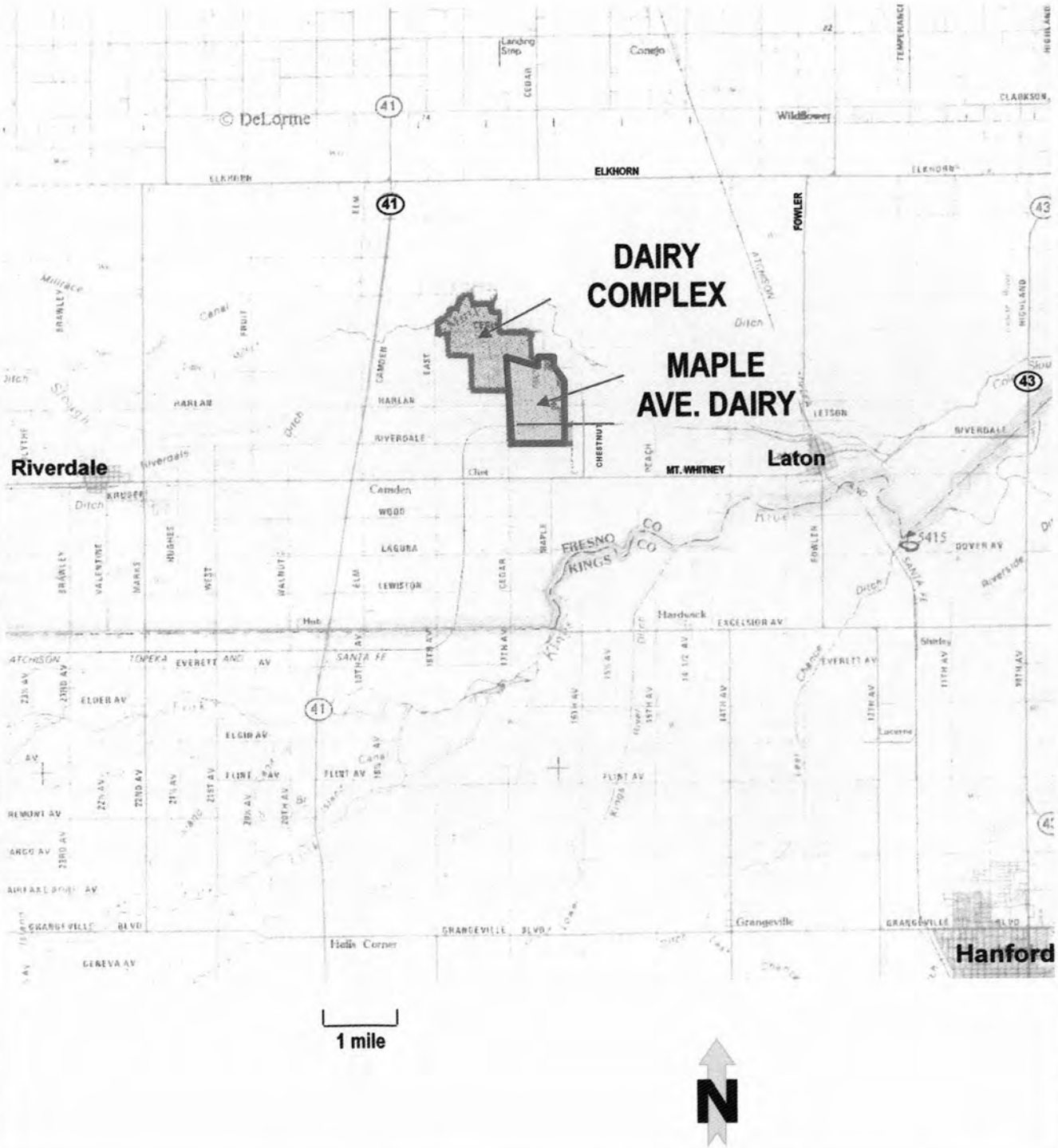


FIGURE 1

CSS 05 – 010

LOCATION MAP

Zonneveld Dairies Complex and Maple Avenue Dairy
Laton, Fresno County, California

CSS

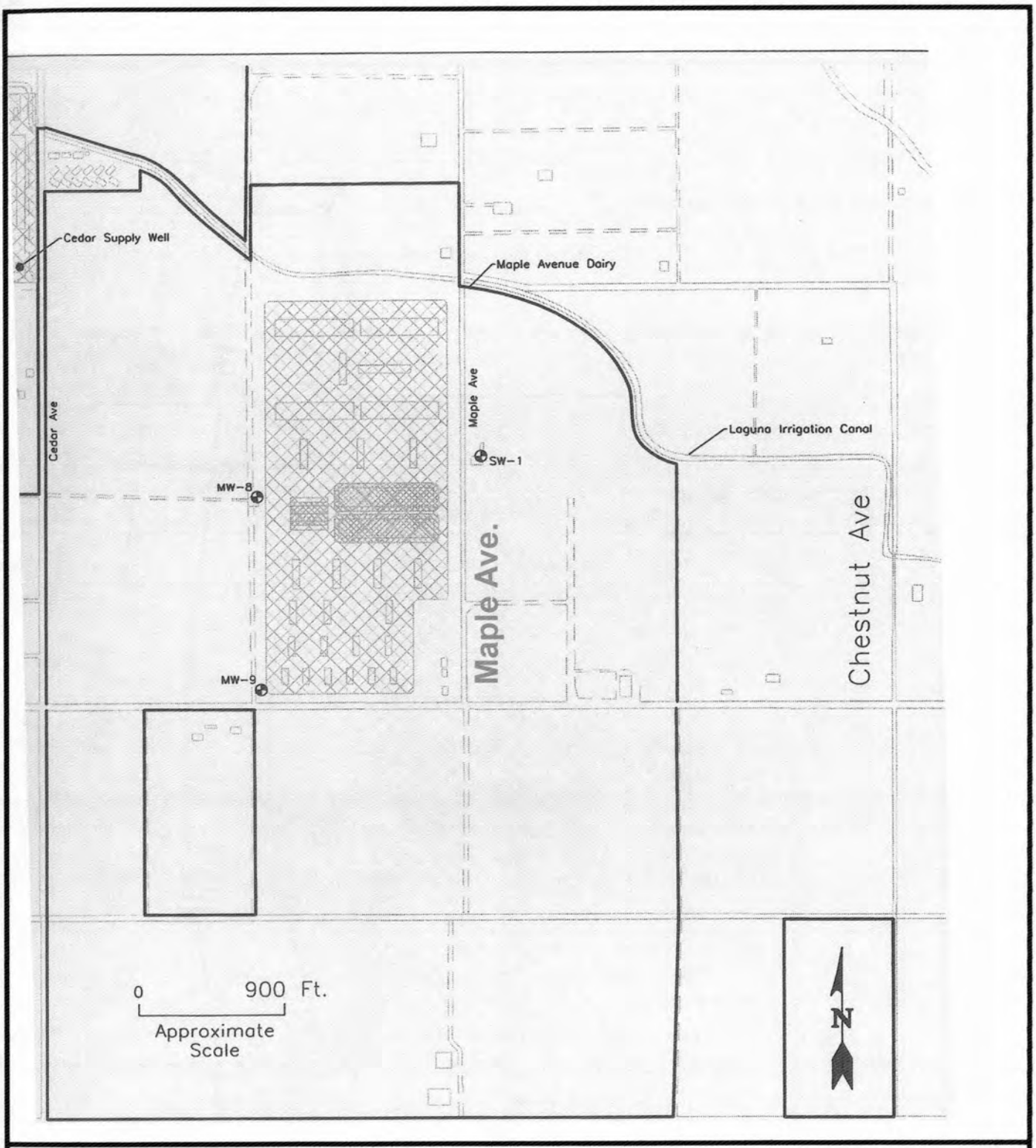
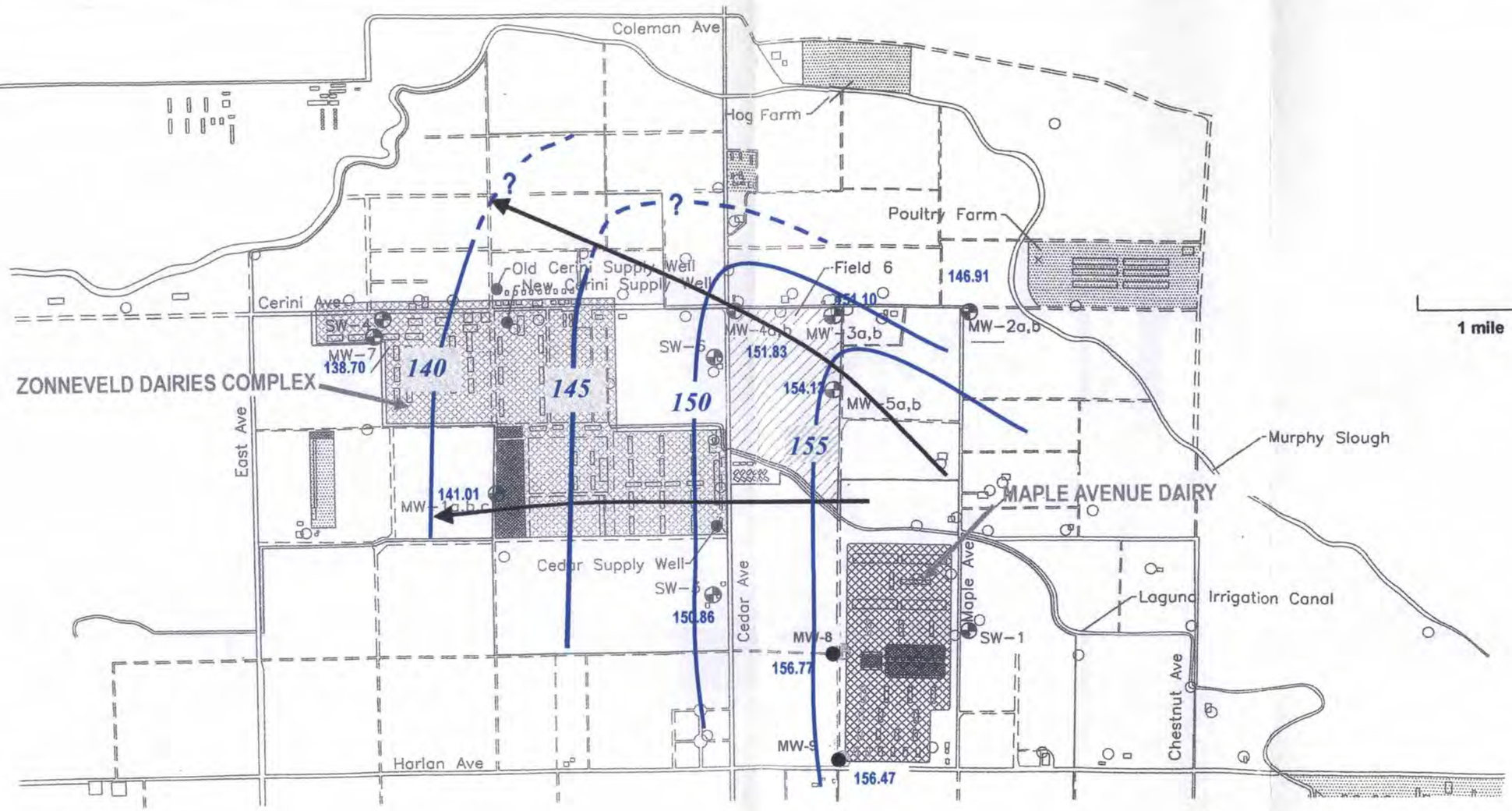


FIGURE 2
CSS 05 –010

SITE PLAN
Maple Avenue Dairy
Laton, Fresno County, California

CSS



Base Map Source: *BSK Associates, Groundwater Monitoring Program Report, Fall 2003 Semi-Annual Monitoring Event, Zonneveld Dairies Complex*, April 30, 2004

153.35 Groundwater Elevation Contour

Groundwater Elevation (feet above mean sea level)

Inferred Groundwater Flow Direction

FIGURE 3
CSS 05-010
JULY 2006

GROUNDWATER CONTOUR ELEVATION MAP- "A" WELLS JULY 15-16, 2006

First 2006 Semi-Annual Groundwater Monitoring Event
Zonneveld Dairies Complex and Maple Avenue Dairy
Laton, Fresno County, California

CSS

ANNUAL DAIRY REPORT JULY 1, 2008
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

RECEIVED
JUL 02 2008
RWQCB-CVR
FRESNO, CALIF.

Name of Operator	Josh Zonneveld
Name of Dairy Facility	Maple Avenue Dairy
Facility Address	19860 S Maple Ave Laton, Ca 93242
Contact Name and Phone Number	Josh Zonneveld 559 923 4546

All attachments included with Annual Report should include dairy name and address

1. **Report Period: May 3, 2007 to December 31, 2007**

2. **Annual Dairy Facility Assessment (ADFA)**
Were there or will there be any changes to the information provided in your Preliminary Dairy Facility Assessment (PDFA)? This includes any changes or proposed changes included in the Proposed Interim Facility Modification to Balance Nitrogen and to Improve Storage Capacity, if submitted.
☑ Yes, you must complete and include the ADFA (an updated PDFA) with your Annual Report. The ADFA (the updated PDFA) should be completed assuming that all proposed interim modifications have been completed.
☐ No (you do not need to complete or submit the ADFA) updated & still complies with nitrogen ratio.

3. **Number and Type of Animals (complete Attachment A and attach)**

4. **Estimated Amount of Total Manure, Process Wastewater, and Nutrients Generated (complete Attachment A and attach)**

5. **Estimated Amount of Total Manure, Process Wastewater, and Nutrients Applied:**
No information at this time on the total manure or process wastewater applied or the nitrogen, phosphorus, potassium or total salt content of this waste

6. **Estimated Amount of Total Manure, Process Wastewater, and Nutrients Transferred to Other Persons:** (Report period 6/30/07 to 12/31/07)

No information at this time on the nitrogen, phosphorus, potassium or total salt content of this waste.
Total Manure: 21,400 tons
Total Process Wastewater: 0 gallons
Refer to item #13 below to attach copies of individual manifests.

7. **Land Application Area Description (complete table in #8 below)**

8. **Areas Where Manure and Process Wastewater Were Applied During the Reporting Period (May 3 through Dec. 31, 2007)**

All Land Application Areas Owned, Rented or Leased (identify by name or number)	Assessor's Parcel #	Acres	Type of Waste Applied (manure, process wastewater, both or none during the reporting period of May 3 to Dec. 31, 2007)
1	55-37-07	19	manure
2	55-15-17	64	wastewater
3	55-15-11	77	both
4	55-37-01	19	wastewater
5	55-14-01	55	both
12	55-37-13	68	both
15	55-14-10	15	wastewater
18	55-37-02	18	wastewater
52	55-37-15	75	none
55	55-14-11	15	none
W-1	55-37-09	38	none
W-2	57-02-10	19	none
T-1	56-60-01	41	none
T-2	56-60-01	36	none
T-6	56-60-01	31	none
Total		593	

Preliminary Dairy Facility Assessment Report

DAIRY FACILITY INFORMATION

A. NAME OF DAIRY OR BUSINESS OPERATING THE DAIRY: Zonneveld Dairies Inc.

Physical address of dairy:

19860 S Maple AVE	Updated 5/14/08	Laton	Fresno	93242
Number and Street		City	County	Zip Code

Street and nearest cross street (if no address):

LAND AREA ESTIMATES

A. LAND AREA

Size of the dairy production area (corrals, barns, ponds, feed storage): 87.0 acres

Estimated area (including roofed, impervious, and earthen surfaces) that receives rainfall which drains into the wastewater retention pond(s): 50.0 acres

Size of the crop land area currently used for manure (lagoon and solids) application: 545.0 acres

HERD AND MILKING ESTIMATES

A. HERD INFORMATION

	Milk Cows	Dry Cows	Bred Heifers (15-24 mo.)	Heifers (7-14 mo. to breeding)	Calves (4-6 mo.)	Calves (0-3 mo.)
Number / head	2,000	300	780	300	636	289
Avg live weight (lbs)	1,100	1,300	900	500		
Avg milk production (lbs/cow/day)	75					
Daily hours on flush	16	5	5	0	0	0

Predominant animal breed: Holstein

Storage period: 120 days

Average number of milk cows per string sent to milkbarn: 250 milk cows per string

Number of milkings per day: 2.0 milkings per day

Number of times milk tank is emptied each day: 2.0 milk loads per day

Number of hours spent milking each day: 18.0 hours per day

Bulk tank wash and sanitizing: 3 run cycles

Pipeline wash and sanitizing: 3 run cycles

Copies of this assessment shall be maintained for 10 years.

These calculations are preliminary and approximate only. Completion of your Waste Management Plan and Nutrient Management Plan will provide you with more detailed and precise calculations upon which to make important decisions.

B. MILKBARN EQUIPMENT AND PARLOR FLOOR WASH

All numerical values in gallons per day	Milkbarn/parlor floor wash	Fresh water used in manure flush lanes	Plate coolers	Vacuum pumps / air compressors / chillers
Selected Type:	Traditional Manual Parlor Floor Wash		Well Water Cooled (Water Reused/Recycled)	Mechanically/Air Cooled
Estimated:	16,000		69,767	0
User-Entered:		0		
Volume used in calculations:	16,000	0	69,767	0
Source is recycled water:	[X] Yes [ ] No			

C. MISCELLANEOUS EQUIPMENT

No miscellaneous equipment added to the preliminary dairy facility assessment.

D. DRINKING WATER SOURCE

Reused water is the source of herd drinking water: [ ] Yes [X] No

If yes, total amount of reused water consumed: _____ gallons per head per day

E. SPRINKLER PEN

Number of sprinklers in the holding pen: 60 sprinklers

Length of each sprinkler cycle: 2.0 minutes

Number of sprinkler pen cycles per string: 2 cycles/string

Water flow rate of each sprinkler head: 5.0 gallons per minute

Sprinkler pen wastewater volume: 19,200 gallons per day

Sprinklers reuse water from equipment: [X] Yes [ ] No

F. MILKBARN WATER CALCULATIONS

Water available for reuse/recycle: 69,767 gallons per day

Recycled water used again: 35,200 gallons per day

Balance: 34,567 gallons per day

Milkbarn water sent to pond: 71,417 gallons per day

Milkbarn water leaving system: 0 gallons per day

RETENTION PONDS STORAGE CAPACITY ESTIMATES

A. PONDS

Copies of this assessment shall be maintained for 10 years.

These calculations are preliminary and approximate only. Completion of your Waste Management Plan and Nutrient Management Plan will provide you with more detailed and precise calculations upon which to make important decisions.

numerical values in feet

Basin Name	Earthen Length (EL)	Earthen Width (EW)	Earthen Depth (ED)	Side Slope H:V (S)	Free Board (FB)	Dead Storage Loss (DS)	Storage Volume Corrected for Dead Storage Loss (ft^3)
pond 1	667	180	25	2.0	2	0	1,792,697
pond 2	667	180	25	2.0	2	0	1,792,697

RAINFALL ESTIMATES

A. RAINFALL AND DRAINAGE INFORMATION

Rainfall station nearest the facility:	Hanford
Storage period:	120 days
25 year / 24 hour storm event (NOAA Atlas 2, 1973):	2.10 inches
Storage period rainfall (DWR climate data):	5.88 inches
Combined storage period rainfall and 25 year / 24 hour storm event:	7.98 inches
Estimated rainfall onto and drained into the wastewater retention pond:	12,029,048 gallons

NUTRIENT REMOVAL BY CROP ESTIMATES

A. CROPS

Acres Planted	Crop Type	Yield (tons/acre)	Moisture (%)	Protein (%)	Phosphorus (lbs/ton yield)	Nitrogen Removed (lbs)	Phosphorus Removed (lbs)
545	Corn silage	35.0	70.0	1.9	0.5	34,793	9,538
545	Wheat silage boot stage	15.0	70.0	2.8	0.4	21,974	3,270

ANNUAL NUTRIENT IMPORT & EXPORT ESTIMATES

A. ANNUAL NUTRIENT IMPORTS

Combined estimate of nutrients from commercial fertilizers and atmospheric Nitrogen applied to crops:

Nutrient Description	Amount Applied (lbs)
Nitrogen (N)	0
Phosphorus as Orthophosphate (P2O5)	0
Potassium as Potash (K2O)	0
Atmospheric Nitrogen Deposition	7,630

Atmospheric Nitrogen Deposition Rate (ANDR) = 14 lbs N / acre / year

Copies of this assessment shall be maintained for 10 years.

These calculations are preliminary and approximate only. Completion of your Waste Management Plan and Nutrient Management Plan will provide you with more detailed and precise calculations upon which to make important decisions.

B. ANNUAL NUTRIENT EXPORTS

Manure Type	Volume Exported	Moisture Content	Total Nitrogen	Total Phosphorus
Separator Solids	0 tons	0.00 %	0.00 %	0.00 %
Corral Solids	21,400 tons	23.00 %	1.80 %	1.27 %
Liquid Manure	0 gallons	N/A	0.00 mg/L	0.00 mg/L

PRELIMINARY DAIRY FACILITY ASSESSMENT SUMMARY

A. LAND USE

Dairy production area (corrals, barns, ponds, feed storage):	87	acres
Estimate the area (including roofed, impervious, and earthen surfaces) that receives rainfall which drains into a wastewater retention pond:	50	acres
Crop land area used for manure application:	545	acres

B. HERD, MILKING, AND MILKBARN/PARLOR

Milk cows:	2,000	head
Dry cows:	300	head
Bred heifers (15 - 24 months):	780	head
Heifers (7 - 14 months to breeding):	300	head
Calves (4 - 6 months):	636	head
Calves (0 - 3 months):	289	head
Total number of animals:	4,305	head
Average number of milk cows per string sent to milk barn:	250	cows per string
Number of milking strings entering milk barn per milking:	8.00	strings per milking
Storage period:	120	days
Total manure production by herd for storage period:	740,471	cu. ft.
Estimated manure production for storage period (to dry lot):	346,300	cu. ft.
Estimated manure production for storage period (to pond):	2,948,599	gallons
Total milkbarn water volume for storage period (to pond):	8,570,040	gallons

C. ROOFED, IMPERVIOUS, AND EARTHEN RAINFALL RUNOFF AREAS

Total area receiving rainfall and draining to ponds (production area):	2,178,000	sq. ft.

Copies of this assessment shall be maintained for 10 years.

These calculations are preliminary and approximate only. Completion of your Waste Management Plan and Nutrient Management Plan will provide you with more detailed and precise calculations upon which to make important decisions.

D. RETENTION POND AND SETTLING BASIN ESTIMATES

Liquid storage surface area (retention ponds only):	240,120	sq. ft.
Rainfall onto and drained into retention ponds for storage period:	12,029,048	gallons
Waste production as manure:	2,948,599	gallons
Milkbarn water:	8,570,040	gallons
Milkbarn water comparative estimate:	36	gallons per cow per day
Fresh flush water for storage period:	0	gallons
25 year / 24 hour storm event (NOAA Atlas 2, 1973):	2.10	inches
Critical storage period rainfall (DWR Climate Data):	5.88	inches
Combined critical storage period and 25 year / 24 hour storm event:	7.98	inches
Total storage capacity required:	23,547,687	gallons
	3,147,868	cu. ft.
Existing storage capacity (adjusted for dead storage loss):	26,820,605	gallons
	3,585,393	cu. ft.
Existing capacity meets estimated storage needs:	Yes	

E. NITROGEN (N) AND PHOSPHORUS (P) EXCRETION ESTIMATES

Daily gross nitrogen excretion estimates:	2,440	lbs nitrogen per day
Annual gross nitrogen excretion estimates:	890,481	lbs nitrogen per year
Nitrogen to pond storage after ammonia losses (30% loss applied):	338,900	lbs nitrogen per year
Nitrogen to drylot storage after ammonia losses (30% loss applied):	284,438	lbs nitrogen per year
Total nitrogen in storage (ponds and drylot combined):	623,337	lbs nitrogen per year
Daily gross phosphorus excretion estimates:	395	lbs phosphorus per day
Annual gross phosphorus excretion estimates:	144,136	lbs phosphorus per year
Phosphorus to pond storage:	81,597	lbs phosphorus per year
Phosphorus to drylot storage:	62,540	lbs phosphorus per year
Total phosphorus in storage (ponds and drylot combined):	144,136	lbs phosphorus per year

F. NITROGEN AND PHOSPHORUS IMPORT ESTIMATES

Total nitrogen imports onto facility as commercial fertilizers:	0	lbs nitrogen per year
Atmospheric Nitrogen Deposition (ANDR):	7,630	lbs nitrogen per year
Total phosphorus imports onto facility as commercial fertilizers:	0	lbs phosphorus per year

G. NITROGEN AND PHOSPHORUS EXPORT ESTIMATES

Total nitrogen exports off facility as manure:	593,208	lbs nitrogen per year
Total phosphorus exports off facility as manure:	418,541	lbs phosphorus per year

Copies of this assessment shall be maintained for 10 years.

These calculations are preliminary and approximate only. Completion of your Waste Management Plan and Nutrient Management Plan will provide you with more detailed and precise calculations upon which to make important decisions.

H. ANNUAL NITROGEN AND PHOSPHORUS BALANCE ESTIMATE

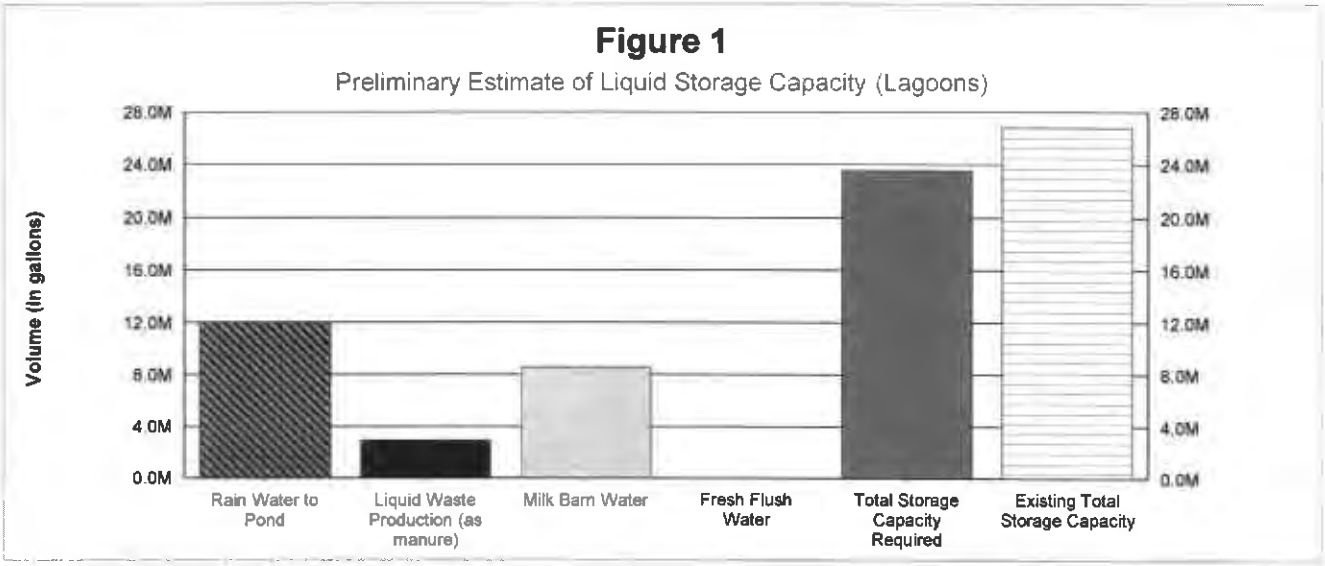
Total nitrogen in storage (after 30% ammonia loss):	623,337	lbs
Nitrogen imported (as commercial fertilizer and ANDR):	7,630	lbs
Nitrogen exported as manure:	593,208	lbs
Nitrogen removed by crops:	56,767	lbs
Excess nitrogen (N generated - N removed):	-19,008	lbs
Whole farm nitrogen balance ratio:	0.67	
Total phosphorus in storage:	144,136	lbs
Phosphorus imported as commercial fertilizer:	0	lbs
Phosphorus exported as manure:	418,541	lbs
Phosphorus removed by crops:	12,808	lbs
Excess phosphorus (P generated - P removed):	-287,213	lbs

Copies of this assessment shall be maintained for 10 years.

These calculations are preliminary and approximate only. Completion of your Waste Management Plan and Nutrient Management Plan will provide you with more detailed and precise calculations upon which to make important decisions.

CHARTS

A. FIGURE 1



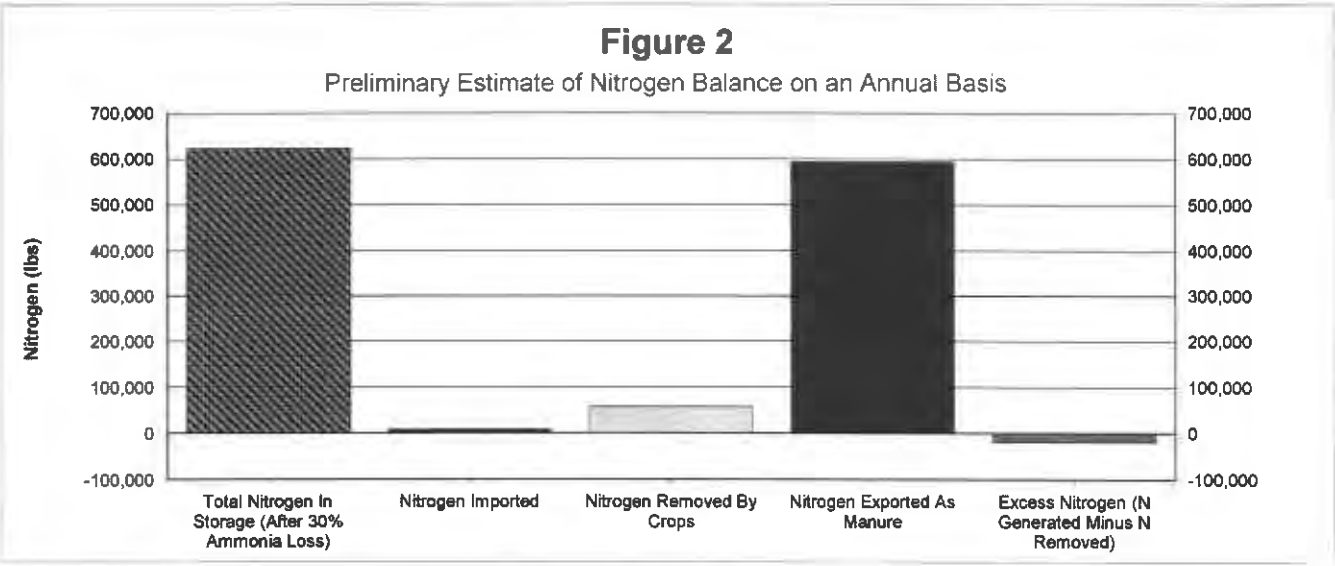
This graph estimates how many gallons of water and waste are sent to the wastewater storage ponds (lagoons) on your dairy during the selected 120 day storage period.

Your wastewater storage ponds (lagoons) must be very close to empty as a result of applying nutrients to crops over the last year starting in the beginning of October and should not fill before February.

Existing Storage Capacity:	26,820,605 gallons
Required Storage Capacity:	23,547,687 gallons
Storage Capacity Difference:	3,272,918 gallons

The estimated pond capacity appears to be adequate.

B. FIGURE 2



This graph estimates the total pounds of nitrogen excreted from the herd ending up in storage, imported, removed by all crops associated with the dairy, exported (typically as dry manure), and balance, excess, or deficiency on an annual basis.

Nutrients must be applied at rates and times appropriate for the crop to prevent surfacewater and groundwater degradation.

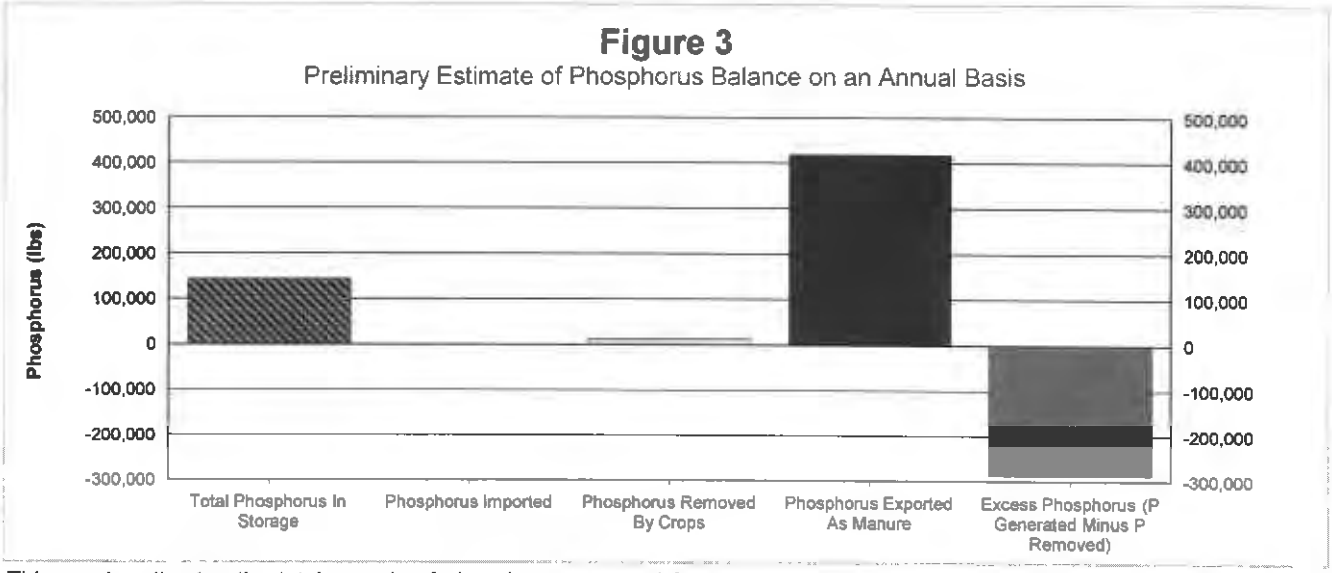
Total nitrogen in storage (after 30% ammonia loss):	623,337 pounds
Nitrogen imported:	7,630 pounds
Nitrogen exported (as manure):	593,208 pounds
Nitrogen removed by crops:	56,767 pounds
Nitrogen excess or deficiency:	-19,008 pounds
Whole farm nitrogen balance ratio:	0.67 (regulatory limit 1.65*)

It appears that the crop rotation may be capable of removing the nitrogen applied on an annual basis.

***Whole Farm Nitrogen Balance alone does not assure compliance, you cannot list cropland acreage or claim nutrient uptake for cropland that lacks infrastructure for controlled nutrient applications at agronomic rates and times.**

Nitrogen balance ratio = (Total nitrogen in storage - Nitrogen exported + Nitrogen in irrigation water + Nitrogen imports) / Crop removal

C. FIGURE 3



This graph estimates the total pounds of phosphorus excreted from the herd ending up in storage, imported, removed by all crops associated with the dairy, exported (typically as dry manure), and balance, excess, or deficiency on an annual basis.

Nutrients must be applied at rates and times appropriate for the crop to prevent surfacewater and groundwater degradation.

Total phosphorus in storage:	144,136 pounds
Phosphorus imported:	0 pounds
Phosphorus exported (as manure):	418,541 pounds
Phosphorus removed by crops:	12,808 pounds
Phosphorus excess or deficiency:	-287,213 pounds

It appears that the crop rotation may be capable of removing the phosphorus applied on an annual basis.

CERTIFICATION

"I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED IN THIS DOCUMENT AND ALL ATTACHMENTS AND THAT, BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION, I BELIEVE THAT THE INFORMATION IS TRUE, ACCURATE, AND COMPLETE I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT. IN ADDITION, I CERTIFY THAT THE PROVISIONS OF WASTE DISCHARGE REQUIREMENTS GENERAL ORDER NO. R5-2007-0035, INCLUDING THE DEVELOPMENT AND IMPLEMENTATION OF A NUTRIENT MANAGEMENT PLAN AND WASTE MANAGEMENT PLAN, WILL BE COMPLIED WITH."

SIGNATURE OF OWNER OF FACILITY	SIGNATURE OF OPERATOR OF FACILITY
John Zonneveld	Josh Zonneveld
PRINT OR TYPE NAME	PRINT OR TYPE NAME
VP 6-30-08	operator 6-30-08
TITLE AND DATE	TITLE AND DATE

Copies of this assessment shall be maintained for 10 years.

These calculations are preliminary and approximate only. Completion of your Waste Management Plan and Nutrient Management Plan will provide you with more detailed and precise calculations upon which to make important decisions.

9. **Summary of Manure and Process Wastewater Discharges from the Production Area**

Provide a summary of all **manure and wastewater discharges from the production area to surface water or to land areas** (land application areas or otherwise) when not in accordance with the facility's Nutrient Management Plan that occurred between Oct. 1, 2007 and Dec. 31, 2007 including the date, time, location, approximate volume, a map showing discharge and sample locations, rationale for sample locations, method of measuring flows. Place an X at the appropriate box below:

☑ No discharges occurred during the reporting period.
☐ Yes [ ] # of discharges occurred **(Summarize all discharges in Attachment B)**

10. **Summary of Stormwater Discharges from the Production Area**

Provide a summary of all storm water discharges **from the production areas to surface water** between Oct.1, 2007 and Dec. 31, 2007, including the date, time, approximate volume, duration, location, a map showing discharge and sample locations, rationale for sampling locations and method of measuring discharge flows. Place an X by the appropriate box below.

☑ No discharges occurred during the reporting period
☐ Yes [ ] # of discharges occurred **(Summarize all discharges in Attachment C)**

11. **Summary of Discharges from the Land Application Area(s)**

Provide a summary of all discharges **from the land application area to surface water** that have occurred between Oct.1, 2007 and Dec. 31, 2007, including the date, time, approximate volume, location, source of discharge (i.e. tailwater, wastewater or blended wastewater), a map showing discharge and sample locations, rationale for sample locations and method of measuring discharge flows. Check the appropriate box below.

☑ No Discharges occuring during the reporting period
☐ Yes [ ] # of discharges occurred **(Summarize all discharges in Attachment D)**

12. **Nutrient Management Plan Update**
Provide a statement indicating the NMP has been updated and that the NMP was developed or approved by a certified nutrient management planner.
NOT REQUIRED FOR THE FIRST YEAR.

13. **Manure/Process Wastewater Tracking Manifests**
Did you sell, give away, or otherwise remove solid, slurry or process wastewater (liquid manure) from your property?

☐ No
☑ Yes, attach manure/wastewater tracking manifests for the period June 30, 2007 through Dec. 31, 2007.
(General Order Attachment D or CDQAP Binder Tab 6)

14. **Written Agreements**
Any process wastewater transferred to a third party must have a written agreement consistent with State requirements. How many written agreements do you have? [0] Attach copies.

15. **Laboratory Analyses for Discharges**

If you answered yes to items #9, 10 or 11 above, attach copies of all laboratory analyses of all discharges (manure, process wastewater or tailwater), surface water (upstream and downstream of a discharge), and stormwater, including chain-of-custody forms and laboratory quality assurance/quality control results, as applicable.

16. **Tabulated Nutrient Analytical Data**
Attach tabulated analytical data, if sampled, for samples of manure, process wastewater, irrigation water, soil and plant tissue. The data shall be tabulated to clearly show sample dates, constituents analyzed, constituent concentrations and detection limits. **(If data is available, complete Attachments E - I)**

ATTACHMENT D

Manure/Process Wastewater Tracking Manifest
For
Existing Milk Cow Dairies

Instructions:

1) Complete one manifest for each hauling event, for each destination. A hauling event may last for several days, as long as the manure is being hauled to the same destination.
2) If there are multiple destinations, **complete a separate form for each destination.**
3) The operator must obtain the signature of the hauler upon completion of each manure-hauling event.
4) The operator shall submit copies of manure/process wastewater tracking manifest(s) with the Annual Monitoring Report for Existing Milk Cow Dairies.

Operator Information:

Name of Operator: Josh Zonneveld

Name of Dairy Facility: Zonneveld Dairies Inc.

Facility Address: 1560 E Cerini Lemoore CA 93242
Number and Street City Zip Code

Contact Person Name and Phone Number: Mike 559-923-4546
Name Phone Number

Manure/Process Wastewater Hauler Information:

Name of Hauling Company/Person: Zonneveld Farms

Address of Hauling Company /Person: 1560 E Cerini Lemoore CA 93242
Number and Street City Zip Code

Contact Person: Mike 559 923-4546
Name Phone Number

Destination Information:

Composting Facility / Broker / Farmer / Other (identify) Farmer (please circle one)

Contact information of Composting Facility, Broker, Farmer, or Other (as identified above):

Name Number and Street City Zip Code Phone Number

Manure/Process Wastewater Destination Address or Assessor's Parcel Number:

Jackson Ave. Hanford
Number and Street City Zip Code Assessor's Parcel Number

Dates Hauled: year round

Amount Hauled:

Enter the amount of manure hauled in tons or cubic yards (indicate the units used), the manure solids content (if amount reported in tons) or manure density (if amount reported in cubic yards), and the method used to calculate the amount:

Manure: 32,684 Tons or Cubic Yards (indicate which units used)
Manure Solids Content (if amount reported in tons): 72% solids
Manure Density (if amount reported in cubic yards): _____

Attachment D
Waste Discharge Requirements General Order No. R5-2007-0035
Existing Milk Cow Dairies

Method used to determine amount of manure: truck & scale

Enter the amount of process wastewater hauled in gallons and the method used to determine the amount.

Process Wastewater: N/A Gallons

Method used to determine volume of process wastewater: _____

Written Agreement:
Does the Operator have a written agreement (in compliance with Land Application Specification C.2 of Waste Discharge Requirements General Order No. R5-2007-0035) with any party that receives process wastewater from the Operator for its own use? (please check one)

____ Yes _____ No N/A

If the answer is no, the Operator agrees to have such a written agreement with any such party for any process wastewater transferred after **31 December 2007** to such party.
_____ (Operator shall provide initials here to acknowledge this requirement).

Certification:
I declare under the penalty of law that I personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment for knowing violations.

Operator's Signature: _____ Date: _____

Hauler's Signature: _____ Date: _____

17. **Record-Keeping Results**

Attach results of the Record-Keeping Requirements for the production and land application areas specified in Record-Keeping Requirements. These include:

- Provide records documenting any corrective actions taken to correct deficiencies noted as a result of the inspections required in the Monitoring Requirements. (Refer to CDQAP Dairy Production Area Visual Inspection and Dairy Land Application Area Visual Inspection sample forms, if used) Deficiencies not corrected in 30 days must be accompanied by an explanation of the factors preventing immediate correction.

Date	Deficiency	Corrective Action	Date Corrected	Explain if greater than 30 days
	N/A			

- Provide records of the date, time and estimated volume of any overflow from production area. (Information already provided in # 9 and 10 above.)
- Provide expected and actual crop yields. (May not be available for the first annual report: attach if available.)
- Provide identification of crop, acreage and dates of planting and harvest for each field. (May not be available for the first annual report: attach if available.)
- Provide dates, locations, and approximate weight and moisture content or volume and density of manure applied to each field. (May not be available for the first annual report: attach if available.)
- Provide weather conditions at time of manure and process wastewater applications and for 24 hours prior to and following applications. (May not be available for the first annual report: attach if available.)
- Provide total amounts of nitrogen, phosphorus and potassium actually applied to each field, including documentation of calculations for the total amount applied. (May not available for the first annual report, same as #5).

GROUNDWATER MONITORING SECTION (All dischargers must comply with Section 18 a)

18. a. **All dischargers** must attach groundwater information of supply wells and subsurface (tile) drainage systems (sample required by Nov. 3, 2007-all dischargers must attach groundwater information) on the location of sample collection and all field and laboratory data, including all laboratory analyses (including chain-of-custody forms and laboratory quality assurance/quality control results).

Dischargers with groundwater monitoring well systems

b. **Dischargers that have monitoring wells systems required by the Regional Board** shall include all laboratory analyses (including chain-of-custody forms and laboratory quality assurance/quality control results) and tabular and graphical summaries of the monitoring data. Data shall be tabulated to clearly show the sample dates, constiuients analyzed, constiuient concentrations, detection limits, depth to groundwater and groundwater elevations. Graphical summaries of groundwater gradients and flow directions shall also be included. Each groundwater monitoring report shall include a summary data table of all historical and current groundwater elevations and analytical results. The groundwater monitoring reports shall be certified by a California registered professional such as a California Registered Engineer or a California Register Geologist with experience in hydrogeology, or a federal officer or employee who is exempt from the California Business and Professions Code Sections 6739 or 7836).

c. **Dischargers with County-required groundwater sampling** shall submit all groundwater analyses to the Regional Board as required in b above to the extent available.

d. **If groundwater monitoring wells for research purposes** are located at your facility, please check this box. ☐
Dischargers with groundwater monitoring for research purposes are exempt from submitting groundwater analyses

STORM WATER REPORTING SECTION

19. The annual report shall include the following information:
(Place an X by the appropriate box below.)

☑ No significant discharge of storm water occurred from the **land application areas**.
☐ Yes, significant discharge(s) of storm water occurred from **land application areas**. The following information shall be submitted for those discharges.

- A map showing all sample locations for all land applications areas.
- Rationale for all sampling locations.
- A discussion of how storm water flow measurements were made.
- The results (including the laboratory analyses, chain of custody reports and laboratory quality assurance/quality control) of all samples of storm water.
- Any modifications made to the facility or sampling plan in response to pollutants detected in storm water.

☐ It was not possible to collect any of the required samples or perform visual observations due to adverse climatic conditions.
Describe the adverse climatic conditions:

NOTE: All unauthorized discharges must be reported to the Regional Board, OES and local environmental health within 24 hours of discharge, followed by a written report to the Regional Board within 2 weeks and laboratory analyses submitted within 45 days of the discharge.

DELLAVALLE Laboratory, Inc.
Chemists and Consultants

Report of Water Analysis

1910 W McKinley Suite 110 Fresno CA 93728
FAX (559) 268-8174 (800) 228-9896 · (559) 233 6129

Zonneveld Dairies, Inc
1560 E Cerini Ave
Laton CA 93242-9700
5718
21

Material Submitted: Water

Lab No 109471
Sample Date 11/2/2007
Sample Time 11:10
Submitted Date 11/3/2007
Submitted by Frank Zonneveld
Reported Date 11/7/2007
Location/Project
Copy To
Fax 559 923-9523
e-mail

	NO_3-N mg/L	EC µmhos/cm	Nitrogen agricultural use calculations calculated from nitrate-N lbs/AcFoot	lbs/Acinch
MCL--->	10			
MDL--->	0.01			
RL--->	0.1			
SM-->	4500NO3 E			
EPA--->	300	Field test		
Analysis Date.	11/3/2007			
001 P1 11:10	**9.1**	501	24.84	2.07
002 P2 10:55	0.2	246	0.55	0.05
003 P3 10:30	**13.4**	612	36.58	3.05
004 P4 11:25	1.9	209	5.19	0.43
005 P5 10:45	**27.8**	870	75.89	6.32
006 P6 10:50	**16.2**	581	44.23	3.69
007 P7 11:00	**6.8**	328	18.56	1.55
008 P8 11:05	**5.8**	339	15.83	1.32
009 P9 11:15	1.9	427	5.19	0.43
010 D2 - Cedar 11.40	0.5	281	1.37	0.11
011 D23 - Cerini 11:35	**12.4**	491	33.85	2.82

Water for Crop Use Nutrient Management	Nitrate Nitrogen	Total Salts
Low Levels	< 2.0	< 1000
Significant Levels	2.0-10.0	1000-2000
High Levels	10.0+	2000+

Sampling abbreviations: H.B. = hose bib, S.P. = stand pipe, Dom. = domestic well, IR = irrigation well, AG = ag well
Nitrate exceeds Water Quality MCL levels if results are above 10 mg/l nitrate-nitrogen NO3-N (equivalent to 45 mg/l nitrate NO3)
Total Salt results are used to monitor changes of salt in the well aquifers between annual tests
MCL = Maximum Contaminant Level according to the California Domestic Water Quality and Monitoring Regulations (Title 22)

Report of Water Analysis

DELLAVALLE Laboratory, Inc.
Chemists and Consultants

1910 W. McKinley, Suite 110, Fresno, CA 93728
FAX (559) 268 8174 (800) 228-9896 - (559) 233-6129

Zonneveld Dairies, Inc
1560 E Cerini Ave
Laton CA 93242-9700
5718
21

Material Submitted: Water

Lab No. 109471
Sample Date 11/2/2007
Sample Time 11 10
Submitted Date 11/3/2007
Submitted by Frank Zonneveld
Reported Date 11/7/2007
Location/Project
Copy To
Fax 559 923-9523
e-mail

	NO_3-N	EC	Nitrogen
	mg/L	umhos/cm	
MCL--->	10		
MDL--->	0 01		
RL--->	0.1		
SM--->	4500NO3 E		
EPA--->	300	Field test	
Analysis Date:	11/3/2007		

agricultural use calculations

calculated from nitrate-N

lbs/AcFoot lbs/Acinch

MDL = Method Detection Limit **RL** = Reporting Limit
SM = Standard Methods for the Examination of Water and Wastewater, 19th ed., 1995
EPA = Environmental Protection Agency methods used unless otherwise indicated

Please call if you have any questions

Keith M Backman M.S., CPH, CCA
Certified Crop Advisor
Dellavalle Laboratory, Inc
Hanford, CA (559) 647-5330

DEL-TECH

GEOTECHNICAL SUPPORT SERVICES

2007 GROUNDWATER FIELD MONITORING SUMMARY REPORT

SITE:

ZONNEVELD DAIRIES
1560 EAST CERINI AVENUE
LAYTON, CA 93242-9700
August 28, 2007

10624 OLIVE AVE., OAKDALE, CALIF. 95361 * OFFICE (209) 847-8757 * FAX (209) 847-7744

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2007

SAMPLE LOCATION / MW - 2A **DATE:** 8/28/2007

PROJECT NAME:	ZONNEVELD DAIRIES	**ANALYSIS PERFORMED:**	SEE CHAIN OF CUSTODY
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	8:36
CITY, STATE:	LAYTON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML
SITE CONTACT:	SCOTT SMITH	**PRESERVATIVES:**	1- NEAT / 1- H2SO4
CONSULTANT:	CSS ENVIRONMENTAL	**LAB. ANALYSIS BY:**	B C LABS / BAKERSFIELD

PROJECT MANAGER	SCOTT SMITH *		**MONUMENT:**	POST	
SAMPLER:	DEL-TECH / DON LIGHT		**WELL CASING MATERIAL**	PVC	
SIGNED:	Don Light		**WELL CASING DIA. :**	2" /	0.1632
SAMPLE MEDIA:	GROUNDWATER		**P.I.D. READING / ODOR:**	N/A	NONE
TOP OF CASING ELEVATION:		MSL	**COLOR:**	BROWN TO LIGHT BROWN	
DEPTH TO WATER: (feet.100th's)	91.97	FEET	**CALC. PURGE VOL.:**	0.95	GAL.
DEPTH OF WELL: (feet.100th's)	97.80	FEET	**TOTAL VOLUME PURGED:**	2.85	GAL.
STANDING WATER COLUMN:	5.83	FEET	**DEPTH OF PUMP:**	96	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A	0.2 GPM	8.76	209	21.9	-56	0.59	230
	0.95	"	"	8.70	174	21.5	-55	0.59	104
	1.90	"	"	8.69	166	21.3	-55	0.58	53
	2.85	"	"	8.65	160	21.2	-55	0.58	48

PURGE METHOD:	2" GRUNDFOS SUBMERSIBLE PUMP		
SAMPLE METHOD:	2" GRUNDFOS SUBMERSIBLE PUMP		
D. T. W. AFTER PURGE:		**D. T. W. AT SAMPLE TIME:**	93.89'
WELL INTEGRITY:	CAP & SEAL ARE SECURE		
WELL LOCATION:	SEE SITE MAP		
REMARKS:			
WEATHER:	CLEAR SKIES / HOT	**WIND:**	NONE
QUALITY CONTROL:	*ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*		
CONTAINMENT:	*D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*		
INSTRUMENTATION:	Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER	
	SOLINIST SLOPE METER	THERMODINE 580B P.I.D.	
	KECK INTERFACE METER	TURBIDITY METER	

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2007

SAMPLE LOCATION / MW - 2B **DATE:** 8/28/2007

PROJECT NAME:	ZONNEVELD DAIRIES	**ANALYSIS PERFORMED:**	SEE CHAIN OF CUSTODY
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	7:40
CITY, STATE:	LAYTON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML.
SITE CONTACT:	SCOTT SMITH	**PRESERVATIVES:**	1- NEAT / 1- H2SO4
CONSULTANT:	CSS ENVIRONMENTAL	**LAB. ANALYSIS BY:**	B C LABS / BAKERSFIELD

PROJECT MANAGER	SCOTT SMITH *	**MONUMENT:**	POST	
SAMPLER:	DEL-TECH / DON LIGHT	**WELL CASING MATERIAL**	PVC	
SIGNED:	Don Light	**WELL CASING DIA. :**	2" /	0.1632
SAMPLE MEDIA:	GROUNDWATER	**P.I.D. READING / ODOR:**	N/A	NONE
TOP OF CASING ELEVATION:	MSL	**COLOR:**	BROWN TO LIGHT BROWN	
DEPTH TO WATER: (feet.100th's)	97.00 FEET	**CALC. PURGE VOL.:**	5.27	GAL.
DEPTH OF WELL: (feet.100th's)	129.30 FEET	**TOTAL VOLUME PURGED:**	15.81	GAL.
STANDING WATER COLUMN:	32.30 FEET	**DEPTH OF PUMP:**	128	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A	0.5 GPM	8.80	147	20.6	-48	0.67	153
	5.27	"	"	8.83	145	20.5	-48	0.63	74
	10.54	"	"	8.85	144	20.3	-50	0.60	46
	15.81	"	"	8.92	140	20.4	-52	0.60	39

PURGE METHOD:	2" GRUNDFOS SUBMERSIBLE PUMP.		
SAMPLE METHOD:	2" GRUNDFOS SUBMERSIBLE PUMP.		
D. T. W. AFTER PURGE:		**D. T. W. AT SAMPLE TIME:**	100.12'
WELL INTEGRITY:	CAP & SEAL ARE SECURE.		
WELL LOCATION:	SEE SITE MAP.		
REMARKS:			
WEATHER:	CLEAR SKIES / HOT	**WIND:**	NONE
QUALITY CONTROL:	*ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*		
CONTAINMENT:	*D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*		
INSTRUMENTATION:	Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER	
	SOLINIST SLOPE METER	THERMODINE 580B P.I.D.	
	KECK INTERFACE METER	TURBIDITY METER	

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2007

SAMPLE LOCATION / MW - 3A **DATE:** 8/28/2007

PROJECT NAME:	ZONNEVELD DAIRIES	**ANALYSIS PERFORMED:**	SEE CHAIN OF CUSTODY
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	10:53
CITY, STATE:	LAYTON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML.
SITE CONTACT:	SCOTT SMITH	**PRESERVATIVES:**	1- NEAT / 1- H2SO4
CONSULTANT:	CSS ENVIRONMENTAL	**LAB. ANALYSIS BY:**	B C LABS / BAKERSFIELD

PROJECT MANAGER	SCOTT SMITH *		**MONUMENT:**	POST	
SAMPLER:	DEL-TECH / DON LIGHT		**WELL CASING MATERIAL**	PVC	
SIGNED:			**WELL CASING DIA. :**	2" /	0.1632
SAMPLE MEDIA:	GROUNDWATER		**P.I.D. READING / ODOR:**	N/A	NONE
TOP OF CASING ELEVATION:		MSL	**COLOR:**	BROWN	
DEPTH TO WATER: (feet.100th's)	96.55	FEET	**CALC. PURGE VOL.:**	0.51	GAL.
DEPTH OF WELL: (feet.100th's)	99.65	FEET	**TOTAL VOLUME PURGED:**	1.52	GAL.
STANDING WATER COLUMN:	3.10	FEET	**DEPTH OF PUMP:**	98	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A	BAILER	7.19	636	22.8	-45	0.84	310
	0.51	DRY							
	1.01	DRY							
	1.52	DRY							

PURGE METHOD:	STAINLESS STEEL BAILER		
SAMPLE METHOD:	STAINLESS STEEL BAILER		
D. T. W. AFTER PURGE:		**D. T. W. AT SAMPLE TIME:**	97.28'
WELL INTEGRITY:	CAP & SEAL ARE SECURE		
WELL LOCATION:	SEE SITE MAP		
REMARKS:	**WELL WENT DRY / POOR RECHARGE / GRAB SAMPLE**		
WEATHER:	CLEAR SKIES / HOT.	**WIND:**	NONE
QUALITY CONTROL:	*ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*		
CONTAINMENT:	*D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*		
INSTRUMENTATION:	Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER	
	SOLINIST SLOPE METER	THERMODINE 580B P.I.D.	
	KECK INTERFACE METER	TURBIDITY METER	

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2007

SAMPLE LOCATION / MW - 5A **DATE:** 8/28/2007

PROJECT NAME:	ZONNEVELD DAIRIES	**ANALYSIS PERFORMED:**	SEE CHAIN OF CUSTODY
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	10:20
CITY, STATE:	LAYTON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML.
SITE CONTACT:	SCOTT SMITH	**PRESERVATIVES:**	1- NEAT / 1- H2SO4
CONSULTANT:	CSS ENVIRONMENTAL	**LAB. ANALYSIS BY:**	B C LABS / BAKERSFIELD

PROJECT MANAGER	SCOTT SMITH *	**MONUMENT:**	POST	
SAMPLER:	DEL-TECH / DON LIGHT	**WELL CASING MATERIAL**	PVC	
SIGNED:	Don Light	**WELL CASING DIA. :**	2" /	0.1632
SAMPLE MEDIA:	GROUNDWATER	**P.I.D. READING / ODOR:**	N/A	NONE
TOP OF CASING ELEVATION:	MSL	**COLOR:**	BROWN TO LIGHT BROWN	
DEPTH TO WATER: (feet.100th's)	92.51 FEET	**CALC. PURGE VOL.:**	1.63	GAL.
DEPTH OF WELL: (feet.100th's)	102.51 FEET	**TOTAL VOLUME PURGED:**	4.90	GAL.
STANDING WATER COLUMN:	10.00 FEET	**DEPTH OF PUMP:**	101	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A	0.2 GPM	7.13	688	21.8	-42	0.57	170
	1.63	"	"	7.05	668	21.8	-40	0.57	45
	3.26	"	"	7.06	620	21.8	-39	0.56	23
	4.90	"	"	7.09	617	21.7	-40	0.55	16

PURGE METHOD: 2" GRUNDFOS SUBMERSIBLE PUMP.
SAMPLE METHOD: 2" GRUNDFOS SUBMERSIBLE PUMP.
D. T. W. AFTER PURGE: **D. T. W. AT SAMPLE TIME:** 94.22'
WELL INTEGRITY: CAP & SEAL ARE SECURE.
WELL LOCATION: SEE SITE MAP.
REMARKS:

WEATHER: CLEAR SKIES / HOT. **WIND:** NONE
QUALITY CONTROL: *ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*
CONTAINMENT: *D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*

INSTRUMENTATION:

Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER
SOLINIST SLOPE METER	THERMODINE 580B P.I.D.
KECK INTERFACE METER	TURBIDITY METER

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2007

SAMPLE LOCATION / MW - 5B **DATE:** 8/28/2007

PROJECT NAME:	ZONNEVELD DAIRIES	**ANALYSIS PERFORMED:**	SEE CHAIN OF CUSTODY
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	9:28
CITY, STATE:	LAYTON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML.
SITE CONTACT:	SCOTT SMITH	**PRESERVATIVES:**	1- NEAT / 1- H2SO4
CONSULTANT:	CSS ENVIRONMENTAL	**LAB. ANALYSIS BY:**	B C LABS / BAKERSFIELD

PROJECT MANAGER	SCOTT SMITH *		**MONUMENT:**	POST	
SAMPLER:	DEL-TECH / DON LIGHT		**WELL CASING MATERIAL**	PVC	
SIGNED:			**WELL CASING DIA. :**	2" /	0.1632
SAMPLE MEDIA:	GROUNDWATER		**P.I.D. READING / ODOR:**	N/A	NONE
TOP OF CASING ELEVATION:		MSL	**COLOR:**	BROWN	
DEPTH TO WATER: (feet.100th's)	94.05	FEET	**CALC. PURGE VOL.:**	7.63	GAL.
DEPTH OF WELL: (feet.100th's)	140.82	FEET	**TOTAL VOLUME PURGED:**	22.90	GAL.
STANDING WATER COLUMN:	46.77	FEET	**DEPTH OF PUMP:**	139	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A	0.5 GPM	8.03	686	21.9	-57	0.88	400
	7.63	"	"	7.63	703	21.7	-50	0.60	225
	15.27	"	"	7.42	713	21.8	-47	0.55	179
	22.90	"	"	7.28	705	21.6	-45	0.54	292

PURGE METHOD:	2" GRUNDFOS SUBMERSIBLE PUMP.		
SAMPLE METHOD:	2" GRUNDFOS SUBMERSIBLE PUMP.		
D. T. W. AFTER PURGE:		**D. T. W. AT SAMPLE TIME:**	99.35'
WELL INTEGRITY:	CAP & SEAL ARE SECURE.		
WELL LOCATION:	SEE SITE MAP		
REMARKS:			
WEATHER:	CLEAR SKIES / HOT	**WIND:**	NONE
QUALITY CONTROL:	*ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP NEW NITRILE GLOVES.*		
CONTAINMENT:	*D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*		
INSTRUMENTATION:	Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER	
	SOLINIST SLOPE METER	THERMODINE 580B P.I.D	
	KECK INTERFACE METER	TURBIDITY METER	

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2007

SAMPLE LOCATION / MW - 7 **DATE:** 8/28/2007

PROJECT NAME:	ZONNEVELD DAIRIES	**ANALYSIS PERFORMED:**	SEE CHAIN OF CUSTODY
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	12:45
CITY, STATE:	LAYTON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML
SITE CONTACT:	SCOTT SMITH	**PRESERVATIVES:**	1- NEAT / 1- H2SO4
CONSULTANT:	CSS ENVIRONMENTAL	**LAB. ANALYSIS BY:**	B C LABS / BAKERSFIELD

PROJECT MANAGER	SCOTT SMITH *	**MONUMENT:**	POST	
SAMPLER:	DEL-TECH / DON LIGHT	**WELL CASING MATERIAL**	PVC	
SIGNED:		**WELL CASING DIA. :**	2" /	0.1632
SAMPLE MEDIA:	GROUNDWATER	**P.I.D. READING / ODOR:**	N/A	NONE
TOP OF CASING ELEVATION:	MSL	**COLOR:**	LIGHT GREY	
DEPTH TO WATER: (feet.100th's)	108.03 FEET	**CALC. PURGE VOL.:**	0.63	GAL.
DEPTH OF WELL: (feet.100th's)	111.90 FEET	**TOTAL VOLUME PURGED:**	1.89	GAL.
STANDING WATER COLUMN:	3.87 FEET	**DEPTH OF PUMP:**	110	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A	BAILER	7.55	659	22.4	-41	0.56	1000+
	0.63	DRY							
	1.26	DRY							
	1.89	DRY							

PURGE METHOD: STAINLESS STEEL BAILER

SAMPLE METHOD: STAINLESS STEEL BAILER

D. T. W. AFTER PURGE: **D. T. W. AT SAMPLE TIME:** 110.68'

WELL INTEGRITY: CAP & SEAL ARE SECURE

WELL LOCATION: SEE SITE MAP

REMARKS: **WELL WENT DRY / POOR RECHARGE / GRAB SAMPLE.**

WEATHER: CLEAR SKIES / HOT **WIND:** NONE

QUALITY CONTROL: *ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAM/CLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*

CONTAINMENT: *D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*

INSTRUMENTATION:

Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER
SOLINIST SLOPE METER	THERMODINE 580B P.I.D.
KECK INTERFACE METER	TURBIDITY METER

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2007

SAMPLE LOCATION / MW - 8 **DATE:** 8/28/2007

PROJECT NAME:	MAPLE DAIRY	**ANALYSIS PERFORMED:**	SEE CHAIN OF CUSTODY
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	16:10
CITY, STATE:	LAYTON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML.
SITE CONTACT:	SCOTT SMITH	**PRESERVATIVES:**	1- NEAT / 1- H2SO4
CONSULTANT:	CSS ENVIRONMENTAL	**LAB. ANALYSIS BY:**	B C LABS / BAKERSFIELD

PROJECT MANAGER	SCOTT SMITH *	**MONUMENT:**	POST	
SAMPLER:	DEL-TECH / DON LIGHT	**WELL CASING MATERIAL**	PVC	
SIGNED:	Don Light	**WELL CASING DIA. :**	2" /	0.1632
SAMPLE MEDIA:	GROUNDWATER	**P.I.D. READING / ODOR:**	N/A	NONE
TOP OF CASING ELEVATION:	MSL	**COLOR:**	BROWN	
DEPTH TO WATER: (feet.100th's)	86.55 FEET	**CALC. PURGE VOL.:**	2.47	GAL.
DEPTH OF WELL: (feet.100th's)	101.68 FEET	**TOTAL VOLUME PURGED:**	7.41	GAL.
STANDING WATER COLUMN:	15.13 FEET	**DEPTH OF PUMP:**	100	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A	0.2 GPM	7.80	417	22.7	-39	0.47	470
	2.47	"	"	7.78	408	22.1	-34	0.47	300
	4.94	"	"	7.77	400	22.1	-33	0.47	180
	7.41	"	"	7.78	397	21.4	-30	0.48	175

PURGE METHOD: 2" GRUNDFOS SUBMERSIBLE PUMP

SAMPLE METHOD: 2" GRUNDFOS SUBMERSIBLE PUMP

D. T. W. AFTER PURGE: **D. T. W. AT SAMPLE TIME:** 90.45

WELL INTEGRITY: CAP & SEAL ARE SECURE.

WELL LOCATION: SEE SITE MAP

REMARKS: **MONUMENT AND CASING BROKEN OFF!!**

WEATHER: CLEAR SKIES / HOT. **WIND:** NONE

QUALITY CONTROL: *ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*

CONTAINMENT: *D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*

INSTRUMENTATION:

Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER
SOLINIST SLOPE METER	THERMODINE 580B P.I.D.
KECK INTERFACE METER	TURBIDITY METER

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2007

SAMPLE LOCATION / MW - 9 **DATE:** 8/28/2007

PROJECT NAME:	MAPLE DAIRY	**ANALYSIS PERFORMED:**	SEE CHAIN OF CUSTODY
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	17:00
CITY, STATE:	LAYTON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML.
SITE CONTACT:	SCOTT SMITH	**PRESERVATIVES:**	1- NEAT / 1- H2SO4
CONSULTANT:	CSS ENVIRONMENTAL	**LAB. ANALYSIS BY:**	B C LABS / BAKERSFIELD

PROJECT MANAGER	SCOTT SMITH *		**MONUMENT:**	POST	
SAMPLER:	DEL-TECH / DON LIGHT		**WELL CASING MATERIAL**	PVC	
SIGNED:			**WELL CASING DIA. :**	2" /	0.1632
SAMPLE MEDIA:	GROUNDWATER		**P.I.D. READING / ODOR:**	N/A	NONE
TOP OF CASING ELEVATION:		MSL	**COLOR:**	BROWN	
DEPTH TO WATER:	**(feet.100th's)**	86.40 FEET	**CALC. PURGE VOL.:**	1.71	GAL.
DEPTH OF WELL:	**(feet.100th's)**	96.90 FEET	**TOTAL VOLUME PURGED:**	5.14	GAL.
STANDING WATER COLUMN:		10.50 FEET	**DEPTH OF PUMP:**	95	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A	0.2 GPM	7.77	451	22.8	-42	0.50	390
	1.71	"	"	7.77	450	22.5	-42	0.50	315
	3.43	"	"	7.75	447	22.2	-41	0.52	140
	5.14	"	"	7.72	444	22.1	-40	0.53	102

PURGE METHOD: 2" GRUNDFOS SUBMERSIBLE PUMP.
SAMPLE METHOD: 2" GRUNDFOS SUBMERSIBLE PUMP.
D. T. W. AFTER PURGE: **D. T. W. AT SAMPLE TIME:** 92.35'
WELL INTEGRITY: CAP & SEAL ARE SECURE.
WELL LOCATION: SEE SITE MAP
REMARKS:

WEATHER: CLEAR SKIES / HOT. **WIND:** NONE
QUALITY CONTROL: *ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*
CONTAINMENT: *D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*

INSTRUMENTATION:

Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER
SOLINIST SLOPE METER	THERMODINE 580B P.I.D.
KECK INTERFACE METER	TURBIDITY METER

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2007

SAMPLE LOCATION / MW - 10 **DATE:** 8/28/2007

PROJECT NAME:	MAPLE DAIRY	**ANALYSIS PERFORMED:**	SEE CHAIN OF CUSTODY
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	18:12
CITY, STATE:	LAYTON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML.
SITE CONTACT:	SCOTT SMITH	**PRESERVATIVES:**	1- NEAT / 1- H2SO4
CONSULTANT:	CSS ENVIRONMENTAL	**LAB. ANALYSIS BY:**	B C LABS / BAKERSFIELD

PROJECT MANAGER	SCOTT SMITH *		**MONUMENT:**	POST	
SAMPLER:	DEL-TECH / DON LIGHT		**WELL CASING MATERIAL**	PVC	
SIGNED:			**WELL CASING DIA. :**	2" /	0.1632
SAMPLE MEDIA:	GROUNDWATER		**P.I.D. READING / ODOR:**	N/A	NONE
TOP OF CASING ELEVATION:		MSL	**COLOR:**	BROWN	
DEPTH TO WATER: (feet.100th's)	82.62	FEET	**CALC. PURGE VOL.:**	4.03	GAL.
DEPTH OF WELL: (feet.100th's)	107.30	FEET	**TOTAL VOLUME PURGED:**	12.08	GAL.
STANDING WATER COLUMN:	24.68	FEET	**DEPTH OF PUMP:**	106	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A	0.5 GPM	7.58	418	22.2	-41	0.49	580
	4.03	"	"	7.51	404	21.1	-36	0.67	270
	8.06	"	"	7.47	380	20.6	-32	0.53	125
	12.08	"	"	7.45	378	20.4	-30	0.50	100

PURGE METHOD:	2" GRUNDFOS SUBMERSIBLE PUMP		
SAMPLE METHOD:	2" GRUNDFOS SUBMERSIBLE PUMP		
D. T. W. AFTER PURGE:		**D. T. W. AT SAMPLE TIME:**	86.34'
WELL INTEGRITY:	CAP & SEAL ARE SECURE		
WELL LOCATION:	SEE SITE MAP.		
REMARKS:			
WEATHER:	CLEAR SKIES / HOT	**WIND:**	NONE
QUALITY CONTROL:	*ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*		
CONTAINMENT:	*D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*		
INSTRUMENTATION:	Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER	
	SOLINIST SLOPE METER	THERMODINE 580B P.I.D.	
	KECK INTERFACE METER	TURBIDITY METER	

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2007

SAMPLE LOCATION / SW - 1 **DATE:** 8/28/2007

PROJECT NAME:	ZONNEVELD DAIRIES	**ANALYSIS PERFORMED:**	N/A
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	NO SAMPLE TAKEN
CITY, STATE:	LAYTON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML.
SITE CONTACT:	SCOTT SMITH	**PRESERVATIVES:**	1- NEAT / 1- H2SO4
CONSULTANT:	CSS ENVIRONMENTAL	**LAB. ANALYSIS BY:**	N/A

PROJECT MANAGER	SCOTT SMITH *		**MONUMENT:**	AG. WELL	
SAMPLER:	DEL-TECH / DON LIGHT		**WELL CASING MATERIAL**	STEEL	
SIGNED:			**WELL CASING DIA. :**	8" /	
SAMPLE MEDIA:	GROUNDWATER		**P.I.D. READING / ODOR:**	N/A	N/A
TOP OF CASING ELEVATION:		MSL	**COLOR:**	N/A	
DEPTH TO WATER: (feet.100th's)	DRY	FEET	**CALC. PURGE VOL.:**	0.00	GAL.
DEPTH OF WELL: (feet.100th's)	82.45	FEET	**TOTAL VOLUME PURGED:**	0.00	GAL.
STANDING WATER COLUMN:	0.00	FEET	**DEPTH OF PUMP:**	N/A	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A		NO	SAMPLE				
	0.00								
	0.00								
	0.00								

PURGE METHOD:	N/A		
SAMPLE METHOD:	N/A		
D. T. W. AFTER PURGE:		**D. T. W. AT SAMPLE TIME:**	N/A
WELL INTEGRITY:	CAP & SEAL ARE SECURE.		
WELL LOCATION:	SEE SITE MAP		
REMARKS:			
WEATHER:	CLEAR SKIES / HOT	**WIND:**	NONE
QUALITY CONTROL:	*ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*		
CONTAINMENT:	*D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*		
INSTRUMENTATION:	Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER	
	SOLINIST SLOPE METER	THERMODINE 580B P.I.D.	
	KECK INTERFACE METER	TURBIDITY METER	

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2007

SAMPLE LOCATION / SW - 3 **DATE:** 8/28/2007

PROJECT NAME:	ZONNEVELD DAIRIES	**ANALYSIS PERFORMED:**	SEE CHAIN OF CUSTODY
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	14:50
CITY, STATE:	LAYTON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML.
SITE CONTACT:	SCOTT SMITH	**PRESERVATIVES:**	1- NEAT / 1- H2SO4
CONSULTANT:	CSS ENVIRONMENTAL	**LAB. ANALYSIS BY:**	B C LABS / BAKERSFIELD

PROJECT MANAGER	SCOTT SMITH *		**MONUMENT:**	FLUSH	
SAMPLER:	DEL-TECH / DON LIGHT		**WELL CASING MATERIAL**	STEEL	
SIGNED:			**WELL CASING DIA. :**	6" /	1.45
SAMPLE MEDIA:	GROUNDWATER		**P.I.D. READING / ODOR:**	N/A	NONE
TOP OF CASING ELEVATION:		MSL	**COLOR:**	CLEAR	
DEPTH TO WATER: (feet.100th's)	97.50	FEET	**CALC. PURGE VOL.:**	60.41	GAL.
DEPTH OF WELL: (feet.100th's)	139.16	FEET	**TOTAL VOLUME PURGED:**	181.22	GAL.
STANDING WATER COLUMN:	41.66	FEET	**DEPTH OF PUMP:**	135	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A	0.2 GPM	7.23	982	24.0	-45	0.55	11.2
	60.41	"	"						
	120.81	"	"						
	181.22	"	"						

PURGE METHOD:	DEDICATED SUBMERSIBLE PUMP.		
SAMPLE METHOD:	DEDICATED SUBMERSIBLE PUMP.		
D. T. W. AFTER PURGE:		**D. T. W. AT SAMPLE TIME:**	98 97
WELL INTEGRITY:	CAP & SEAL ARE SECURE.		
WELL LOCATION:	SEE SITE MAP.		
REMARKS:			
WEATHER:	CLEAR SKIES / HOT.	**WIND:**	NONE
QUALITY CONTROL:	*ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*		
CONTAINMENT:	*D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*		
INSTRUMENTATION:	Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER	
	SOLINIST SLOPE METER	THERMODINE 580B P.I.D.	
	KECK INTERFACE METER	TURBIDITY METER	

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2007

SAMPLE LOCATION / SW - 4 **DATE:** 8/28/2007

PROJECT NAME:	ZONNEVELD DAIRIES	**ANALYSIS PERFORMED:**	N/A
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	NO SAMPLE TAKEN
CITY, STATE:	LAYTON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML.
SITE CONTACT:	SCOTT SMITH	**PRESERVATIVES:**	1- NEAT / 1- H2SO4
CONSULTANT:	CSS ENVIRONMENTAL	**LAB. ANALYSIS BY:**	N/A

PROJECT MANAGER	SCOTT SMITH *		**MONUMENT:**	DOMESTIC WELL	
SAMPLER:	DEL-TECH / DON LIGHT		**WELL CASING MATERIAL**	STEEL	
SIGNED:			**WELL CASING DIA. :**	6" /	0 1632
SAMPLE MEDIA:	GROUNDWATER		**P.I.D. READING / ODOR:**	N/A	N/A
TOP OF CASING ELEVATION:		MSL	**COLOR:**	N/A	
DEPTH TO WATER: (feet.100th's)	N/A	FEET	**CALC. PURGE VOL.:**	0.00	GAL.
DEPTH OF WELL: (feet.100th's)	83.50	FEET	**TOTAL VOLUME PURGED:**	0.00	GAL.
STANDING WATER COLUMN:	0.00	FEET	**DEPTH OF PUMP:**	N/A	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A		NO	SAMPLE				
	0.00								
	0.00								
	0.00								

PURGE METHOD:	N/A		
SAMPLE METHOD:	N/A		
D. T. W. AFTER PURGE:		**D. T. W. AT SAMPLE TIME:**	N/A
WELL INTEGRITY:	CAP & SEAL ARE SECURE.		
WELL LOCATION:	SEE SITE MAP.		
REMARKS:	**AREA HAS BEEN CLEARED AND GRADED / COULD NOT FIND WELL.**		
WEATHER:	CLEAR SKIES / HOT.	**WIND:**	NONE
QUALITY CONTROL:	*ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*		
CONTAINMENT:	*D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*		
INSTRUMENTATION:	Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER	
	SOLINIST SLOPE METER	THERMODINE 580B P.I.D.	
	KECK INTERFACE METER	TURBIDITY METER	

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2007

SAMPLE LOCATION / SW - 6 **DATE:** 8/28/2007

PROJECT NAME:	ZONNEVELD DAIRIES	**ANALYSIS PERFORMED:**	N/A
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	NO SAMPLE TAKEN
CITY, STATE:	LAYTON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML.
SITE CONTACT:	SCOTT SMITH	**PRESERVATIVES:**	1- NEAT / 1- H2SO4
CONSULTANT:	CSS ENVIRONMENTAL	**LAB. ANALYSIS BY:**	N/A

PROJECT MANAGER	SCOTT SMITH *	**MONUMENT:**	DOMESTIC WELL	
SAMPLER:	DEL-TECH / DON LIGHT	**WELL CASING MATERIAL**	STEEL	
SIGNED:		**WELL CASING DIA. :**	6" /	0.1632
SAMPLE MEDIA:	GROUNDWATER	**P.I.D. READING / ODOR:**	N/A	N/A
TOP OF CASING ELEVATION:	MSL	**COLOR:**	N/A	
DEPTH TO WATER: (feet.100th's)	DRY FEET	**CALC. PURGE VOL.:**	0.00	GAL.
DEPTH OF WELL: (feet.100th's)	87.90 FEET	**TOTAL VOLUME PURGED:**	0.00	GAL.
STANDING WATER COLUMN:	0.00 FEET	**DEPTH OF PUMP:**	N/A	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A		NO	SAMPLE				
	0.00								
	0.00								
	0.00								

PURGE METHOD: N/A

SAMPLE METHOD: N/A

D. T. W. AFTER PURGE: **D. T. W. AT SAMPLE TIME:** N/A

WELL INTEGRITY: CAP & SEAL ARE SECURE

WELL LOCATION: SEE SITE MAP

REMARKS:

WEATHER: CLEAR SKIES / HOT **WIND:** NONE

QUALITY CONTROL: *ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP NEW NITRILE GLOVES.*

CONTAINMENT: *D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*

INSTRUMENTATION:

Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER
SOLINIST SLOPE METER	THERMODINE 580B P.I.D.
KECK INTERFACE METER	TURBIDITY METER

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2007

SAMPLE LOCATION / AG. & DOMESTIC **DATE:** 8/28/2007

PROJECT NAME:	ZONNEVELD DAIRIES	**ANALYSIS PERFORMED:**	SEE CHAIN OF CUSTODY
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	SEE BELOW
CITY, STATE:	LAYTON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML.
SITE CONTACT:	SCOTT SMITH	**PRESERVATIVES:**	1- NEAT / 1- H2SO4
CONSULTANT:	CSS ENVIRONMENTAL	**LAB. ANALYSIS BY:**	B C LABS / BAKERSFIELD

PROJECT MANAGER	SCOTT SMITH *	**MONUMENT:**	AG. & DOMESTIC WELLS
SAMPLER:	DEL-TECH / DON LIGHT	**WELL CASING MATERIAL**	STEEL
SIGNED:		**WELL CASING DIA. :**	6 OR 8" /
SAMPLE MEDIA:	GROUNDWATER	**P.I.D. READING / ODOR:**	N/A NONE
TOP OF CASING ELEVATION:	MSL	**COLOR:**	CLEAR
DEPTH TO WATER: (feet.100th's)	N/A FEET	**CALC. PURGE VOL.:**	N/A GAL.
DEPTH OF WELL: (feet.100th's)	N/A FEET	**TOTAL VOLUME PURGED:**	N/A GAL.
STANDING WATER COLUMN:	N/A FEET	**DEPTH OF PUMP:**	N/A FEET

FIELD PARAMETERS

TIME	SAMPLING LOCATION	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	SW- 1	DRY		NO	SAMPLE				
14:50	SW- 3	N/A	N/A *	7.23	982	24.0	-45	0.55	11.2
	SW- 4	DRY		NO	SAMPLE				
	SW- 6	DRY		NO	SAMPLE				
14:30	NEW CERINI		N/A	7.61	595	22.7	-46	0.52	5.4
14:00	OLD CERINI		N/A	7.76	610	20.7	-40	0.54	4.7
	COMPLEX LAGOON		N/A	7.78	1528	29.3	-63	0.53	86
	MAPLE LAGOON		N/A	7.74	4533	26.5	-74	0.51	240

PURGE METHOD: * DEDICATED SUBMERSIBLE PUMP.
SAMPLE METHOD: * DEDICATED SUBMERSIBLE PUMP.
D. T. W. AFTER PURGE: **D. T. W. AT SAMPLE TIME:** N/A
WELL INTEGRITY: CAP & SEAL ARE SECURE.
WELL LOCATION: SEE SITE MAP
REMARKS:

WEATHER: CLEAR SKIES / HOT **WIND:** NONE
QUALITY CONTROL: *ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*
CONTAINMENT: *D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*

INSTRUMENTATION:

Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER
SOLINIST SLOPE METER	THERMODINE 580B P.I.D.
KECK INTERFACE METER	TURBIDITY METER

DEL-TECH GEOTECHNICAL SUPPORT
(209) 847-8757 (OFFICE) * (209) 847-7744 (FAX) * deltech1@pacbell.net (Email)

ZONNEVELD DAIRY - MAPLE AVE. DAIRY
1500 EAST CERINI AVE. / LAYTON, CA.

MONITORING WELL FIELD SUMMARY LOG 2007
DEPTH TO WATER MEASUREMENTS

	QTR. 1	QTR. 2	QTR. 3	QTR. 4	TOTAL
DATE	1/31/07		8/28/07		DEPTH
LOCATION					
MW-1A	DRY		8.73		14.25'
MW-1B	N/A		DRY		
MW-1C	97.18		100.68		105.60'
MW-2A	76.80		91.97		97.80'
MW-2B	78.83		97.00		129.30'
MW-3A	83.10		96.55		99.65'
MW-3B	84.13		102.14		137.90'
MW-4A	84.86		91.34		94.80'
MW-4B	88.10		105.25		141.00'
MW-5A	80.77		92.51		102.51'
MW-5B	81.32		94.05		140.82'
MW-7	91.89		108.03		111.90'
MW-8	79.55		86.55		101.68'
MW-9	80.45		86.40		96.90'
MW-10	N/A		82.62		107.30'
SW-1	DRY		DRY		82.45'
SW-3	80.53		97.50		139.16'
SW-4	MISSING		MISSING		83.50'
SW-6	DRY		DRY		87.90'

NOTE
ALL MEASUREMENTS ARE MADE FROM THE NORTH SIDE AND TOP EDGE OF THE WELL CASING THE TOP OF CASING WITH A NOTCH OR PERMENANT MARKINGS, WHICH EVER ONE CONDITION IS APPROPRIATE.

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

Signature of Owner of Facility	Signature of Operator of Facility
John Zonneveld Print of Type Name	Josh Zonneveld Print of Type Name
owner 6/17/2008 Title and Date	operator 6/17/2008 Title and Date

Note:

- The results of monitoring conducted more frequently than required at the locations specified in the Monitoring and Reporting Program shall be included in the Annual Report. (You only need to submit the results of additional monitoring if the extra monitoring is being conducted at locations and for the constituents that are already required to be monitored under the Monitoring and Reporting Program.)
- Laboratory analyses for manure, wastewater and soil shall be submitted to the Central Valley Water Board upon request by the Executive Officer.

The annual report shall be postmarked no later than <u>July 1, 2008</u> and mailed to:

For facilities in Fresno, Kern, Kings, Madera, Mariposa and Tulare counties:
California Regional Water Quality Control Board
Central Valley Region
1685 E Street
Fresno, CA 93706
Attention: Confined Animal Regulatory Unit

For facilities in Butte, Lassen, Modoc, Plumas, Tehama and Shasta counties:
California Regional Water Quality Control Board
Central Valley Region
415 Knollcrest Dr., Suite 100
Redding, CA 96002
Attention: Confined Animal Regulatory Unit

For facilities in all other counties:
California Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Dr., #200
Rancho Cordova, CA 95670
Attention: Confined Animal Regulatory Unit

ANNUAL DAIRY REPORT (DUE JULY 1, 2008) ATTACHMENT A

Enter data in white cells only, remainder of spreadsheet is locked.

Estimated Amount of Total Manure and Nutrients Generated for the Report Period (Reporting Period - May 3, 2007 to December 31, 2007)

3/4. Type of Animals	Maximum Number of Animals between May 3, 2007 and Dec. 31, 2007	Open Confinement (# of animals in open lots including those with shades)	Housed Under Roof (# of animals in Freestall barns)	Average Live Weight **(lbs/head)	Average Milk Production (lbs/cow/day)	Predominant Breed of Animals***	Total Manure lbs/day*	Nitrogen lbs/day*	Phosphorus lbs/day*	Potassium lbs/day*
Milk cows	2,100	0	2,100	1,100	70	H	294,748	1,929	326	409
Dry cows	300	300	0	1,300		H	22,997	150	20	99
Bred Heifers 15-24 months	780	780	0	900		H	43,210	203	34	
Heifers 7-14 months	300	300	0	500		H	14,459	78	13	
Calves 4-6 months	636	636	0			H	12,084	89	6	
Calves 0-3 months	289	0	0			H	5,491	40	3	
Other types of commercial animals	0	0	0			n/a				
Total pounds for report period								604936	97856	123330
Total tons for report period							47,748			

*American Society of Agricultural Engineers D384.2 March 2005

** Refer to PDFA

***h=Holsteins, j=Jersys, h-j=crossbreds, bs=Brown Swiss, o=other

4. **Estimated Amount of Process Wastewater Generated for the Report Period** (Reporting Period - May 3, 2007 to December 31, 2007)

Rainwater (gal)	12,029,048	(Current PDFA Pg 5. D)
Milk Barn (gal)	8,570,040	(Current PDFA Pg 5. D)
Fresh Flush (gal)	0	(Current PDFA Pg 5. D)
Total Gallons	20,599,088	
Storage Period (days)	120	(Current PDFA Pg. 4 B)
Process Waterwater Generated for Report Period (gal)	41,713,153	

Name of Dairy Facility	Maple Avenue Dairy
Facility Address	19860 S Maple Ave Laton, Ca 93242

CDQAP – WDR General
Order Reference Binder
TAB 6.11, Version 3-4-08

CALIFORNIA ENVIRONMENTAL
PROTECTION AGENCY

OPERATION AND MAINTENANCE PLAN

Dairy Name: Maple Ave Dairy

Dairy Address: 17860 E Maple Ave Lodi CA 95242

Plan Preparation Date: July 1, 2008

Plan Update Date (if applicable): _____

OPERATIONAL PLAN CHECKLIST

THE FOLLOWING OPERATIONAL PROCEDURES AND PRACTICES ARE UTILIZED ON THE Maple **DAIRY.**

Indicate those characteristics or activities in each production area category that you are using in the operation of the manure management system on your dairy farm. Check all that apply.

MILKING PARLOR

Standard Operating Procedures

- ■ Automatic parlor wash
- ■ Manual parlor wash (red barn hose)

- ☐ Other _____

ANIMAL HOUSING

Standard Operating Procedures

- ☐ Freestall housing without exercise pens
- ■ Freestall housing with exercise pens (see corral management section)
- ■ Corrals with shade structures
- ☐ Corrals without shade structures
- ☐ Corrals unused during rainy months
- ■ Corrals used during periods of dry weather

- ☐ Other: _____

4570 permit

MANURE STORAGE

Standard Operating Procedures

- ☐ Solid manure is stored covered outside of corrals until spread
- ■ Solid manure is stored uncovered outside of corrals until spread
- ☐
- ☐ Solid manure is immediately spread upon removal from corrals
- ■ Manure bedding piles are covered
- ☐ Manure bedding piles are not covered
- ■ Liquid manure is stored in waste storage ponds
- ☐ Liquid manure is stored in specifically designed anaerobic lagoons
- ■ Liquid manure is stored in specifically designed aerobic lagoons
- ■ Lagoon or pond has a system of agitation for use during unloading
- ☐ Lagoon or storage ponds have mechanical agitators (circulators) on all or some of the ponds
- ■ Ponds are managed in a sequential manner
- ☐ Mechanical solids separation is used
- ☐ Mechanical agitation is used
- ☐ Hydraulic agitation is used

- ☐ No agitation system
- ■ Settling basins are used
- ☐ Weeping walls are used
- ☐ Mechanical sand separation is used
- ☐ Gravity sand separation is used
- ☐ Lagoon or pond is covered with a non-permeable cover including a gas capture system
- ☐ Lagoon or pond has a non-permeable cover without a gas capture system
- ☐ Lagoon or pond has a semi-permeable cover
- ☐ Lagoon or pond has a bio-cover
- ☐ Lagoon or pond has a natural or artificial crust by operational design
- ■ Lagoon or pond has a method of measuring freeboard
- ■ Lagoon or pond sludge accumulation is monitored

☐ Other _____

FEED STORAGE AREA

Standard Operating Procedures:

- ■ Concentrate feedstuffs and feed commodities are stored in barns
- ☐ Concentrate feedstuffs and feed commodities are stored on cement/asphalt
- ☐ Concentrate feedstuffs and feed commodities are stored on earthen ground
- ■ Concentrate feedstuffs and feed commodities are covered
- ☐ Concentrate feedstuffs and feed commodities are not covered
- ■ Silage piles are covered
- ☐ Silage piles are uncovered
- ☐ Silage is bagged
- ■ Liquids, including rain runoff are collected and conveyed to the liquid storage system
- ■ Liquids, including rain runoff are collected in a centralized point and pumped to the liquid storage system
- ■ Berms, ditches, or other methods are used to divert run-on or clean run-off
- ■ Berms, ditches, or other methods are used to direct contaminated run-off to collection point or to a conveyance to the liquid storage system
- ☐ Non-manure commodities used for bedding are stored in barns
- ☐ Non-manure commodities used for bedding are stored in/on cement/asphalt
- ☐ Non-manure commodities used for bedding are stored in/on earthen ground
- ☐ Non-manure commodities used for bedding are covered
- ☐ Non-manure commodities used for bedding are uncovered

☐ Other _____

LAND APPLICATION AREAS

Standard Operating Procedures

- ■ Liquid manure is applied blended with irrigation water
- ☐ Liquid manure is applied full strength
- ■ Flood irrigation
- ☐ Sprinkler irrigation line
- ☐ Big gun irrigation

Operational Plan Checklist

- ☐ Liquid manure is applied with trucks or trailers
- ☐ Liquid manure is applied with center pivot system
- ☐ Drop Hoses
- ☐ Sprinkler Heads
- ☐ Liquid manure injected
- ☒ Liquid manure not injected
- ☐ Liquid manure tilled under within 3 days
- ☐ Liquid manure not tilled under within 3 days
- ☐ Liquid manure used on pasture
- ☐ Irrigation lines hand set
- ☐ Irrigation lines automatically reeled
- ☒ Slurry manure applied with tank or vacuum tank trucks or trailers
- ☒ Slurry manure applied by drag hose system
- ☐ Slurry manure injected
- ☒ Slurry manure not injected
- ☒ Slurry manure tilled under within 3 days
- ☐ Slurry manure not tilled under within 3 days
- ☐ Slurry manure used on pasture
- ☒ Dry manure spread by truck and/or trailer
- ☒ Dry manure tilled under within 3 days
- ☐ Dry manure not tilled under within 3 days
- ☐ Dry manure tilled under when next crop is farmed
- ☐ Dry manure used on pasture
- ☒ Custom manure hauling service used (circle as appropriate: Liquid, Slurry, Dry)
- ☒ Personally-owned hauling equipment used (circle as appropriate: Liquid, Slurry, Dry)

- ☐ Other:_____

OTHER OPERATIONAL CONSIDERATIONS OR PLANS

Standard Operating Procedures

- ☒ Mortality management is consistent with current approved practices to minimize nuisance conditions and protect groundwater quality
- ☒ Salt management practices have been selected to limit the amount to that required to maintain animal health and optimum production

- ☐ Other_____

- ☒ Emergency manure management plan available to farm management staff on-site to address:
  - ☒ Unauthorized discharge of manure
  - ☒ Unauthorized discharge of contaminated storm water
  - ☒ Pond failure (overflow)
  - ☒ Pump failures
  - ☒ Power failure

MAINTENANCE PLAN CHECKLIST

THE FOLLOWING MAINTENANCE PROCEDURES AND PRACTICES ARE UTILIZED ON THE Maple Ave **DAIRY.**

Indicate those maintenance activities in each production area category that you are using in the operation of the manure management system on your dairy operation. Check all that apply. Where applicable, indicate the frequency that the activity is conducted. Mark "event" if the work is only done in response to an irregular event, such as rainfall.

Maintenance Plan Checklist	Frequency (where applicable)				
	Daily	Weekly	Monthly	Other	Event
MILK BARN					
☒ Have a scheduled maintenance program with equipment supplier				X	
☒ Pumps and associated infrastructure maintained according to manufacturers direction					
☒ Manufacturers recommendations are on file					
☒ Flush valves clear and functional					
☒ Floor drains clear and functional					
☒ Water supply and hoses kept in good repair					
☒ Floors maintained in good condition					
☒ Milk parlor inspected					
☒ Curbing and wastewater flow control measures maintained					
☐ Other:					
ANIMAL HOUSING AREAS					
☒ Flush valves are maintained clear of debris					
☒ Pumps are maintained on a schedule with equipment supplier					
☒ Pumps are maintained by operator as recommended by manufacturer					
☒ Pumps are checked prior to the rainy season to ensure proper function					
☒ Roofs are guttered - drain to flush system					
☒ Roofs are guttered - drain off production area					
☒ Corral shades are guttered-downspouts drain to flush system					
☒ Gutters and downspouts are cleaned as necessary to remain functional throughout rain season					
☒ Gutters are inspected for leaks and serviced as necessary prior to the rainy season					

Maintenance Plan Checklist

	Frequency (where applicable)				
	Daily	Weekly	Monthly	Other	Event
☐ Gutters and associated piping are inspected for sound connections and joints					
☐ Gutters are observed for leaks during rain events					
☐ Flush valves are maintained clear of debris					
☐ Trash and foreign material removed to prevent inadvertent disposal in or clogging of liquid waste system					
☐ Corral feed aprons (where cows stand when eating) are flushed to manure storage					
☐ Corral feed aprons scraped to manure storage					
☐ Corral feed apron runoff collected and transferred to liquid storage system					
☐ Corrals sloped to drain directly into flush lane					
☐ Corrals sloped to drain to collection point & water pumped to flush lane- automatic pump system					
☐ Corrals sloped to drain to collection point & water pumped to flush lane- manual pump system					
☐ Exercise pens and open corrals are cleaned prior to the wet season					
☐ Holes in corrals that may cause ponding are filled					
☐ Corrals are observed for ponding after rainfall					
☐ Corrals are managed in the rainy season to prevent ponding.					
☐ Corral manure mounds built and compacted prior to the rainy season					
☐ Wet weather manure accumulation in corrals is checked to determine the need for manure removal or corral grading					
☐ Unless diverted, rain run-on to housing and corrals is collected and conveyed to the liquid manure storage system					
☐ Corrals scraped/harrowed weather permitting					
☐ Corral solid manure removed spring and fall					
☐ Corral solid manure removed prior to wet weather.					
☐ Manure removed from fence lines when corrals are cleaned					
☐ Rain runoff and surface drainage is diverted away from manured areas					
☐ Rain runoff and surface drainage are collected and conveyed to liquid storage system.					
☐ Diversion piping used to divert storm water run-off checked before and during rain season to ensure freedom from blockage					

Maintenance Plan Checklist

	Frequency (where applicable)				
	Daily	Weekly	Monthly	Other	Event
☒ Run-on and run-off controls such as berms or ditches are inspected before the rain season to ensure they will work properly					
☒ Run-on and run-off controls inspected during rain season					
☐ A stream, drain, or other surface water does not flow though the confined areas					
☐ A stream, drain, or other surface water flows through some or all of the confined areas					
☒ Animals within confined areas are prevented from entering surface waters flowing through the confined area(Ex: creeks, rivers, streams)					
☐ Other					
MANURE STORAGE AREAS					
☒ All waste storage areas, liquid or solid, and manure bedding storage areas, are inspected as required by Table 1 of Monitoring and Reporting Program No. R5-2007-0035					
☒ Record-keeping requirements of Monitoring and Reporting Program No. R5-2007-0035 are being performed as directed.					
☐ Solid manure stored outside of corrals is covered or protected from rainfall					
☐ Solid manure stored outside of corrals is covered or protected from rainfall					
☒ Runoff from solid manure piles is collected and conveyed to liquid storage system					
☒ Solid manure storage areas are inspected for standing water during and after significant storm events					
☒ Integrity of the solid manure storage surface is maintained					
☐ Integrity of solid manure storage surface is repaired if it is damaged prior to additional use					
☐ Pumps and other equipment are serviced and maintained on a schedule with equipment supplier					
☐ Pumps and other equipment are serviced and maintained by operator as recommended by manufacturer					
☒ Other manure management equipment (agitators, weirs, gates, valves)inspected, serviced and maintained in operating					

Maintenance Plan Checklist

	Frequency (where applicable)				
	Daily	Weekly	Monthly	Other	Event
condition					
☒ Lagoon or pond freeboard is maintained as directed by Waster Discharge Order No. R5-2007-0035					
☒ Ponds are managed to maintain the required freeboard					
☒ Ponds are managed to minimize vectors (mosquitoes, burrowing animals, flies, etc)					
☒ Pond liner integrity is maintained during pond operation (including sludge removal)					
☒ Contractors hired to empty ponds, install equipment, or to remove sludge will be briefed on the importance of maintaining pond liner integrity					
☒ Ponds are managed to ensure adequate storage throughout the rain season as per the Waste Management Plan calculations					
☒ Sludge accumulation on lagoon or pond bottoms is monitored					
☐ Herbicides and other agricultural chemicals are not allowed to enter the manure system					
☒ Equipment is used as intended by the manufacturer					
☒ Spare parts (belts, bearings, switches, plumbing, fuses, etc) inventory is maintained on-site					
☒ Spare parts not on site but available on demand as needed reliably on a 24/7 basis					
☒ Emergency plan, including the sources of equipment that may be needed is readily available on-site					
☒ Equipment with screens is regularly inspected to prevent accumulation of debris					
☐ Other:					
FEED STORAGE AREAS					
☒ Berms, ditches, or other diversion or control methods are checked before the rain season for proper integrity and function					
☒ The perimeter of the feed storage area is checked prior to rain season to be sure that run-on and run-off controls are in working order					
☒ Berms, ditches, or other methods used to divert run-on or clean run-off are monitored regularly					
☒ Berms, ditches, or other methods are used to control and direct leachate, rainfall and other contaminated water are monitored					

Maintenance Plan Checklist

	Frequency (where applicable)				
	Daily	Weekly	Monthly	Other	Event
regularly					
☒ Area is checked for proper drainage while in use					
☒ Employees are instructed to repair or report malfunctions					
☒ Pumps are checked and serviced as necessary prior to and during the rainy season					
☒ Feed covers are kept in good repair or replaced if necessary					
☒ Plastic from covers collected and prevented from clogging feed area runoff controls					
☒ Spoiled feed disposed of, covered or appropriately managed					
☒ Surface of feed storage area is managed to prevent infiltration of silage and feed leachate to underlying soil					
☐ Other					
LAND APPLICATION AREAS					
☒ Manure application vehicles maintained in operating condition					
☒ Application equipment calibrated as necessary					
☒ Transport ditches, pipelines kept in operating condition, free of debris					
☒ Ditches and pipelines inspected for structural integrity, holes, erosion, etc					
☒ Equipment is operated per manufacturers instructions					
☒ Equipment is used for its intended use					
☒ Spare parts (hoses, belts, roller chains, pipe fittings, etc) on hand or readily available 24/7					
☐ Flow meters and associated system serviced and maintained as directed					
☒ Field valves checked and verified operational before irrigating					
☐ Other:					
OTHER OPERATIONAL CONSIDERATIONS OR PLANS					
Standard Operating Procedures					
☒ Mortality management is kept up to date with current approved practices to minimize nuisance conditions and protect groundwater quality					
☒ Salt management practices have been selected and updated to limit the amount of salt to that required to maintain animal health and optimum production					
☐ Other:					

Maintenance Plan Checklist

Frequency (where applicable)				
Daily	Weekly	Monthly	Other	Event

- Emergency manure management SOPs are kept current and readily available to farm management staff on-site to address:
  - Unauthorized discharge of manure
  - Unauthorized discharge of contaminated storm water
  - Pond failure (overflow)
  - Pump failures
  - Power failure

Location of Waste Discharge Requirements, mortality management, salt management and emergency management plans:

1560 E Corcoran Lemoore CA 93242

Location of equipment maintenance requirements and records:

1560 E. Corcoran Lemoore CA 93242

Location of sampling equipment, procedures and records:

1560 E. Corcoran Lemoore CA 93242

Parties trained to conduct Operations and Maintenance work:

Martins Dairy Service Sandoz Pumps.

CALIFORNIA ENVIRONMENTAL
PROTECTION AGENCY

CDQAP – WDR General
Order Reference Binder
TAB 6.7, Version 2-29-08

FORM FOR DOCUMENTING BACKFLOW PREVENTION FOR EXISTING MILK COW DAIRIES UNDER WASTE DISCHARGE REQUIREMENTS GENERAL ORDER NO. R5-2007-0035

This form consists of six parts and can be used to document compliance with the requirements in Waste Discharge Requirements General Order No. R5-2007-0035 for owners/operators of existing milk cow dairies (Dischargers) to:

1. Identify cross-connections that would allow the backflow of wastewater into a water supply well, irrigation well, or surface water as identified on the dairy's Site Map;

2. Propose and schedule corrective action to prevent backflow of wastewater into a water supply well, irrigation well, or surface water as identified on the dairy's Site Map; and/or

3 Document there are no cross-connections that would allow the backflow of wastewater into a water supply well, irrigation well, or surface water as identified on the dairy's Site Map.

The Discharger must complete this form except for Parts IV and V, which are to be completed by a trained professional[1]. Both the owner and the operator of the dairy must sign the certification statement in Part VI. Additional sheets may be attached as necessary to complete Parts I, II, and III.

A Site Map must be attached to this form that shows all water supply wells, irrigation wells, and surface water bodies in the dairy's Production Area and all Land Application Areas that are under the Discharger's control. The Site Map must also show all wastewater conveyance structures, wastewater discharge points to surface water, and where wastewater is mixed/blended with fresh irrigation water in these areas. Each of these locations must be identified by a name or number and listed in Part II below. Completion of Part II will identify how backflow can or does occur at each location and any current backflow preventive measures.

PART I: DAIRY FACILITY INFORMATION

A. Name of Dairy or Business Operating the Dairy: Maple Ave Dairy

Physical address of Dairy:

19860 S. Maple Ave	Laton	Fresno	93242
Number and Street	City	County	Zip Code

B. Operator Name: Josh Zonneveld Telephone No: 559 923-4546

Operator mailing address:

1560 E Cerini	Laton	Fresno	93242
Number and Street	City	County	Zip Code

C. Owner Name: John Zonneveld Telephone No: 559-923-4546

Owner Mailing Address:

1560 E Cerini	Laton	Fresno	93242
Number and Street	City	County	Zip Code

[1] A trained professional could be a person certified by the American Backflow Prevention Association, an inspector for a state or local governmental agency who has experience and/or training in backflow prevention, or a consultant with such experience and/or training.

FORM FOR DOCUMENTING BACKFLOW PREVENTION FOR EXISTING MILK COW DAIRIES UNDER WASTE DISCHARGE REQUIREMENTS GENERAL ORDER NO. R5-2007-0035

PART II: IDENTIFICATION OF EXISTING BACKFLOW CONDITIONS (due by 1 July 2008)
The attached Site Map identifies all of the locations in the Production Area and all Land Application Areas under the control of the Discharger at the dairy identified in Part I above where there are cross-connections that could, or do, allow the backflow of wastewater into a water supply well, irrigation well, or surface water. For each location shown on the map, the table below describes:

a. How and where wastewater can potentially, or does, backflow to a groundwater supply and/or surface water supply (if there are no current or potential backflow problems, indicate so with "none"), and

b. How backflow of process wastewater into the groundwater or surface water supply is currently prevented (if there is no current prevention method, indicate so with "none").

Location Where Backflow can Occur	How Backflow Can or Does Occur	Current Backflow Preventive Measure
P1	No air gap between discharge + standpipe.	none
P2	"	"
P3	"	"
P4	"	"
P5	"	"
P6	"	"
P7	"	"
P8	"	"
P9	"	"

FORM FOR DOCUMENTING BACKFLOW PREVENTION FOR EXISTING MILK COW DAIRIES UNDER WASTE DISCHARGE REQUIREMENTS GENERAL ORDER NO. R5-2007-0035

PART III: PROPOSED BACKFLOW CORRECTIVE ACTIONS AND SCHEDULE (due by 1 July 2008)

For each location identified in Part II above where there is currently no backflow prevention, the table below identifies:

a. The method proposed to be implemented that will prevent backflow, and

b. A schedule to install the preventive measure.

If there are no current or potential backflow problems identified in Part II above, this Part does not need to be completed.

Location With No Current Backflow Prevention	Proposed Backflow Prevention Method	Schedule to Install Proposed Backflow Prevention Method
P1	Raise Standpipe to make air gap.	Prior to July 2009.
P2	"	"
P3	"	"
P4	"	"
P5	"	"
P6	"	"
P7	"	"
P8	"	"
P9	"	"

PART IV: DOCUMENTATION OF EXISTING BACKFLOW CONDITIONS AND PROPOSED BACKFLOW PREVENTION METHODS (due by 1 July 2008)

As a trained professional in backflow prevention, I certify that, based on the information provided to me by the Discharger named above and my personal examination of the wastewater system, the above information in Part II above is true, accurate, and complete and the proposed backflow prevention method in Part III above will be effective to prevent the backflow of wastewater into a water supply well, irrigation well, or surface water at the dairy named in Part I above.

UCCE/CDQAP Training for Dairy Professionals
QUALIFICATIONS OF TRAINED PROFESSIONAL (EDUCATION AND/OR EXPERIENCE)

Tessa Curti 6/17/08
SIGNATURE OF TRAINED PROFESSIONAL DATE

Tessa Curti
PRINT OR TYPE NAME

FORM FOR DOCUMENTING BACKFLOW PREVENTION FOR EXISTING MILK COW DAIRIES UNDER WASTE DISCHARGE REQUIREMENTS GENERAL ORDER NO. R5-2007-0035

PART V: DOCUMENTATION THAT THERE ARE NO CROSS-CONNENCTIONS THAT WOULD ALLOW THE BACKFLOW OF WASTEWATER INTO A WATER SUPPLY WELL, IRRIGATION WELL, OR SURFACE WATER (due by 1 July 2009)

As a trained professional in backflow prevention, I certify that, based on the information provided to me by the Discharger named in Part I above and my personal examination of the wastewater system, that the backflow prevention methods proposed in Part III above (if any) have been completed, and/or there are currently no cross-connections that would allow the backflow of wastewater into a water supply well, irrigation well, or surface water at the dairy named in Part I above.

QUALIFICATIONS OF TRAINED PROFESSIONAL (EDUCATION AND/OR EXPERIENCE)

SIGNATURE OF TRAINED PROFESSIONAL DATE

PRINT OR TYPE NAME

PART VI: OWNER AND/OR OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

SIGNATURE OF OWNER	SIGNATURE OF OPERATOR
John Zonneveld	Josh Zonneveld
PRINT OR TYPE NAME	PRINT OR TYPE NAME
6-30-08	6-30-08
DATE	DATE

California Environmental Protection Agency

CDQAP – WDR General Order Reference Binder TAB 6.6, Version 2-29-08

FORM TO PROPOSE AND DOCUMENT INTERIM FACILITY MODIFICATIONS TO BALANCE NITROGEN AND/OR IMPROVE STORAGE CAPACITY AT EXISTING MILK COW DAIRIES

Waste Discharge Requirements General Order No. R5-2007-0035 for Existing Milk Cow Dairies (General Order) requires owners and/or operators of existing milk cow dairies (Discharger) to submit by **1 July 2008**:

- Proposed Interim Facility Modifications as Necessary to Balance Nitrogen if, as indicated in the Discharger's Preliminary Dairy Facility Assessment (PDFA), the Whole Farm Nitrogen Balance is greater than 1.65, and/or
- Proposed Interim Facility Modifications as Necessary to Improve Storage Capacity if, as indicated in the PDFA, the existing retention pond(s) total storage capacity is less than the total storage capacity required.

The General Order also requires the Discharger to submit by **1 July 2009**:

- Documentation of Interim Facility Modifications Completion for Storage Capacity and to Balance Nitrogen.

This form may be used to propose the required interim facility modifications for either nitrogen balance or storage capacity and to document completion of those modifications. When used, both the dairy owner and operator must sign this form in Part VI. The completed form must be submitted to the Central Valley Regional Water Quality Control Board by the deadlines noted.

PART I: DAIRY FACILITY INFORMATION

A. Name of Dairy or Business Operating the Dairy: Maple Avenue Dairy

Physical address of Dairy:

Number and Street	City	County	Zip Code
19860 S Maple Ave	Laton	Fresno	93242

B. Operator Name: Josh Zonneveld Telephone No: 559-923-4546

Operator mailing address:

Number and Street	City	County	Zip Code
1560 E. Cerini	Laton	Fresno	93242

C. Owner Name: John Zonneveld Telephone No: 559-923-4546

Owner Mailing Address:

Number and Street	City	County	Zip Code
1560 E. Cerini	Laton	Fresno	93242

FORM TO PROPOSE AND DOCUMENT INTERIM FACILITY MODIFICATIONS TO BALANCE NITROGEN AND/OR IMPROVE STORAGE CAPACITY AT EXISTING MILK COW DAIRIES

PART II: PROPOSED INTERIM FACILITY MODIFICATIONS FACILITY FOR WHOLE FARM NITROGEN BALANCE (due by 1 July 2008)

The Whole Farm Nitrogen Balance for the dairy facility identified in Part I above is .67 as indicated in the dairy's Preliminary Dairy Facility Assessment. This exceeds the required Whole Farm Nitrogen Balance of 1.65 (Note: If the Whole Farm Nitrogen Balance is 1.65 or less, it is not necessary to complete this Part of the form). Therefore, I propose the following schedule of interim modifications that can be completed by **1 July 2009** in order to balance the nitrogen generated and imported with the nitrogen removed by crops and exported (attach additional sheets as necessary).

Proposed Interim Modifications for Whole Farm Nitrogen Balance	Schedule to Install and Complete Interim Modifications
1.	
2.	
3.	
4.	
5.	
6.	
7.	

PART III: PROPOSED INTERIM FACILITY MODIFICATIONS FOR STORAGE CAPACITY (due by 1 July 2008)

The Storage Capacity Difference (Existing Storage Capacity minus Required Storage Capacity) of all wastewater storage ponds at the dairy facility identified in Part I above is 3,212,918 gallons as indicated in the dairy's Preliminary Dairy Facility Assessment. This indicates that the existing

storage capacity is insufficient to contain the wastewater generated at the dairy (Note: if the Storage Capacity Difference is a positive number (i.e., the existing storage capacity is greater than the required storage capacity), then it is not necessary to complete this Part of the form). Therefore, I propose the following schedule of interim modifications that can be completed by **1 July 2009** in order to decrease storage capacity needs or increase existing storage capacity (attach additional sheets as necessary).

Proposed Interim Modifications for Storage Capacity	Schedule to Install and Complete Interim Modifications
1.	
2.	
3.	
4.	
5.	
6.	
7.	

PART IV: DOCUMENTATION OF INTERIM MODIFICATIONS COMPLETION FOR NITROGEN BALANCE (due by 1 July 2009)

I have completed the following proposed interim facility modifications listed in Part II above (list item numbers) for the Whole Farm Nitrogen Balance:

_____

Provide an explanation and schedule for completion below for all items in Part II above that have not been completed by 1 July 2009.

_____

_____

_____

_____

PART V: DOCUMENTATION OF INTERIM MODIFICATIONS COMPLETION FOR STORAGE CAPACITY (due by 1 July 2009)

I have completed the following proposed interim facility modifications listed in Part III above (list item numbers) for Storage Capacity:

_____

Provide an explanation and schedule for completion below for all items in Part III above that have not been completed by 1 July 2009.

_____

_____

_____

_____

PART VI: OWNER AND/OR OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

SIGNATURE OF OWNER	SIGNATURE OF OPERATOR
John Zonneveld	Josh Zonneveld
PRINT OR TYPE NAME	PRINT OR TYPE NAME
6-30-08	6-30-08
DATE	DATE

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

CDQAP - WDR General Order Reference Binder TAB 6.9, Version 2-29-08

STATEMENTS OF COMPLETION FOR EXISTING MILK COW DAIRIES UNDER WASTE DISCHARGE REQUIREMENTS GENERAL ORDER NO. R5-2007-0035

Waste Discharge Requirements General Order No. R5-2007-0035 for Existing Milk Cow Dairies (General Order) requires owners and operators of existing milk cow dairies (Dischargers) to develop and implement a Nutrient Management Plan for their land application areas (land under control of the Discharger, whether it is owned, rented, or leased, to which manure or process wastewater from the production area is or may be applied for nutrient cycling). The Discharger is required to maintain the NMP at the dairy, make the NMP available to Central Valley Water Board staff during their inspections, and submit the NMP to the Executive Officer upon request.

The General Order requires the Discharger to submit two Statements of Completion during development of the NMP. The Discharger may use this form to comply with the General Order requirement to submit one or both of these Statements of Completion. Parts I and IV must be completed for each Statement of Completion. Parts II and III are to be completed for the Statements of Completion due by 1 July 2008 and 1 July 2009, respectively. Both the owner and operator of the dairy must sign this form in Part IV below.

PART I: DAIRY FACILITY INFORMATION

Name of Dairy Facility: Maple Avenue Dairy

Physical Address of Dairy Facility:

Number and Street	City	County	Zip Code
19860 S Maple Ave	Laton	Fresno	93242

Name of Operator: Josh Zonneveld Phone Number: 559-923-4546

Operator Mailing Address:

Number and Street	City	County	Zip Code
1560 E Cerini	Laton	Fresno	93242

Name of Owner: John Zonneveld Phone Number: 559-923-4546

Owner Mailing Address:

Number and Street	City	County	Zip Code
1560 E Cerini	Laton	Fresno	93242

**STATEMENTS OF COMPLETION
FOR EXISTING MILK COW DAIRIES UNDER
WASTE DISCHARGE REQUIREMENTS
GENERAL ORDER NO. R5-2007-0035**

PART II: STATEMENT OF COMPLETION DUE 1 JULY 2008

I have completed the following items of the Nutrient Management Plan (check the boxes of completed sections), which are due 1 July 2008:

☑ **Item I.A.1 Land Application Information** - Identification of land used for manure application and needed information on a facility map

☑ **Item I.B Land Application Information** - Information list for information provided on map above.

☐ N/A **Item I.C Land Application Information** – Copies of written third-party process wastewater agreements

☑ **Item I.D Land Application Information** – Identification of fields under the control of the discharger within five miles of the dairy where neither process wastewater nor manure is applied.

☑ **Item II Sampling and Analysis Plan**

☑ **Item IV Setbacks, Buffers, and Other Alternatives to Protect Surface Water** - Identification of all potential surface waters or conduits to surface waters within 100 feet of land application areas and appropriate protection.

☑ **Item VI Record-Keeping Requirements** – Identification of of monitoring records that will be maintained as required in the production & land application areas.

Has Item II (Sampling and Analysis Plan) of the Nutrient Management Plan been certified by a Certified Nutrient Management Specialist as required in the General Order?

☑ Yes
☐ No

PART III: STATEMENT OF COMPLETION DUE 1 JULY 2009

I have completed the following items of the Nutrient Management Plan (check the boxes of completed sections), which are due 1 July 2009:

☐ **Item I.A.2 Land Application Area Information** – Identification of process wastewater conveyance, mixing and drainage information for each land application area on a facility map.

☐ **Item III Nutrient Budget** – Established planned rates of nutrient applications by crop based on nutrient monitoring results for each land application area.

Has Item III Nutrient Budget of the Nutrient Management Plan been certified by a Certified Nutrient Management Specialist as required in the General Order?

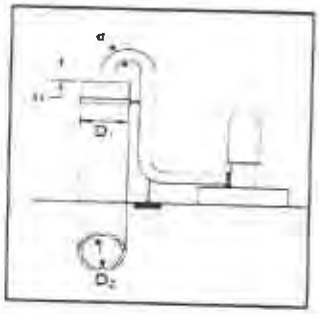
☐ Yes
☐ No

**STATEMENTS OF COMPLETION
FOR EXISTING MILK COW DAIRIES UNDER
WASTE DISCHARGE REQUIREMENTS
GENERAL ORDER NO. R5-2007-0035**

PART IV: CERTIFICATION STATEMENT

I certify under penalty of law that I have completed the items of the Nutrient Management Plan that are checked in Parts II and/or III above for the dairy identified in Part I above and that the appropriate certified nutrient management specialist has certified the items requiring such certification as noted in Part II and/or III above and that I have personally examined and am familiar with the information submitted in Parts I, II, and III of this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

SIGNATURE OF OWNER	SIGNATURE OF OPERATOR
John Zonneveld	Josh Zonneveld
PRINT OR TYPE NAME	PRINT OR TYPE NAME
6.30.08	6.30.08
DATE	DATE



Determination of Air Gap Size

Dairy Facility Name: Maple Avenue Dairy

Dairy Facility Address: 19860 S Maple Ave Laton, CA 93242

Date: 6/17/2008

Individual responsible for measuring pipe diameters: Tessa Curti & Andrew Zonneveld

Necessary documentation to determine air gap size. Information should be maintained in the records of the Waste Management Plan for the dairy.

Well identification (Use same well identification that are on your maps)	**D1** (Internal diameter of standpipe)	**D2** (Internal diameter of lines under standpipe)	**D1/D2**	**d** (internal diameter of fresh water source from well)	**G** (if D1/D2 > 1.5 then G=>1d; if D1/D2 is < 1.5 then G =>2d as long as G=> 6 inches)
P1	42"	18"	2.33	10"	G = 10"
P2	42"	18"	2.33	10"	G = 10"
P3	42"	16"	2.25	10"	G = 10"
P4					
P5	36"	14"	2.57	8"	G = 8"
P6	36"	14"	2.57	8"	G = 8"
P7	40"	15"	2.66	8"	G = 8"
P8	36"	14"	2.57	10"	G = 10"
P9	42"	18"	2.33	10"	G = 10"

Required minimum air gap

Setbacks, Buffers and Other Alternatives to Protect Surface Waters

CDQAP - WDR General Order Reference Binder
TAB 6.8, Version 2-29-08

DAIRY FACILITY INFORMATION

Name of Dairy Facility: Maple Avenue Dairy

Physical Address of Dairy Facility:
19860 S. Maple Ave. Laton CA 93242
Number and Street City County Zip Code

Name of Operator: Josh Zonneveld Phone Number: 559-923-4546

Date: 6-20-2008

Land Application Area within 100 ft. of a Surface Water or a Conduit to Surface Water. *(List each land application area; use same names used on maps of the dairy facility & cropland.)[GO Nutrient Management Plan (Attachment C Part IV.B, page C-5)]*	**Potential Surface Water or Conduit to Surface Water** *(Use same names for surface water bodies or wells as used on facility maps) [GO Nutrient Management Plan (Attachment C Part IV.A, page C-4)]*	**Describe setback, vegetated buffer, physical barrier or other alternative practice implemented to protect surface water.**
Field 5 Field 15 Field 2 Field 6	laguna irrigation ditch	ditch has a 5ft barrier between it & the fields
Field 24 Field 19 Field 16 Field 7	Murphey Slough	a man made barrier & trench is used to protect potential runoff from the fields going into the Murphey Slough

6-30-08

F1 - 19ac	WF/CORN	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	W3 - 23ac	Walnuts	T6 - 31ac	Almonds
F2 - 64ac	WF/CORN	[illegible]	[illegible]	[illegible]	[illegible]	F52 - 75ac	WF/CORN	T1 - 41ac	Pistachios		
F3 - 77ac	WF/CORN	[illegible]	[illegible]	F18 - 18ac	WF/CORN	[illegible]	[illegible]	T2 - 36ac	Almonds	Maple Avenue liquid & dry manure application	
F4 - 19ac	WF/CORN	[illegible]	[illegible]	[illegible]	[illegible]	F55 - 18ac	WF/CORN	T3 - 44ac	Almonds	No manure application fields	
F5 - 55ac	WF/CORN	F12 - 68ac	WF/CORN	[illegible]	[illegible]	W1 - 38ac	Walnuts	T4 - 55ac	Almonds	Total acres 1255	
[illegible]	[illegible]	F15 - 15ac	WF/CORN	[illegible]	[illegible]	W2 - 19ac	Walnuts	T5 - 25ac	Pistachios	Total acres with manure 943	

→ flow

⊕ irrigation well/backflow hazard

★ potential runoff into surface water

ZM-1

6-30-08

M-1

Milking Parlors

Open lot cow corrals

Calves in hutches

Maternity barns

lagoons/settling pond

hay barns/concrete feed storage

employee housing

localized manure area
for distribution and bedding

shop/equipment yards

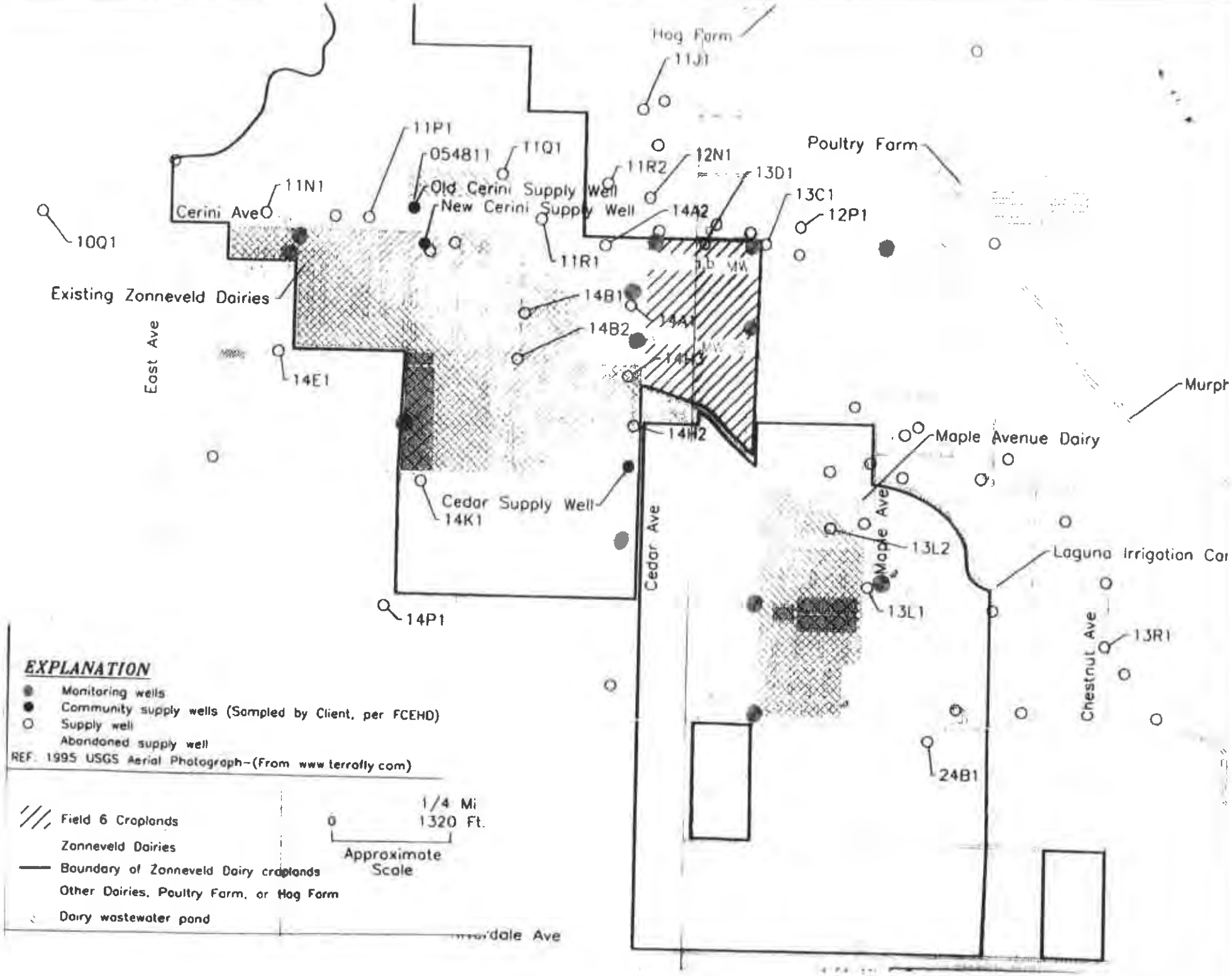
direction of slope

cemetery

free stalls with exercise pen

concrete separator

irrigation ditch


Hog Farm
11J1
11P1
054811
11Q1
11R2
12N1
13D1
Poultry Farm
11N1
Old Cerini Supply Well
New Cerini Supply Well
14A2
13C1
12P1
Cerini Ave
10Q1
11R1
Existing Zonneveld Dairies
14B1
14A1
14B2
East Ave
14E1
Murph
14H2
Maple Avenue Dairy
Cedar Supply Well
14K1
Cedar Ave
Maple Ave
13L2
Laguna Irrigation Car
13L1
14P1
Chestnut Ave
13R1
24B1
EXPLANATION
Monitoring wells
Community supply wells (Sampled by Client, per FCEHD)
Supply well
Abandoned supply well
REF: 1995 USGS Aerial Photograph-(From www.terrafly.com)
Field 6 Croplands
Zonneveld Dairies
Boundary of Zonneveld Dairy croplands
Other Dairies, Poultry Farm, or Hog Farm
Dairy wastewater pond
0
1/4 Mi
1320 Ft.
Approximate Scale
dale Ave

W-1

California Regional Water Quality Control Board

Central Valley Region

Robert Schneider, Chair

Dan Skopec
Acting Secretary

Arnold Schwarzenegger
Governor

Fresno Branch Office
1685 E Street, Fresno, California 93706
(559) 445-5116 • FAX (559) 445-5910
http://www.waterboards.ca.gov/centralvalley

TO: DAVID A. SHOLES
Senior Engineering Geologist
CEG No. 1687

FROM: STEVEN HULBERT
Environmental Scientist

DATE: 18 April 2006

SIGNATURE: Steven Hulbert

SUBJECT: ***REVIEW OF FALL 2005 GROUNDWATER MONITORING EVENT REPORT, MAPLE DAIRY, FRESNO COUNTY***

On 10 March 2006, I received a *Fall 2005 Groundwater Monitoring Event Report* for the Maple Dairy. The site includes 96 acres of developed area including the dairy proper, and 360 acres of associated cropland. The recently built dairy was constructed at the site of the former Nunes Dairy which was razed in 2001 by Zonneveld Dairies, Inc., after acquiring the site. Zonneveld Dairies, Inc. began farming the associated cropland in May 2002 while the new dairy was being constructed, and first brought animals on-site in December 2002. The report was prepared by CSS Environmental Engineering Services (CSS) of Fresno, California and summarized the seventh round of semi-annual groundwater assessment activities at the site (the sixth round since animals were brought on-site). I have reviewed the report and my comments are presented in the following sections.

MONITORING ACTIVITIES

The monitoring well network consists of two monitoring wells (MW-8 and MW-9) and an inactive supply well (SW-1). Monitoring wells MW-8 and MW-9 were constructed on-site by BSK in October 2002, west of the wastewater retention system and near the southwest corner of the confined animal area, respectively. Monitoring well SW-1 is an inactive domestic water supply well located on-site near a residence east of Maple Avenue and the dairy proper.

Wastewater monitoring activities included the collection of grab wastewater samples from the on-site wastewater retention system.

GROUNDWATER ELEVATION DATA AND SAMPLE COLLECTION

On 5 October 2005, the three monitoring wells were sounded to obtain depth to groundwater measurements. Groundwater was found between 86 and 88 feet below grade in monitoring wells MW-8 and MW-9; however, monitoring well SW-1 (which is screened to a depth of 82 feet)

was dry. With this limited groundwater elevation data and the similar data available for the adjoining Zonneveld Dairies Complex, CSS concluded that groundwater in the vicinity of both flowed westerly.

The groundwater sample collection procedures used to collect samples from the monitoring well network were consistent with the workplan we approved in a letter dated 28 October 2002. The groundwater samples were collected from two (monitoring well MW-8 and MW-9) of the three monitoring wells on 6 October 2005. On that same day the samples were received by Dellavalle Laboratory, Inc. (ELAP Certification #1595) and analyzed for alkalinity, ammonia, bicarbonate, calcium, carbonate, chloride, specific electrical conductivity, hydroxide, magnesium, nitrate, total Kjeldahl nitrogen, pH, potassium, sodium, sulfate, iron, manganese, and total dissolved solids. A cation/anion balance was not performed for the general mineral analyses. The current and historical analytical data for select analytes are summarized in Table 1, below.

TABLE 1
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

WELL ID	DATE	NO_3-N (mg/L)	NO_2-N (mg/L)	NH_4-N (mg/L)	TKN (mg/L)	Cl (mg/L)	TDS (mg/L)	SEC (umhos/cm)	cation/anion (percent)
MW-8	11/14/02	12.0	<0.25	<1	<1	19	360	590	4.2
	1/31/03	11.0	<0.10	<1	<1	8	370	590	1.1
	5/13/03	14.0	<0.10	<1	2	7	310	490	4.0
	12/17/03	9.5	<0.10	<1	<1	9	400	580	7.8
	7/28/04	12.0	NA	<1	<1	15	390	610	0.8
	11/17/04	11.0	<0.05	<1	<1	10	340	530	1.4
	10/6/05	9.9	<0.1	0.1	<1	10.2	324	513	
MW-9	11/14/02	9.7	<0.25	<1	<1	10	310	480	6.7
	1/31/03	8.2	<0.10	<1	<5	5	350	540	1.2
	5/13/03	8.0	<0.05	<1	3	6	320	490	4.8
	12/17/03	7.7	<0.10	<1	<1	7	320	490	6.6
	7/28/04	8.1	NA	<1	<1	6	330	510	0.5
	11/17/04	8.4	<0.05	<1	<1	6	360	540	1.7
	10/6/05	8.6	<0.1	0.2	<1	8.8	386	518	
SW-1	11/14/02	19.0	<0.25	<1	<1	25	380	630	3.8
	1/31/03	19.0	<0.10	<1	1	27	410	670	3.8
	5/13/03	22.0	<0.10	<1	<1	27	430	710	1.0
	12/17/03	23.0	<0.10	<1	<1	39	480	760	7.4
	7/28/04	not sampled (well dry)							
	11/17/04	not sampled (well dry)							
	10/6/05	not sampled (well dry)							
Primary MCL		10	1	NE	NE	NE	NE	NE	
Secondary MCL		NE	NE	250	NE	NE	500	900	

NO_3-N - nitrate as nitrogen
NO_2-N - nitrite as nitrogen
NH_4-N – ammonia
TKN - total Kjeldahl nitrogen
Cl - chloride
TDS - total dissolved solids
SEC - specific electrical conductivity
mg/L – milligrams per liter
NA – constituent not analyzed for
NE - not established
umhos/cm - micromhos per centimeter
Primary MCL - Primary Maximum Contaminant Levels
Secondary MCL - Recommended Secondary Maximum Contaminant Levels

On 16 October 2005 and 12 December 2005, wastewater samples were collected from the on-site wastewater retention system. On that same day the samples were received by Dellavalle Laboratory, Inc. (ELAP Certification #1595) and analyzed for pH, electrical conductivity, nitrate-nitrogen, total Kjeldahl nitrogen, sulfate, total dissolved solids, phosphate, calcium, magnesium, sodium, potassium, boron, carbonate, bicarbonate, and chloride. The wastewater analytical data for select analytes are summarized in Table 2, below.

TABLE 2
Summary of Wastewater Analytical Results

Sample Date	NO_3-N (mg/L)	SO_4 (mg/L)	NH_4-N (mg/L)	TKN (mg/L)	Cl (mg/L)	total potassium (mg/L)	total phosphorous (mg/L)
10/6/05	<0.1	<0.1	128	290	160	390	NA
12/13/05	0.5	4.3	NA	334	133	375	75.9

NO_3-N - nitrate as nitrogen
SO_4 - sulfate
NH_4-N – ammonia
TKN - total Kjeldahl nitrogen
Cl - chloride
mg/L – milligrams per liter
NA – constituent not analyzed for
< - less than

NITROGEN AND SALT LOADING ON ASSOCIATED CROPLAND

During 2005, liquid dairy waste was applied to 801.5 acres of cropland associated with Maple Dairy and the adjoining dairy complex. No solid manure was reportedly applied to the associated cropland during 2005. In a *Preliminary Review of Nutrient Management Process* report, LDCI estimates the amount of salt and nitrogen applied, by field, to the associated cropland during 2005. Considering the concentration of total Kjeldahl nitrogen found in the wastewater samples collected in January, April, July, and October 2005, LDCI estimated that amount of nitrogen and salt which was applied, through the application of the liquid dairy waste, to the cropland associated with the dairy. A summary of the findings is presented in Table 3, below.

TABLE 3
Summary of Nitrogen and Salt Loading by Field (2005)

FIELD NUMBER	ACREAGE/CROP	TOTAL NITORGEN APPLIED (lbs/acre)	TOTAL SALT APPLIED (lbs/acres)
2	65 ac/wheat and corn	330	1,931
3	76 ac/wheat and corn	46	357
4	19 ac/wheat and corn	183	1644
5	55 ac/wheat and corn	50	286
6	19 ac/wheat and corn	236	1,127
7	90 ac/wheat and corn	292	2,016
9	25 ac/wheat and corn	37	147
11	65 ac/wheat and corn	132	1,019
12	68 ac/wheat and corn	167	1,199
15	15 ac/wheat and corn	778	3,256
16	20 ac/wheat and corn	400	2,264
17	20 ac/wheat and corn	118	887
18	18 ac/wheat and corn	336	2,690
22	56 ac/wheat and corn	142	1,105
23	59 ac/wheat and corn	153	1,123
52	75.5 ac/peaches	21	124
W-1	38 ac/walnuts	195	1,740
W-3	19 ac/walnuts	176	1,576

DISCUSSION OF RESULTS

Monitoring well MW-8 is west of the wastewater retention system and confined animal area. Prior to bringing animals on-site (December 2002), nitrate as nitrogen was detected in groundwater collected from this monitoring well at 12 mg/L. Since bringing animals on-site, the concentration of nitrate as nitrogen in groundwater collected from this well has ranged from 9.5 mg/L to 14 mg/L. As of this most recent sampling event, nitrate as nitrogen was detected at a concentration of 9.9 mg/L. The concentration of nitrate as nitrogen in groundwater intercepted by this monitoring well has consistently approached, met, or exceeded the MCL for nitrate as nitrogen (10 mg/L).

Monitoring well MW-9 is near the southwest corner of the confined animal area and considering the groundwater data collected to date, is downgradient of the southernmost portion of the confined animal area and the associated cropland. Prior to bringing animals on-site (December 2002), nitrate as nitrogen was detected in groundwater collected from this monitoring well at 9.7 mg/L. Since bringing animals on-site, the concentration of nitrate as nitrogen in groundwater collected from this well has ranged from 7.7 mg/L to 8.4 mg/L. As of this most recent sampling event, nitrate as nitrogen was detected at a concentration of 8.6 mg/L.

Monitoring well SW-1 is more than 200 feet east (upgradient) of the confined animal at a homesite located within the cropland associated with the dairy. The concentration of nitrate as nitrogen in groundwater intercepted by this well has consistently exceeded that found in the downgradient monitoring wells (MW-8 and MW-9), and has exceeded the MCL for nitrate as nitrogen since prior to bringing animals on-site. This monitoring well has been dry at the time of the last three sampling events.

CSS

Environmental Engineering Services

June 2006 Groundwater Monitoring Event Report
Zonneveld Dairies Complex
Laton, Fresno County, California

August 7, 2006

Prepared for: California Regional Water Quality Control Board
by: CSS Environmental Engineering Services
on Behalf of: Zonneveld Dairies, Inc.,

CSS PROJECT 05-010

CSS

Environmental Engineering Services
1505 North Wishon, Ave.
Fresno, CA 93728

C. Scott Smith, P.E
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Cellular: (559) 347-8242
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E-Mail: cssenviro@aol.com

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AUG - 9 2006
RWQCB-CVR
FRESNO, CALIF.

August 7, 2006

CSS Project 05-010

Mr. Steve Hulbert, Environmental Scientist
California Regional Water Quality Control Board,
Central Valley Region
1685 E Street
Fresno, California 93706

SUBJECT: June 2006 Groundwater Monitoring Event Report
Zonneveld Dairies Complex
Layton, Fresno County, California

Dear Mr. Hulbert:

On behalf of Zonneveld Dairies, Inc.(Zonneveld), CSS Environmental Engineering Services (CSS) has prepared this report documenting the findings of the subject monitoring event.

The findings support the previous proposal (presented in the Fall 2005 Monitoring Event Report) to reduce the monitoring frequency to annual and a modification in the monitoring program to involve solely the water table wells. A meeting withe the California Regional Water Quality Control Board is requested to further discuss this proposal. Please advise the undersigned of your availability for the meeting.

Zonneveld has reviewed, and concurs with, the findings and recommendations presented in this report. If you have questions, and/or are in need of addition information, please call me at 559.442.0527.

Sincerely,
CSS Environmental Engineering Services

C. Scott Smith, P.E.
Owner/Principal

REGISTERED PROFESSIONAL ENGINEER
C. SCOTT SMITH
No. 040118
Exp. 3/31/09
CIVIL
STATE OF CALIFORNIA

C:\CSS\05\010 Zonneveld\June 06 event - Complex\cvr let.wpd

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JUNE 2006 GROUNDWATER MONITORING EVENT REPORT
ZONNEVELD DAIRIES COMPLEX
LATON, FRESNO COUNTY, CALIFORNIA

1.0 INTRODUCTION

This report summarizes the findings of the June 2006 groundwater monitoring event conducted at the Zonneveld Dairies Complex (Complex). The Complex is located about five miles northwest of Laton as shown on Figure 1. Also shown is the location of the Maple Avenue Dairy (Maple), which is also owned by Zonneveld Dairies, Inc. The management of manure from the Complex and Maple are integrated to maximize the benefit of manure nutrient usage.

The monitoring event was conducted in substantial conformance with the California Regional Water Quality Control Board (CRWQCB)-approved *Groundwater Investigation Workplan, Zonneveld Dairy Complex* (Workplan), dated May 7, 2002 (BSK Associates).

2.0 GROUNDWATER MONITORING NETWORK

The Complex monitoring network currently includes fourteen wells. The locations of the wells are shown on Figure 2 and their screened intervals are summarized in Table 1. Also shown on Figure 2 are the locations of wells MW-8 and -9 of the Maple monitoring program which are incorporated into the groundwater level monitoring element for the Complex. The rationale for the construction of the indicated well clusters at the Complex (e.g., "a," "b" and "c" suffixes) has been previously addressed in the associated CRWQCB-approved workplans.

3.0 BACKGROUND

3.1 Groundwater Monitoring and Assessments

Semi-annual groundwater monitoring commenced at the Complex in October 2001. The groundwater monitoring program has since been expanded to include the current extensive network of wells. Various assessments have been conducted at the Complex commencing in 2001. In addition, the framework for a Nutrient Management Plan (NMP) for the Complex and Maple was developed and implemented by Livingston Dairy Consulting (LDC).

The Fall 2005 Groundwater Monitoring Event Report (CSS Environmental Engineering Services, *Fall 2005 Groundwater Monitoring Event Report, Zonneveld Dairies Complex, Laton, Fresno County, California*, February 11, 2006) presented the salient findings of the various assessments and groundwater monitoring events conducted to date, which can be summarized as follows:

- Manure managed at the Complex lagoons does not appear to be a source of groundwater quality impairment (when compared to the results at SW-3 and -6 (located upgradient of the lagoons).

- The low reported concentrations of salinity constituents at both the Old Cerini Supply Well and the Cedar Supply Well appears to indicate the absence of groundwater impairment from dairy manure management practices. Accordingly the source of elevated nitrate at these wells has not been established.

- Overall, the differences in groundwater geochemistry between sampled first-encountered groundwater and groundwater in the deeper water-bearing strata finds no indication of vertical mixing.

The Fall 2005 report recommended the following:

- Monitoring of the deeper "b" zone wells and well MW-1c no longer appears warranted (unless trends of increasing concentrations become evident).

- Continue to conduct semi-annual monitoring at wells MW-4a and MW-7 and reduce the monitoring frequency to annual at the remaining more shallow "a" zone wells (unless trends of increasing concentrations become evident in the shallow wells)

- Conduct annual groundwater monitoring (beginning June 2006) at remaining network wells (less the "b' wells). Such a monitoring frequency appears adequate based on the findings to date. Should trends of increasing concentrations be evident, then an increased monitoring frequency may be in order at selected wells.

By letter dated April 18, 2006 the CRWQCB commented on the report and indicated, in part, that monitoring events should continue to include each Complex well and semi-annual monitoring should continue. Section 7.0, herein, presents comments on the CRWQCB comments as they relate to the findings of this monitoring event.

3.2 Nutrient Management

The NMP has been developed which address manure application at the Complex and Maple facilities. The application program maximizes the beneficial use of the manure at both dairies through integration/use of the irrigation pipeline system. The overall objectives of the NMP are to maintain and regularly evaluate records of manure application practices toward (1) optimizing the beneficial use of the manure and (2) addressing crop nutrient requirements in concert with minimizing substantial vertical migration of the nutrients beyond the crop root zone. Evaluation of the effectiveness of the NMP is an ongoing process to assess potentially needed modifications in manure application practices to

accomplish the objective. NMP implementation for the Complex and Maple facilities is an iterative process which is regularly evaluated as it evolves. The next monitoring Report will include a summary of pertinent findings of NMP monitoring, updating those presented in the Fall 2005 monitoring report, and any recommended changes in manure application practices.

4.0 MONITORING METHODOLOGIES

The monitoring event was conducted in substantial conformance with the Workplan, including:

- measurement of water levels;
- measurement of field parameters;
- well purging and water sample collection;
- water sample preservation, shipment; and chain-of custody protocol; and
- laboratory analytical procedures.

The field phase of the monitoring event was conducted by Del-Tech Geotechnical Services. Appendix A contains the field logs which include documentation of purge volumes and measurement of field parameters (EC, temperature, dissolved oxygen and turbidity).

In addition, at the request of the CRWQCB, the monitoring event included sampling and analyses of the lagoon water. Samples of the discharge from the pump at the lagoon were collected by Dellavalle Laboratories, Inc. (Dellavalle). Sample preservation, shipment; and chain-of custody protocol and laboratory analytical procedures were similarly in accordance with the Workplan.

5.0 MONITORING EVENT FINDINGS

The following subsections summarize the findings of the monitoring event.

5.1 Groundwater Levels and Flow Directions

Table 1 summarizes measured depths and associated groundwater elevations for the subject event and for the events since commencement of the monitoring program. Figure 3 presents a groundwater contour elevation map for the subject monitoring event. Groundwater level data for Maple is incorporated into the contour map.

5.2 Groundwater Sample Laboratory Analytical Results

The laboratory analytical reports for the subject event are included as Appendix B. The laboratory reports also include the CRWQCB-requested cation/anion balance. Table 2 summarizes the laboratory analytical results for the subject event and for the events since commencement of the monitoring program.

The CRWQCB requested that water samples be analyzed for phosphorus. The request was inadvertently overlooked and future water sample analyses will include total phosphorous and orthophosphate.

5.3 Lagoon Water Sample Laboratory Analytical Results

The analytical results are included in Appendix B. Based on the analytical results, nitrogen compounds in the effluent are largely as ammonia (reported as ammonia nitrogen, NH4-N) and organic nitrogen (difference of Total Kjeldahl Nitrogen [TKN] and NH4-N). Future monitoring reports will include tabular summaries of historical results.

6.0 EVALUATION OF GROUNDWATER MONITORING FINDINGS

6.1 Groundwater Levels and Flow Directions

From Figure 3, the groundwater flow direction beneath the Complex and Maple facilities varied from westerly to northwesterly, as with previous monitoring events.

Well hydrographs for each Complex monitoring well are presented in Appendix C. From the well hydrographs, an overall decline in water levels with time is seen at all wells except well MW-1a which is screened across a discontinuous layer of shallow groundwater. Moderate rising water levels at the time of more recent events is seen at wells MW-3a, -3b, -4b, -5a, -7 and SW-3. Factors include the varied time of year that the samples have been collected since program commencement.

6.2 Groundwater Analytical Results

Appendix D includes time versus concentration graphs for Electrical Conductivity and NO3-N, which are the key constituents in the assessment. Review of the graphs reveals the following:

- *MW-1a*: A general declining trend in EC and NO3-N since the May 2003 monitoring event.
- *MW-1c, 2a, -2b, -3B, -4b, -5a, -5b, -7:* Insignificant changes, or a slight declining trend in EC and/or NO3-N.
- *MW-3a*: Sporadic changes in EC and NO3-N with an overall slight declining trend.

- *MW-4a*: Sporadic changes in EC and NO3-N. No overall trend of increased levels indicated.

- MW-7: Moderate fluctuations in EC and NO3-N.

- *SW-1*: Increasing trend in EC and NO3-N (through last event in December 2003).

- *SW-3*: Moderate fluctuations in EC and NO3-N and a recent declining trend

- *SW-6*: Insufficient data to evaluate possible trends.

7.0 SUMMARY AND RECOMMENDATIONS

Comparison of the findings of the subject monitoring event to those of the previous events at the Complex to date finds the following:

- No trend of increased EC and NO3-N in the shallow (MW-1a, -2a, -3a, -5a, and -7). An exception is well MW-4b where the EC increased over the Fall 2005 event.

- The continued absence of appreciable changes in EC and NO3-N (with the exception of slight declines) in the deeper wells (MW-1c, -2b, -3b, -4b, and -5b) indicates the absence of communication between the water bearing strata in area of the Complex and of upgradient contaminant sources which recharge the deeper water-bearing strata.

- The continued non-detectable to low ammonia-nitrogen (NH4-N) and Total Kjeldahl Nitrogen (TKN) in the shallow wells. The absence of these nitrogen constituents serves as an indication that nitrogen constituents originating from the manure are either (1) not migrating to groundwater, or than complete mineralization of nitrogen is occurring (which doesn't appear likely). Elevated TKN is limited to deeper wells MW-2b and -3b for the Fall 2005 event (see Table 2). The source of this anomaly is not clear, particular since such elevated levels has not been detected in the shallow wells.

Based on the findings of this report, the following is recommended:

- With the exception of wells MW-2b and -3b, monitoring of the deeper wells MW-1c and remaining "b" wells, no longer appears warranted. Wells MW-2b and -3b should continue to be included until the anomaly can be resolved or until elevated levels of TKN are not reported for three consecutive events. Should trends of increasing concentrations in the shallow wells become evident, reincorporation of selected deeper wells may be in order.

- Conduct annual groundwater monitoring (beginning June 2007) at the shallow wells.

Should trends of increasing concentrations be evident, then an increased monitoring frequency may be in order at selected wells.

A workplan for a new well to replace SW-1 .will be submitted to provide for construction of the well prior to the forthcoming event.

8.0 LIMITATIONS

This monitoring report has been prepared for the exclusive use of Zonneveld Dairies, Inc., Livingston Dairy Consulting, and regulatory agencies overseeing the Complex. It has been prepared in accordance with current generally accepted standards for engineering practice in the area. The findings are valid as of the present and may change with changes in Complex conditions and/or regulatory requirements. No other warranty is implied.

TABLE 2
SUMMARY OF GROUNDWATER SAMPLE ANALTICAL RESULTS
ZONNEVELD DAIRIES COMPLEX

WELL NO.	DATE	pH[1]	EC[2]	TDS[3]	NO3-N[4]	NO2-N[5]	NH4-N[6]	TKN[7]	K[8]	Ca[9]	Mg[10]	Na[11]	SO4[12]	Cl[13]	Alk[14]	HCO3[15]	CO3[16]	OH[17]
MW 1a	10/01/01	6.3	350	260	5.6	<0.15	<1	<1	3	15	2.1	49	18	10	110	110	<1	<1
	04/19/02	7.3	1000	500	23	0.51	<1	<1	8	53	8.9	130	39	97	280	280	<1	<1
	11/13/02	6.7	380	280	3.7	<0.1	<1	<1	3	14	2.9	59	13	16	140	140	<1	<1
	05/13/03	6.9	1800	1300	120	<0.3	<1	3	17	120	21	190	78	110	280	280	<1	<1
	07/28/04	7.6	450	300	9.9	na[18]	<1	1	31	8	1.8	74	17	12	140	140	<1	<1
	11/16/04	7.6	590	360	19	<0.05	<1	2	17	26	13	71	30	23	130	130	<1	<1
	10/06/05	7.2	408	441	6.9	<0.1	0.5	4.5	87.2	23	4.5	42.1	17.3	11.1	147	147	<1	<1
	06/22/06	**7.1**	**274**	**313**	**12.7**	**<0.1**	**<0.5**	**1.2**	**64.5**	**25.8**	**6.6**	**22.6**	**19.0**	**8**	**87**	**87**	**<1**	**<1**
MW 1c	10/01/01	6.7	1100	710	2.9	<0.7	<1	<1	<2	120	3.9	140	<28	38	530	530	<1	<1
	04/19/02	6.9	1100	740	3.9	<0.5	<1	<1	<2	110	2.8	120	<20	46	530	530	<1	<1
	11/13/02	6.7	1300	820	7.9	<0.5	<1	<1	<2	120	3.1	150	<20	41	610	610	<1	<1
	01/31/03	6.8	1300	810	2.9	<0.75	<1	<1	<2	160	4	130	9	42	650	650	<1	<1
	05/13/03	6.9	1300	820	3.9	<0.25	<1	<1	<2	130	3.6	150	<10	44	640	640	<1	<1
	12/17/03	7.4	1100	730	4.7	<0.15	<1	<1	<2	96	2.4	150	14	36	590	590	<1	<1
	10/06/05	7.1	1241	730	2.1	0.1	<1	<1	2.5	130	3.7	137	15.1	35	577	577	<1	<1
	06/22/06	**7.3**	**1350**	**820**	**5.7**	**<0.1**	**<0.5**	**<1**	**2**	**155**	**4.7**	**152**	**15.5**	**48**	**619**	**619**	**<1**	**<1**
MW 2a	11/13/02	8.0	490	300	1.1	<0.1	<1	<5	<2	9	1.4	83	22	77	160	160	<1	<1
	01/31/03	8.3	240	400	1.3	<0.05	<1	<5	<2	4	0.8	48	15	11	96	96	<1	<1
	12/17/03	8.1	290	190	2.2	<0.05	<1	<1	<2	14	1.4	42	51	4	79	79	<1	<1
	07/28/04	8.5	160	170	2.2	na	<1	1	<2	9	0.2	27	5	2	75	71	4	<1
	11/16/04	8.2	180	150	2.9	<0.05	<1	<1	<2	23	0.4	17	6	2	82	82	<1	<1
	10/06/05	8.2	370	270	7.1	<0.1	<0.1	3.3	1.5	38	1.1	41	13.4	7.2	141	141	<1	<1
	06/15/06	**8.2**	**273**	**285**	**5.9**	**<0.1**	**<0.5**	**<1**	**2.5**	**26.8**	**0.7**	**31**	**9.4**	**9.7**	**100**	**100**	**<1**	**<1**
MW 2b	11/13/02	8.8	160	130	0.8	<0.05	<1	<5	<2	2	0.4	31	7	4	66	54	12	<1
	01/31/03	8.9	140	110	0.6	<0.05	<1	<5	<2	2	0.2	26	4	2	60	48	12	<1
	10/06/05	9.3	154	292	1.1	<0.1	<0.1	31.3	1.0	2.7	0.6	27.1	3.7	2.7	63.2	54	8.2	<1
	06/15/06	**8.9**	**154**	**210**	**2.3**	**<0.1**	**<0.5**	**<1**	**1.3**	**3.7**	**<0.1**	**31.7**	**4.9**	**4.3**	**69.7**	**69.7**	**7.8**	**<1**
MW 3a	11/14/02	6.7	1100	780	41	<0.4	<1	1	<2	130	9.4	82	26	32	360	360	<1	<1
	01/31/03	6.9	1200	760	44	<0.6	<1	<5	<2	130	6.5	88	26	33	350	350	<1	<1
	12/17/03	7.7	1000	700	40	<0.15	<1	<1	<2	120	5.9	71	22	29	330	330	<1	<1
	07/27/04	8.1	520	410	5.9	na	<1	12	2	30	5.9	77	32	29	180	180	<1	<1
	11/16/04	7.7	810	580	29	<0.05	<1	3	<2	110	7.2	70	21	22	300	300	<1	<1
	10/06/05	7.7	693	495	23.7	<0.1	<0.1	1.5	1.4	73.1	4.7	65.8	21.7	14.3	220	220	<1	<1
	06/15/06	**7.7**	**811**	**605**	**26.0**	**<0.1**	**<0.5**	**<1**	**2.1**	**94.3**	**4.7**	**73.3**	**21.2**	**19**	**286**	**286**	**<1**	**<1**
MW 3b	11/13/02	7.2	1100	720	36	<0.35	<1	<1	<2	130	2.3	97	16	37	370	370	<1	<1
	01/31/03	6.9	1100	740	38	<0.6	<1	<1	<2	140	2.4	94	16	34	380	380	<1	<1
	10/06/05	7.7	985	688	35.8	<0.1	<0.1	10.6	1.2	123	1.7	102	19.1	28.8	369	369	<1	<1
	06/15/06	**7.6**	**963**	**670**	**34.7**	**<0.1**	**<0.5**	**<1**	**2.4**	**115**	**1.9**	**95.4**	**19.3**	**39.5**	**343**	**343**	**<1**	**<1**
MW 4a	11/14/02	7.6	1200	660	12	<0.5	<1	7	3	28	5.9	210	54	210	830	830	<1	<1
	01/31/03	7.4	1200	750	43	<0.6	<1	<1	<2	120	2.9	94	30	34	280	280	<1	<1
	05/13/03	7.5	990	650	38	<0.5	<1	<1	<2	100	2.5	82	28	34	270	270	<1	<1
	12/17/03	7.9	1000	660	60	<0.5	<1	1	<2	150	3.6	98	46	53	290	290	<1	<1
	07/27/04	8.1	470	300	51	<0.6	<1	<1	<2	120	3	90	36	42	290	290	<1	<1
	06/15/06	**7.9**	**1058**	**733**	**36.7**	**<0.1**	**<0.5**	**<1**	**4.9**	**87.1**	**12.7**	**121**	**38.6**	**39.5**	**343**	**343**	**<1**	**<1**

TABLE 2
SUMMARY OF GROUNDWATER SAMPLE ANALTICAL RESULTS
ZONNEVELD DAIRIES COMPLEX

WELL NO.	DATE	pH[1]	EC[2]	TDS[3]	NO3-N[4]	NO2-N[5]	NH4-N[6]	TKN[7]	K[8]	Ca[9]	Mg[10]	Na[11]	SO4[12]	Cl[13]	Alk[14]	HCO3[15]	CO3[16]	OH[17]
MW 4b	11/14/02	7.4	970	610	36	<0.4	<1	2	<2	38	1.3	150	16	40	280	280	<1	<1
	01/31/03	7.3	990	620	36	<0.5	<1	<5	<2	42	1.2	160	16	41	280	280	<1	<1
	10/06/05	7.6	944	653	31.3	<0.1	<0.1	<1	1.2	74	1	137	16.7	31.5	356	356	<1	<1
	6/22/2006	**7.8**	**932**	**633**	**30.4**	**<0.1**	**<0.5**	**<1**	**1.7**	**77.2**	**1.0**	**145**	**16.7**	**28**	**619**	**619**	**<1**	**<1**
MW 5a	01/31/03	7.1	1200	780	40	<0.6	<1	<1	2	100	6.4	130	26	45	370	370	<1	<1
	05/13/03	7.3	1200	760	43	<0.15	<1	<1	<2	110	4.9	120	15	39	380	380	<1	<1
	12/17/03	7.8	1400	960	45	<0.25	<1	<1	<2	110	6.1	190	20	43	560	560	<1	<1
	07/28/04	7.7	1200	770	45	na	<1	<1	<2	130	3.4	140	14	34	430	430	<1	<1
	11/16/04	7.7	1100	770	42	<0.1	<1	<1	<2	120	7	140	20	32	420	420	<1	<1
	10/06/05	7.5	1159	832	43.1	<0.1	<0.1	<1	1.1	115	8.7	134	23.2	40.2	341	341	<1	<1
	06/15/06	**7.7**	**1194**	**823**	**42.5**	**<0.1**	**<0.5**	**<1**	**2.6**	**147**	**5.7**	**104**	**21.4**	**39.5**	**421**	**421**	**<1**	**<1**
MW 5b	01/31/03	7.6	1000	680	40	<0.6	<1	<5	<2	49	2.1	160	15	35	320	320	<1	<1
	10/06/05	7.6	984	676	39.2	<0.1	<0.1	<1	0.8	98.3	1.8	120	18.1	32.2	341	341	<1	<1
	06/15/06	**7.8**	**1013**	**745**	**37.5**	**<0.1**	**<0.5**	**<1**	**2.2**	**86.9**	**2.2**	**121**	**18.1**	**32.1**	**342**	**342**	**<1**	**<1**
MW 7	11/13/02	7.5	510	340	5.4	<0.1	<1	<1	<2	29	1.4	76	21	12	210	210	<1	<1
	01/31/03	7.3	750	490	18	<0.4	<1	<5	<2	53	1.2	110	30	22	250	250	<1	<1
	05/13/03	7.3	790	480	16	<0.1	<1	<1	<2	59	1.3	100	36	23	290	290	<1	<1
	12/17/03	8.0	600	390	8.6	<0.05	<1	<1	<2	43	1	80	24	14	250	250	<1	<1
	07/28/04	8.1	430	270	5	na	<1	<1	4	37	14	32	23	28	140	140	<1	<1
	11/16/04	8.0	600	400	12	<0.05	<1	<1	<2	52	1.4	92	28	15	250	250	<1	<1
	10/06/05	8.1	784	530	16.9	<0.1	<0.1	<1	0.9	63.1	1.3	123	37.6	29.36	295	295	<1	<1
	06/16/06	**7.9**	**523**	**490**	**9.8**	**<0.1**	**<0.5**	**2.9**	**1.3**	**42.1**	**0.9**	**74.8**	**11.6**	**10**	**225**	**225**	**<1**	**<1**
SW 1	10/01/01	7.0	520	320	13	<0.25	<1	<1	<2	57	4.4	52	17	11	180	180	<1	<1
	04/19/02	8.0	570	360	16	<0.2	<1	<1	<2	47	5.6	57	16	23	180	180	<1	<1
	11/13/02	6.9	630	380	19	<0.25	<1	<1	<2	62	3.9	59	18	25	200	200	<1	<1
	01/31/03	7.2	670	410	19	<0.1	<1	1	<2	66	4.6	57	17	27	210	210	<1	<1
	05/13/03	7.1	710	430	22	<0.1	<1	<1	<2	76	5.2	63	16	27	220	220	<1	<1
	12/17/03	7.9	760	480	23	<0.1	<1	<1	<2	63	4.1	78	22	39	240	240	<1	<1
SW 3	10/01/01	6.9	1000	680	43	<0.6	<1	<1	<2	120	2.9	94	30	34	280	280	<1	<1
	04/19/02	7.4	940	660	38	<0.5	<1	<1	<2	100	2.5	82	28	34	270	270	<1	<1
	11/13/02	7.4	1200	890	60	<0.5	<1	1	<2	150	3.6	98	46	53	290	290	<1	<1
	01/31/03	7.2	1200	760	51	<0.6	<1	<1	<2	120	3	90	36	42	290	290	<1	<1
	05/13/03	7.5	1100	740	45	<0.15	<1	<1	<2	120	3	90	31	41	310	310	<1	<1
	10/06/05	7.4	1321	933	51.8	<0.1	<1	<1	1.2	158	5.5	129	34.1	52.7	427	427	<1	<1
	06/15/06	**7.6**	**1181**	**825**	**45.6**	**<0.1**	**<1**	**<1**	**1.9**	**138**			**34.6**	**51.9**	**367**	**367**	**<1**	**<1**
SW 4	10/01/01	7.5	690	440	11	<0.5	<1	<1	<2	52	1.4	100	33	18	250	250	<1	<1
SW 6	10/01/01	7.2	930	610	38	<0.6	<1	1	<2	51	0.8	150	<24	34	270	270	<1	<1
	04/19/02	7.4	900	590	34	<0.4	<1	1	<2	55	0.9	120	<16	30	270	270	<1	<1
	11/13/02	7.2	950	610	34	<0.3	<1	<1	<2	69	1.2	120	17	30	290	290	<1	<1
	01/31/03	7.0	940	570	35	<0.5	<1	<1	<2	65	1.1	120	16	27	280	280	<1	<1

TABLE 1
SUMMARY OF MONITORING WELL SCREENED INTERAVALS AND HISTORIC WATER LEVEL MEASUREMENTS AND ELEVATIONS
ZONNEVELD DAIRIES COMPLEX

Well No.	Screened Interval (depth[1])	Screened Interval (elevation[2])	Date	Reference Elevation[2]	Groundwater Depth[1]	Groundwater Elevation[2]
MW 1a	9.5-14.5	232.2-227.2	07/20/01	241.72	7.96	233.76
			08/24/01	241.72	9.04	232.68
			09/17/01	241.72	10.00	231.72
			10/01/01	241.72	11.02	230.70
			04/19/02	241.72	10.40	231.32
			06/05/02	241.72	10.16	231.56
			11/13/02	241.72	12.08	229.64
			01/31/03	241.72	12.01	229.71
			05/13/03	241.72	10.57	231.15
			12/17/03	241.72	13.91	227.81
			07/28/04	241.72	8.21	233.51
			11/16/04	241.72	10.51	231.21
			10/06/05	241.72	9.68	232.04
			06/22/06	**241.72**	**10.02**	**231.70**
MW 1c	72.5-107.5	169.3-134.3	09/17/01	241.82	80.30	161.52
			09/28/01	241.82	80.72	161.10
			10/01/01	241.82	81.13	160.69
			04/19/02	241.82	80.11	161.71
			06/05/02	241.82	82.49	159.33
			11/13/02	241.82	87.86	153.96
			01/31/03	241.82	85.56	156.26
			05/13/03	241.82	88.25	153.57
			12/17/03	241.82	93.17	148.65
			07/28/04	241.82	97.16	144.66
			11/17/04	241.82	99.57	142.25
			10/06/05	241.82	100.81	141.01
			06/22/06	**241.82**	**97.18**	**144.64**
MW 2a	60-90	182.9-152.9	11/13/02	242.88	76.42	166.46
			01/31/03	242.88	74.02	168.86
			05/13/03	242.88	79.70	163.18
			12/17/03	242.88	80.47	162.41
			07/28/04	242.88	90.81	152.07
			11/16/04	242.88	92.03	150.85
			10/06/05	242.88	89.71	153.17
			06/15/06	**242.88**	**95.97**	**146.91**
MW 2b	125-135	117.9-107.9	11/13/02	242.88	77.39	165.49
			01/31/03	242.88	76.03	166.85
			05/13/03	242.88	81.86	161.02
			12/17/03	242.88	81.86	161.02
			11/16/04	242.88	93.29	149.59
			10/06/05	242.88	92.27	150.61
			06/15/06	**242.88**	**87.93**	**154.95**

TABLE 1
SUMMARY OF MONITORING WELL SCREENED INTERAVALS AND HISTORIC WATER LEVEL MEASUREMENTS AND ELEVATIONS
ZONNEVELD DAIIRIES COMPLEX

Well No.	Screened Interval (depth[1])	Screened Interval (elevation[2])	Date	Reference Elevation[2]	Groundwater Depth[1]	Groundwater Elevation[2]
MW 3a	67-97	176.2-146.2	11/14/02	243.22	78.30	164.92
			01/31/03	243.22	78.76	164.46
			05/13/03	243.22	84.14	159.08
			12/17/03	243.22	84.08	159.14
			07/27/04	243.22	96.85	146.37
			11/16/04	243.22	94.21	149.01
			10/06/05	243.22	93.94	149.28
			06/15/06	**243.22**	**92.12**	**151.10**
MW 3b	117-132	126.2-111.2	11/13/02	243.22	80.72	162.50
			01/31/03	243.22	79.79	163.43
			05/13/03	243.22	85.96	157.26
			12/17/03	243.22	84.88	158.34
			10/06/05	243.22	96.52	146.70
			06/15/06	**243.22**	**92.94**	**150.28**
MW 4a	60-90	182.9-152.9	11/14/02	242.86	81.21	161.65
			01/31/03	242.86	80.18	162.68
			05/13/03	242.86	83.87	158.99
			12/17/03	242.86	85.49	157.37
			07/27/04	242.86	91.62	151.24
			11/16/04	242.86	(dry)	
			10/06/05	242.86	(dry)	
			06/15/06	**242.86**	**91.03**	**151.83**
MW 4b	125-135	117.9-107.9	11/14/02	242.89	84.34	158.55
			01/31/03	242.89	84.69	158.20
			05/13/03	242.89	88.64	154.25
			12/17/03	242.89	88.61	154.28
			11/16/04	242.89	(not measured)	
			10/06/05	242.89	100.51	142.38
			06/15/06	**242.89**	**95.76**	**147.13**
MW 5a	65-95	178.5-148.5	01/31/03	243.53	76.52	167.01
			05/13/03	243.53	80.66	162.87
			12/17/03	243.53	81.51	162.02
			07/27/04	243.53	93.45	150.08
			11/16/04	243.53	90.25	153.28
			10/06/05	243.53	90.01	153.52
			06/15/06	**243.53**	**89.40**	**154.13**
MW 5b	128-138	115.4-105.4	01/31/03	243.41	77.07	166.34
			05/13/03	243.41	81.49	161.92
			12/17/03	243.41	82.08	161.33
			10/06/05	243.41	91.17	152.24
			06/15/06	**243.41**	**89.78**	**153.63**

TABLE 1
SUMMARY OF MONITORING WELL SCREENED INTERAVALS AND HISTORIC WATER LEVEL MEASUREMENTS AND ELEVATIONS
ZONNEVELD DAIIRIES COMPLEX

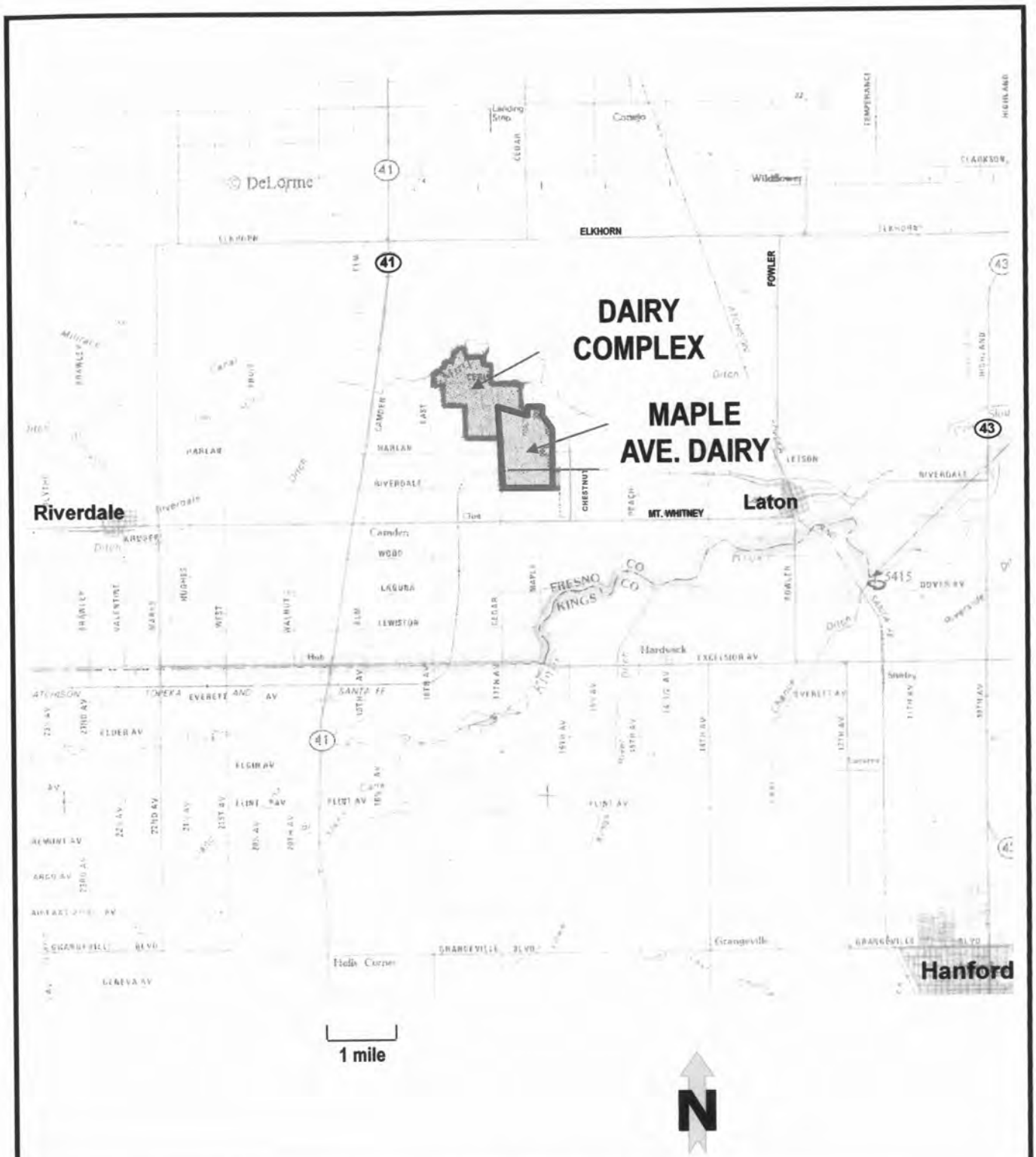
Well No.	Screened Interval (depth[1])	Screened Interval (elevation[2])	Date	Reference Elevation[2]	Groundwater Depth[1]	Groundwater Elevation[2]
MW 7	88-108	150.4-130.4	11/13/02	238.38	88.90	149.48
			01/31/03	238.38	86.91	151.47
			05/13/03	238.38	92.84	145.54
			12/17/03	238.38	92.85	145.53
			07/28/04	238.38	106.00	132.38
			11/16/04	238.38	102.64	135.74
			10/06/05	238.38	105.30	133.08
			06/16/06	**238.38**	**99.68**	**138.70**
SW 1	73-82	171.6-162.6	09/17/01	244.57	68.21	176.35
			10/01/01	244.57	68.43	176.13
			04/19/02	244.57	68.65	175.91
			06/05/02	244.57	71.67	172.89
			11/13/02	244.57	74.15	170.41
			01/31/03	244.57	74.04	170.52
			05/13/03	244.57	76.63	167.93
			12/17/03	244.57	79.51	165.05
			07/28/04	244.57	(dry)	
			11/17/04	244.57	(dry)	
			10/05/05	244.57	(dry)	
			06/15/06	**244.57**	**(dry)**	
SW 3	120-139	118.2-99.2	10/01/01	238.24	70.84	167.40
			04/19/02	238.24	70.00	168.24
			06/05/02	238.24	76.41	161.83
			11/13/02	238.24	74.94	163.30
			01/31/03	238.24	74.37	163.87
			05/13/03	238.24	(dry)	
			12/17/03	238.24	79.19	159.05
			11/17/04	238.24	(dry)	
			10/05/05	238.24	91.37	146.87
			06/15/06	**238.24**	**87.38**	**150.86**
SW 4	153(ob)	153(ob)	08/24/01	238.24	83.10	155.14
			09/17/01	238.24	82.21	156.03
			10/01/01	238.24	82.36	155.88
			04/19/02	238.24	84.60	153.64
			06/05/02	238.24	(dry)	
			11/13/02	238.24	(dry)	
			01/31/03	238.24	(dry)	
			05/13/03	238.24	(dry)	
			12/17/03	238.24	(dry)	
			11/17/04	238.24	(dry)	
			10/05/05	238.24	(dry)	
			06/15/06	**238.24**	**(dry)**	

TABLE 1
SUMMARY OF MONITORING WELL SCREENED INTERAVALS AND HISTORIC WATER LEVEL MEASUREMENTS AND ELEVATIONS
ZONNEVELD DAIIRIES COMPLEX

Well No.	Screened Interval		Date	Reference Elevation[2]	Groundwater Depth[1]	Groundwater Elevation[2]
	(depth[1])	(elevation[2])				
SW 6	154.1(ob)	154.1(ob)	10/01/01	244.11	73.45	170.66
			04/19/02	244.11	77.35	166.76
			06/05/02	244.11	80.64	163.47
			11/13/02	244.11	81.36	162.75
			01/31/03	244.11	80.85	163.26
			05/13/03	244.11	85.05	159.06
			12/17/03	244.11	86.03	158.08
			11/17/04	244.11	(dry)	
			10/05/05	244.11	(dry)	
			06/15/06	**244.11**	**(dry)**	

NOTES

1 feet measured from top of casing
2 feet above mean sea level
ob wells are open bottom; screened interval not established



LOCATION MAP

FIGURE 1
CSS 05 – 010

Zonneveld Dairies Complex and
Maple Avenue Dairy
Laton, Fresno County, California

CSS

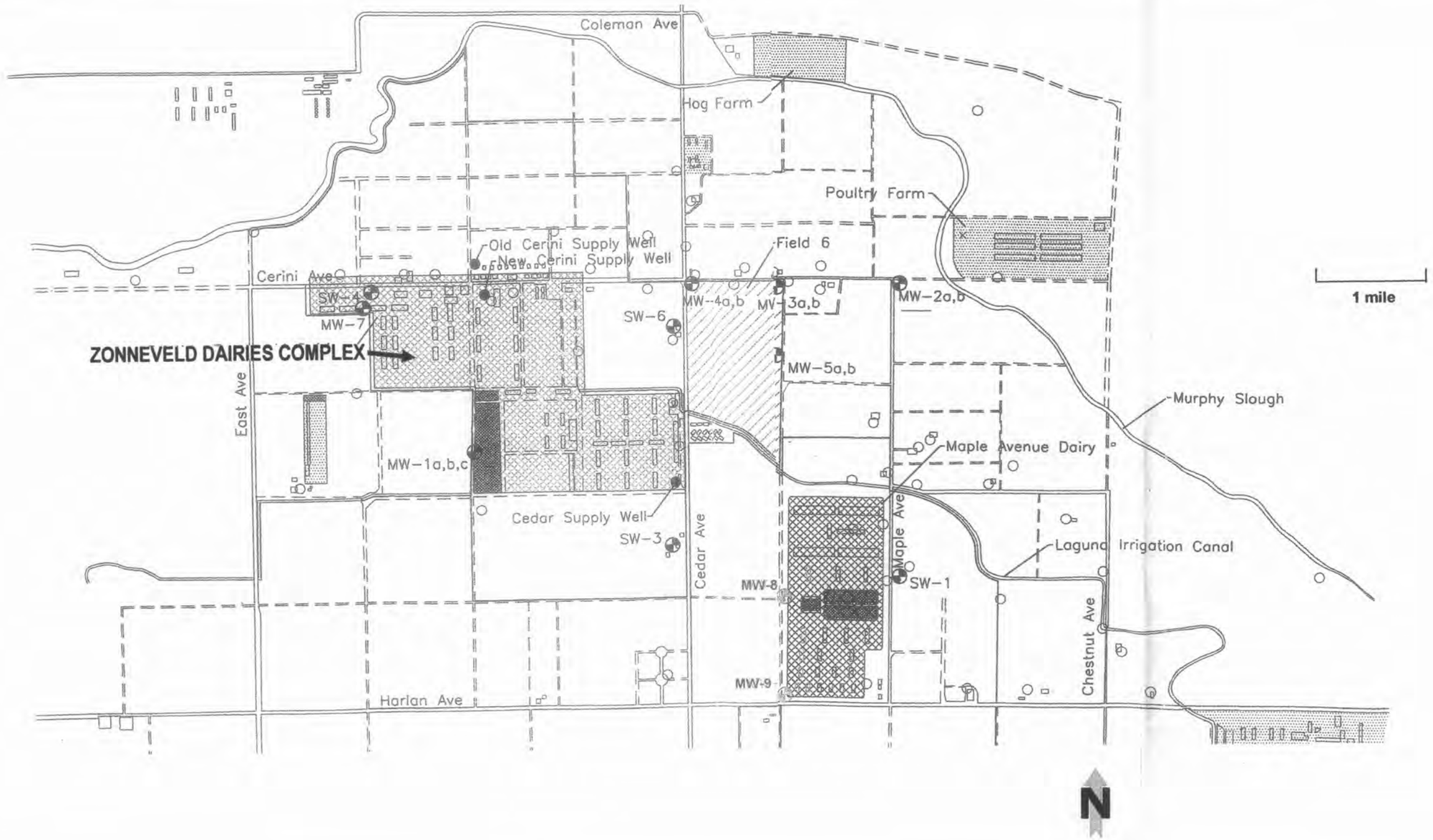
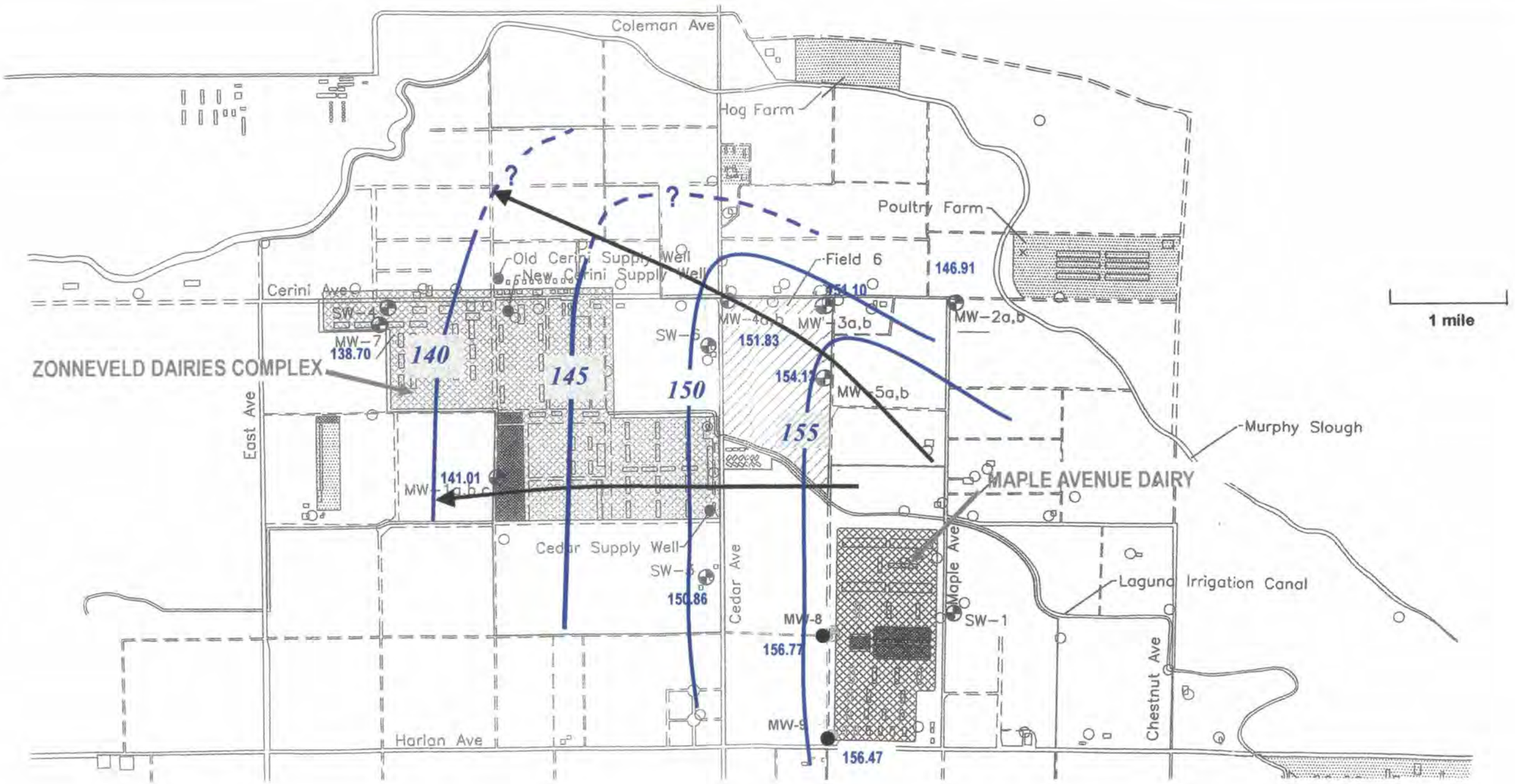


FIGURE 2
CSS 05-010
FEBRUARY 2006

SITE PLAN
Zonneveld Dairies Complex
Laton, Fresno County, California

CSS



Base Map Source: *BSK Associates, Groundwater Monitoring Program Report, Fall 2003 Semi-Annual Monitoring Event, Zonneveld Dairies Complex*, April 30, 2004

Groundwater Elevation Contour

153.35 Groundwater Elevation (feet above mean sea level)

Inferred Groundwater Flow Direction

FIGURE 3
CSS 05-010
JULY 2006

GROUNDWATER CONTOUR ELEVATION MAP- "A" WELLS JULY 15-16, 2006

First 2006 Semi-Annual Groundwater Monitoring Event
Zonneveld Dairies Complex and Maple Avenue Dairy
Laton, Fresno County, California

CSS

APPENDIX A

DEL-TECH

GEOTECHNICAL SUPPORT SERVICES

2006 GROUNDWATER FIELD MONITORING SUMMARY REPORT

SITE:

ZONNEVELD DAIRIES
1560 EAST CERINI AVENUE
LATON, CA 93242-9700
June 15-16 & 22, 2006

10624 OLIVE AVE., OAKDALE, CALIF. 95361 * OFFICE (209) 847-8757 * FAX (209) 847-7744

DEL-TECH GEOTECHNICAL SUPPORT
(209) 847-8757 (OFFICE) * (209) 847-7744 (FAX) * deltech1@pacbell.net (Email)

ZONNEVELD DAIRY - MAPLE AVE. DAIRY
1500 EAST CENNI AVE. / LATON, CA.

MONITORING WELL FIELD SUMMARY LOG 2006
DEPTH TO WATER MEASUREMENTS

	QTR. 1	QTR. 2	QTR. 3	QTR. 4	TOTAL
DATE		6/15-16 & 22/06			DEPTH
LOCATION					
MW- 1A		10.20			14.25'
MW- 1C		97.18			105.60'
MW- 2A		95.97			97.80'
MW- 2B		87.93			129.30'
MW- 3A		92.12			99.65'
MW- 3B		92.94			137.90'
MW- 4A		91.03			94.80'
MW- 4B		95.76			141.00'
MW- 5A		89.40			102.51'
MW- 5B		89.78			140.82'
MW- 7		99.68			111.90'
MW- 8		83.66			101.68'
MW- 9		83.72			96.90'
SW- 1		DRY			82.45'
SW- 3		87.38			139.16'
SW- 4		MISSING			83.50'
SW- 6		DRY			87.90'

NOTE:
ALL MEASUREMENTS ARE MADE FROM THE NORTH SIDE AND TOP EDGE OF THE WELL CASING. THE TOP OF CASING WITH A NOTCH OR PERMENANT MARKINGS, WHICH EVER ONE CONDITION IS APPROPRIATE.

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2006

SAMPLE LOCATION / SW - 1 **DATE:** 6/15/2006

PROJECT NAME:	ZONNEVELD DAIRIES	**ANALYSIS PERFORMED:**	N/A
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	NO SAMPLE TAKEN
CITY, STATE:	LATON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML.
SITE CONTACT:	SCOTT SMITH	**PRESERVATIVES:**	1- NEAT / 1- H2SO4
CONSULTANT:	CSS ENVIRONMENTAL	**LAB. ANALYSIS BY:**	N/A

PROJECT MANAGER	BEN NYDAM		**MONUMENT:**	POST	
SAMPLER:	DEL-TECH / DON LIGHT		**WELL CASING MATERIAL**	PVC	
SIGNED:			**WELL CASING DIA. :**	2" /	0.1632
SAMPLE MEDIA:	GROUNDWATER		**P.I.D. READING / ODOR:**	N/A	N/A
TOP OF CASING ELEVATION:		MSL	**COLOR:**	N/A	
DEPTH TO WATER: (feet.100th's)	DRY	FEET	**CALC. PURGE VOL.:**	0.00	GAL.
DEPTH OF WELL: (feet.100th's)	82.45	FEET	**TOTAL VOLUME PURGED:**	0.00	GAL.
STANDING WATER COLUMN:	0.00	FEET	**DEPTH OF PUMP:**	N/A	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A							
	0.00								
	0.00								
	0.00								

PURGE METHOD:	N/A		
SAMPLE METHOD:	N/A		
D. T. W. AFTER PURGE:		**D. T. W. AT SAMPLE TIME:**	N/A
WELL INTEGRITY:	CAP & SEAL ARE SECURE.		
WELL LOCATION:	SEE SITE MAP.		
REMARKS:			
WEATHER:	CLEAR / HOT	**WIND:**	NONE
QUALITY CONTROL:	*ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*		
CONTAINMENT:	*D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*		
INSTRUMENTATION:	Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER	
	SOLINIST SLOPE METER	THERMODINE 580B P.I.D.	
	KECK INTERFACE METER	TURBIDITY METER	

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2006

SAMPLE LOCATION / MW - 1A **DATE:** 6/22/2006

PROJECT NAME:	ZONNEVELD DAIRIES	**ANALYSIS PERFORMED:**	SEE CHAIN OF CUSTODY
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	10:49
CITY, STATE:	LATON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML.
SITE CONTACT:	SCOTT SMITH	**PRESERVATIVES:**	1- NEAT / 1- H2SO4
CONSULTANT:	CSS ENVIRONMENTAL	**LAB. ANALYSIS BY:**	DELLAVALLE LABS.

PROJECT MANAGER	BEN NYDAM		**MONUMENT:**	POST	
SAMPLER:	DEL-TECH / DON LIGHT		**WELL CASING MATERIAL**	PVC	
SIGNED:			**WELL CASING DIA. :**	2" /	0.1632
SAMPLE MEDIA:	GROUNDWATER		**P.I.D. READING / ODOR:**	N/A	NONE
TOP OF CASING ELEVATION:		MSL	**COLOR:**	CLEAR	
DEPTH TO WATER: (feet.100th's)	10.20	FEET	**CALC. PURGE VOL.:**	0.66	GAL.
DEPTH OF WELL: (feet.100th's)	14.25	FEET	**TOTAL VOLUME PURGED:**	1.98	GAL.
STANDING WATER COLUMN:	4.05	FEET	**DEPTH OF PUMP:**	13	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A	H.B.	6.16	330	20.5	326.4	2.15	80.3
	0.66	DRY							
	1.32	DRY							
	1.98	DRY							

PURGE METHOD:	2" STAINLESS STEEL BAILER.		
SAMPLE METHOD:	2" STAINLESS STEEL BAILER.		
D. T. W. AFTER PURGE:		**D. T. W. AT SAMPLE TIME:**	11.68'
WELL INTEGRITY:	CAP & SEAL ARE SECURE.		
WELL LOCATION:	SEE SITE MAP.		
REMARKS:	**WELL WENT DRY / POOR RECHARGE / GRABBED SAMPLE.**		
WEATHER:	CLEAR / HOT	**WIND:**	NONE
QUALITY CONTROL:	*ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*		
CONTAINMENT:	*D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*		
INSTRUMENTATION:	Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER	
	SOLINIST SLOPE METER	THERMODINE 580B P.I.D.	
	KECK INTERFACE METER	TURBIDITY METER	
# OF DRUMS ON SIGHT:	**WATER:** 0	**SOIL:** 0	

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2006

SAMPLE LOCATION / MW - 1C **DATE:** 6/22/2006

PROJECT NAME:	ZONNEVELD DAIRIES	**ANALYSIS PERFORMED:**	SEE CHAIN OF CUSTODY
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	10:53
CITY, STATE:	LATON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML.
SITE CONTACT:	SCOTT SMITH	**PRESERVATIVES:**	1- NEAT / 1- H2SO4
CONSULTANT:	CSS ENVIRONMENTAL	**LAB. ANALYSIS BY:**	DELLAVALLE LABS.

PROJECT MANAGER	BEN NYDAM		**MONUMENT:**	POST	
SAMPLER:	DEL-TECH / DON LIGHT		**WELL CASING MATERIAL**	PVC	
SIGNED:			**WELL CASING DIA. :**	2" /	0.1632
SAMPLE MEDIA:	GROUNDWATER		**P.I.D. READING / ODOR:**	N/A	NONE
TOP OF CASING ELEVATION:		MSL	**COLOR:**	BROWN	
DEPTH TO WATER: (feet.100th's)	97.18	FEET	**CALC. PURGE VOL.:**	1.37	GAL.
DEPTH OF WELL: (feet.100th's)	105.60	FEET	**TOTAL VOLUME PURGED:**	4.12	GAL.
STANDING WATER COLUMN:	8.42	FEET	**DEPTH OF PUMP:**	104	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A	0.5 GPM	6.74	916	20.4	334.7	2.37	867.9
	1.37	"	"	6.18	876	20.0	335.5	1.79	913.2
	2.75	"	"	6.14	864	20.2	335	1.31	1000+
	4.12	"	"	6.43	838	20.1	333	1.14	378.9

PURGE METHOD:	DEDICATED WATERRA INERTIA PUMP.		
SAMPLE METHOD:	DEDICATED WATERRA INERTIA PUMP.		
D. T. W. AFTER PURGE:		**D. T. W. AT SAMPLE TIME:**	103.58'
WELL INTEGRITY:	CAP & SEAL ARE SECURE.		
WELL LOCATION:	SEE SITE MAP.		
REMARKS:	**INSTALLED WATERRA PUMP.**		
WEATHER:	CLEAR / HOT	**WIND:**	NONE
QUALITY CONTROL:	*ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*		
CONTAINMENT:	*D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*		
INSTRUMENTATION:	Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER	
	SOLINIST SLOPE METER	THERMODINE 580B P.I.D.	
	KECK INTERFACE METER	TURBIDITY METER	

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2006

SAMPLE LOCATION / MW - 2A **DATE:** 6/10/2006

PROJECT NAME:	ZONNEVELD DAIRIES	**ANALYSIS PERFORMED:**	SEE CHAIN OF CUSTODY
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	17:30
CITY, STATE:	LATON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML.
SITE CONTACT:	SCOTT SMITH	**PRESERVATIVES:**	1- NEAT / 1- H2SO4
CONSULTANT:	CSS ENVIRONMENTAL	**LAB. ANALYSIS BY:**	DELLAVALLE LABS.

PROJECT MANAGER	BEN NYDAM		**MONUMENT:**	POST	
SAMPLER:	DEL-TECH / DON LIGHT		**WELL CASING MATERIAL**	PVC	
SIGNED:			**WELL CASING DIA. :**	2" /	0.1632
SAMPLE MEDIA:	GROUNDWATER		**P.I.D. READING / ODOR:**	N/A	NONE
TOP OF CASING ELEVATION:		MSL	**COLOR:**	BROWN	
DEPTH TO WATER: (feet.100th's)	95.97	FEET	**CALC. PURGE VOL.:**	0.30	GAL.
DEPTH OF WELL: (feet.100th's)	97.80	FEET	**TOTAL VOLUME PURGED:**	0.90	GAL.
STANDING WATER COLUMN:	1.83	FEET	**DEPTH OF PUMP:**	96	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A	0.5 GPM	7.14	235	19.0	403	5.5	426.4
	0.30	"	"	7.00	223	18.4	409	4.9	73.4
	0.60	"	"	6.74	207	18.0	420	4.5	156.9
	0.90	"	"	6.78	209	18.0	420	3.9	76.1

PURGE METHOD: 2" GRUNDFOS SUBMERSIBLE PUMP.
SAMPLE METHOD: 2" GRUNDFOS SUBMERSIBLE PUMP.
D. T. W. AFTER PURGE: **D. T. W. AT SAMPLE TIME:** 96.21'
WELL INTEGRITY: CAP & SEAL ARE SECURE.
WELL LOCATION: SEE SITE MAP.
REMARKS:

WEATHER: CLEAR / HOT **WIND:** NONE
QUALITY CONTROL: *ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*
CONTAINMENT: *D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*

INSTRUMENTATION:

Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER
SOLINIST SLOPE METER	THERMODINE 580B P.I.D.
KECK INTERFACE METER	TURBIDITY METER

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2006

SAMPLE LOCATION / MW - 2B **DATE:** 6/15/2006

PROJECT NAME:	THE WINE GROUP - FRANZIA	**ANALYSIS PERFORMED:**	SEE CHAIN OF CUSTODY
ADDRESS:	1887 N. MOONEY BLVD.	**SAMPLE TIME:**	18:00
CITY, STATE:	TULARE, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML.
SITE CONTACT:	WAYNE KNOX	**PRESERVATIVES:**	1- NEAT / 1- H2SO4
CONSULTANT:	CSS ENVIRONMENTAL	**LAB. ANALYSIS BY:**	DELLAVALLE LABS.

PROJECT MANAGER	BEN NYDAM		**MONUMENT:**	POST	
SAMPLER:	DEL-TECH / DON LIGHT		**WELL CASING MATERIAL**	PVC	
SIGNED:			**WELL CASING DIA. :**	2" /	0.1632
SAMPLE MEDIA:	GROUNDWATER		**P.I.D. READING / ODOR:**	N/A	NONE
TOP OF CASING ELEVATION:		MSL	**COLOR:**	BROWN	
DEPTH TO WATER:	**(feet.100th's)** 87.93	FEET	**CALC. PURGE VOL.:**	6.75	GAL.
DEPTH OF WELL:	**(feet.100th's)** 129.30	FEET	**TOTAL VOLUME PURGED:**	20.25	GAL.
STANDING WATER COLUMN:	41.37	FEET	**DEPTH OF PUMP:**	128	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A	0.5 GPM	6.74	116	18.2	400	3.2	244.2
	6.75	"	"	7.17	120	17.8	396	4.0	84.7
	13.50	"	"	7.54	122	17.7	390	4.0	115.4
	20.25	"	"	7.88	122	17.7	404	4.2	120

PURGE METHOD:	2" GRUNDFOS SUBMERSIBLE PUMP.		
SAMPLE METHOD:	2" GRUNDFOS SUBMERSIBLE PUMP.		
D. T. W. AFTER PURGE:		**D. T. W. AT SAMPLE TIME:**	93.62'
WELL INTEGRITY:	CAP & SEAL ARE SECURE.		
WELL LOCATION:	SEE SITE MAP.		
REMARKS:			
WEATHER:	CLEAR / HOT	**WIND:**	NONE
QUALITY CONTROL:	*ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*		
CONTAINMENT:	*D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*		
INSTRUMENTATION:	Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER	
	SOLINIST SLOPE METER	THERMODINE 580B P.I.D.	
	KECK INTERFACE METER	TURBIDITY METER	

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2006

SAMPLE LOCATION / MW - 3A **DATE:** 6/15/2006

PROJECT NAME:	ZONNEVELD DAIRIES	**ANALYSIS PERFORMED:**	SEE CHAIN OF CUSTODY
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	16:37
CITY, STATE:	LATON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML.
SITE CONTACT:	SCOTT SMITH	**PRESERVATIVES:**	1- NEAT / 1- H2SO4
CONSULTANT:	CSS ENVIRONMENTAL	**LAB. ANALYSIS BY:**	DELLAVALLE LABS.

PROJECT MANAGER	BEN NYDAM		**MONUMENT:**	POST	
SAMPLER:	DEL-TECH / DON LIGHT		**WELL CASING MATERIAL**	PVC	
SIGNED:			**WELL CASING DIA. :**	2" /	0.1632
SAMPLE MEDIA:	GROUNDWATER		**P.I.D. READING / ODOR:**	N/A	NONE
TOP OF CASING ELEVATION:		MSL	**COLOR:**	BROWN	
DEPTH TO WATER: (feet.100th's)	92.12	FEET	**CALC. PURGE VOL.:**	1.23	GAL.
DEPTH OF WELL: (feet.100th's)	99.65	FEET	**TOTAL VOLUME PURGED:**	3.69	GAL.
STANDING WATER COLUMN:	7.53	FEET	**DEPTH OF PUMP:**	98	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A	0.2 GPM	7.26	698	20.9	365	2.4	1000+
	1.23	"	"	6.45	650	20.8	388	3.1	"
	2.46	"	"	6.79	631	20.4	381	3.4	"
	3.69	"	"	6.75	622	20.4	383	3.3	725.8

PURGE METHOD:	2" GRUNDFOS SUBMERSIBLE PUMP.		
SAMPLE METHOD:	2" GRUNDFOS SUBMERSIBLE PUMP.		
D. T. W. AFTER PURGE:		**D. T. W. AT SAMPLE TIME:**	95.90'
WELL INTEGRITY:	CAP & SEAL ARE SECURE.		
WELL LOCATION:	SEE SITE MAP.		
REMARKS:			
WEATHER:	CLEAR / HOT	**WIND:**	NONE
QUALITY CONTROL:	*ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*		
CONTAINMENT:	*D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*		
INSTRUMENTATION:	Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER	
	SOLINIST SLOPE METER	THERMODINE 580B P.I.D.	
	KECK INTERFACE METER	TURBIDITY METER	

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2006

SAMPLE LOCATION / MW - 3B **DATE:** 6/15/2006

PROJECT NAME:	ZONNEVELD DAIRIES	**ANALYSIS PERFORMED:**	SEE CHAIN OF CUSTODY
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	17:02
CITY, STATE:	LATON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML.
SITE CONTACT:	SCOTT SMITH	**PRESERVATIVES:**	1- NEAT / 1- H2SO4
CONSULTANT:	CSS ENVIRONMENTAL	**LAB. ANALYSIS BY:**	DELLAVALLE LABS.

PROJECT MANAGER	BEN NYDAM		**MONUMENT:**	POST	
SAMPLER:	DEL-TECH / DON LIGHT		**WELL CASING MATERIAL**	PVC	
SIGNED:			**WELL CASING DIA. :**	2" /	0.1632
SAMPLE MEDIA:	GROUNDWATER		**P.I.D. READING / ODOR:**	N/A	NONE
TOP OF CASING ELEVATION:		MSL	**COLOR:**	BROWN	
DEPTH TO WATER: (feet.100th's)	92.94	FEET	**CALC. PURGE VOL.:**	7.34	GAL.
DEPTH OF WELL: (feet.100th's)	137.90	FEET	**TOTAL VOLUME PURGED:**	22.01	GAL.
STANDING WATER COLUMN:	44.96	FEET	**DEPTH OF PUMP:**	136	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A	0.5 GPM	6.82	671	20.2	375	2.1	1000+
	7.34	"	"	7.21	706	20.2	372	3.2	"
	14.67	"	"	7.00	715	20.1	375	3.1	"
	22.01	"	"	7.08	735	20.1	372	3.0	505.7

PURGE METHOD:	2" GRUNDFOS SUBMERSIBLE PUMP.		
SAMPLE METHOD:	2" GRUNDFOS SUBMERSIBLE PUMP.		
D. T. W. AFTER PURGE:		**D. T. W. AT SAMPLE TIME:**	97.53'
WELL INTEGRITY:	CAP & SEAL ARE SECURE.		
WELL LOCATION:	SEE SITE MAP.		
REMARKS:			
WEATHER:	CLEAR / HOT	**WIND:**	NONE
QUALITY CONTROL:	*ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*		
CONTAINMENT:	*D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*		
INSTRUMENTATION:	Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER	
	SOLINIST SLOPE METER	THERMODINE 580B P.I.D.	
	KECK INTERFACE METER	TURBIDITY METER	

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2006

SAMPLE LOCATION / MW - 4A **DATE:** 6/15/2006

PROJECT NAME:	ZONNEVELD DAIRIES	**ANALYSIS PERFORMED:**	SEE CHAIN OF CUSTODY
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	16:12
CITY, STATE:	LATON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML.
SITE CONTACT:	SCOTT SMITH	**PRESERVATIVES:**	1- NEAT / 1- H2SO4
CONSULTANT:	CSS ENVIRONMENTAL	**LAB. ANALYSIS BY:**	DELLAVALLE LABS.

PROJECT MANAGER	BEN NYDAM		**MONUMENT:**	POST	
SAMPLER:	DEL-TECH / DON LIGHT		**WELL CASING MATERIAL**	PVC	
SIGNED:			**WELL CASING DIA. :**	2" /	0.1632
SAMPLE MEDIA:	GROUNDWATER		**P.I.D. READING / ODOR:**	N/A	NONE
TOP OF CASING ELEVATION:		MSL	**COLOR:**	BROWN	
DEPTH TO WATER: (feet.100th's)	91.03	FEET	**CALC. PURGE VOL.:**	0.62	GAL.
DEPTH OF WELL: (feet.100th's)	94.80	FEET	**TOTAL VOLUME PURGED:**	1.85	GAL.
STANDING WATER COLUMN:	3.77	FEET	**DEPTH OF PUMP:**	93	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A	0.2 GPM	6.96	893	21.8	370	5.8	1000+
	0.62	DRY							
	1.23	DRY							
	1.85	DRY							

PURGE METHOD:	2" GRUNDFOS SUBMERSIBLE PUMP.		
SAMPLE METHOD:	2" GRUNDFOS SUBMERSIBLE PUMP.		
D. T. W. AFTER PURGE:		**D. T. W. AT SAMPLE TIME:**	93.04'
WELL INTEGRITY:	CAP & SEAL ARE SECURE.		
WELL LOCATION:	SEE SITE MAP.		
REMARKS:	**WELL WENT DRY / POOR RECHARGE / GRAB SAMPLE.**		
WEATHER:	CLEAR / HOT	**WIND:**	NONE
QUALITY CONTROL:	*ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*		
CONTAINMENT:	*D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*		
INSTRUMENTATION:	Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER	
	SOLINIST SLOPE METER	THERMODINE 580B P.I.D.	
	KECK INTERFACE METER	TURBIDITY METER	

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2006

SAMPLE LOCATION / MW - 4B **DATE:** 6/22/2006

PROJECT NAME:	ZONNEVELD DAIRIES	**ANALYSIS PERFORMED:**	SEE CHAIN OF CUSTODY
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	10:12
CITY, STATE:	LATON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML.
SITE CONTACT:	SCOTT SMITH	**PRESERVATIVES:**	1- NEAT / 1- H2SO4
CONSULTANT:	CSS ENVIRONMENTAL	**LAB. ANALYSIS BY:**	DELLAVALLE LABS.

PROJECT MANAGER	BEN NYDAM		**MONUMENT:**	POST	
SAMPLER:	DEL-TECH / DON LIGHT		**WELL CASING MATERIAL**	PVC	
SIGNED:			**WELL CASING DIA. :**	2" /	0.1632
SAMPLE MEDIA:	GROUNDWATER		**P.I.D. READING / ODOR:**	N/A	NONE
TOP OF CASING ELEVATION:		MSL	**COLOR:**	BROWN TO LIGHT BROWN	
DEPTH TO WATER: (feet.100th's)	95.76	FEET	**CALC. PURGE VOL.:**	7.38	GAL.
DEPTH OF WELL: (feet.100th's)	141.00	FEET	**TOTAL VOLUME PURGED:**	22.15	GAL.
STANDING WATER COLUMN:	45.24	FEET	**DEPTH OF PUMP:**	140	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A	0.5 GPM	6.80	748	21.6	333.8	3.44	209.3
	7.38	"	"	6.38	692	20.9	338.5	2.20	591.5
	14.77	"	"	6.30	683	20.6	340.2	2.31	237.5
	22.15	"	"	6.60	687	20.7	334	2.58	153.9

PURGE METHOD:	DEDICATED WATERRA INERTIA PUMP.		
SAMPLE METHOD:	DEDICATED WATERRA INERTIA PUMP.		
D. T. W. AFTER PURGE:		**D. T. W. AT SAMPLE TIME:**	97.38'
WELL INTEGRITY:	CAP & SEAL ARE SECURE.		
WELL LOCATION:	SEE SITE MAP.		
REMARKS:	**INSTALLED WATERRA TUBING.**		
	WELL MONUMENT HAS BEEN HIT BY TRACTOR / BENT OVER 20 DEGREES.		
WEATHER:	CLEAR / HOT	**WIND:**	NONE
QUALITY CONTROL:	*ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE*		
	FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.		
CONTAINMENT:	*D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*		
INSTRUMENTATION:	Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER	
	SOLINIST SLOPE METER	THERMODINE 580B P.I.D.	
	KECK INTERFACE METER	TURBIDITY METER	

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2006

SAMPLE LOCATION / MW - 5A **DATE:** 6/15/2006

PROJECT NAME:	ZONNEVELD DAIRIES	**ANALYSIS PERFORMED:**	SEE CHAIN OF CUSTODY
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	18:46
CITY, STATE:	LATON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML.
SITE CONTACT:	SCOTT SMITH	**PRESERVATIVES:**	1- NEAT / 1- H2SO4
CONSULTANT:	CSS ENVIRONMENTAL	**LAB. ANALYSIS BY:**	DELLAVALLE LABS.

PROJECT MANAGER	BEN NYDAM		**MONUMENT:**	POST	
SAMPLER:	DEL-TECH / DON LIGHT		**WELL CASING MATERIAL**	PVC	
SIGNED:			**WELL CASING DIA. :**	2" /	0.1632
SAMPLE MEDIA:	GROUNDWATER		**P.I.D. READING / ODOR:**	N/A	NONE
TOP OF CASING ELEVATION:		MSL	**COLOR:**	BROWN	
DEPTH TO WATER: (feet.100th's)	89.40	FEET	**CALC. PURGE VOL.:**	2.14	GAL.
DEPTH OF WELL: (feet.100th's)	102.51	FEET	**TOTAL VOLUME PURGED:**	6.42	GAL.
STANDING WATER COLUMN:	13.11	FEET	**DEPTH OF PUMP:**	101	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A	0.2 GPM	6.72	925	20.6	372	3.0	288.8
	2.14	"	"	6.76	866	19.9	379	3.4	1059
	4.28	"	"	6.89	848	19.9	378	3.0	963
	6.42	"	"	6.87	848	20.1	378	3.2	1048

PURGE METHOD: 2" GRUNDFOS SUBMERSIBLE PUMP.
SAMPLE METHOD: 2" GRUNDFOS SUBMERSIBLE PUMP.
D. T. W. AFTER PURGE: **D. T. W. AT SAMPLE TIME:** 94.67'
WELL INTEGRITY: CAP & SEAL ARE SECURE.
WELL LOCATION: SEE SITE MAP.
REMARKS:

WEATHER: CLEAR / HOT **WIND:** NONE
QUALITY CONTROL: *ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*
CONTAINMENT: *D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*

INSTRUMENTATION: Y.S.I. 3560 FLOWCELL — Y.S.I. DISSOLVED OXYGEN METER
SOLINIST SLOPE METER — THERMODINE 580B P.I.D.
KECK INTERFACE METER — TURBIDITY METER

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2006

SAMPLE LOCATION / MW - 5B **DATE:** 6/15/2006

PROJECT NAME:	ZONNEVELD DAIRIES	**ANALYSIS PERFORMED:**	SEE CHAIN OF CUSTODY
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	19:17
CITY, STATE:	LATON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML.
SITE CONTACT:	SCOTT SMITH	**PRESERVATIVES:**	1- NEAT / 1- H2SO4
CONSULTANT:	CSS ENVIRONMENTAL	**LAB. ANALYSIS BY:**	DELLAVALLE LABS.

PROJECT MANAGER	BEN NYDAM		**MONUMENT:**	POST	
SAMPLER:	DEL-TECH / DON LIGHT		**WELL CASING MATERIAL**	PVC	
SIGNED:	Don Light		**WELL CASING DIA. :**	2" /	0.1632
SAMPLE MEDIA:	GROUNDWATER		**P.I.D. READING / ODOR:**	N/A	NONE
TOP OF CASING ELEVATION:		MSL	**COLOR:**	LIGHT BROWN	
DEPTH TO WATER: (feet.100th's)	89.78	FEET	**CALC. PURGE VOL.:**	8.33	GAL.
DEPTH OF WELL: (feet.100th's)	140.82	FEET	**TOTAL VOLUME PURGED:**	24.99	GAL.
STANDING WATER COLUMN:	51.04	FEET	**DEPTH OF PUMP:**	139	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A	0.2 GPM	7.13	731	20.0	367	2.0	351.3
	8.33	"	"	7.40	732	20.0	366	2.9	567.2
	16.66	"	"	7.40	740	20.0	365	2.9	934.1
	24.99	"	"	7.37	745	20.0	365	2.8	882.5

PURGE METHOD:	2" GRUNDFOS SUBMERSIBLE PUMP.		
SAMPLE METHOD:	2" GRUNDFOS SUBMERSIBLE PUMP.		
D. T. W. AFTER PURGE:		**D. T. W. AT SAMPLE TIME:**	94.11'
WELL INTEGRITY:	CAP & SEAL ARE SECURE.		
WELL LOCATION:	SEE SITE MAP.		
REMARKS:			
WEATHER:	CLEAR / HOT	**WIND:**	NONE
QUALITY CONTROL:	*ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*		
CONTAINMENT:	*D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*		
INSTRUMENTATION:	Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER	
	SOLINIST SLOPE METER	THERMODINE 580B P.I.D.	
	KECK INTERFACE METER	TURBIDITY METER	

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2006

SAMPLE LOCATION / MW - 7 **DATE:** 6/16/2006

PROJECT NAME:	ZONNEVELD DAIRIES	**ANALYSIS PERFORMED:**	SEE CHAIN OF CUSTODY
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	7:28
CITY, STATE:	LATON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML.
SITE CONTACT:	SCOTT SMITH	**PRESERVATIVES:**	1- NEAT / 1- H2SO4
CONSULTANT:	CSS ENVIRONMENTAL	**LAB. ANALYSIS BY:**	DELLAVALLE LABS.

PROJECT MANAGER	BEN NYDAM		**MONUMENT:**	POST	
SAMPLER:	DEL-TECH / DON LIGHT		**WELL CASING MATERIAL**	PVC	
SIGNED:			**WELL CASING DIA. :**	2" /	0.1632
SAMPLE MEDIA:	GROUNDWATER		**P.I.D. READING / ODOR:**	N/A	NONE
TOP OF CASING ELEVATION:		MSL	**COLOR:**	BROWN	
DEPTH TO WATER: (feet.100th's)	99.68	FEET	**CALC. PURGE VOL.:**	1.99	GAL.
DEPTH OF WELL: (feet.100th's)	111.90	FEET	**TOTAL VOLUME PURGED:**	5.98	GAL.
STANDING WATER COLUMN:	12.22	FEET	**DEPTH OF PUMP:**	110	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A	0.2 GPM	7.23	692	19.5	347	8.1	1000+
	1.99	"	"	6.48	714	19.5	358	4.9	"
	3.99	"	"	6.47	710	19.4	355	4.8	938
	5.98	"	"	6.44	712	19.4	359	5.0	783

PURGE METHOD:	2" GRUNDFOS SUBMERSIBLE PUMP.		
SAMPLE METHOD:	2" GRUNDFOS SUBMERSIBLE PUMP.		
D. T. W. AFTER PURGE:		**D. T. W. AT SAMPLE TIME:**	104.33'
WELL INTEGRITY:	CAP & SEAL ARE SECURE.		
WELL LOCATION:	SEE SITE MAP.		
REMARKS:			
WEATHER:	CLEAR / HOT	**WIND:**	NONE
QUALITY CONTROL:	*ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*		
CONTAINMENT:	*D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*		
INSTRUMENTATION:	Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER	
	SOLINIST SLOPE METER	THERMODINE 580B P.I.D.	
	KECK INTERFACE METER	TURBIDITY METER	

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2006

SAMPLE LOCATION / SW - 3 **DATE:** 6/15/2006

PROJECT NAME:	ZONNEVELD DAIRIES	**ANALYSIS PERFORMED:**	SEE CHAIN OF CUSTODY
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	
CITY, STATE:	LATON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML.
SITE CONTACT:	SCOTT SMITH	**PRESERVATIVES:**	1- NEAT / 1- H2SO4
CONSULTANT:	CSS ENVIRONMENTAL	**LAB. ANALYSIS BY:**	DELLAVALLE LABS.

PROJECT MANAGER	BEN NYDAM		**MONUMENT:**	POST	
SAMPLER:	DEL-TECH / DON LIGHT		**WELL CASING MATERIAL**	PVC	
SIGNED:			**WELL CASING DIA. :**	2" /	0.1632
SAMPLE MEDIA:	GROUNDWATER		**P.I.D. READING / ODOR:**	N/A	NONE
TOP OF CASING ELEVATION:		MSL	**COLOR:**	CLEAR	
DEPTH TO WATER: (feet.100th's)	87.38	FEET	**CALC. PURGE VOL.:**	8.45	GAL.
DEPTH OF WELL: (feet.100th's)	139.16	FEET	**TOTAL VOLUME PURGED:**	25.35	GAL.
STANDING WATER COLUMN:	51.78	FEET	**DEPTH OF PUMP:**	138	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A	0.2 GPM	7.31	1108	27.2	348	1.9	10.7
	8.45	"	"						
	16.90	"	"						
	25.35	"	"						

PURGE METHOD:	DEDICATED SUBMERSIBLE PUMP.		
SAMPLE METHOD:	DEDICATED SUBMERSIBLE PUMP.		
D. T. W. AFTER PURGE:		**D. T. W. AT SAMPLE TIME:**	93.44'
WELL INTEGRITY:	CAP & SEAL ARE SECURE.		
WELL LOCATION:	SEE SITE MAP.		
REMARKS:			
WEATHER:	CLEAR / HOT	**WIND:**	NONE
QUALITY CONTROL:	*ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*		
CONTAINMENT:	*D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*		
INSTRUMENTATION:	Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER	
	SOLINIST SLOPE METER	THERMODINE 580B P.I.D.	
	KECK INTERFACE METER	TURBIDITY METER	

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2006

SAMPLE LOCATION / SW - 4 **DATE:** 6/15/2006

PROJECT NAME:	ZONNEVELD DAIRIES	**ANALYSIS PERFORMED:**	N/A
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	NO SAMPLE TAKEN
CITY, STATE:	LATON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML.
SITE CONTACT:	SCOTT SMITH	**PRESERVATIVES:**	1- NEAT / 1- H2SO4
CONSULTANT:	CSS ENVIRONMENTAL	**LAB. ANALYSIS BY:**	N/A

PROJECT MANAGER	BEN NYDAM		**MONUMENT:**	POST	
SAMPLER:	DEL-TECH / DON LIGHT		**WELL CASING MATERIAL**	PVC	
SIGNED:			**WELL CASING DIA. :**	2" /	0.1632
SAMPLE MEDIA:	GROUNDWATER		**P.I.D. READING / ODOR:**	N/A	N/A
TOP OF CASING ELEVATION:		MSL	**COLOR:**	N/A	
DEPTH TO WATER: (feet.100th's)	N/A	FEET	**CALC. PURGE VOL.:**	0.00	GAL.
DEPTH OF WELL: (feet.100th's)	83.50	FEET	**TOTAL VOLUME PURGED:**	0.00	GAL.
STANDING WATER COLUMN:	0.00	FEET	**DEPTH OF PUMP:**	N/A	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A							
	0.00								
	0.00								
	0.00								

PURGE METHOD:	N/A		
SAMPLE METHOD:	N/A		
D. T. W. AFTER PURGE:		**D. T. W. AT SAMPLE TIME:**	N/A
WELL INTEGRITY:	CAP & SEAL ARE SECURE.		
WELL LOCATION:	SEE SITE MAP.		
REMARKS:	**AREA HAS BEEN CLEARED AND GRADED / COULD NOT FIND WELL.**		
WEATHER:	CLEAR / HOT	**WIND:**	NONE
QUALITY CONTROL:	*ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*		
CONTAINMENT:	*D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*		
INSTRUMENTATION:	Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER	
	SOLINIST SLOPE METER	THERMODINE 580B P.I.D.	
	KECK INTERFACE METER	TURBIDITY METER	

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2006

SAMPLE LOCATION / SW - 6 **DATE:** 6/15/2006

PROJECT NAME:	ZONNEVELD DAIRIES	**ANALYSIS PERFORMED:**	N/A
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	NO SAMPLE TAKEN
CITY, STATE:	LATON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML.
SITE CONTACT:	SCOTT SMITH	**PRESERVATIVES:**	1- NEAT / 1- H2SO4
CONSULTANT:	CSS ENVIRONMENTAL	**LAB. ANALYSIS BY:**	N/A

PROJECT MANAGER	BEN NYDAM		**MONUMENT:**	POST	
SAMPLER:	DEL-TECH / DON LIGHT		**WELL CASING MATERIAL**	PVC	
SIGNED:			**WELL CASING DIA. :**	2" /	0.1632
SAMPLE MEDIA:	GROUNDWATER		**P.I.D. READING / ODOR:**	N/A	N/A
TOP OF CASING ELEVATION:		MSL	**COLOR:**	N/A	
DEPTH TO WATER: (feet.100th's)	DRY	FEET	**CALC. PURGE VOL.:**	0.00	GAL.
DEPTH OF WELL: (feet.100th's)	87.90	FEET	**TOTAL VOLUME PURGED:**	0.00	GAL.
STANDING WATER COLUMN:	0.00	FEET	**DEPTH OF PUMP:**	N/A	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A							
	0.00								
	0.00								
	0.00								

PURGE METHOD:	N/A		
SAMPLE METHOD:	N/A		
D. T. W. AFTER PURGE:		**D. T. W. AT SAMPLE TIME:**	N/A
WELL INTEGRITY:	CAP & SEAL ARE SECURE.		
WELL LOCATION:	SEE SITE MAP.		
REMARKS:			
WEATHER:	CLEAR / HOT	**WIND:**	NONE
QUALITY CONTROL:	*ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*		
CONTAINMENT:	*D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*		
INSTRUMENTATION:	Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER	
	SOLINIST SLOPE METER	THERMODINE 580B P.I.D.	
	KECK INTERFACE METER	TURBIDITY METER	

APPENDIX B

DELLAVALLE
Laboratory, Inc.

July 10, 2006

Frank Zonneveld
Zonneveld Dairies, Inc.
1560 E. Cerini Ave
Laton, CA 93242-9700

Lab # 95216, 95221, 95504

Dear Frank:

Enclosed are the results for the monitoring well and manure pond water samples recently collected from the Zonneveld Dairies Complex during June of 2006.

Quality Assurance
Results are validated using internal and external check samples, duplicate samples, reagent blanks, internal consistency, and reasonableness of the result. Two of the internal check methods used are:

1. Cation/Anion Balance: The cation/anion balance is the sum of the cations on a charge basis divided by the sum of the anions on a charge basis.

2. Electrical Conductivity/Cation Balance: The sums of the cations are divided by EC (µmhos/cm) X 0.640 which is an estimate of TDS.

The results of the Cation/Anion balance check are presented on the "Report of Water Analysis". The laboratory technician, laboratory supervisor, and the consultant evaluate reasonableness of the result based on their knowledge of the sample, history of the site sampled, etc. Results judged unreasonable are rejected.

Copies of the results have been sent to Scott Smith of CSS Environmental Engineering Services. If you have any questions please do not hesitate to call me.

Respectfully,

Ben Nydam

Ben Nydam
Certified Crop Advisor # 22552
Dellavalle Laboratory, Inc.
Enclosure

CC. Scott Smith, CSS Environmental Engineering Services

DELLAVALLE® Laboratory, Inc.
Chemists and Consultants

Report of Water Analysis

1910 W. McKinley, Suite 110, Fresno, CA 93728
FAX (559) 268-8174 - (800) 228-9896 - (559) 233-6129

Zonneveld Dairies, Inc
1560 E Cerini Ave
Laton CA 93242-9700
5718
08

Material Submitted Water

Lab No. 95501
Sample Date 6/22/2006
Sample Time 8:10 AM
Submitted Date 6/22/2006
Submitted by Pamela Parsons
Reported Date 7/7/2006
Location/Project Zonneveld Dairies-Cerini & Cedar
Copy To Scott Smith-CSS Env. Eng. Ser.
Fax 559 923-9523
e-mail

No.		Unit pH	µmhos/cm EC	mg/L NO_3-N	NO_2-N	NH_4-N	TKN	SO_4	TDS	Ca	Mg	Na	K	Total Alkalinity as $CaCO_3$	OH as CaCO3	CO_3 as $CaCO_3$	HCO_3 as $CaCO_3$	Cl
	MDL--->			0.01	0.004	0.2	0.7	0.03	10	0.1	0.1	0.2	0.3			0.9	3	0.03
	RL--->	1.0 ± 14.0	10	0.1	0.1	0.5	1	0.2	10	0.1	0.1	1.0	0.5	10	1	1	5	0.1
	SM--->	4500H-B	2510B	4500NO3E	4500NO2B	4500NH4H	4500NorgC		2540C	3120B	3120B	3120B	3120B	2320B	1.0	2320B	2320B	4500Cl C
	EPA--->			300.0	300.0			300.0		200.7	200.7	200.7	200.7		2320B			300.0
1	Cedar-Cerini Manure Pond Eff.	7.0	1363	0.3	0.1	98.3	136	3.7	925	<0.1	<0.1	<1	<0.5	1002	<1	<1	1002	67

*See external laboratory documentation

NOTE: For dissolved metals (bolded), all water samples were filtered when received in the laboratory and acidified with HNO_3 to pH <2

ND = None Detected

MCL = Maximum Contaminant Level according to the California Domestic Water Quality and Monitoring Regulations (Title 22)

MDL = Method Detection Limit; RL = Reporting Limit

SM = Standard Methods for the Examination of Water and Wastewater, 19th ed., 1995

EPA = Environmental Protection Agency methods used unless otherwise indicated.

Records retained for 5 yrs.

Approved By: Scott Rulland
ELAP Certification #1595

DELLAVALLE® Laboratory, Inc.
Chemists and Consultants

Report of Water Analysis

1910 W. McKinley, Suite 110, Fresno, CA 93728
FAX (559) 268-6174 - (800) 228-9896 - (559) 233-6129

Zonneveld Dairies, Inc
1560 E Cerini Ave
Laton CA 93242-9700
5718
08

Material Submitted Water

Lab No. 95504
Sample Date 6/22/2006
Sample Time
Submitted Date 6/22/2006
Submitted by Don Light-Del Tec
Reported Date 7/7/2006
Location/Project
Copy To Scott Smith - CSS Env. Eng. Ser.
Fax 559 923-9523
e-mail

No.		Unit pH	µmhos/cm EC	mg/L NO_3-N	NO_2-N	NH_4-N	TKN	SO_4	TDS	Ca	Mg	Na	K	Total Alkalinity as CaCO3	OH as CaCO3	CO_3 as $CaCO_3$	HCO_3 as $CaCO_3$	Cl
	MDL--->			0.01	0.004	0.2	0.7	0.03	10	0.1	0.1	0.2	0.3		1	0.9	3	0.03
	RL--->	1.0 ± 14.0	10	0.1	0.1	0.5	1	0.2	10	0.1	0.1	1.0	0.5	10	1	1	5	0.1
	SM--->	4500H-B	2510B	4500NO3E	4500NO2B	4500NH4H	4500NorgC		2540C	3120B	3120B	3120B	3120B	2320B	2320B	2320B	2320B	4500Cl C
	EPA--->			300.0	300.0			300.0		200.7	200.7	200.7	200.7					300.0
1	MW - 1A 10:49 am	7.1	274	12.7	<0.1	<0.5	1.2	19.0	313	25.8	6.6	22.6	64.5	87	<1	<1	87	8
2	MW - 1C 10:53 am	7.3	1350	5.7	<0.1	<0.5	<1	15.5	820	155	4.7	152	2.0	619	<1	<1	619	48
3	MW - 4B 10:12 am	7.8	932	30.4	<0.1	<0.5	<1	16.7	633	77.2	1.0	145	1.7	336	<1	<1	336	28

No.		0.9-1.1
		sum Cation/
	MDL--->	Sum Anion
	RL--->	Balance
	SM--->	Ratio
	EPA--->	
1	MW - 1A 10:49 am	0.9
2	MW - 1C 10:53 am	1.0
3	MW - 4B 10:12 am	1.0

*See external laboratory documentation

NOTE: For dissolved metals (bolded), all water samples were filtered when received in the laboratory and acidified with HNO_3 to pH <2

ND = None Detected

MCL = Maximum Contaminant Level according to the California Domestic Water Quality and Monitoring Regulations (Title 22)

MDL = Method Detection Limit; RL = Reporting Limit

SM = Standard Methods for the Examination of Water and Wastewater, 19th ed., 1995

EPA = Environmental Protection Agency methods used unless otherwise indicated.

Records retained for 5 yrs.

Approved By: _____
ELAP Certification #1595

DELLAVALLE Laboratory, Inc.
Chemists and Consultants

Report of Water Analysis

1910 W. McKinley, Suite 110, Fresno CA 93728
FAX (559) 268-8174 - (800) 226-9896 - (559) 233-6129

Zonneveld Dairies, Inc
1560 E Cerini Ave
Laton CA 93242-9700
5718
08

Material Submitted Water

Lab No. 95216
Sample Date 6/15/2006
Sample Time
Submitted Date 6/15/2006
Submitted by Don Light-Del Tec
Reported Date 6/26/2006
Location/Project 2nd Qtr G.W.Mon. 2006
Copy To Scott Smith
FAX 559 923-9523
E-Mail

No.	Description	Unit pH	µmhos/cm EC	mg/L NO_3-N	NO_2-N	NH_4-N	TKN	SO_4	TDS	Ca	Mg	Na	K	Total Alkalinity as $CaCO_3$	CO_3 as $CaCO_3$	HCO_3 as $CaCO_3$	OH as $CaCO_3$	Cl	0.9-1.1 Sum Cat/Sum Anion Balance Ratio
	MDL--->			0.01	0.004	0.2	0.7	0.03	10	0.1	0.1	0.2	0.3		0.9	3	1.0	0.03	
	RL--->	1.0 ± 14.0	10	0.1	0.1	0.5	1	0.2	10	0.1	0.1	1	0.5	10	1	5	1.0	0.1	
	SM--->	4500H-B	2510B	4500NO3E	4500NO2B	4500NH4H	4500NorgC		2540C	3120B	3120B	3120B	3120B	2320B	2320B	2320B	2320B	4500Cl C	
	EPA--->			300.0	300.0			300.0		200.7	200.7	200.7	200.7					300.0	
1	MW 2A 5:30 pm	8.2	273	5.9	<0.1	<0.5	<1	9.4	285	26.8	0.7	31.0	2.5	100	<1	100	<1	9.7	1.0
2	MW 2B 6:00 pm	8.9	154	2.3	<0.1	<0.5	<1	4.9	210	3.7	<0.1	31.7	1.3	69.7	7.8	61.9	<1	4.3	1.0
3	MW 3A 4:37 pm	7.7	811	26.0	<0.1	<0.5	<1	21.2	605	94.3	4.7	73.3	2.1	286	<1	286	<1	19.0	1.0
4	MW 3B 5:02 pm	7.6	963	34.7	<0.1	<0.5	<1	19.3	670	115	1.9	95.4	2.4	336	<1	336	<1	27.8	1.0
5	MW 4A 4:12 pm	7.9	1058	36.7	<0.1	<0.5	<1	38.6	733	87.1	12.7	121	4.9	343	<1	343	<1	39.5	1.0
6	MW 5A 6:40 pm	7.7	1194	42.5	<0.1	<0.5	<1	21.4	823	147	5.7	104	2.6	421	<1	421	<1	39.6	1.0
7	MW 5B 7:10 pm	7.8	1013	37.5	<0.1	<0.5	<1	18.1	745	86.9	2.2	121	2.2	342	<1	342	<1	32.1	0.9
8	SW 3 6:00 pm	7.6	1181	45.6	<0.1	<0.5	<1	34.6	825	138	4.5	107	1.9	367	<1	367	<1	51.9	1.0

*See external laboratory documentation

NOTE: For dissolved metals (bolded), all water samples were filtered when received in the laboratory and acidified with HNO_3 to pH <2

ND = None Detected

MCL = Maximum Contaminant Level according to the California Domestic Water Quality and Monitoring Regulations (Title 22)

MDL = Method Detection Limit; RL = Reporting Limit

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Approved By: _____
ELAP Certification #1595

DELLAVALLE Laboratory, Inc.
Chemists and Consultants

Report of Water Analysis

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FAX (559) 266-8174 - (800) 228-9896 (559) 233-6129

Zonneveld Dairies, Inc
1560 E Cerini Ave
Laton CA 93242-9700
5718
08

Material Submitted Water

Lab No. 95221
Sample Date 6/16/2006
Sample Time
Submitted Date 6/16/2006
Submitted by Don Light-Del Tec
Reported Date 6/29/2006
Location/Project
Copy To Scott Smith
Fax 559 923-9523
e-mail

No.		Unit pH	µmhos/cm EC	mg/L NO_3-N	NO_2-N	NH_4-N	TKN	SO_4	TDS	Ca	Mg	Na	K	Total Alkalinity as $CaCO_3$	OH as $CaCO_3$	CO_3 as $CaCO_3$	HCO_3 as $CaCO_3$	Cl
MDL--->				0.01	0.004	0.2	0.7	0.03	10	0.1	0.1	0.2	0.3		1.0	0.9	3	0.03
RL--->		1.0 ± 14.0	10	0.1	0.1	0.5	1	0.2	10	0.1	0.1	1.0	0.5	10	1.0	1	5	0.1
SM--->		4500H-B	2510B	4500NO3E	4500NO2B	4500NH4H	4500NorgC		2540C	3120B	3120B	3120B	3120B	2320B	2320B	2320B	2320B	4500Cl C
EPA--->				300.0	300.0			300.0		200.7	200.7	200.7	200.7					300.0
3	MW 7 7:28 am	7.9	523	9.8	<0.1	<0.5	2.9	11.6	490	42.1	0.9	74.8	1.3	225	<1	<1	225	10

*See external laboratory documentation

No.		0.9-1.1
MDL--->		sum Cation/ Sum Anion Balance Ratio
RL--->		
SM--->		
EPA--->		
3	MW 7 7:28 am	1.0

NOTE: For dissolved metals (bolded), all water samples were filtered when received in the laboratory and acidified with HNO_3 to pH <2

ND = None Detected

MCL = Max Contaminant Level according to the CA Domestic Water Quality and Monitoring Reg (Title 22)

MDL = Method Detection Limit; **RL** = Reporting Limit

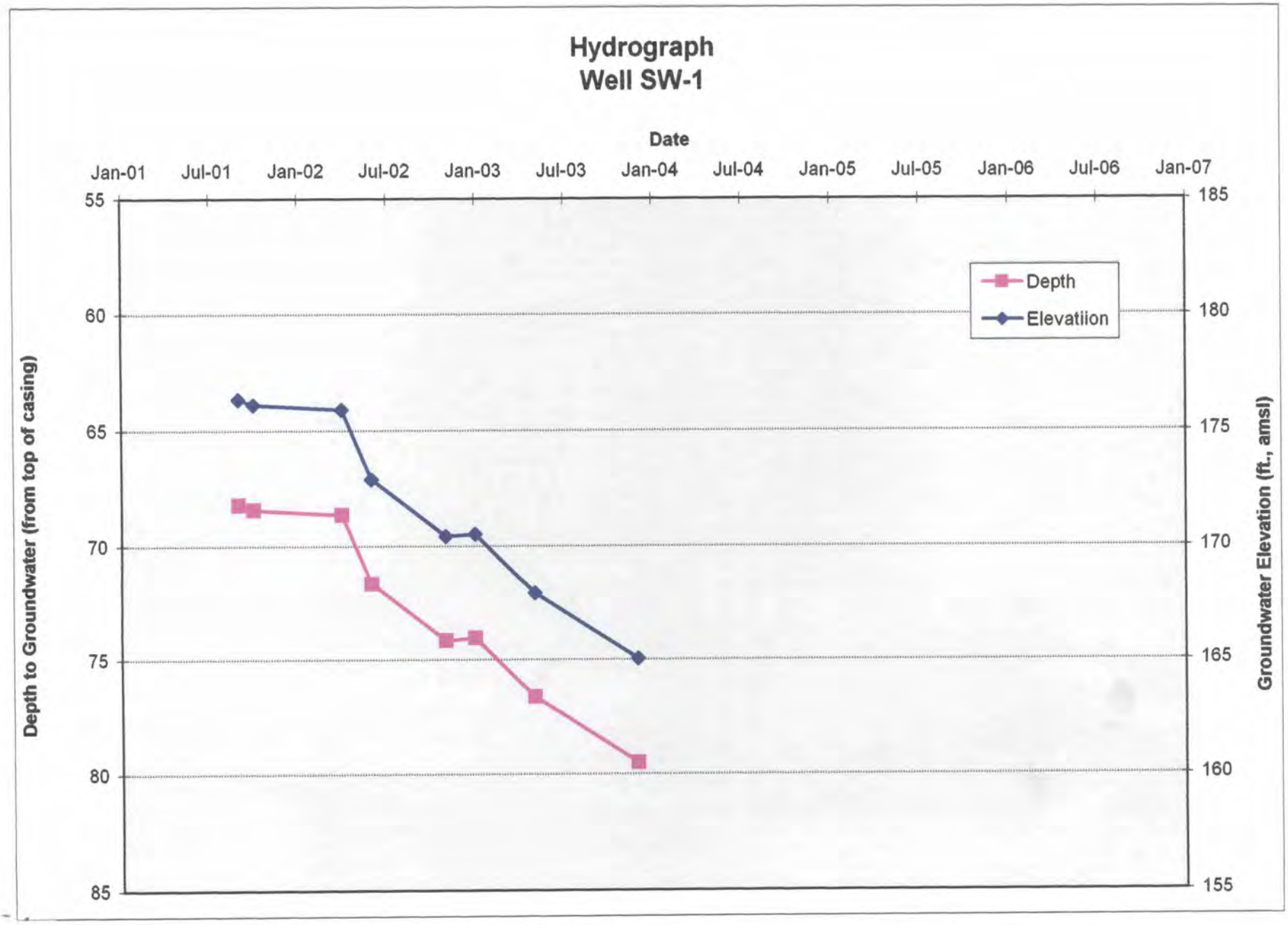
SM = Standard Methods for the Examination of Water and Wastewater, 19th ed., 1995

EPA = Environmental Protection Agency methods used unless otherwise indicated.

Records retained for 5 yrs.

Approved By: _____
ELAP Certification #1595

APPENDIX C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Jul-01
Jan-02
Jul-02
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Jan-04
Jul-04
Jan-05
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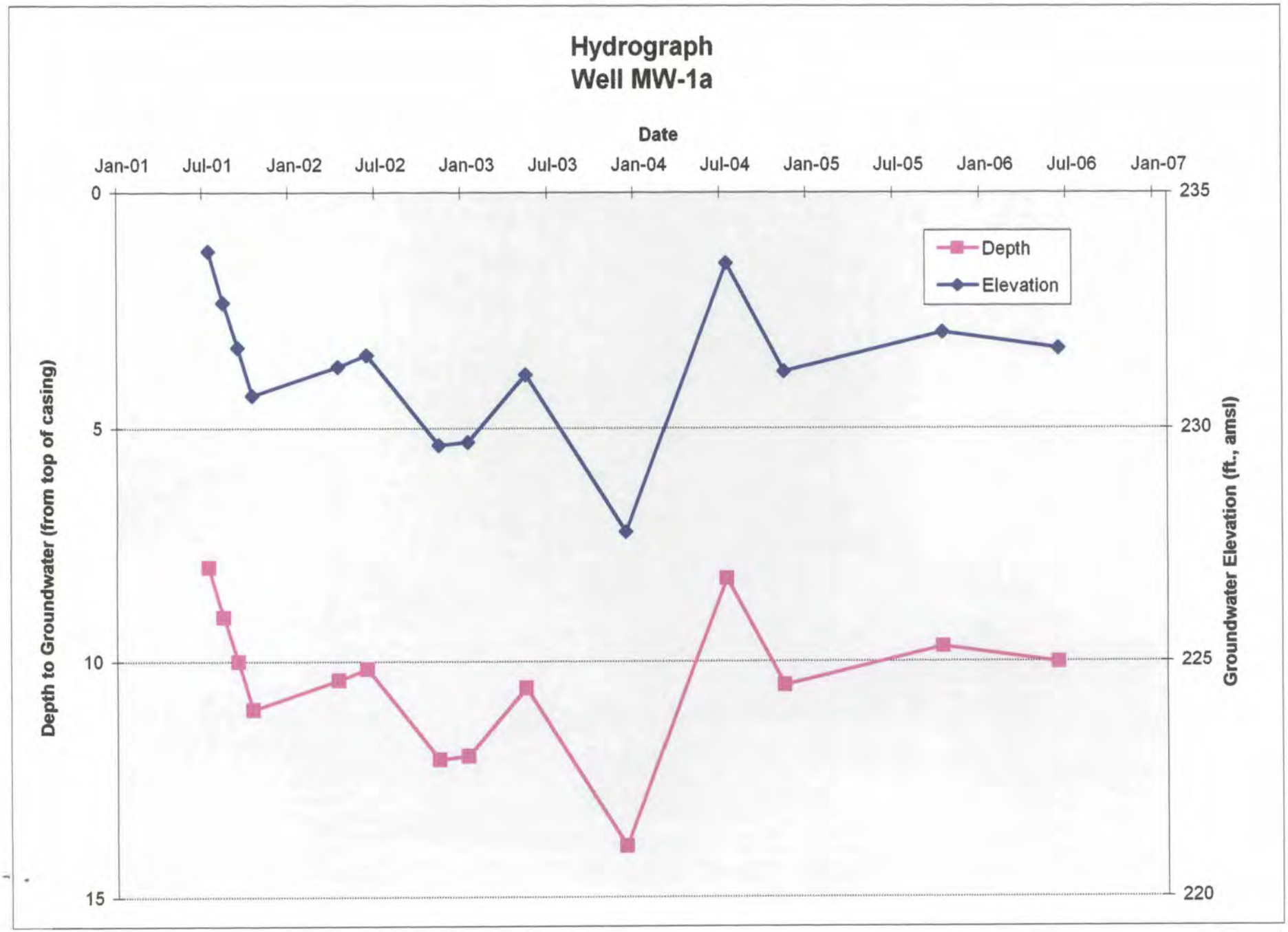
Jan-06
Jul-06
Jan-07
55
60
65
70
75
80
85
185
180
175
170
165
160
155
Depth to Groundwater (from top of casing)
Groundwater Elevation (ft., amsl)
Depth
Elevatiion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Well MW-1a
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Jul-01
Jan-02
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Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07
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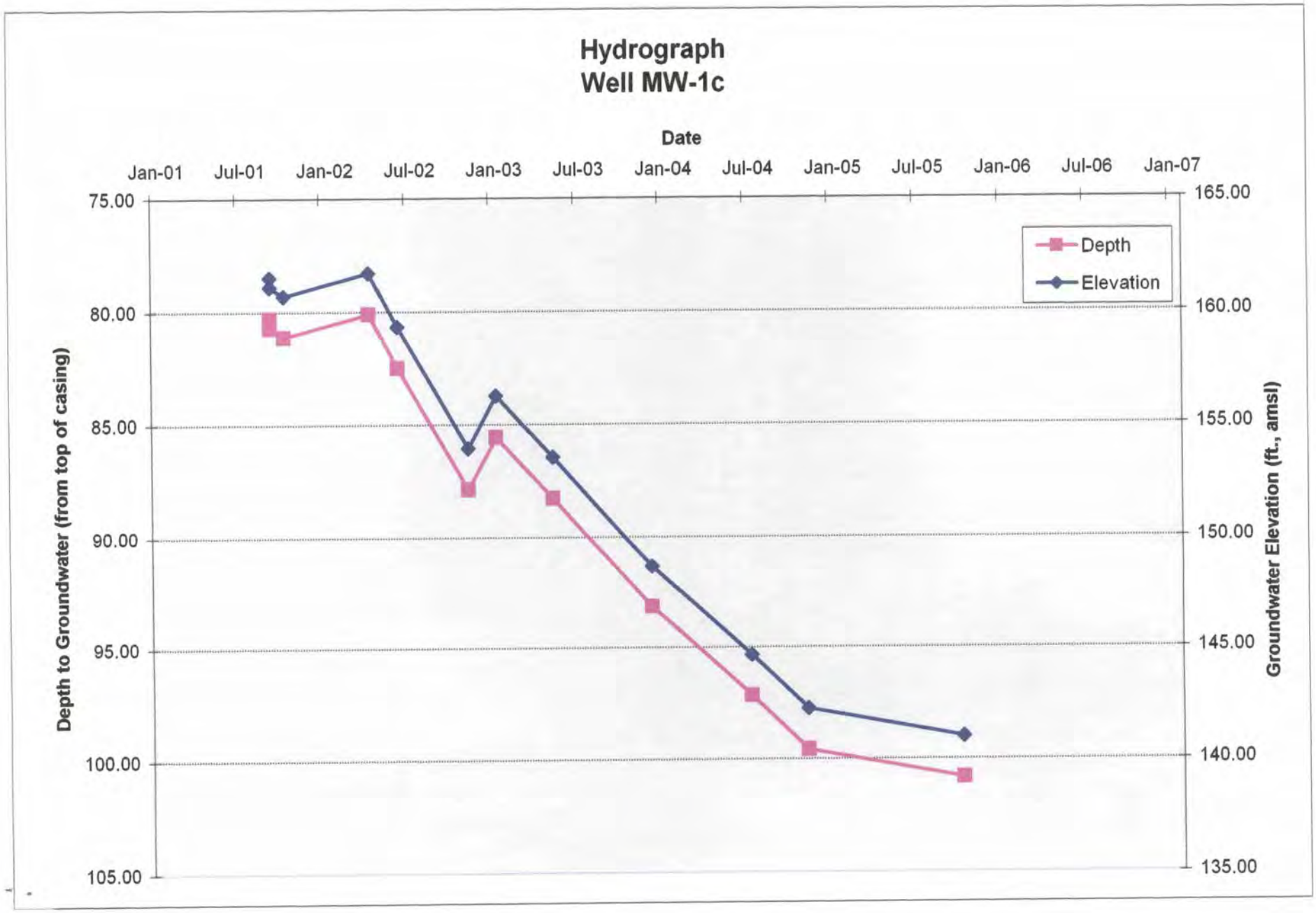
5
10
15
235
230
225
220
Depth
Elevation
Depth to Groundwater (from top of casing)
Groundwater Elevation (ft., amsl)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Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07
75.00
80.00
85.00
90.00
95.00
100.00
105.00
Depth to Groundwater (from top of casing)
165.00
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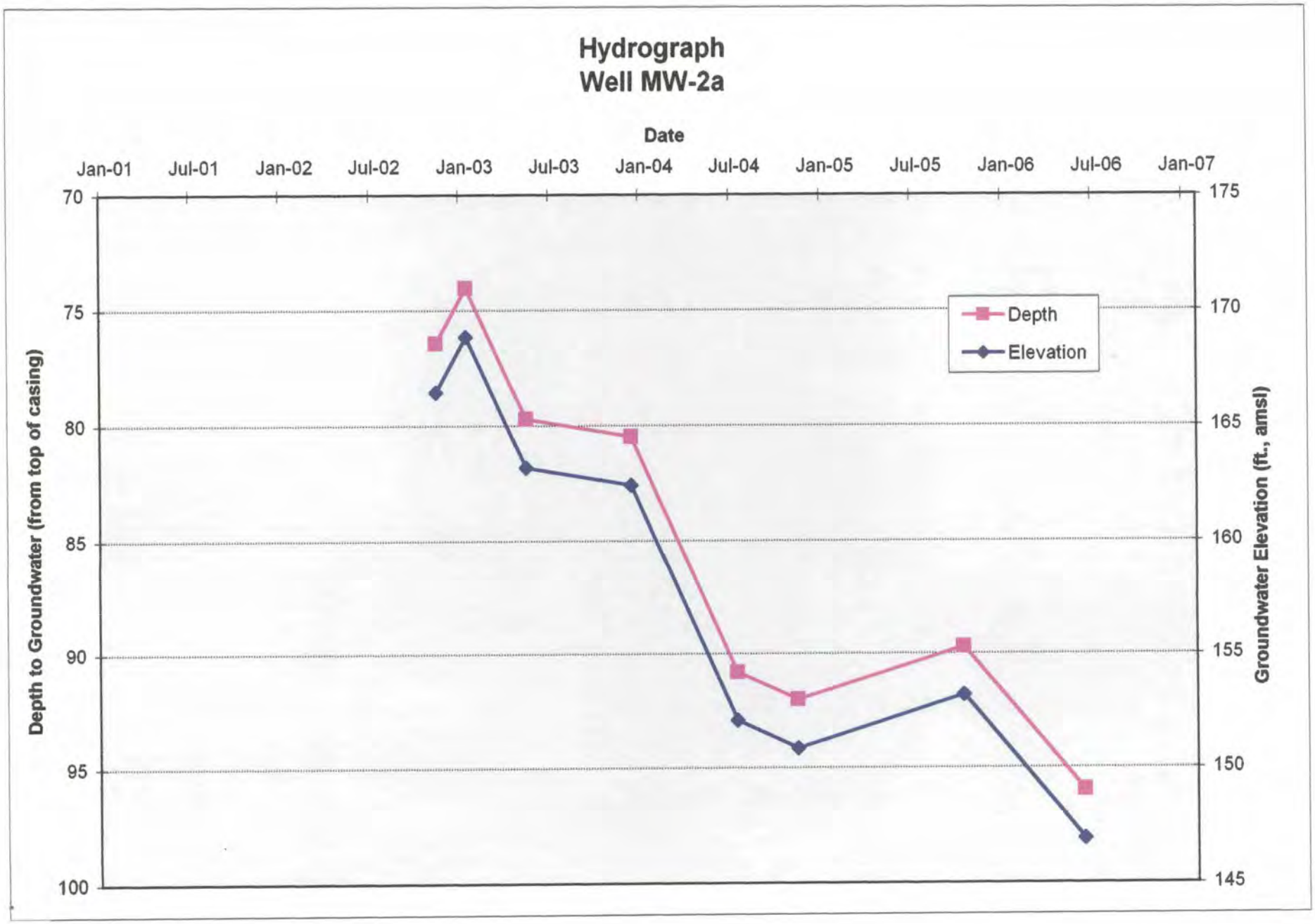
155.00
150.00
145.00
140.00
135.00
Groundwater Elevation (ft., amsl)
Depth
Elevation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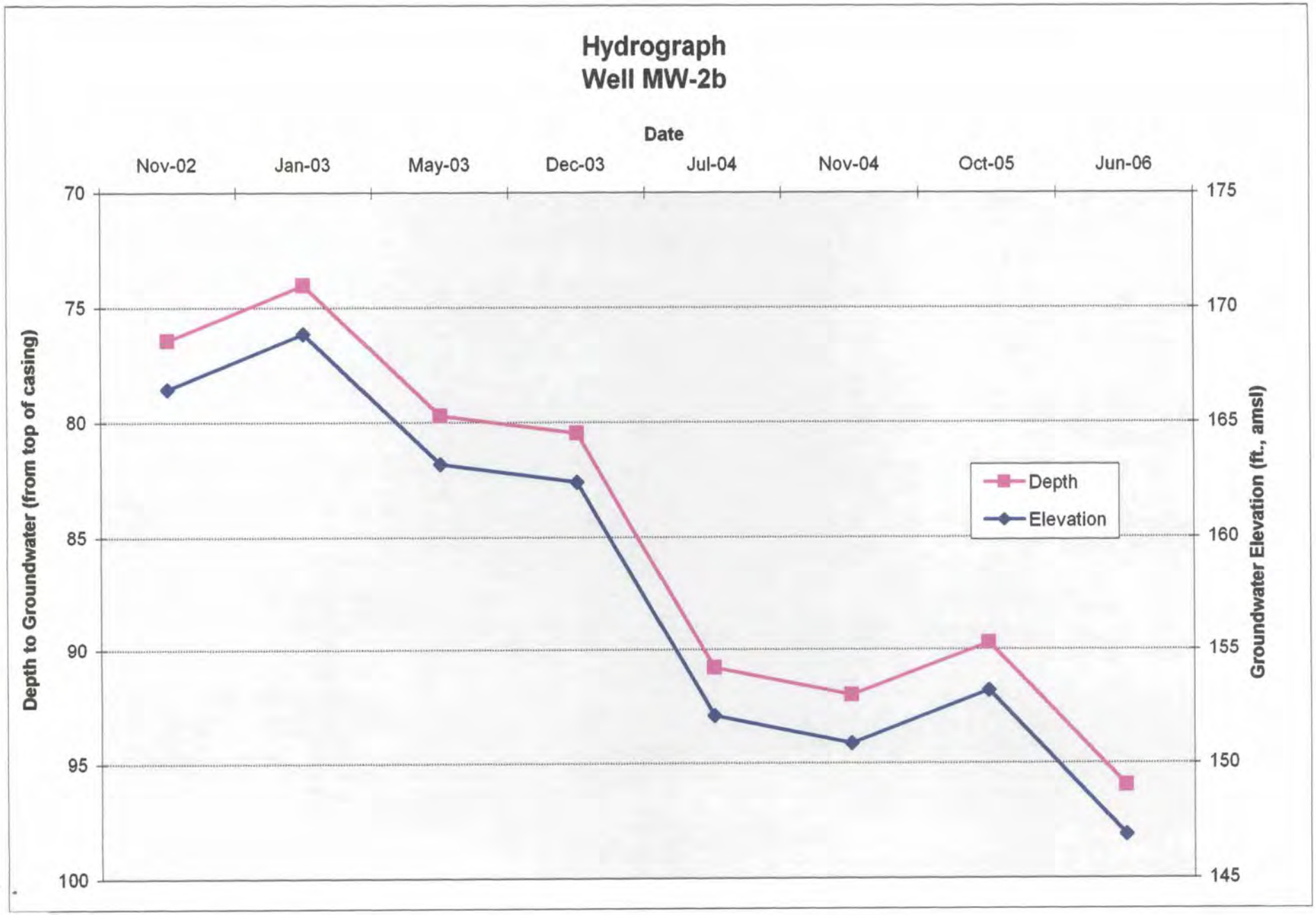
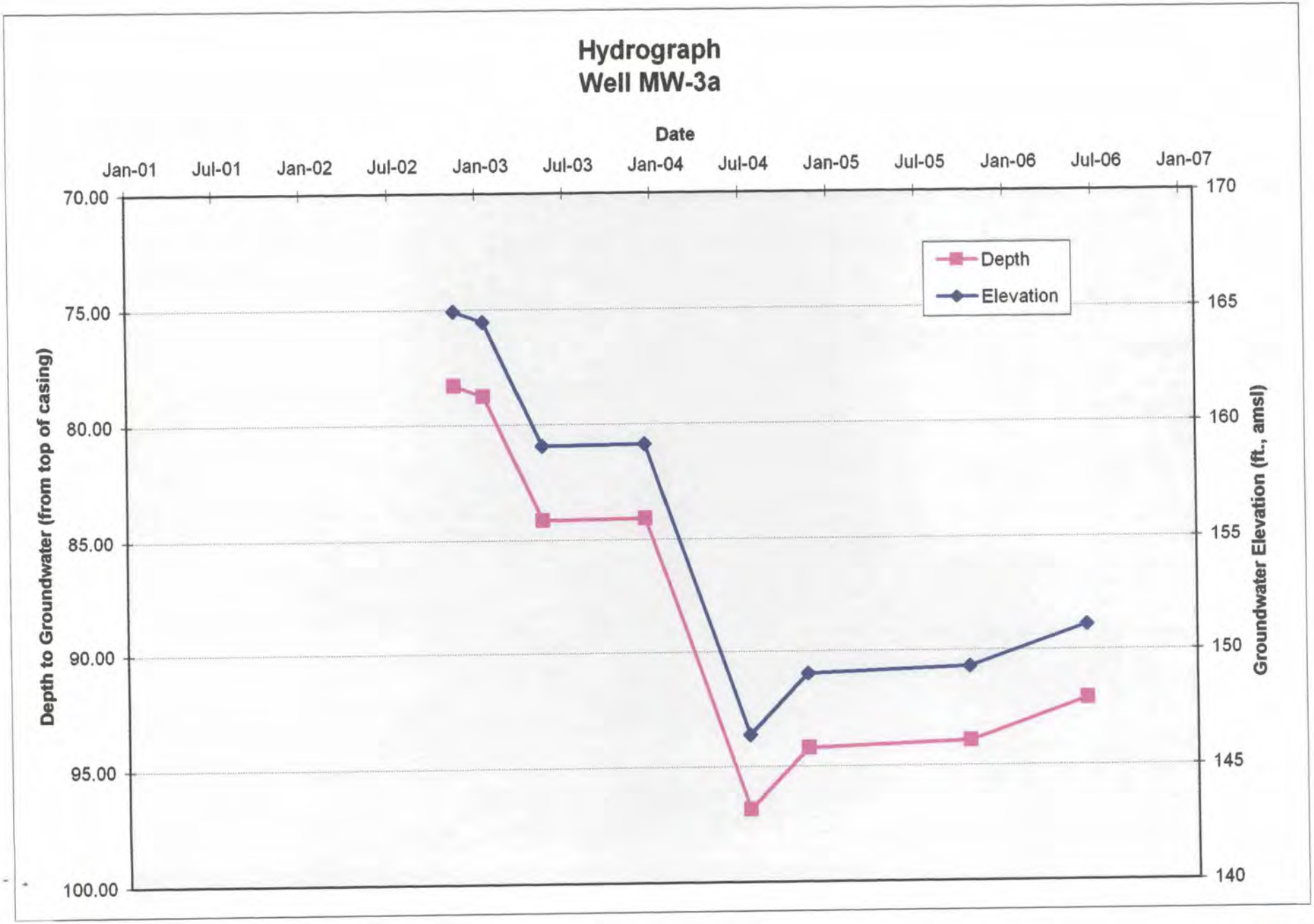
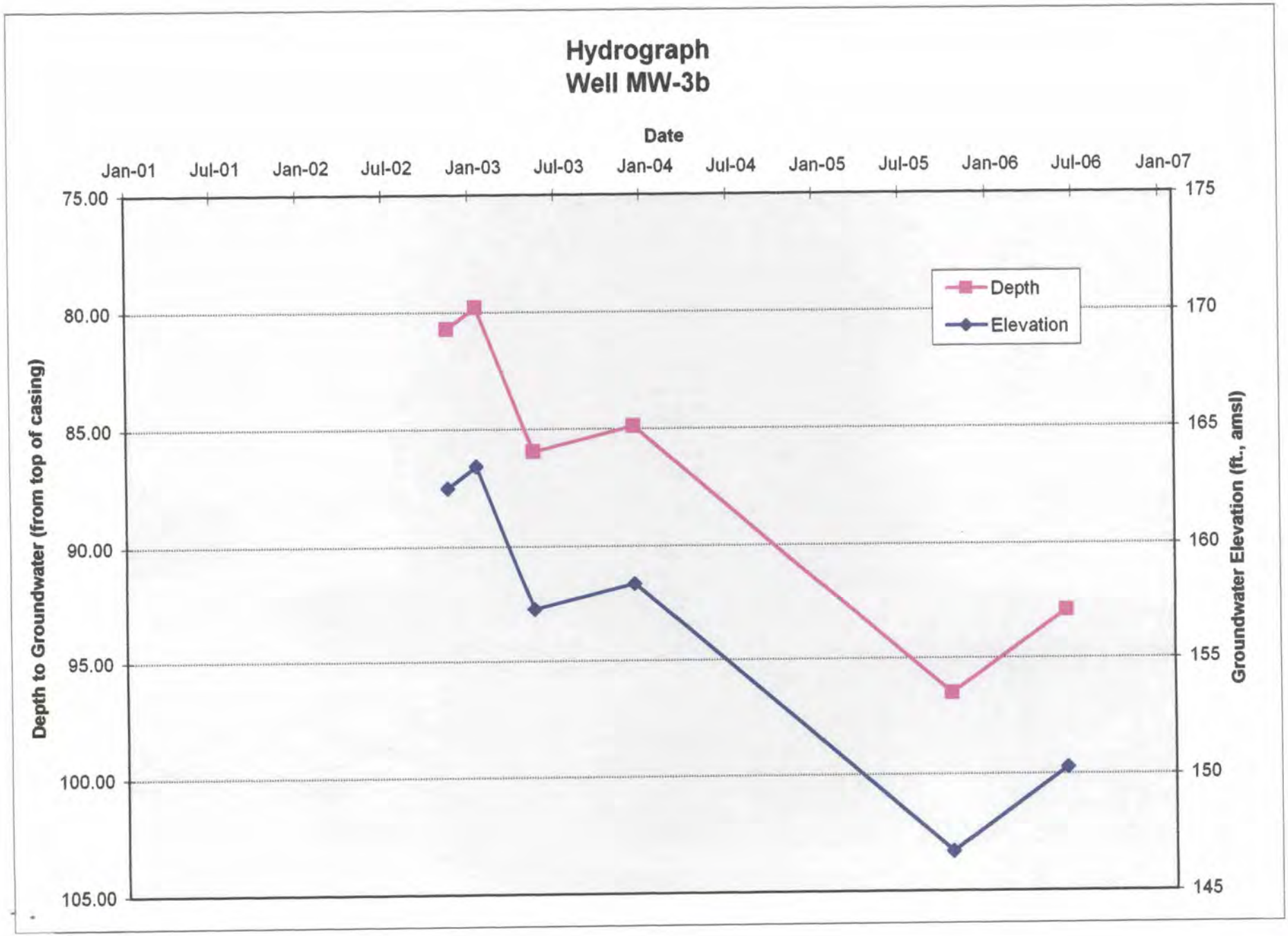
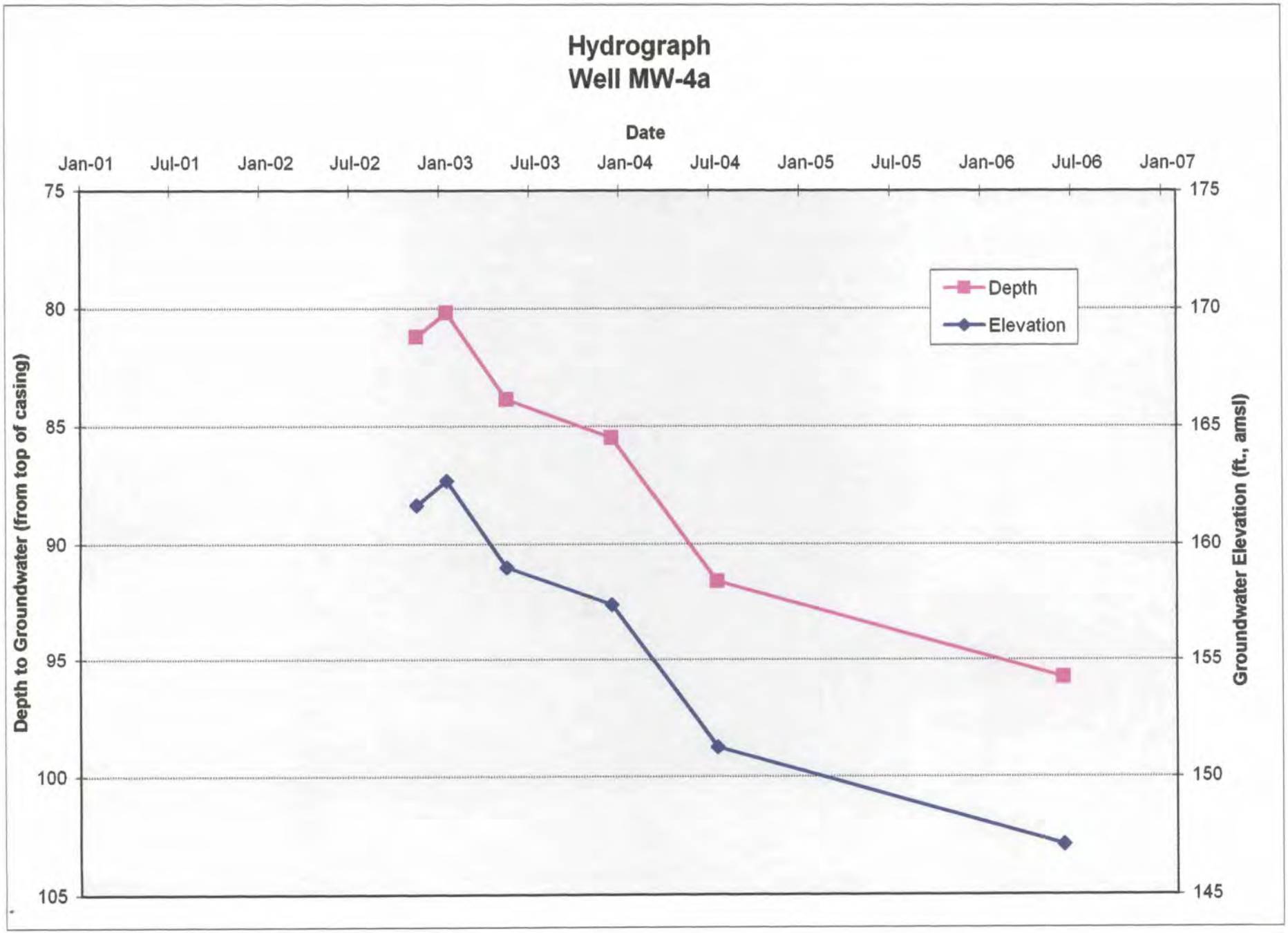
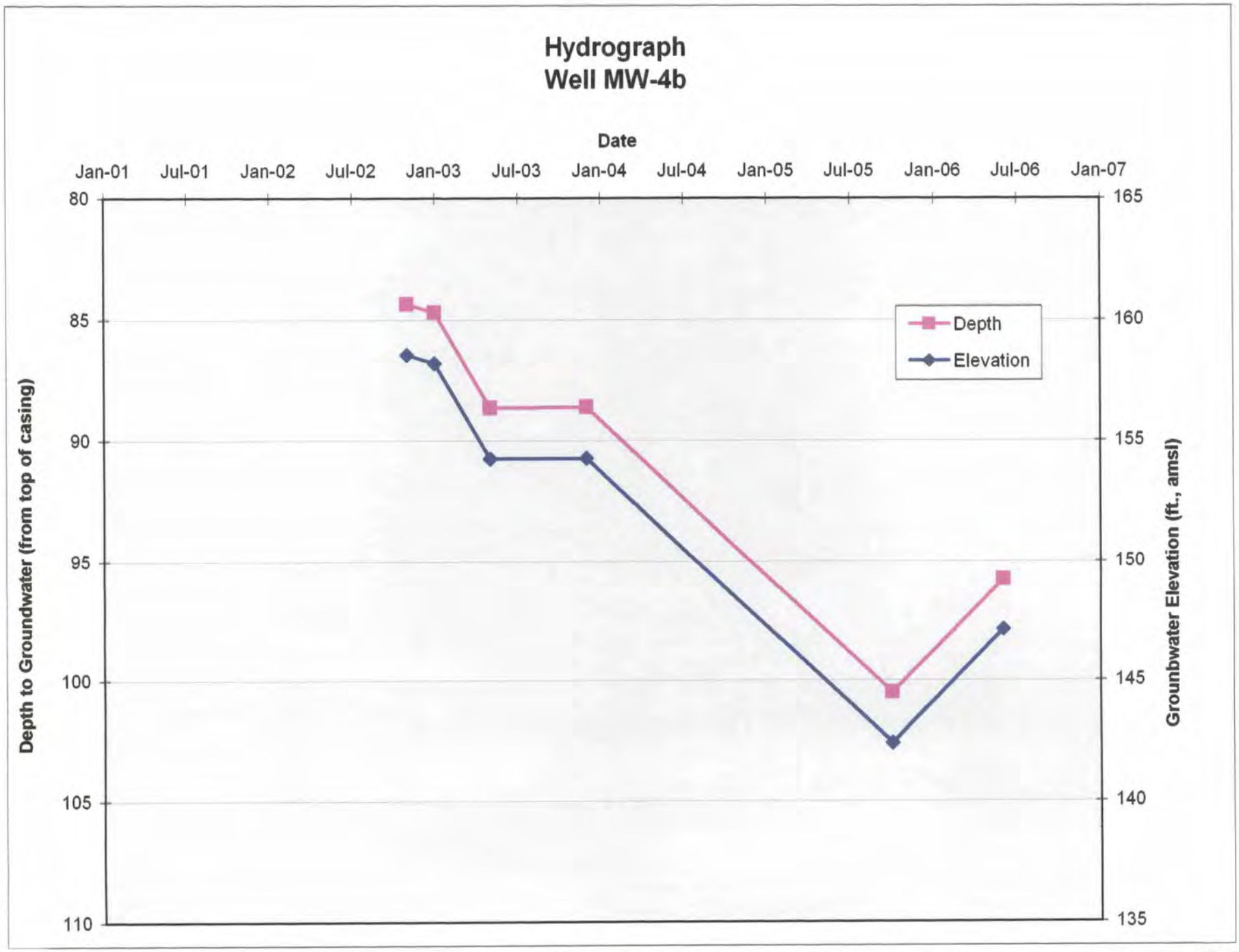
Jul-05
Jan-06
Jul-06
Jan-07
Depth to Groundwater (from top of casing)
70
75
80
85
90
95
100
Groundwater Elevation (ft., amsl)
175
170
165
160
155
150
145
Depth
Elevation

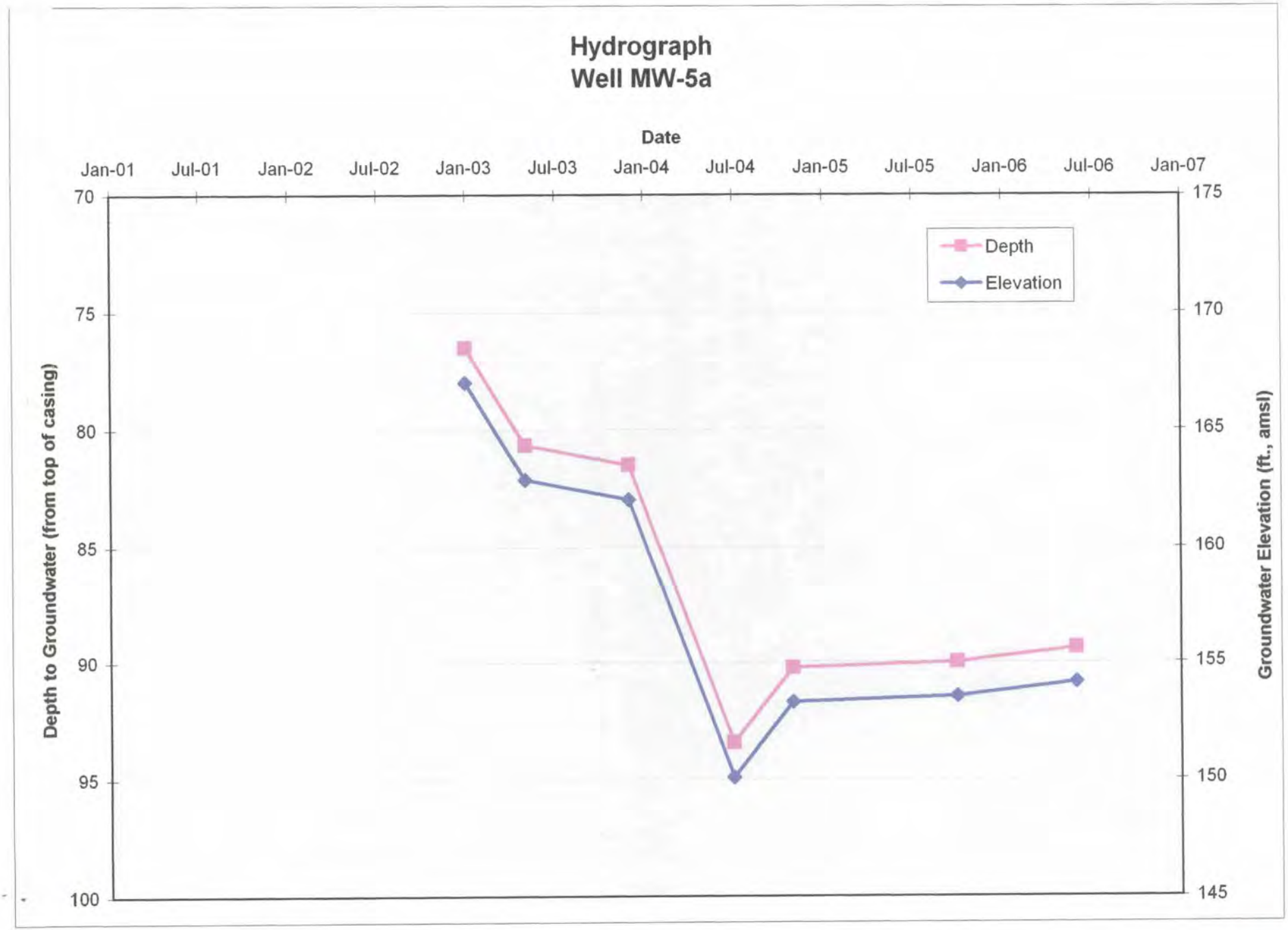

Hydrograph
Well MW-2b
Date
Nov-02
Jan-03
May-03
Dec-03
Jul-04
Nov-04
Oct-05
Jun-06
Depth to Groundwater (from top of casing)
70
75
80
85
90
95
100
Groundwater Elevation (ft., amsl)
175
170
165
160
155
150
145
Depth
Elevation

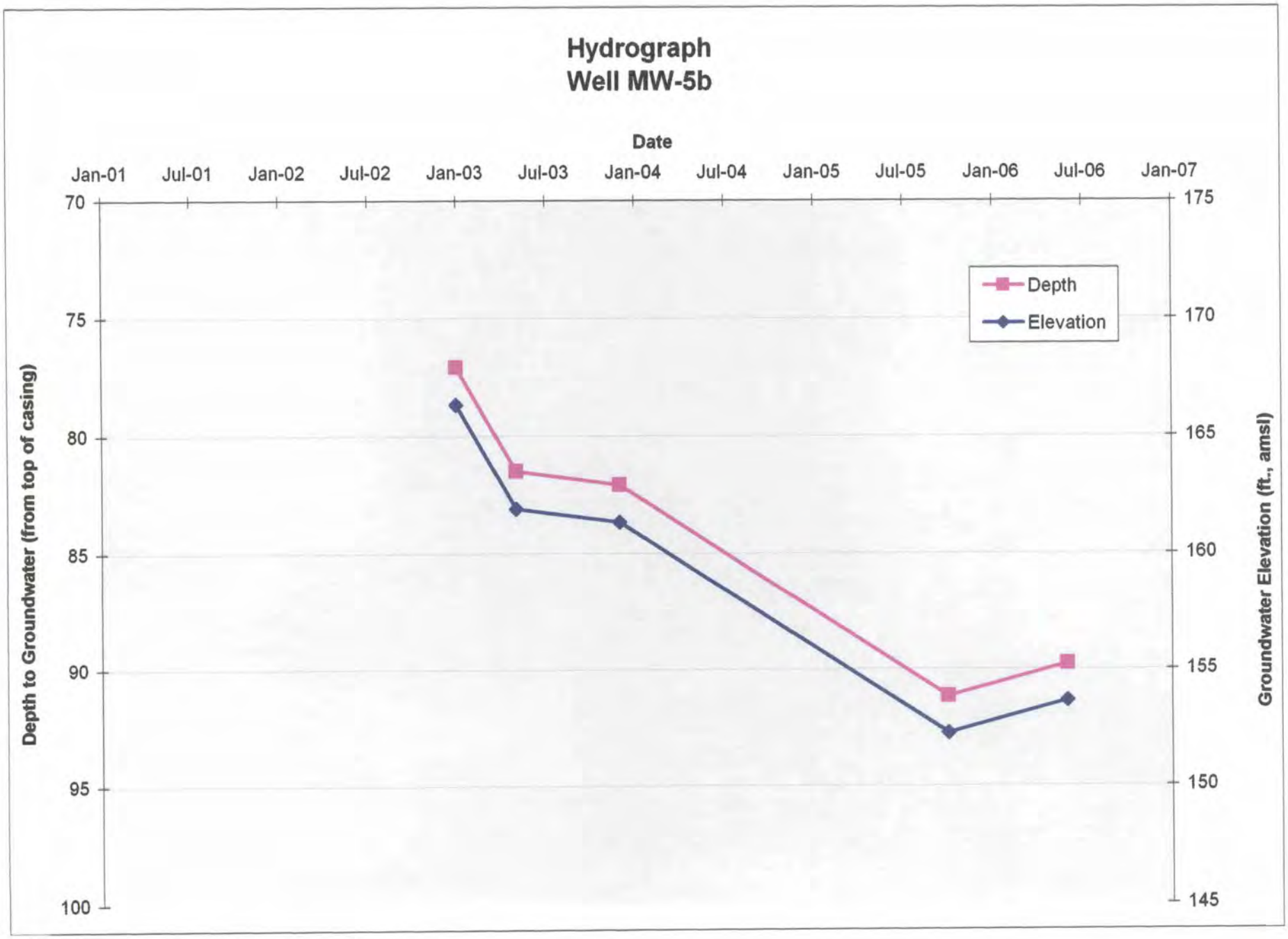

Hydrograph
Well MW-3a
Date
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07
Depth to Groundwater (from top of casing)
70.00
75.00
80.00
85.00
90.00
95.00
100.00
Groundwater Elevation (ft., amsl)
170
165
160
155
150
145
140
Depth
Elevation

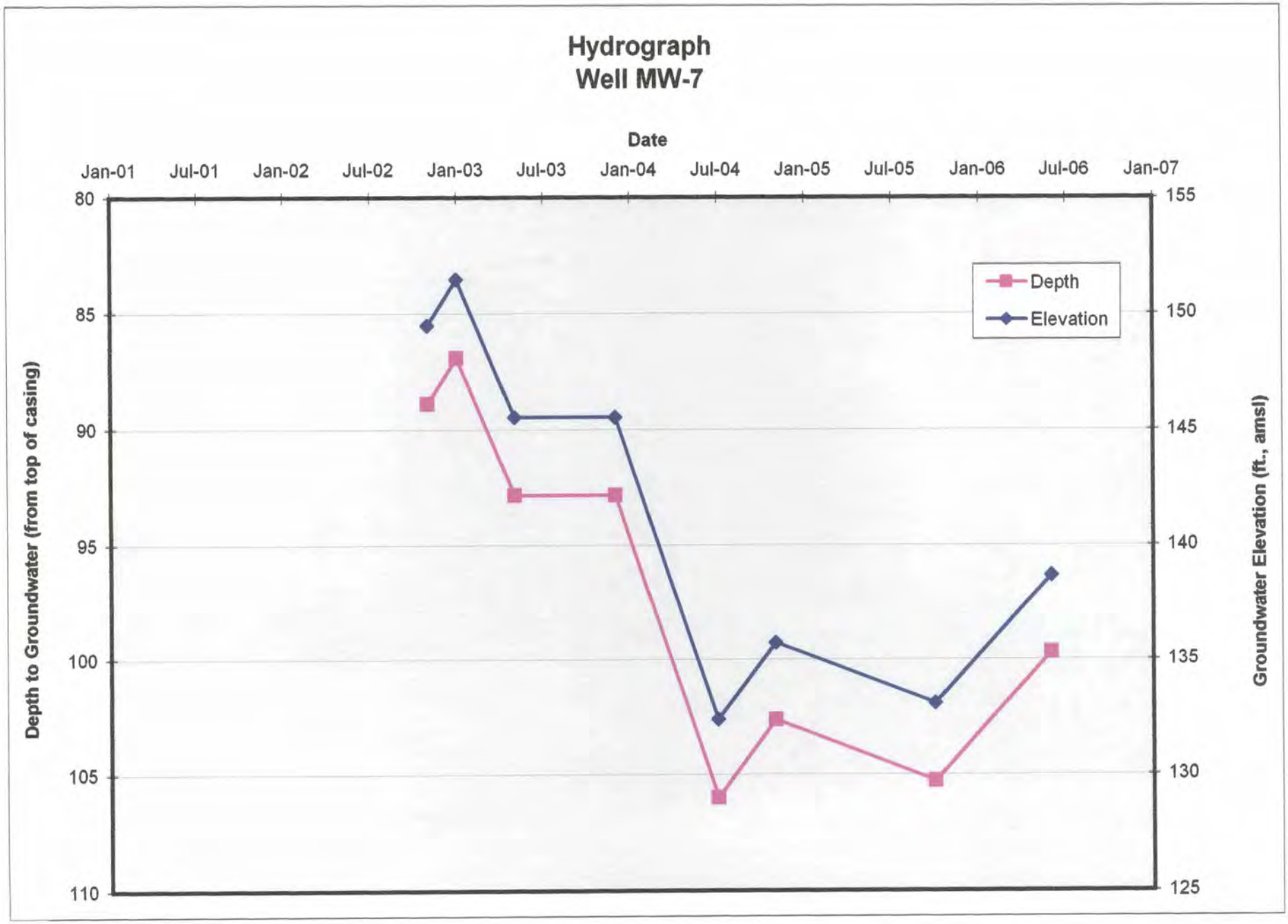

Hydrograph
Well MW-3b
Date
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07
75.00
80.00
85.00
90.00
95.00
100.00
105.00
175
170
165
160
155
150
145
Depth to Groundwater (from top of casing)
Groundwater Elevation (ft., amsl)
Depth
Elevation

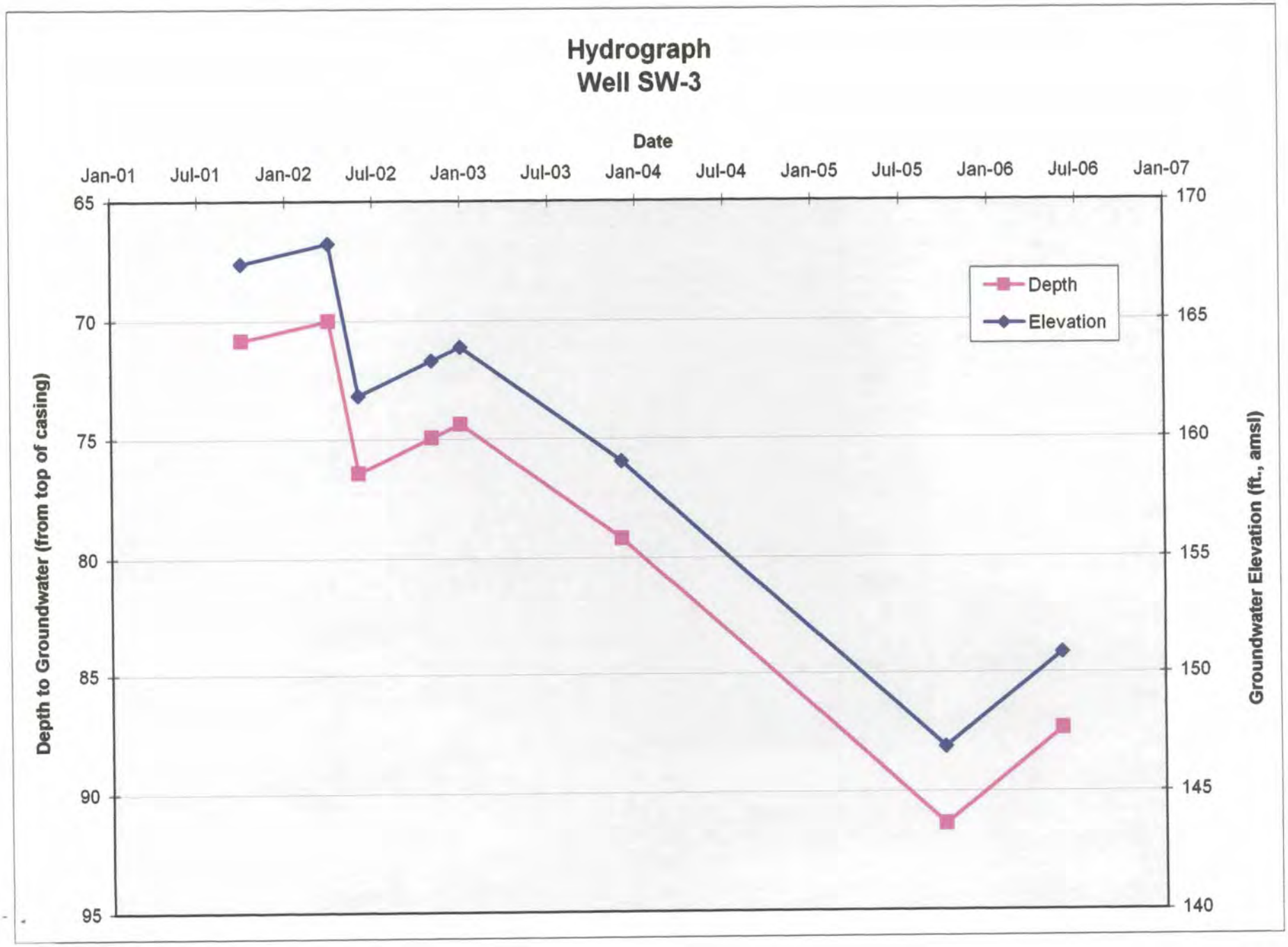

Hydrograph
Well MW-4a
Date
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07
Depth to Groundwater (from top of casing)
75
80
85
90
95
100
105
Groundwater Elevation (ft., amsl)
175
170
165
160
155
150
145
Depth
Elevation

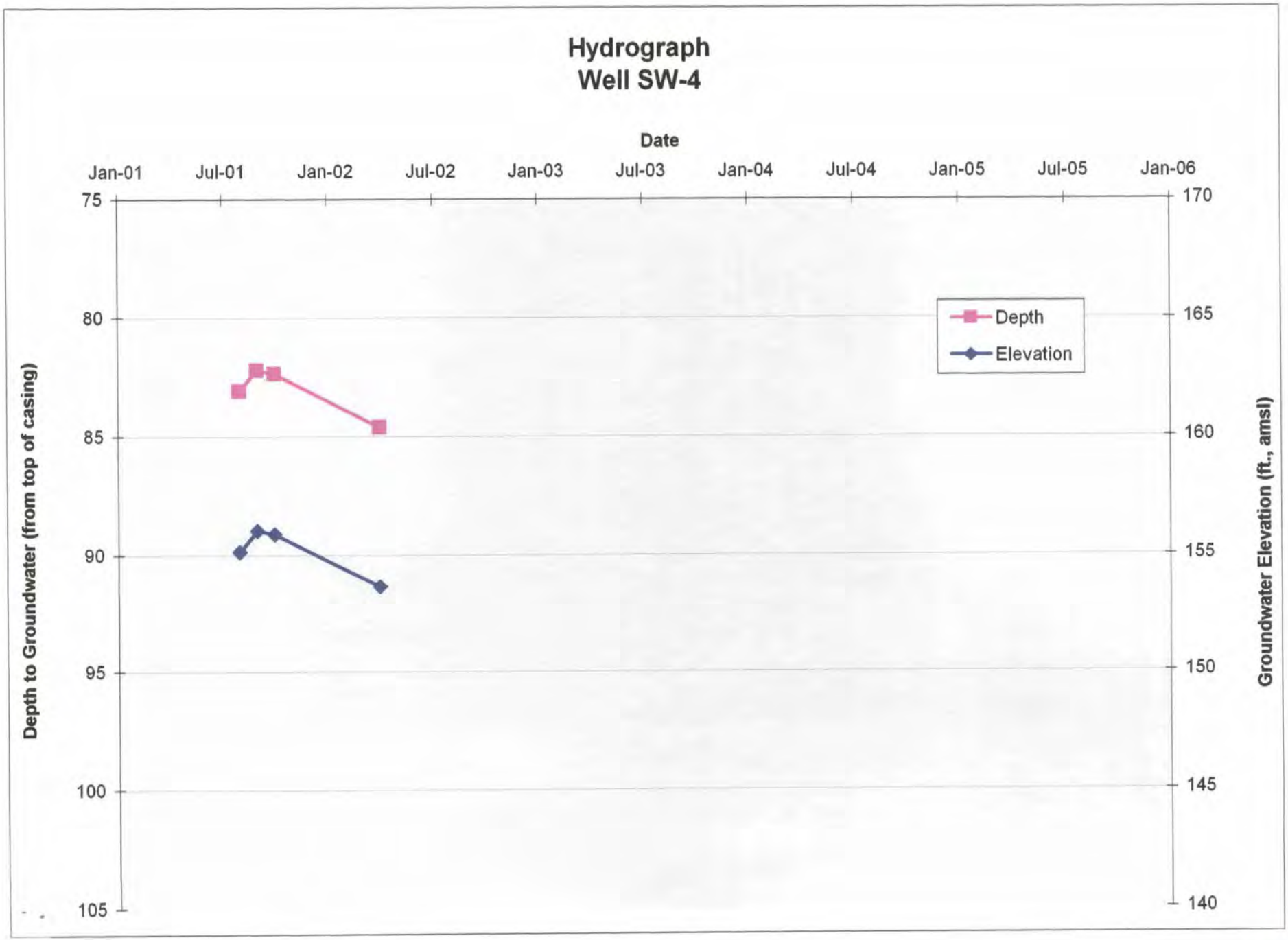

Hydrograph
Well MW-4b
Date
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07
Depth to Groundwater (from top of casing)
80
85
90
95
100
105
110
Grounbwater Elevation (ft., amsl)
165
160
155
150
145
140
135
Depth
Elevation

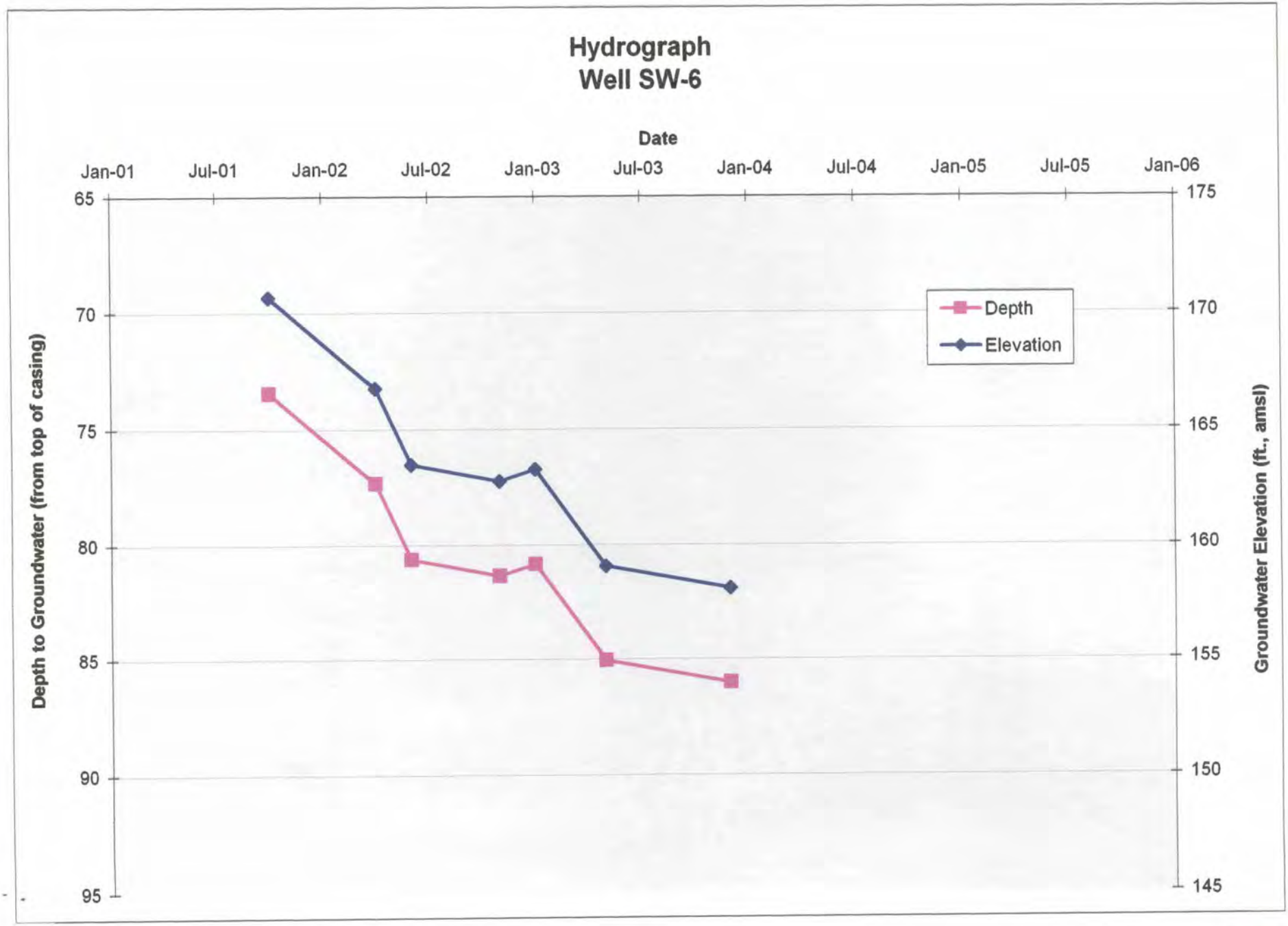

Hydrograph
Well MW-5a
Date
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07
Depth to Groundwater (from top of casing)
70
75
80
85
90
95
100
Groundwater Elevation (ft., amsl)
175
170
165
160
155
150
145
Depth
Elevation


Hydrograph
Well MW-5b
Date
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07
Depth to Groundwater (from top of casing)
70
75
80
85
90
95
100
Groundwater Elevation (ft., amsl)
175
170
165
160
155
150
145
Depth
Elevation

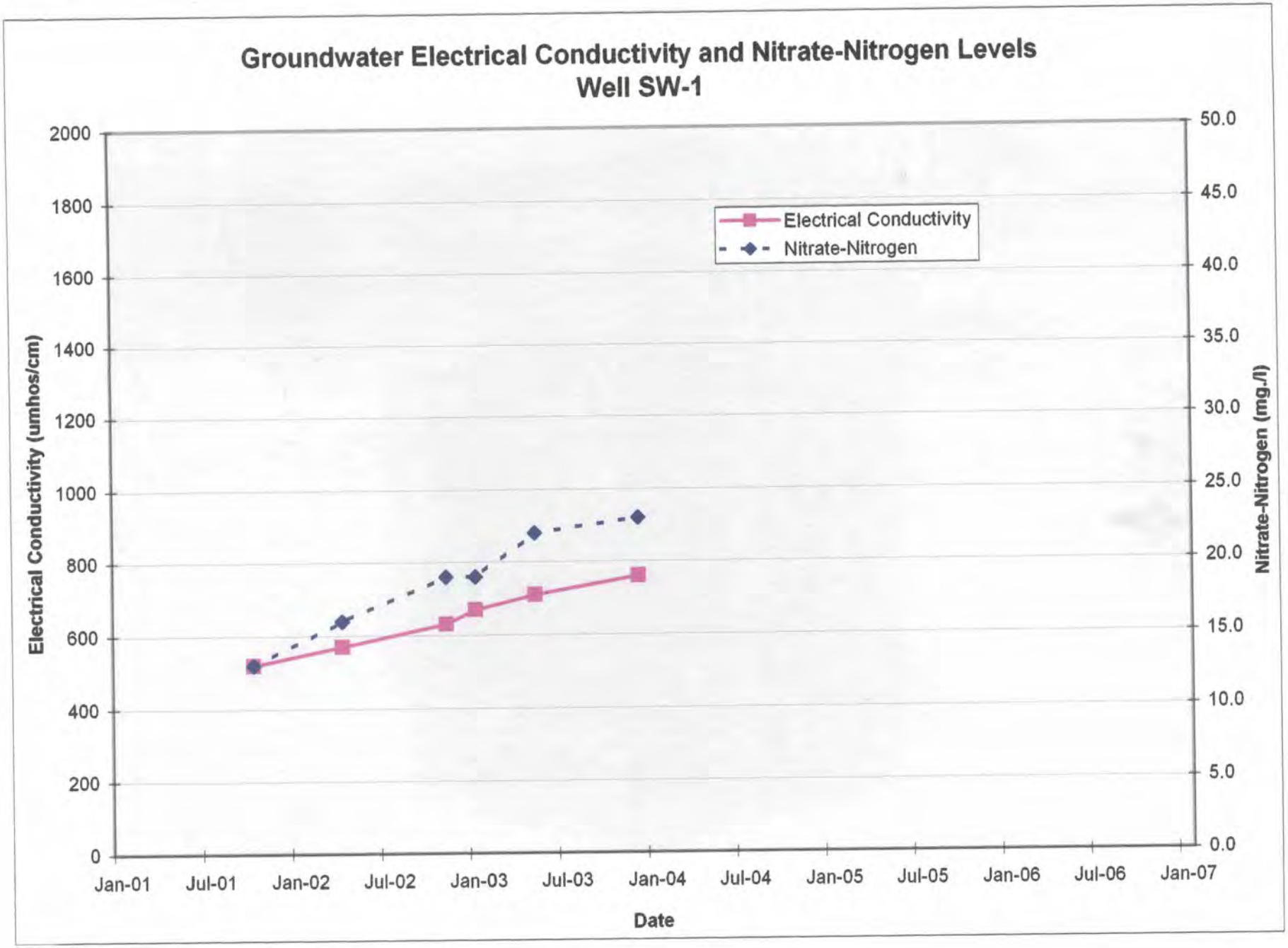

Hydrograph
Well MW-7
Date
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07
Depth to Groundwater (from top of casing)
80
85
90
95
100
105
110
Groundwater Elevation (ft., amsl)
155
150
145
140
135
130
125
Depth
Elevation


Hydrograph
Well SW-3
Date
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07
Depth to Groundwater (from top of casing)
65
70
75
80
85
90
95
Groundwater Elevation (ft., amsl)
170
165
160
155
150
145
140
Depth
Elevation

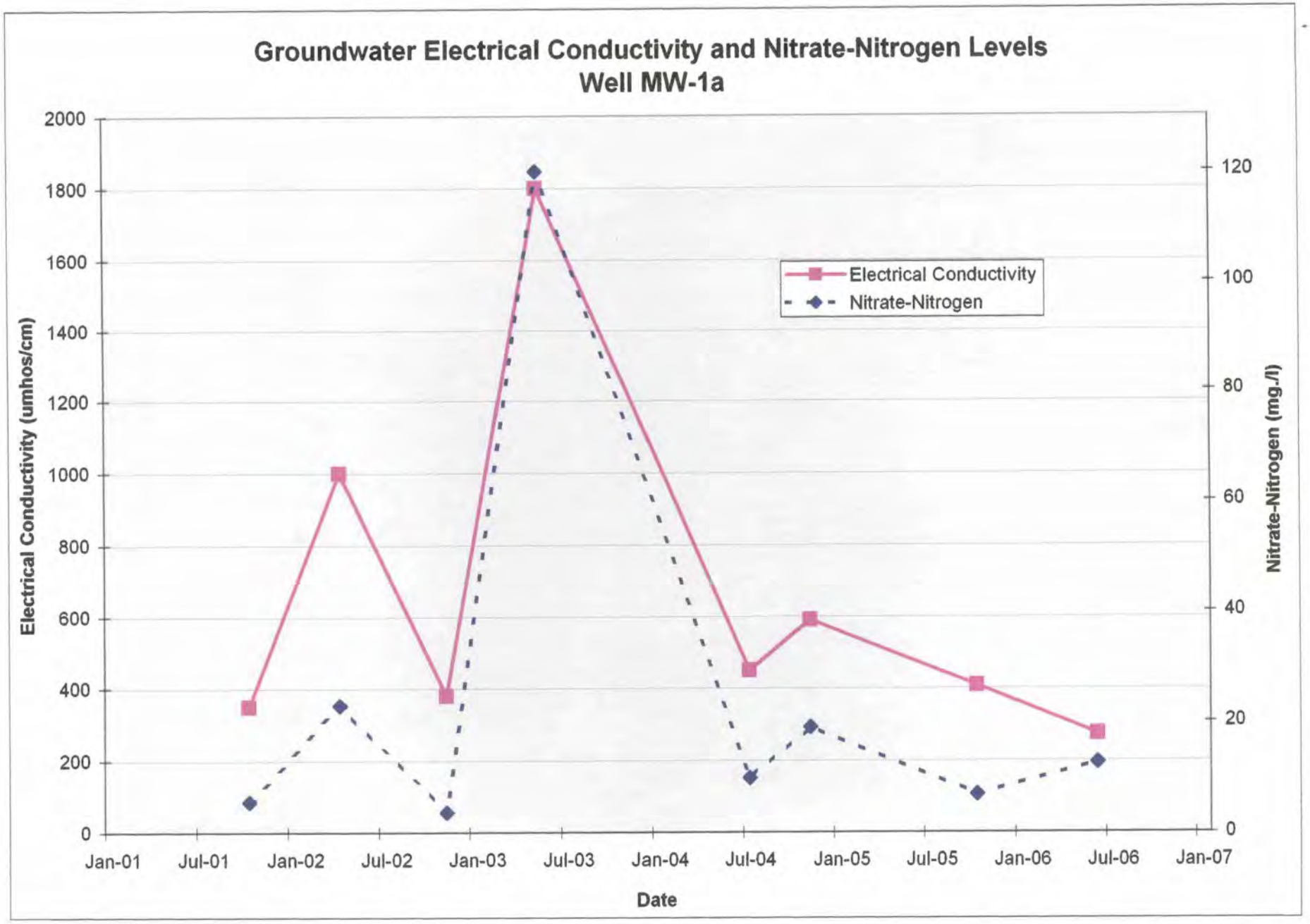

Hydrograph
Well SW-4
Date
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
75
80
85
90
95
100
105
170
165
160
155
150
145
140
Depth to Groundwater (from top of casing)
Groundwater Elevation (ft., amsl)
Depth
Elevation


Hydrograph
Well SW-6
Date
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
65
70
75
80
85
90
95
175
170
165
160
155
150
145
Depth to Groundwater (from top of casing)
Groundwater Elevation (ft., amsl)
Depth
Elevation

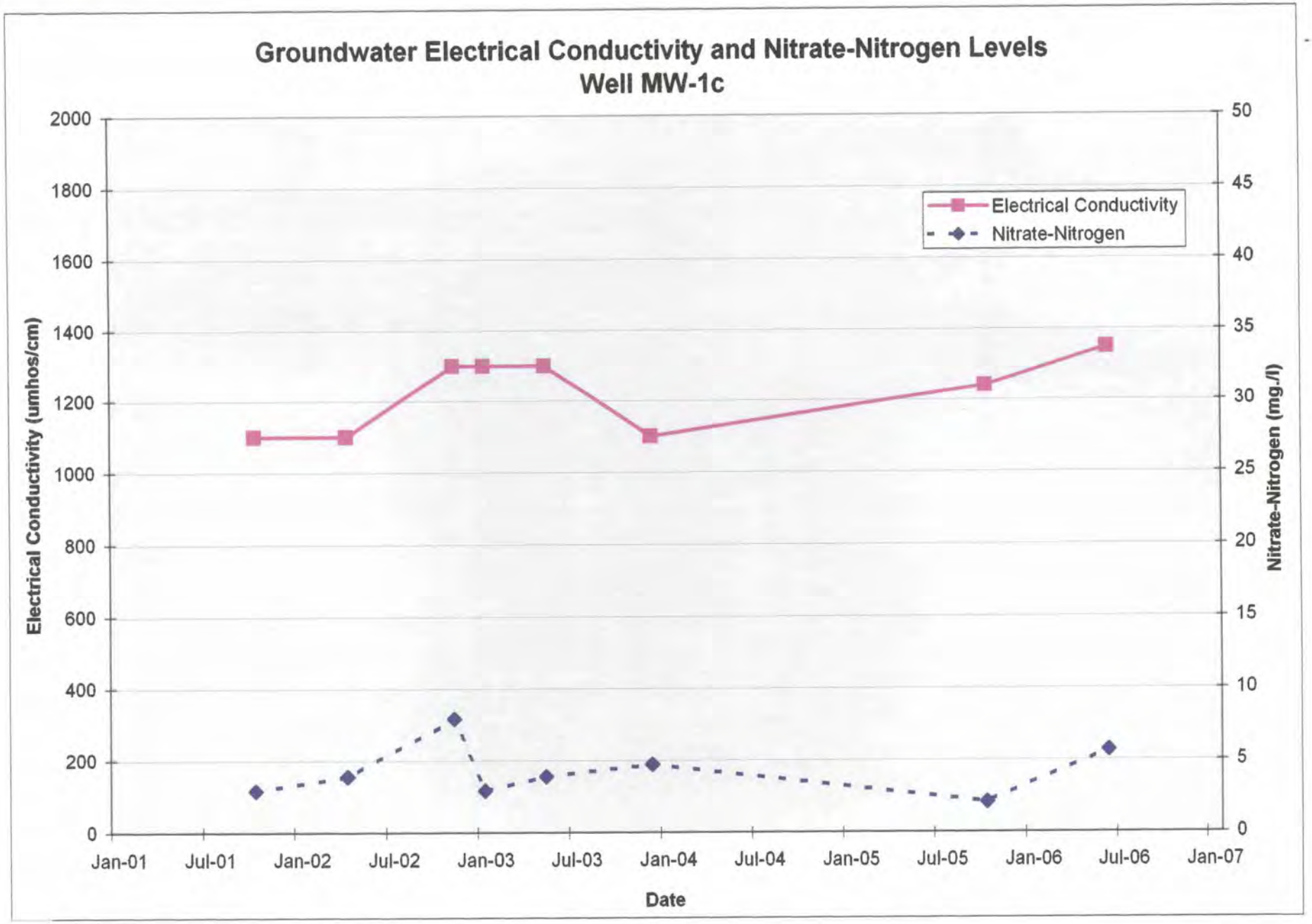
APPENDIX D

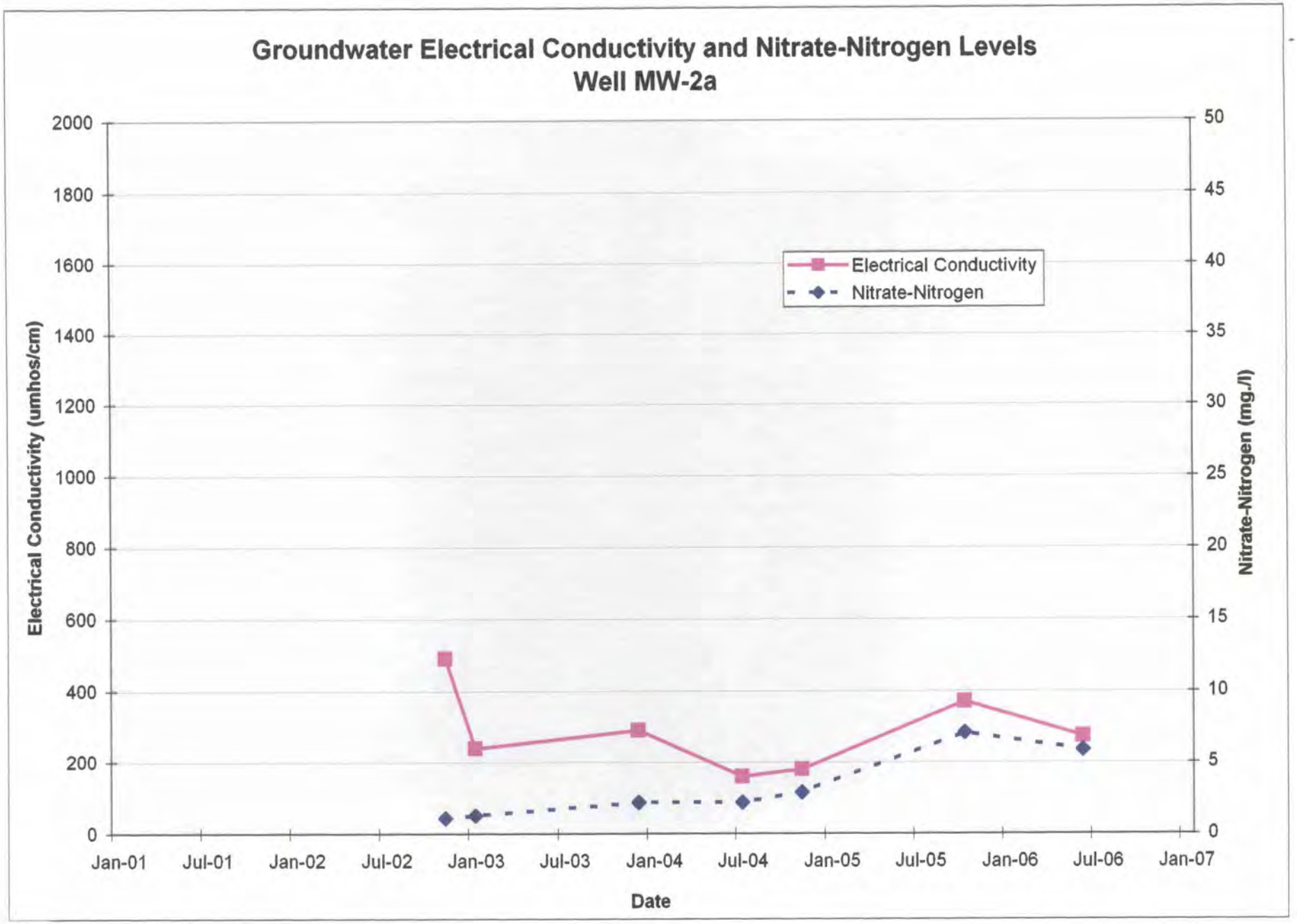

Groundwater Electrical Conductivity and Nitrate-Nitrogen Levels
Well SW-1
Electrical Conductivity
Nitrate-Nitrogen
Electrical Conductivity (umhos/cm)
Nitrate-Nitrogen (mg./l)
Date
2000
1800
1600
1400
1200
1000
800
600
400
200
0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07

CSS

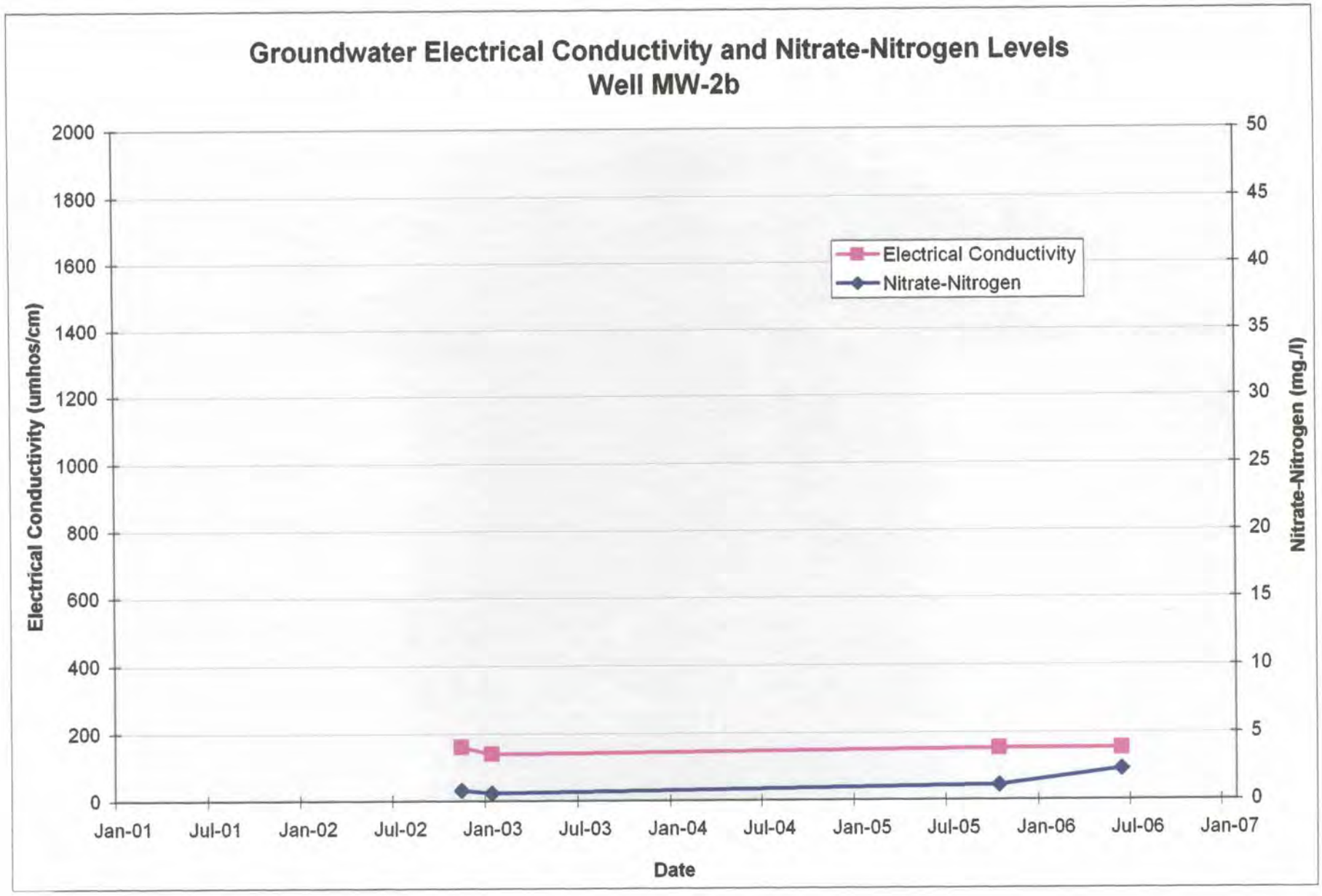

Groundwater Electrical Conductivity and Nitrate-Nitrogen Levels
Well MW-1a
Electrical Conductivity (umhos/cm)
Nitrate-Nitrogen (mg./l)
Date
Electrical Conductivity
Nitrate-Nitrogen
0
200
400
600
800
1000
1200
1400
1600
1800
2000
0
20
40
60
80
100
120
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07

CSS

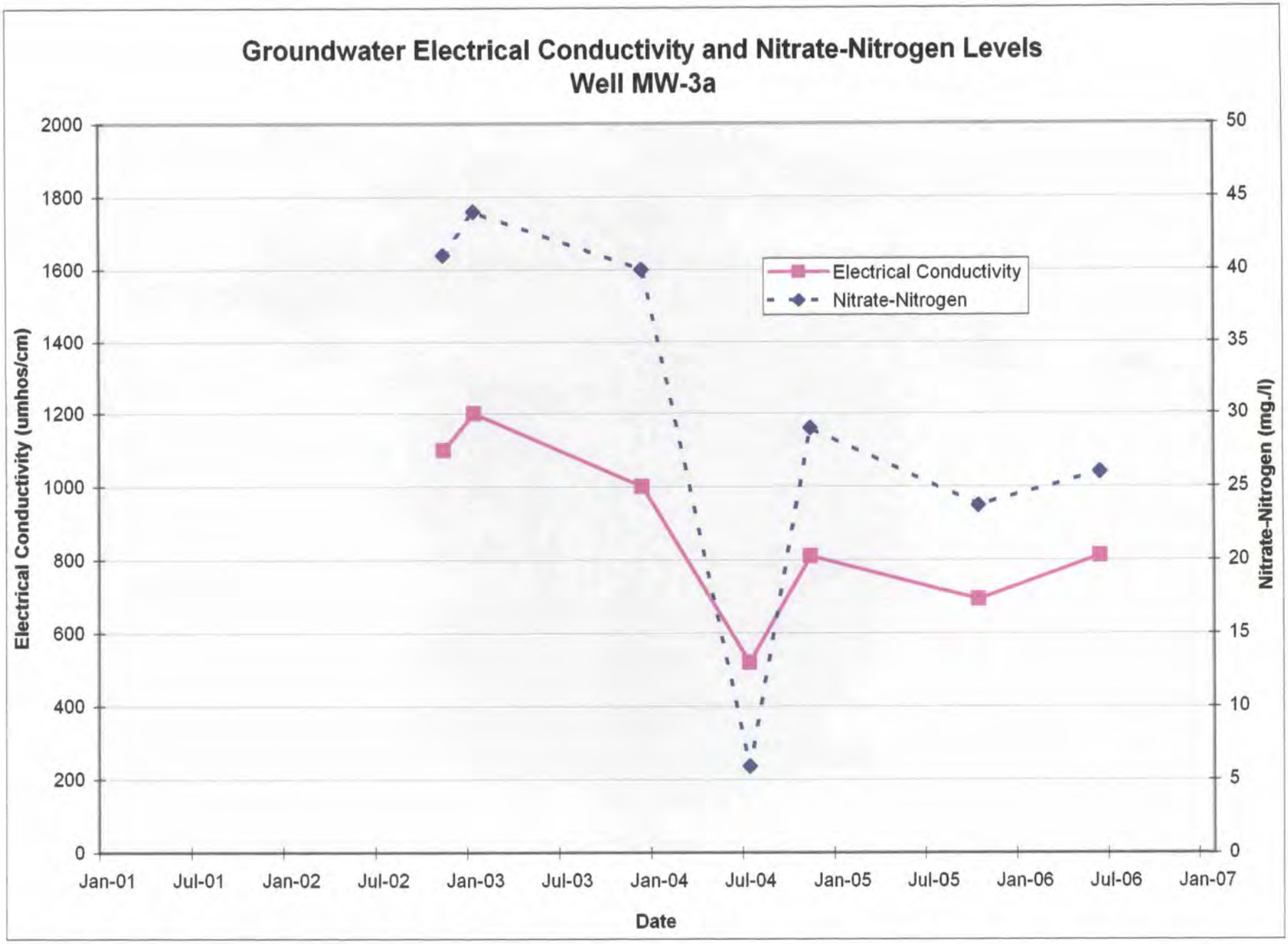

Groundwater Electrical Conductivity and Nitrate-Nitrogen Levels
Well MW-1c
Electrical Conductivity
Nitrate-Nitrogen
Electrical Conductivity (umhos/cm)
Nitrate-Nitrogen (mg./l)
Date
2000
1800
1600
1400
1200
1000
800
600
400
200
0
50
45
40
35
30
25
20
15
10
5
0
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07


Groundwater Electrical Conductivity and Nitrate-Nitrogen Levels
Well MW-2a
Electrical Conductivity (umhos/cm)
Nitrate-Nitrogen (mg./l)
Date
Electrical Conductivity
Nitrate-Nitrogen
0
200
400
600
800
1000
1200
1400
1600
1800
2000
0
5
10
15
20
25
30
35
40
45
50
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07

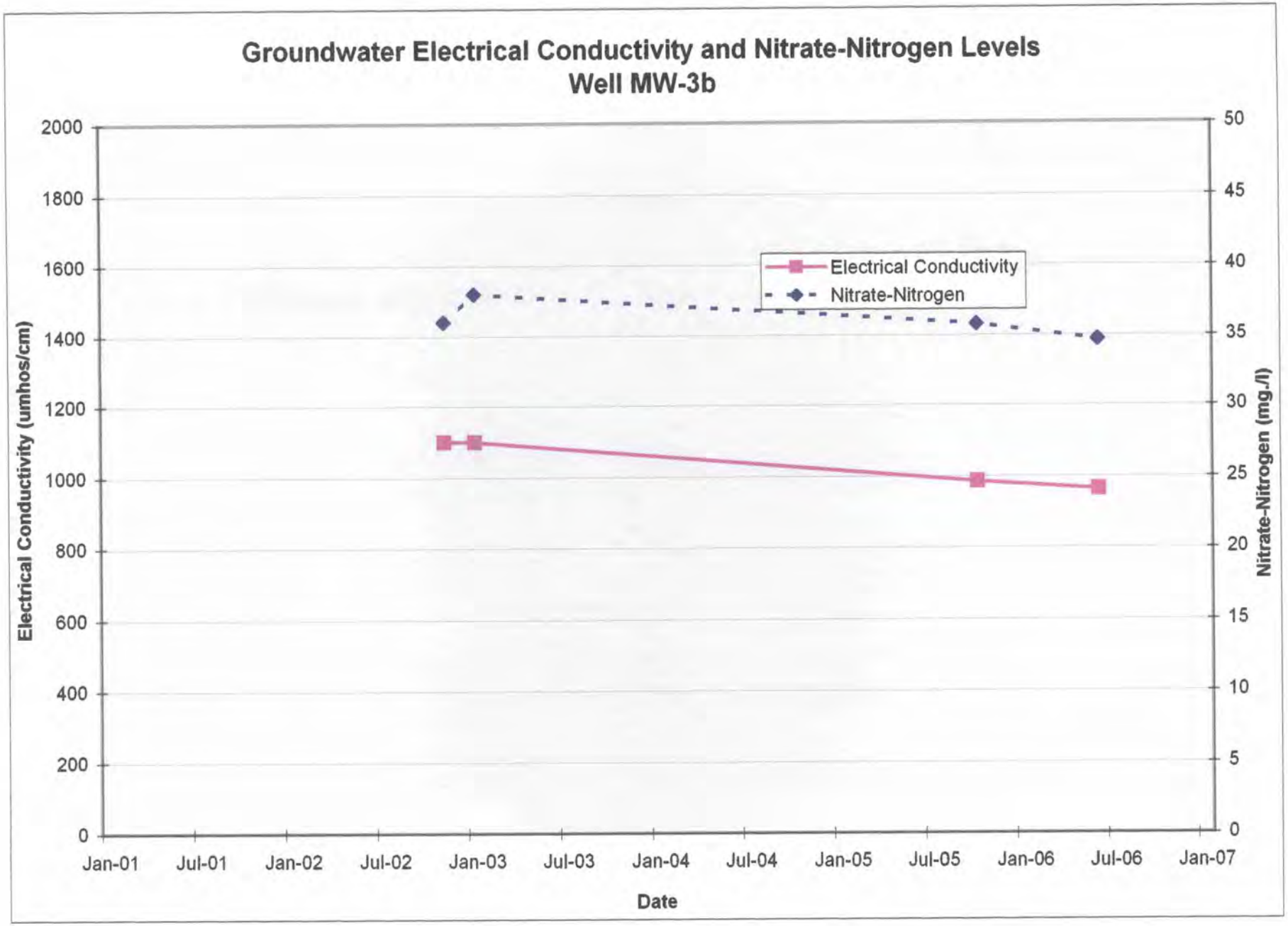
CSS


Groundwater Electrical Conductivity and Nitrate-Nitrogen Levels
Well MW-2b
Electrical Conductivity (umhos/cm)
Nitrate-Nitrogen (mg./l)
Date
Electrical Conductivity
Nitrate-Nitrogen
2000
1800
1600
1400
1200
1000
800
600
400
200
0
50
45
40
35
30
25
20
15
10
5
0
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07

CSS


Groundwater Electrical Conductivity and Nitrate-Nitrogen Levels
Well MW-3a
Electrical Conductivity (umhos/cm)
Nitrate-Nitrogen (mg./l)
Date
Electrical Conductivity
Nitrate-Nitrogen
0
200
400
600
800
1000
1200
1400
1600
1800
2000
0
5
10
15
20
25
30
35
40
45
50
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07

CSS


Groundwater Electrical Conductivity and Nitrate-Nitrogen Levels
Well MW-3b
Electrical Conductivity (umhos/cm)
Nitrate-Nitrogen (mg./l)
Date
Electrical Conductivity
Nitrate-Nitrogen
0
200
400
600
800
1000
1200
1400
1600
1800
2000
0
5
10
15
20
25
30
35
40
45
50
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
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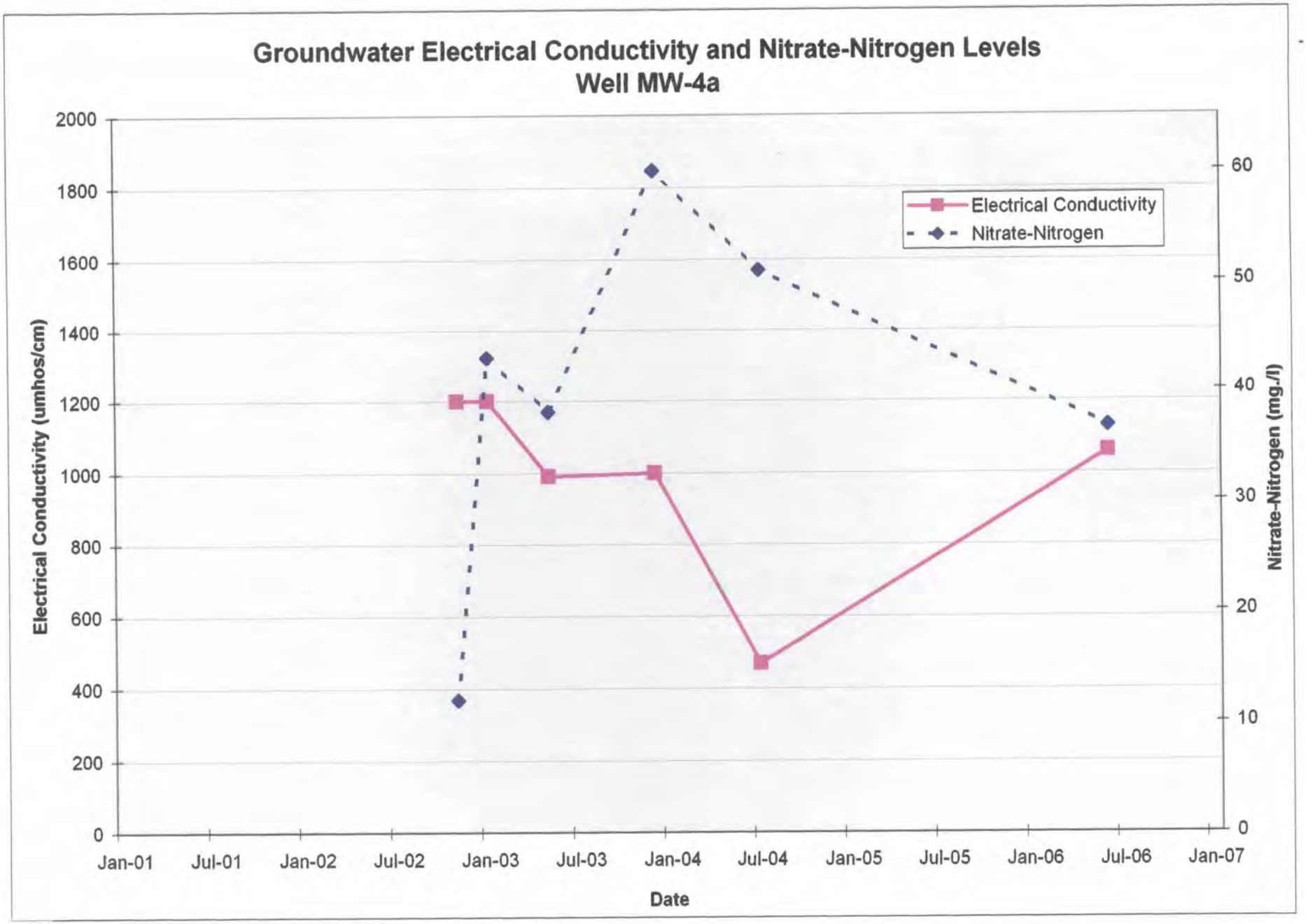
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07

CSS


Groundwater Electrical Conductivity and Nitrate-Nitrogen Levels
Well MW-4a
Electrical Conductivity (umhos/cm)
Nitrate-Nitrogen (mg./l)
Date
Electrical Conductivity
Nitrate-Nitrogen
0
200
400
600
800
1000
1200
1400
1600
1800
2000
0
10
20
30
40
50
60
Jan-01
Jul-01
Jan-02
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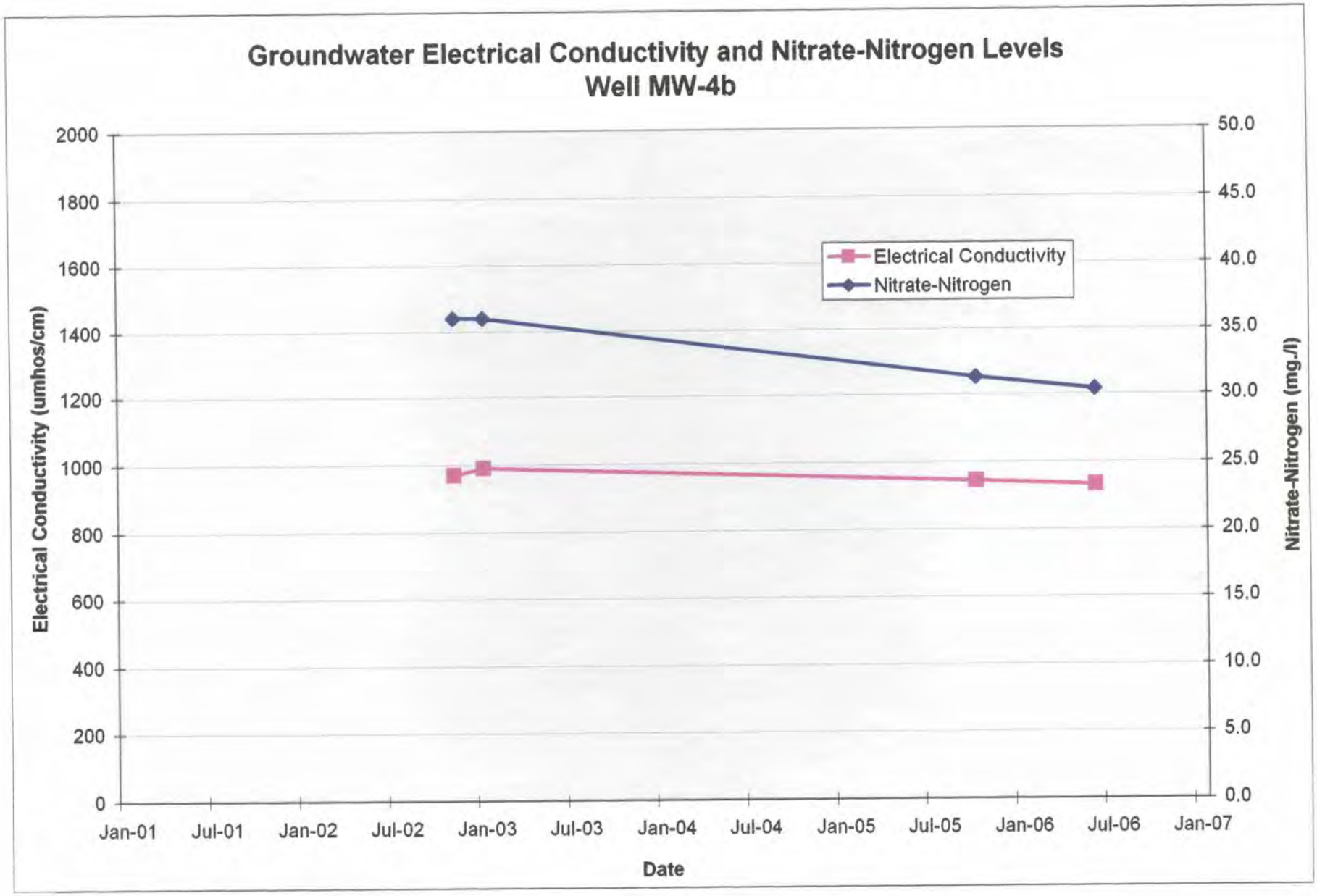
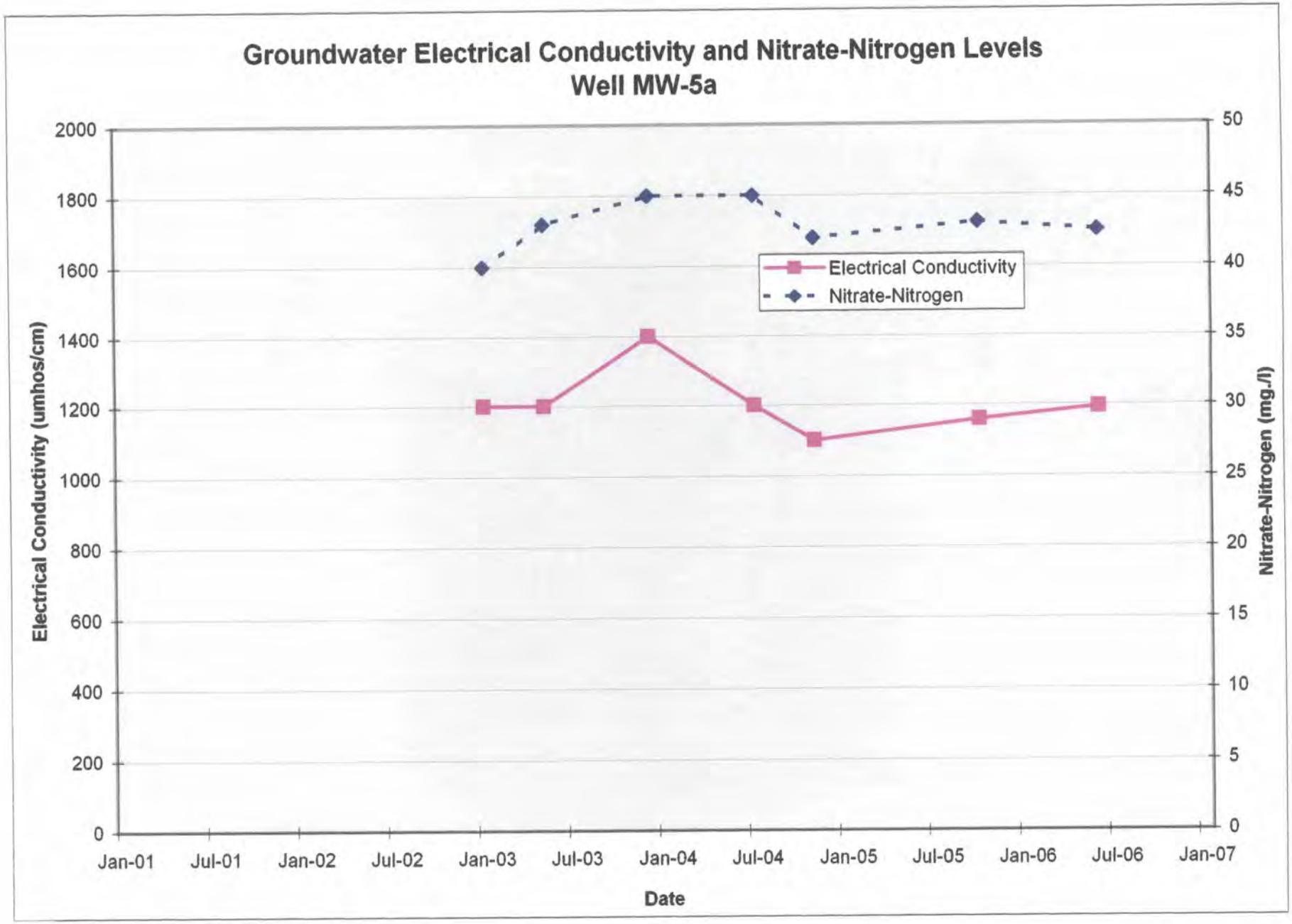
Jul-06
Jan-07

CSS


Groundwater Electrical Conductivity and Nitrate-Nitrogen Levels
Well MW-4b
Electrical Conductivity (umhos/cm)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
Nitrate-Nitrogen (mg./l)
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Electrical Conductivity
Nitrate-Nitrogen
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07
Date

CSS


Groundwater Electrical Conductivity and Nitrate-Nitrogen Levels
Well MW-5a
Electrical Conductivity (umhos/cm)
Nitrate-Nitrogen (mg./l)
Date
Electrical Conductivity
Nitrate-Nitrogen
0
200
400
600
800
1000
1200
1400
1600
1800
2000
0
5
10
15
20
25
30
35
40
45
50
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
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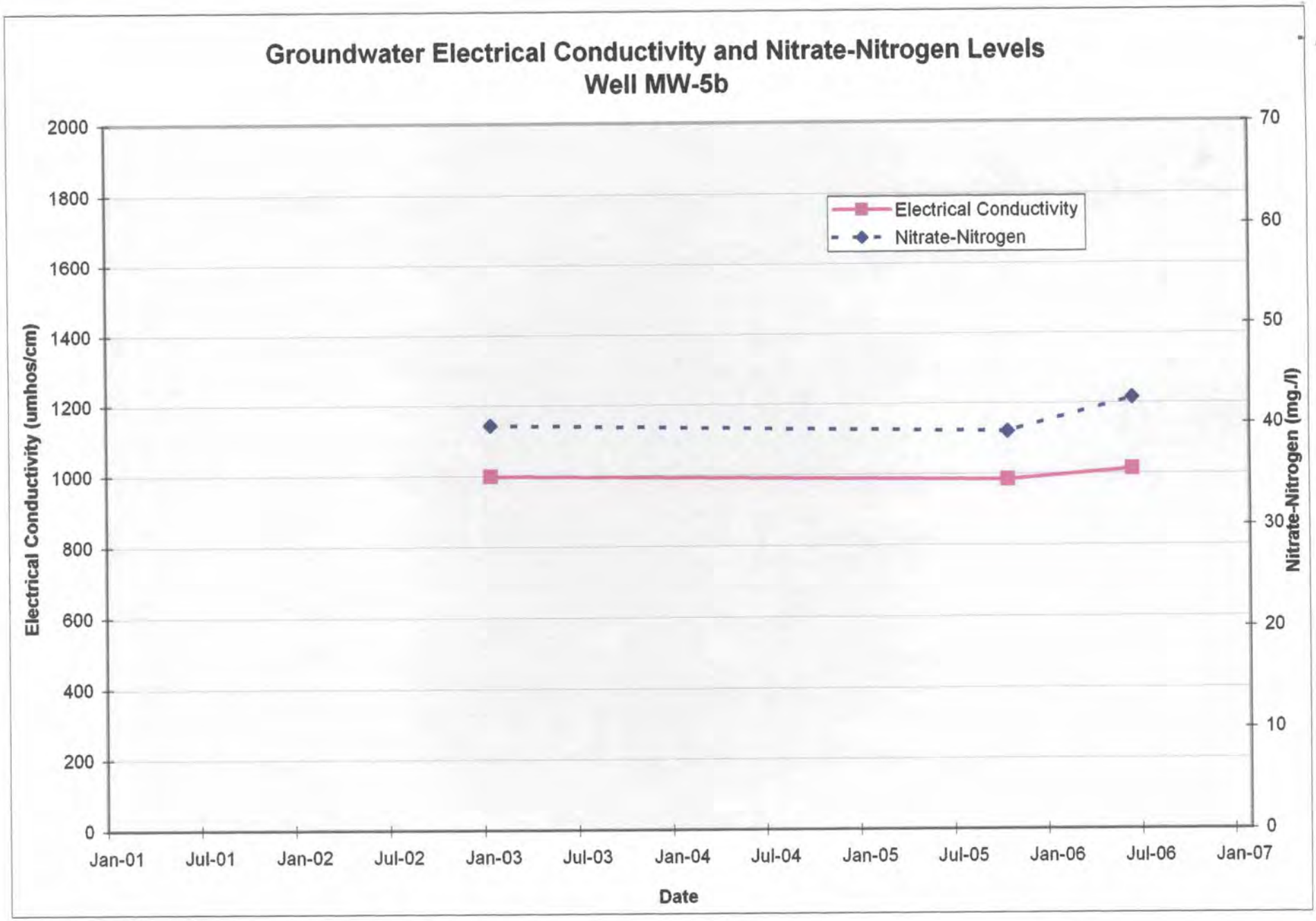
Jan-06
Jul-06
Jan-07

CSS


Groundwater Electrical Conductivity and Nitrate-Nitrogen Levels
Well MW-5b
Electrical Conductivity
Nitrate-Nitrogen
Electrical Conductivity (umhos/cm)
Nitrate-Nitrogen (mg./l)
Date
2000
1800
1600
1400
1200
1000
800
600
400
200
0
70
60
50
40
30
20
10
0
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
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Jan-04
Jul-04
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Jan-07

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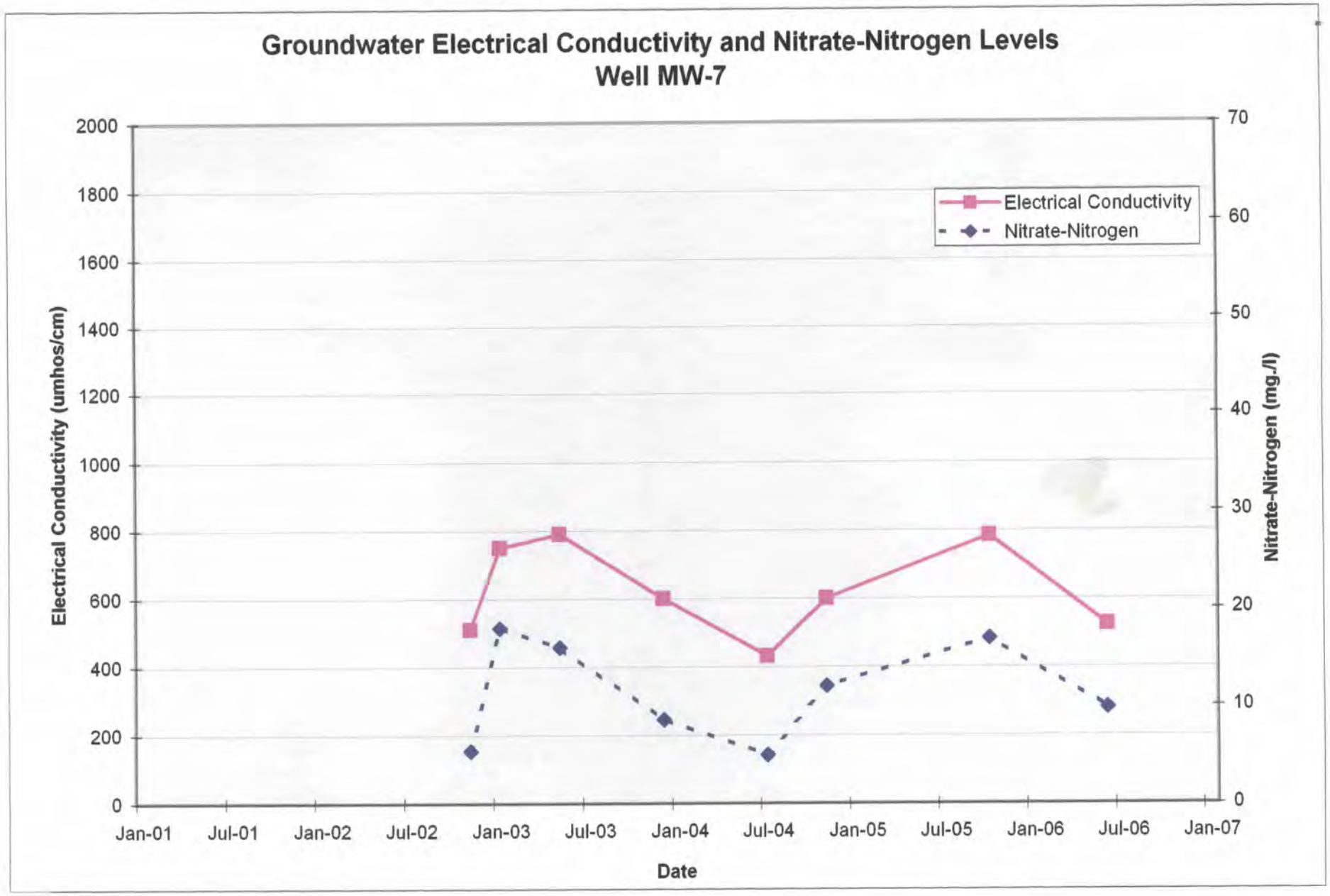
Groundwater Electrical Conductivity and Nitrate-Nitrogen Levels
Well MW-7
Electrical Conductivity
Nitrate-Nitrogen
Electrical Conductivity (umhos/cm)
Nitrate-Nitrogen (mg./l)
Date
0
200
400
600
800
1000
1200
1400
1600
1800
2000
0
10
20
30
40
50
60
70
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
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Jul-04
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Jul-05
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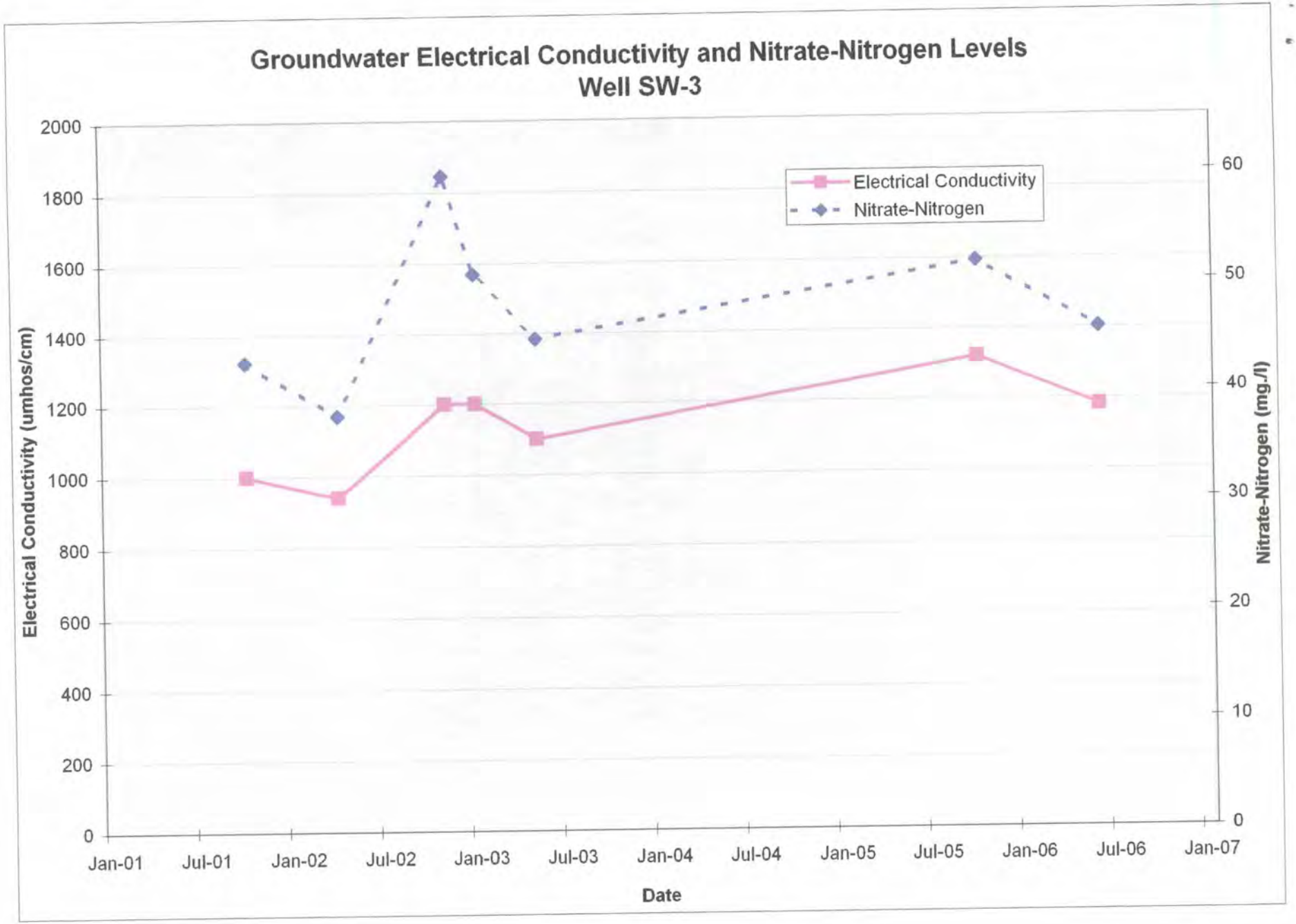
Jul-06
Jan-07

CSS


Groundwater Electrical Conductivity and Nitrate-Nitrogen Levels
Well SW-3
Electrical Conductivity
Nitrate-Nitrogen
Electrical Conductivity (umhos/cm)
Nitrate-Nitrogen (mg./l)
Date
2000
1800
1600
1400
1200
1000
800
600
400
200
0
60
50
40
30
20
10
0
Jan-01
Jul-01
Jan-02
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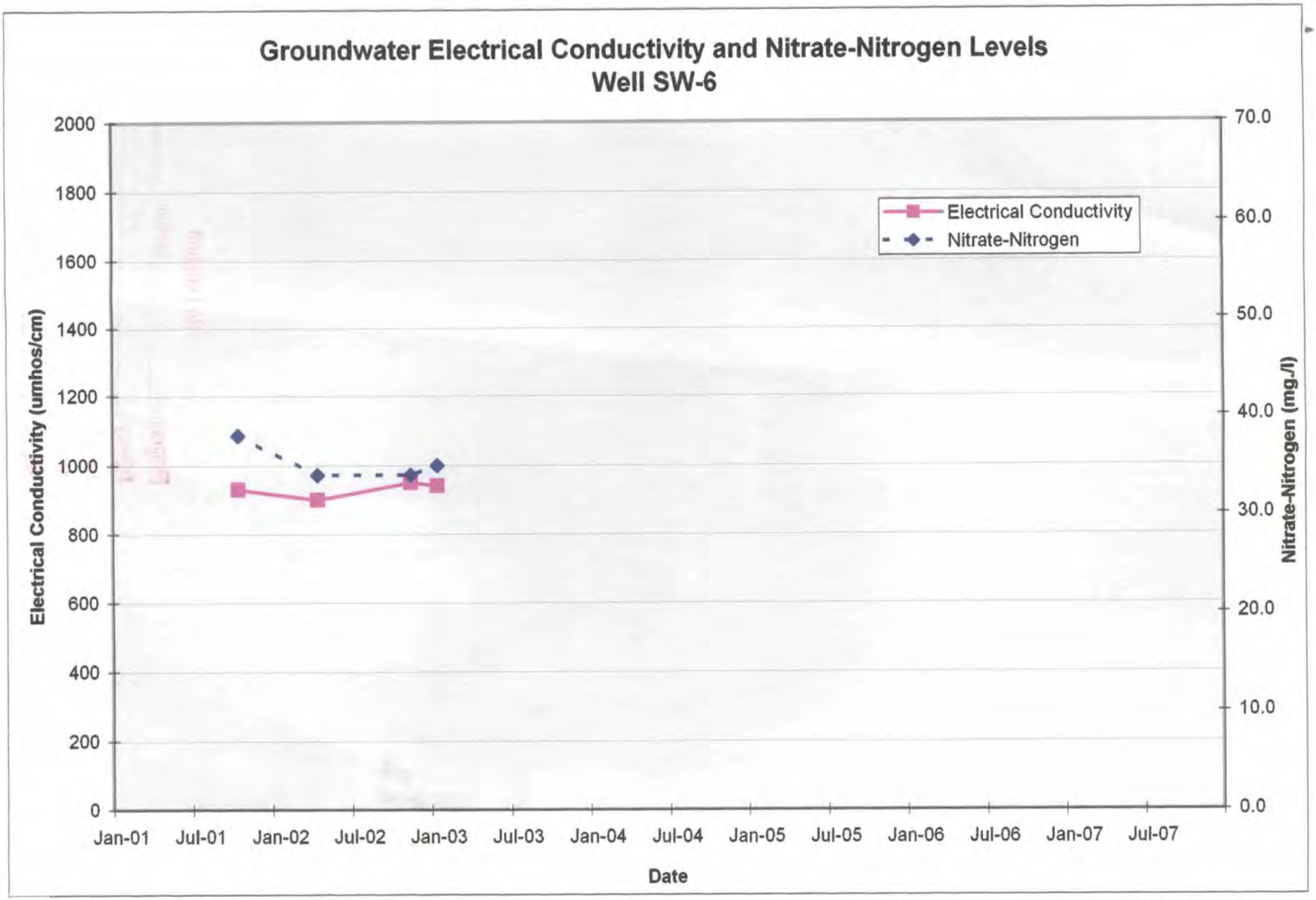
Jul-06
Jan-07

CSS


Groundwater Electrical Conductivity and Nitrate-Nitrogen Levels
Well SW-6
Electrical Conductivity
Nitrate-Nitrogen
Electrical Conductivity (umhos/cm)
Nitrate-Nitrogen (mg./l)
Date
2000
1800
1600
1400
1200
1000
800
600
400
200
0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07
Jul-07

CSS

LETTER OF TRANSMITTAL

Visalia Office
1150 N. Chinowth Street, Suite B
Visalia, California 93291
P: (559) 802.3052
F: (559) 802.3215

Porterville Office
881 W. Morton Avenue, Suite D
Porterville, California 93257
P: (559) 781. 0102
F: (559) 781.6840

4CREEKS

DEE
KPD

TO: Regional Water Quality Control Board
1685 E. St.
Fresno, CA 93706

DATE	JOB NO.
10/11/11	11080

ATTENTION: Dale Essary

RE: Maple Avenue Dairy

RECEIVED
OCT 12 2011
RWQCB-CVR
FRESNO, CALIF.

WE ARE SENDING YOU: ☒ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples
☐ Specifications ☐ Copy of letter ☐ Change order ☐ _____

Copies	Date	No.	Description
1	10/11/11		Response to Notice of Violation 23 March 2011

THESE ARE TRANSMITTED as checked below:

☐ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval
☒ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution
☐ As requested ☐ Returned for corrections ☐ Return _____ corrected prints
☐ For review and comment ☐ _____

REMARKS:
Dale, please see the attached response to the notice of violation received on the 23rd of March 2011 for Maple Ave Dairy.

COPY TO: _____

SIGNED: _____
Charlene Kudwell

IF ENCLOSURES ARE NOT AS NOTED, PLEASE LET US KNOW

4CREEKS

October 10, 2011

Visalia Office
1150 N. Chinowth Street, Suite B
Visalia, California 93291
P: (559) 802.3052
F: (559) 802.3215

Porterville Office
881 W. Morton Avenue, Suite D
Porterville, California 93257
P: (559) 781. 0102
F: (559) 781.6840

Mr. Dale Essary
California Regional Water Quality Control Board, Central Valley Region
1685 E Street
Fresno, CA 93706

RE: Response to Notice of Violation – 23 March 2011
Maple Avenue Dairy - WDID #5C10NC00017
19860 South Maple Avenue, Laton, Fresno County

Dear Dale:

4Creeks, Inc. has been retained by Zonneveld Dairy (Dairy) to respond to the Notice of Violation (NOV) prepared by the California Regional Water Quality Control Board, Region 5 (RWQCB) on 23 March 2011 which requested the annual samples for groundwater monitoring as well as a Groundwater Monitoring Report for the previous year samples.

After discussions with the facility operator, we were able to locate the historical data for the existing monitoring well network at Maple Avenue Dairy. This monitoring well network has been evaluated in conjunction with the monitoring well network of Zonneveld Dairy Complex, the adjacent dairy which is under the same ownership as Maple Avenue Dairy. Enclosed is a Historical Groundwater Monitoring Report which identifies the historical sample data for each of the monitoring wells since 2001, where data was available. We were not able to locate the well casing elevations for each monitoring well, therefore were unable to prepare annual groundwater flow maps.

Both Maple Avenue Dairy and the Zonneveld Dairy Complex will continue the groundwater monitoring and reporting , including semi-annual field sampling and laboratory analysis along with submitting the Annual Groundwater Report in July subsequent to each sampling year, beginning in July 2012. In addition, 4Creeks will provide survey data for each of the monitoring wells prior to the next annual report so we can evaluate the direction of groundwater flow beneath each facility.

Both facilities would like to continue to cooperate with the RWQCB to provide the required reports and data. Please review the historical report and notify us if you have any questions or comments.

Sincerely,

David De Groot, RCE No. 70992

cc: Mr. Josh Zonneveld – Zonneveld Dairies
Mr. Lorin Sutton – RWQCB Inspector

Encl: Historical Groundwater Monitoring Report – Maple Avenue Dairy and Zonneveld Dairy Complex

File: 11080

GROUNDWATER MONITORING REPORT

Historical Monitoring Well Summary

PREPARED FOR:

Zonneveld Dairies, Inc.
1560 E. Cerini Avenue
Laton, CA 93242

INCLUDING:

Zonneveld Dairy Complex
Maple Avenue Dairy

October 10, 2011

PREPARED BY:

4CREEKS
CIVIL ENGINEERING AND LAND SURVEYING
1150 N. CHINOWTH, SUITE B
VISALIA, CA 93291
(559) 802-3052

SUBMITTED TO:

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION
1685 E. STREET
FRESNO, CA 93706

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APPENDICES

A. June 6, 2011 Groundwater Monitoring Results – Deltec Laboratories

B. Historical Data Summary

I. Introduction

4Creeks, Inc. has been retained by Zonneveld Dairy Complex and Maple Avenue Dairy, both owned by Zonneveld Dairies, Inc., to complete a historical summary of the Groundwater Monitoring Well results previously completed. This report integrates the data from both facilities because the facilities are adjacent together and the manure from each facility is collectively managed over the farmable land associated with each facility. Both of these facilities are currently under the California Regional Water Quality Control Board - Central Valley Region – General Order Number R5-2007-0035 and have implemented both the Waste Management Plan and Nutrient Management Plans at the facilities.

This report includes a description of each dairy facility along, the existing groundwater monitoring network, and the historical results from each monitoring well. The original Groundwater Monitoring Well Installation, Sampling and Analysis Work Plan (Work Plan) was completed by BSK Associates and approved in October 2002 by the Regional Water Quality Control Board (RWQCB). The goal of this report is to identify the past monitoring data collected and work completed and to re-establish the monitoring program. Beginning in the Fall of 2011, the field analysis will be completed on a semi-annual basis, with the Annual Report summarizing the results submitting by July 1 the subsequent year.

II. Facility Summary

A. Facility Description

Both Maple Avenue Dairy and Zonneveld Dairy Complex are located in Fresno County, approximately 3.5 miles northwest of Laton, see Attachment A – Vicinity Map. The address for each facility is identified below:

Zonneveld Dairy Complex Facility Address:	1560 Cerini Avenue, Laton, CA 93242
Maple Avenue Dairy Facility Address:	19445 Maple Avenue, Laton, CA 93242

B. Existing Monitoring Well Network

A summary of the approved Work Plan, monitoring well locations, and monitoring well specifications are summarized below:

1. Monitoring Well Location

There are fifteen monitoring wells constructed between the two facilities, identified as: MW1a, MW1b, MW1c, MW2a, MW2b, MW3a, MW3b, MW4a, MW4b, MW5a, MW5b, MW7, MW8, MW9, and MW10. Monitoring Wells MW8, MW9, and MW10 were installed for Maple Avenue Dairy, the others were installed for the Zonneveld Dairy Complex. The locations of each monitoring well are identified in Attachment B – Monitoring Well Network Map.

2. Monitoring Well Specifications

Each of the fifteen monitoring wells was constructed from 2-inch diameter schedule 40 PVC well pipe. The screened intervals were constructed using flush thread 0.020-inch well screen. Some of the monitoring wells were constructed directly adjacent to each other, while others

were constructed independent from any other well. Table 1 below summarizes the available data for each monitoring well.

Table 1: Monitoring Well Specifications

Well ID	Top of Casing Elevation (ft)[1]	Diameter of Casing (in)	Latitude	Longitude
MW1a	241.82	2	36°27'15.23"N	119°46'17.62"W
MW1b	241.82	2	36°27'15.23"N	119°46'17.62"W
MW1c	241.82	2	36°27'15.23"N	119°46'17.62"W
MW2a	242.88	2	36°27'35.96"N	119°45'12.73"W
MW2b	242.88	2	36°27'35.96"N	119°45'12.73"W
MW3a	243.22	2	36°27'35.75"N	119°45'29.08"W
MW3b	243.22	2	36°27'35.75"N	119°45'29.08"W
MW4a	242.86	2	36°27'35.71"N	119°45'44.72"W
MW4b	242.89	2	36°27'35.71"N	119°45'44.72"W
MW5a	243.53	2	36°27'22.68"N	119°45'28.97"W
MW5b	243.41	2	36°27'22.68"N	119°45'28.97"W
MW7	238.38	2	36°27'34.00"N	119°46'32.87"W
MW8	240.63	2	36°26'53.55"N	119°45'28.86"W
MW9	240.19	2	36°26'44.45"N	119°45'28.58"W
MW10	n/a	2	36°26'55.21"N	119°44'56.71"W

III. Historical Groundwater Well Monitoring Results

The fifteen monitoring wells were sampled periodically between 2001 through 2011. Following is a summary of the historical depth to groundwater and the quality of groundwater based upon the previous sampling events. The procedures for sampling the wells and completing the reports has not been verified, but is assumed that proper standard procedures were followed to validate the results. Any sampling events in the future will include a certified sampler and proper procedures followed which document the field conditions, purging data, decontamination protocols, and a complete chain of custody for each sample taken.

A. Historical Depth to Groundwater

The average historical depth to groundwater between the years 2001 to 2011 at each monitoring well is summarized in Table 2 below (*See Appendix A for the data from each sampling event*).

Table 2: Average Historical Depth to Groundwater

Well ID	Average Depth (ft)	Average Relative Groundwater Elevation (ft)[1]	Maximum Depth (ft)	Maximum Relative Groundwater Elevation (ft)	Minimum Depth (ft)	Minimum Relative Groundwater Elevation (ft)
MW1a	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*
MW1b	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*
MW1c	89.61	152.21	100.81	161.71	80.11	141.01
MW2a	86.15	156.73	94.40	168.86	74.02	148.48
MW2b	91.69	151.19	112.52	166.85	76.03	130.36
MW3a	90.03	153.19	97.55	164.92	78.30	145.67
MW3b	96.20	147.02	118.45	163.43	79.79	124.77
MW4a	85.68	157.19	91.68	162.68	80.18	151.18
MW4b	96.58	146.31	120.77	158.55	84.34	122.12
MW5a	87.14	156.39	97.55	167.01	76.52	145.98
MW5b	93.26	150.15	111.20	166.34	77.07	132.21
MW7	98.02	140.36	108.74	151.47	86.91	129.64
MW8	83.46	157.17	94.34	168.91	71.72	146.29
MW9	78.69	161.50	86.84	168.50	71.69	153.35
MW10	90.80	150.20	92.20	152.02	88.98	148.80
Combined Average:	**89.79**	**152.28**	**102.08**	**163.17**	**78.90**	**139.99**

[1] - Elevation of Well Casing based upon Relative Elevation, elevations should be verified by a licensed land surveyor

B. Historical Groundwater Quality

The average historical groundwater quality data for each of the monitoring wells is summarized below in Table 3 (See Appendix A for the data from each sampling event).

Table 3: Average Historical Groundwater Quality Data

Well ID	pH			Electrical Conductivity (EC) *(uS/cm)*			Nitrate (NO_3N) (mg/l)			Ammonium (NH_4N) (mg/l)		
	Avg.	*Max.*	*Min.*	*Avg.*	*Max.*	*Min.*	*Avg.*	*Max.*	*Min.*	*Avg.*	*Max.*	*Min.*
MW1a	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*
MW1b	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*
MW1c	7.0	7.7	6.7	1011	1300	316	4.5	8.0	2.1	< 1	< 1	< 1
MW2a	8.1	8.5	7.9	370	645	160	5.0	18.2	1.1	< 1	< 1	< 1
MW2b	9.0	9.3	8.8	222	433	140	5.7	20.1	0.6	< 1	< 1	< 1
MW3a	7.5	8.1	6.7	873	1200	520	31.6	44.0	5.9	< 1	< 1	< 1
MW3b	7.3	7.7	6.9	1027	1100	921	36.9	38.0	35.8	< 1	< 1	< 1
MW4a	7.8	8.1	7.4	983	1200	470	40.8	60.0	12.0	< 1	< 1	< 1
MW4b	7.4	7.6	7.3	968	990	944	34.2	36.0	31.3	< 1	< 1	< 1
MW5a	7.5	7.8	7.1	1210	1400	1100	43.0	45.0	40.0	< 1	< 1	< 1
MW5b	7.4	7.6	7.1	1021	1079	984	41.2	44.4	39.2	< 1	< 1	< 1
MW7	7.8	8.1	7.3	638	790	430	11.7	18.0	5.0	< 1	< 1	< 1
MW8	7.6	8.1	6.6	654	1050	490	16.0	48.2	9.5	< 1	< 1	< 1
MW9	8.1	8.2	7.7	510	540	480	8.4	9.7	7.7	< 1	< 1	< 1
MW10	7.2	7.2	7.2	1597	1620	1573	81.6	81.6	81.6	< 1	< 1	< 1
Combined Average:	**7.7**	**8.0**	**7.3**	**852**	**1027**	**656**	**27.7**	**36.2**	**20.9**	**< 1**	**< 1**	**< 1**

IV. Conclusion and Recommendations

Based upon the historical depth to groundwater, the average depth to groundwater is approximately 90 feet below ground surface, with fluctuations of approximately 10 feet in either direction. Based upon the historical groundwater quality, there has been little to no change in pH with the average around 7.7. The electrical conductivity has averaged around 850 uS/cm, with fluctuations of approximately 150 uS/cm in either direction. Nitrate as Nitrogren has averaged around 28 mg/l, with average fluctuations of approximately 7 mg/l in either direction. Lastly, there have been no readings greater than 1 mg/l of Ammonium. Although the Nitrate has exceeded 10 mg/l on average, without more data to identify the direction of flow of the groundwater and the integrity of each well casing, we cannot identify the source(s) of the nitrate in groundwater.

Several of the monitoring wells do not have surveyed top of well casing elevations and several of the wells have been dry or damaged and should be abandoned as other wells were installed to replace them. Prior to the next annual report submittal, we will complete a survey by a licensed land surveyor for each well casing and complete an evaluation of each well to verify the wells which are still operational and to verify that each well is adequately protected within the setback area. With the new survey data, we will be able to identify the direction of flow of the groundwater and better understand the characteristics of the aquifer beneath each facility. The historical data summarized in this report will be helpful in comparing future data to determine changes and trends in the quality of the groundwater.

V. Changed Conditions and Limitations

The findings of this report are valid as of the date of this report. However, 4Creeks was not involved in any of the data sampling events or the installation of the monitoring wells. This report is a summary of the past reports completed at these facilities. The data presented has been validated by other professionals in the industry and the purpose of this report is not to validate this data.

4Creeks, Inc. has prepared this report for the exclusive use of the said client. The report has been prepared in accordance with generally accepted practices of engineering. No other warranties, either expressed or implied, are made as to the professional advice provided in this report.

VI. References

Groundwater Assessment Report & Groundwater Investigation – August 15, 2003
BSK, Inc.

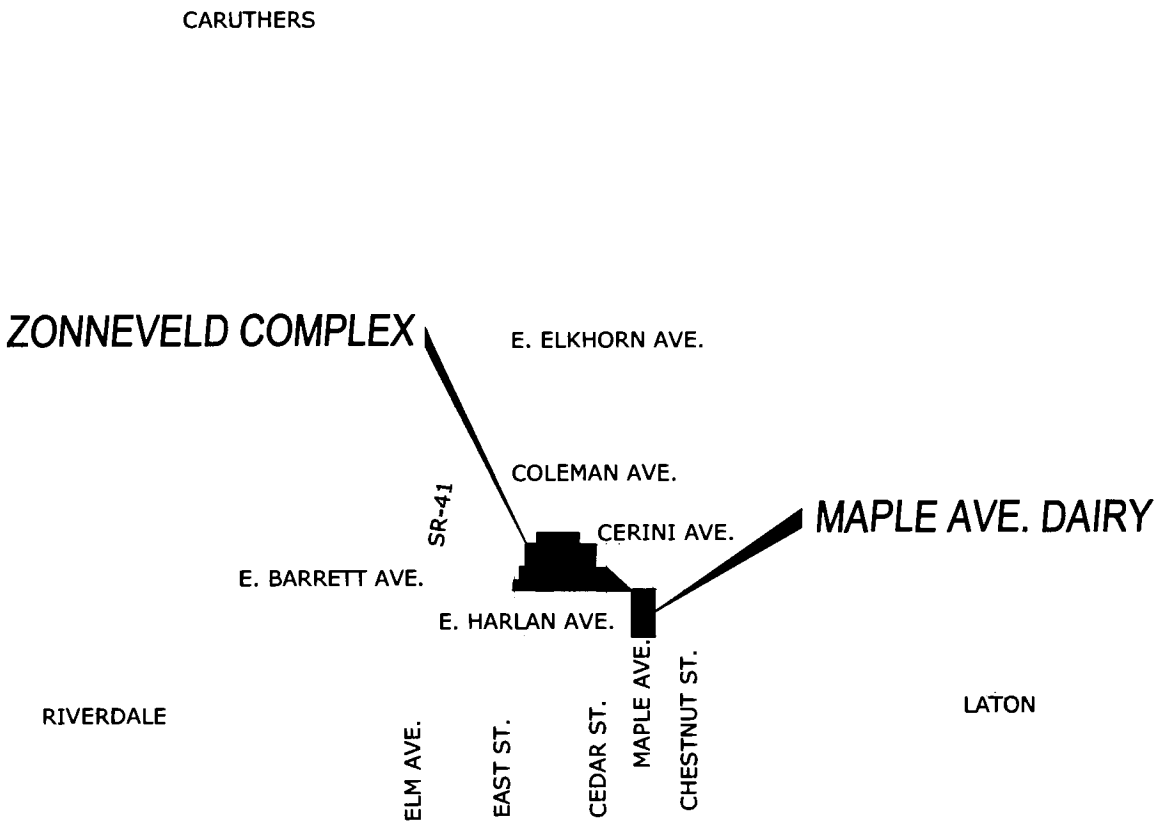
Fall 2005 Groundwater Monitoring Report, Zonneveld Dairy Complex – February 21, 2006
Environmental Engineering Services Report - CSS

Fall 2005 Groundwater Monitoring Report, Maple Avenue Dairy – February 21, 2006
Environmental Engineering Services Report – CSS

2010 Groundwater Field Monitoring Summary Report – June 10, 2011
Deltec Laboratories

California Regional Water Quality Control Board - Central Valley Region – Order Number R5-2007-0035
"Waste Discharge Requirements General Order for Existing Milk Cow Dairies"

Central Valley Regional Water Quality Control Board – A Compilation of Water Quality Goals, July 2008



LEGEND

PROJECT SITE

4CREEKS
1150 N. Chinowth St., Ste. B
Visalia, CA 93291
(559) 802-3052

VICINITY MAP

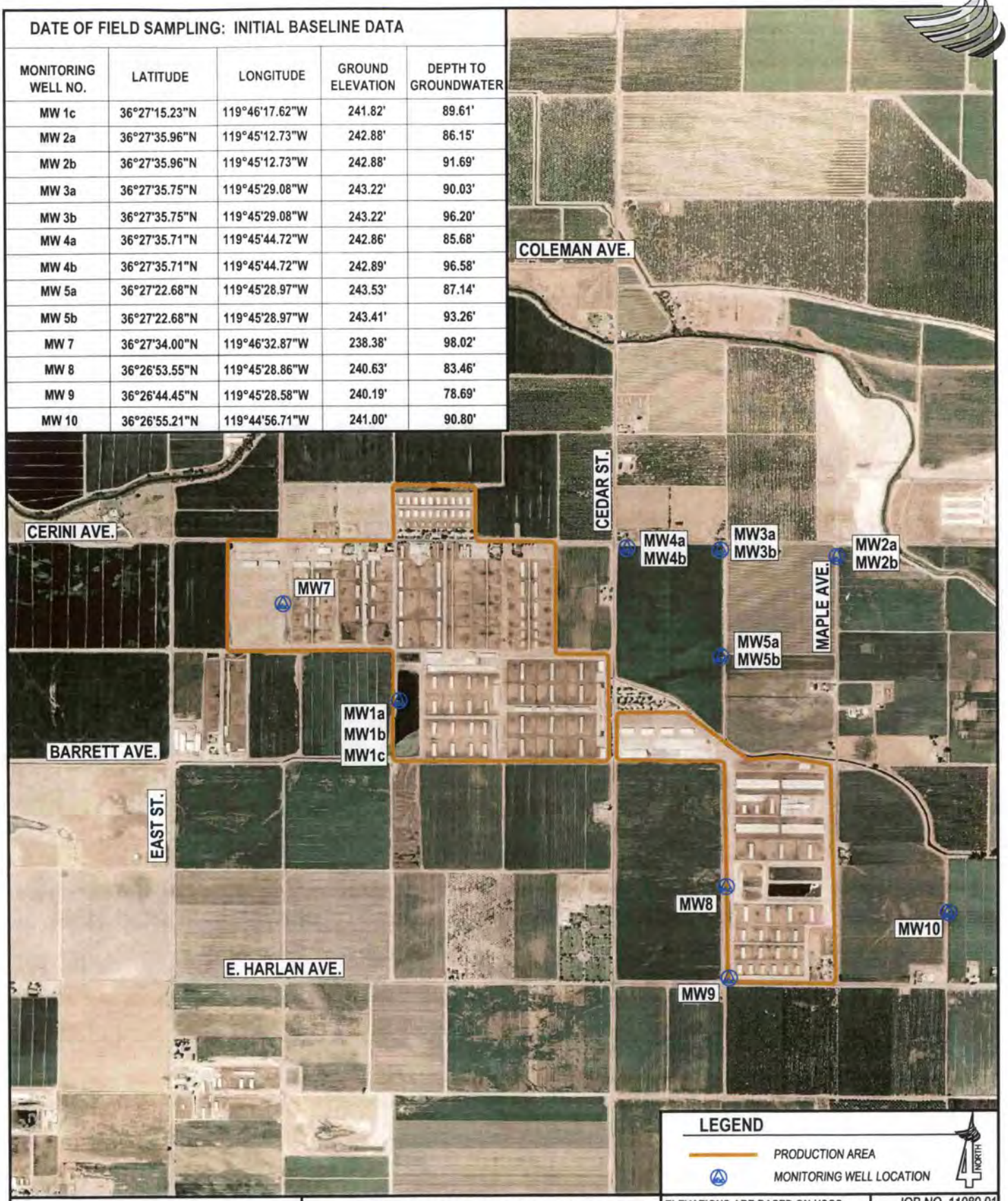
ZONNEVELD DAIRIES
FRESNO COUNTY, CA

NORTH

JOB NO. 11080.01
ATTACHMENT A
Oct 10, 2011
1"= 2 mi

DATE OF FIELD SAMPLING: INITIAL BASELINE DATA

MONITORING WELL NO.	LATITUDE	LONGITUDE	GROUND ELEVATION	DEPTH TO GROUNDWATER
MW 1c	36°27'15.23"N	119°46'17.62"W	241.82'	89.61'
MW 2a	36°27'35.96"N	119°45'12.73"W	242.88'	86.15'
MW 2b	36°27'35.96"N	119°45'12.73"W	242.88'	91.69'
MW 3a	36°27'35.75"N	119°45'29.08"W	243.22'	90.03'
MW 3b	36°27'35.75"N	119°45'29.08"W	243.22'	96.20'
MW 4a	36°27'35.71"N	119°45'44.72"W	242.86'	85.68'
MW 4b	36°27'35.71"N	119°45'44.72"W	242.89'	96.58'
MW 5a	36°27'22.68"N	119°45'28.97"W	243.53'	87.14'
MW 5b	36°27'22.68"N	119°45'28.97"W	243.41'	93.26'
MW 7	36°27'34.00"N	119°46'32.87"W	238.38'	98.02'
MW 8	36°26'53.55"N	119°45'28.86"W	240.63'	83.46'
MW 9	36°26'44.45"N	119°45'28.58"W	240.19'	78.69'
MW 10	36°26'55.21"N	119°44'56.71"W	241.00'	90.80'



4CREEKS

1150 N. Chinowth St., Ste. B
Visalia, CA 93291
(559) 802-3052

MONITORING WELL LOCATION MAP

ZONNEVELD DAIRIES
FRESNO COUNTY, CA

ELEVATIONS ARE BASED ON USGS MEAN SEA LEVEL DATUM

AERIAL DATE: SEPT. 2009

JOB NO.	11080.01
ATTACHMENT	B
	Oct 10, 2011
	1"=2000'

DEL-TECH

GEOTECHNICAL SUPPORT SERVICES

2011
GROUNDWATER
FIELD MONITORING
SUMMARY REPORT

SITE:

ZONNEVELD DAIRIES
1560 EAST CERINI AVENUE
LAYTON, CA 93242-9700
6/10 & 6/16/2011

10624 OLIVE AVE., OAKDALE, CALIF. 95361 * OFFICE (209) 847-8757 * FAX (209) 847-7744

APPENDIX A

June 10, 2011 Groundwater Monitoring Results
Deltec Laboratories

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2010

SAMPLE LOCATION / MW - 1A **DATE:** 6/10/2011

PROJECT NAME:	ZONNEVELD DAIRIES	**ANALYSIS PERFORMED:**	SEE CHAIN OF CUSTODY
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	5:23
CITY, STATE:	LAYTON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML. / 250 ML.
SITE CONTACT:	JOSH ZONNEVELD	**PRESERVATIVES:**	1 NEAT / 1 - H2SO4
CONSULTANT:	IN HOUSE	**LAB. ANALYSIS BY:**	DELLAVALLE LABS/ FRESN

PROJECT MANAGER	JOSH ZONNEVELD *	**MONUMENT:**	POST	
SAMPLER:	DEL-TECH / DON LIGHT	**WELL CASING MATERIAL**	PVC	
SIGNED:	Don Light	**WELL CASING DIA. :**	2" /	0.1632
SAMPLE MEDIA:	GROUNDWATER	**P.I.D. READING / ODOR:**	N/A	NONE
TOP OF CASING ELEVATION:	MSL	**COLOR:**	BROWN	
DEPTH TO WATER: (feet.100th's)	9.02 FEET	**CALC. PURGE VOL.:**	0.85	GAL.
DEPTH OF WELL: (feet.100th's)	14.25 FEET	**TOTAL VOLUME PURGED:**	2.56	GAL.
STANDING WATER COLUMN:	5.23 FEET	**DEPTH OF PUMP:**	N/A	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A	0.5 GPM	6.75	392	17.9	195	N/A	256
	0.85	"	"	6.73	253	17.5	190	"	221
	1.71	DRY							
	2.56								

PURGE METHOD:	WATERRA INERTIA PUMP.		
SAMPLE METHOD:	DEDICATED TUBING.		
D. T. W. AFTER PURGE:		**D. T. W. AT SAMPLE TIME:**	12.25'
WELL INTEGRITY:	CAP & SEAL ARE SECURE.		
WELL LOCATION:	SEE SITE MAP.		
REMARKS:	**SW - 3: PH- 7.07 / EC- 1534 / TEMP.- 23.2 / ORP- 190 / TURB.- 39**		
	SW - 6: PH- 7.20 / EC- 1110 / TEMP.- 21.6 / ORP- 199 / TURB.- 20		
WEATHER:	CLEAR SKIES / HOT.	**WIND:**	NONE
QUALITY CONTROL:	*ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*		
CONTAINMENT:	*D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*		
INSTRUMENTATION:	Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER	
	SOLINIST SLOPE METER	THERMODINE 580B P.I.D.	
	KECK INTERFACE METER	TURBIDITY METER	

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2010

SAMPLE LOCATION / MW - 2A **DATE:** 6/10/2011

PROJECT NAME:	ZONNEVELD DAIRIES	**ANALYSIS PERFORMED:**	SEE CHAIN OF CUSTODY
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	9:15
CITY, STATE:	LAYTON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML. / 250 ML.
SITE CONTACT:	JOSH ZONNEVELD	**PRESERVATIVES:**	1 NEAT / 1 - H2SO4
CONSULTANT:	IN HOUSE	**LAB. ANALYSIS BY:**	DELLAVALLE LABS/ FRESN

PROJECT MANAGER	JOSH ZONNEVELD *	**MONUMENT:**	POST	
SAMPLER:	DEL-TECH / DON LIGHT	**WELL CASING MATERIAL**	PVC	
SIGNED:	Don Light	**WELL CASING DIA. :**	2" /	0.1632
SAMPLE MEDIA:	GROUNDWATER	**P.I.D. READING / ODOR:**	N/A	NONE
TOP OF CASING ELEVATION:	MSL	**COLOR:**	BROWN	
DEPTH TO WATER: (feet.100th's)	90.00 FEET	**CALC. PURGE VOL.:**	1.42	GAL.
DEPTH OF WELL: (feet.100th's)	98.71 FEET	**TOTAL VOLUME PURGED:**	4.26	GAL.
STANDING WATER COLUMN:	8.71 FEET	**DEPTH OF PUMP:**	N/A	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A	N/A	7.08	580	18.1	179	N/A	1000+
	1.42	DRY		7.31	528	18.7	166	"	"
	2.84								
	4.26								

PURGE METHOD:	ELECTRONIC BAILER.		
SAMPLE METHOD:	ELECTRONIC BAILER.		
D. T. W. AFTER PURGE:		**D. T. W. AT SAMPLE TIME:**	97.77'
WELL INTEGRITY:	CAP & SEAL ARE SECURE.		
WELL LOCATION:	SEE SITE MAP.		
REMARKS:	**WELL MONUMENT IN BAD CONDITION AND NEEDS REPAIR**		
WEATHER:	CLEAR SKIES / HOT.	**WIND:**	NONE
QUALITY CONTROL:	*ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*		
CONTAINMENT:	*D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*		
INSTRUMENTATION:	Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER	
	SOLINIST SLOPE METER	THERMODINE 580B P.I.D.	
	KECK INTERFACE METER	TURBIDITY METER	

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2010

SAMPLE LOCATION / MW - 2B **DATE:** 6/10/2011

PROJECT NAME:	ZONNEVELD DAIRIES	**ANALYSIS PERFORMED:**	SEE CHAIN OF CUSTODY
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	9:48
CITY, STATE:	LAYTON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML. / 250 ML.
SITE CONTACT:	JOSH ZONNEVELD	**PRESERVATIVES:**	1 NEAT / 1 - H2SO4
CONSULTANT:	IN HOUSE	**LAB. ANALYSIS BY:**	DELLAVALLE LABS/ FRESN

PROJECT MANAGER	JOSH ZONNEVELD *	**MONUMENT:**	POST	
SAMPLER:	DEL-TECH / DON LIGHT	**WELL CASING MATERIAL**	PVC	
SIGNED:	Don Light	**WELL CASING DIA. :**	2" /	0.1632
SAMPLE MEDIA:	GROUNDWATER	**P.I.D. READING / ODOR:**	N/A	NONE
TOP OF CASING ELEVATION:	MSL	**COLOR:**	BROWN	
DEPTH TO WATER: (feet.100th's)	97.95 FEET	**CALC. PURGE VOL.:**	5.12	GAL.
DEPTH OF WELL: (feet.100th's)	129.30 FEET	**TOTAL VOLUME PURGED:**	15.35	GAL.
STANDING WATER COLUMN:	31.35 FEET	**DEPTH OF PUMP:**	N/A	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A	N/A	7.22	369	17.9	140	N/A	1000+
	5.12	DRY	"	7.20	381	17.9	136	"	"
	10.23								
	15.35								

PURGE METHOD:	ELECTRONIC BAILER.		
SAMPLE METHOD:	ELECTRONIC BAILER.		
D. T. W. AFTER PURGE:		**D. T. W. AT SAMPLE TIME:**	128.81'
WELL INTEGRITY:	CAP & SEAL ARE SECURE.		
WELL LOCATION:	SEE SITE MAP.		
REMARKS:	**WELL WENT DRY**		
WEATHER:	CLEAR SKIES / HOT.	**WIND:**	NONE
QUALITY CONTROL:	*ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*		
CONTAINMENT:	*D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*		
INSTRUMENTATION:	Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER	
	SOLINIST SLOPE METER	THERMODINE 580B P.I.D.	
	KECK INTERFACE METER	TURBIDITY METER	

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2010

SAMPLE LOCATION / MW - 3A **DATE:** 6/10/2011

PROJECT NAME:	ZONNEVELD DAIRIES	**ANALYSIS PERFORMED:**	SEE CHAIN OF CUSTODY
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	10:35
CITY, STATE:	LAYTON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML. / 250 ML.
SITE CONTACT:	JOSH ZONNEVELD	**PRESERVATIVES:**	1 NEAT / 1 - H2SO4
CONSULTANT:	IN HOUSE	**LAB. ANALYSIS BY:**	DELLAVALLE LABS/ FRESN

PROJECT MANAGER	JOSH ZONNEVELD *	**MONUMENT:**	POST	
SAMPLER:	DEL-TECH / DON LIGHT	**WELL CASING MATERIAL**	PVC	
SIGNED:	Don Light	**WELL CASING DIA. :**	2" /	0.1632
SAMPLE MEDIA:	GROUNDWATER	**P.I.D. READING / ODOR:**	N/A	NONE
TOP OF CASING ELEVATION:	MSL	**COLOR:**	BROWN	
DEPTH TO WATER: (feet.100th's)	97.55 FEET	**CALC. PURGE VOL.:**	0.34	GAL.
DEPTH OF WELL: (feet.100th's)	99.65 FEET	**TOTAL VOLUME PURGED:**	0.00	GAL.
STANDING WATER COLUMN:	2.10 FEET	**DEPTH OF PUMP:**	N/A	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A	N/A	6.78	858	21.2	130	N/A	1000+
		DRY							

PURGE METHOD:	ELECTRONIC BAILER.		
SAMPLE METHOD:	ELECTRONIC BAILER.		
D. T. W. AFTER PURGE:		**D. T. W. AT SAMPLE TIME:**	99.01'
WELL INTEGRITY:	CAP & SEAL ARE SECURE.		
WELL LOCATION:	SEE SITE MAP.		
REMARKS:	**POOR RECHARGE / GRAB SAMPLE**		
WEATHER:	CLEAR SKIES / HOT.	**WIND:**	NONE
QUALITY CONTROL:	*ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*		
CONTAINMENT:	*D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*		
INSTRUMENTATION:	Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER	
	SOLINIST SLOPE METER	THERMODINE 580B P.I.D.	
	KECK INTERFACE METER	TURBIDITY METER	

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2010

SAMPLE LOCATION / MW - 3B **DATE:** 6/10/2011

PROJECT NAME:	ZONNEVELD DAIRIES	**ANALYSIS PERFORMED:**	SEE CHAIN OF CUSTODY
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	11:05
CITY, STATE:	LAYTON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML. / 250 ML.
SITE CONTACT:	JOSH ZONNEVELD	**PRESERVATIVES:**	1 NEAT / 1 - H2SO4
CONSULTANT:	IN HOUSE	**LAB. ANALYSIS BY:**	DELLAVALLE LABS/ FRESN

PROJECT MANAGER	JOSH ZONNEVELD *	**MONUMENT:**	POST	
SAMPLER:	DEL-TECH / DON LIGHT	**WELL CASING MATERIAL**	PVC	
SIGNED:	Don Light	**WELL CASING DIA. :**	2" /	0.1632
SAMPLE MEDIA:	GROUNDWATER	**P.I.D. READING / ODOR:**	N/A	NONE
TOP OF CASING ELEVATION:	MSL	**COLOR:**	N/A	
DEPTH TO WATER: (feet.100th's)	105.70 FEET	**CALC. PURGE VOL.:**	5.26	GAL.
DEPTH OF WELL: (feet.100th's)	137.90 FEET	**TOTAL VOLUME PURGED:**	15.77	GAL.
STANDING WATER COLUMN:	32.20 FEET	**DEPTH OF PUMP:**	N/A	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A	N/A	6.67	829	20.2	180	N/A	128
	5.26	"	"	6.77	828	20.4	174	"	340
	10.51	"	"	6.80	833	20.4	170	"	385
	15.77	"	"	6.82	835	20.3	172	"	410

PURGE METHOD:	ELECTRONIC BAILER.		
SAMPLE METHOD:	ELECTRONIC BAILER.		
D. T. W. AFTER PURGE:		**D. T. W. AT SAMPLE TIME:**	109.56'
WELL INTEGRITY:	CAP & SEAL ARE SECURE.		
WELL LOCATION:	SEE SITE MAP.		
REMARKS:			
WEATHER:	CLEAR SKIES / HOT.	**WIND:**	NONE
QUALITY CONTROL:	*ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*		
CONTAINMENT:	*D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*		
INSTRUMENTATION:	Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER	
	SOLINIST SLOPE METER	THERMODINE 580B P.I.D.	
	KECK INTERFACE METER	TURBIDITY METER	

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2010

SAMPLE LOCATION / MW - 4B **DATE:** 6/16/2011

PROJECT NAME:	ZONNEVELD DAIRIES	**ANALYSIS PERFORMED:**	SEE CHAIN OF CUSTODY
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	6:25
CITY, STATE:	LAYTON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML. / 250 ML.
SITE CONTACT:	JOSH ZONNEVELD	**PRESERVATIVES:**	2 NEAT / 1 - H2SO4 / 1 - HNO3
CONSULTANT:	IN HOUSE	**LAB. ANALYSIS BY:**	DELLAVALLE LABS/ FRESN

PROJECT MANAGER	JOSH ZONNEVELD *		**MONUMENT:**	POST	
SAMPLER:	DEL-TECH / DON LIGHT		**WELL CASING MATERIAL**	PVC	
SIGNED:			**WELL CASING DIA. :**	2" /	0.1632
SAMPLE MEDIA:	GROUNDWATER		**P.I.D. READING / ODOR:**	N/A	NONE
TOP OF CASING ELEVATION:		MSL	**COLOR:**	N/A	
DEPTH TO WATER: (feet.100th's)	108.52	FEET	**CALC. PURGE VOL.:**	5.30	GAL.
DEPTH OF WELL: (feet.100th's)	141.00	FEET	**TOTAL VOLUME PURGED:**	15.90	GAL.
STANDING WATER COLUMN:	32.48	FEET	**DEPTH OF PUMP:**	N/A	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A	N/A	7.30	1147	21.1	159	N/A	88
	5.30	"	"	7.29	1054	21.2	157	"	124
	10.60	"	"	7.27	1036	21.3	155	"	43
	15.90	"	"	7.27	1021	21.3	155	"	40

PURGE METHOD:	ELECTRONIC BAILER.		
SAMPLE METHOD:	ELECTRONIC BAILER.		
D. T. W. AFTER PURGE:		**D. T. W. AT SAMPLE TIME:**	109.28'
WELL INTEGRITY:	CAP & SEAL ARE SECURE.		
WELL LOCATION:	SEE SITE MAP.		
REMARKS:			
WEATHER:	CLEAR SKIES / HOT.	**WIND:**	NONE
QUALITY CONTROL:	*ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*		
CONTAINMENT:	*D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*		
INSTRUMENTATION:	Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER	
	SOLINIST SLOPE METER	THERMODINE 580B P.I.D.	
	KECK INTERFACE METER	TURBIDITY METER	

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2010

SAMPLE LOCATION / MW - 5B **DATE:** 6/16/2011

PROJECT NAME:	MAPLE DAIRY	**ANALYSIS PERFORMED:**	SEE CHAIN OF CUSTODY
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	7:18
CITY, STATE:	LAYTON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML. / 250 ML.
SITE CONTACT:	JOSH ZONNEVELD	**PRESERVATIVES:**	1 NEAT / 1 - H2SO4
CONSULTANT:	IN HOUSE	**LAB. ANALYSIS BY:**	DELLAVALLE LABS/ FRESN

PROJECT MANAGER	JOSH ZONNEVELD *		**MONUMENT:**	POST	
SAMPLER:	DEL-TECH / DON LIGHT		**WELL CASING MATERIAL**	PVC	
SIGNED:	Don Light		**WELL CASING DIA. :**	2" /	0.1632
SAMPLE MEDIA:	GROUNDWATER		**P.I.D. READING / ODOR:**	N/A	NONE
TOP OF CASING ELEVATION:		MSL	**COLOR:**	BROWN	
DEPTH TO WATER: (feet.100th's)	102.22	FEET	**CALC. PURGE VOL.:**	6.30	GAL.
DEPTH OF WELL: (feet.100th's)	140.82	FEET	**TOTAL VOLUME PURGED:**	18.90	GAL.
STANDING WATER COLUMN:	38.60	FEET	**DEPTH OF PUMP:**	N/A	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A	N/A	7.15	1069	20.6	225	N/A	247
	6.30	"	"	7.11	1074	20.6	202	"	84
	12.60	"	"	7.10	1085	20.4	198	"	53
	18.90	"	"	7.07	1089	20.3	191	"	36

PURGE METHOD:	ELECTRONIC BAILER.		
SAMPLE METHOD:	ELECTRONIC BAILER.		
D. T. W. AFTER PURGE:		**D. T. W. AT SAMPLE TIME:**	104.28'
WELL INTEGRITY:	CAP & SEAL ARE SECURE.		
WELL LOCATION:	SEE SITE MAP.		
REMARKS:			
WEATHER:	CLEAR SKIES / HOT.	**WIND:**	NONE
QUALITY CONTROL:	*ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*		
CONTAINMENT:	*D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*		
INSTRUMENTATION:	Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER	
	SOLINIST SLOPE METER	THERMODINE 580B P.I.D.	
	KECK INTERFACE METER	TURBIDITY METER	

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2010

SAMPLE LOCATION / MW - 8 **DATE:** 6/10/2011

PROJECT NAME:	MAPLE DAIRY	**ANALYSIS PERFORMED:**	SEE CHAIN OF CUSTODY
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	8:00
CITY, STATE:	LAYTON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML. / 250 ML.
SITE CONTACT:	JOSH ZONNEVELD	**PRESERVATIVES:**	1 NEAT / 1 - H2SO4
CONSULTANT:	IN HOUSE	**LAB. ANALYSIS BY:**	DELLAVALLE LABS/ FRESN

PROJECT MANAGER	JOSH ZONNEVELD *		**MONUMENT:**	POST	
SAMPLER:	DEL-TECH / DON LIGHT		**WELL CASING MATERIAL**	PVC	
SIGNED:	Don Light		**WELL CASING DIA. :**	2" /	0.1632
SAMPLE MEDIA:	GROUNDWATER		**P.I.D. READING / ODOR:**	N/A	NONE
TOP OF CASING ELEVATION:		MSL	**COLOR:**	N/A	
DEPTH TO WATER: (feet.100th's)	94.16	FEET	**CALC. PURGE VOL.:**	1.23	GAL.
DEPTH OF WELL: (feet.100th's)	101.68	FEET	**TOTAL VOLUME PURGED:**	0.00	GAL.
STANDING WATER COLUMN:	7.52	FEET	**DEPTH OF PUMP:**	95	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A	N/A	7.05	938	20.2	123	N/A	1000+
	1.23	DRY							

PURGE METHOD:	ELECTRONIC BAILER.		
SAMPLE METHOD:	ELECTRONIC BAILER.		
D. T. W. AFTER PURGE:		**D. T. W. AT SAMPLE TIME:**	100.56'
WELL INTEGRITY:	CAP & SEAL ARE SECURE.		
WELL LOCATION:	SEE SITE MAP.		
REMARKS:	**WELL WENT DRY.**		
WEATHER:	CLEAR SKIES / HOT.	**WIND:**	NONE
QUALITY CONTROL:	*ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*		
CONTAINMENT:	*D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*		
INSTRUMENTATION:	Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER	
	SOLINIST SLOPE METER	THERMODINE 580B P.I.D.	
	KECK INTERFACE METER	TURBIDITY METER	

DEL-TECH GEOTECHNICAL SUPPORT SERVICES

MONITORING WELL FIELD LOG 2010

SAMPLE LOCATION / MW - 10 **DATE:** 6/10/2011

PROJECT NAME:	MAPLE DAIRY	**ANALYSIS PERFORMED:**	SEE CHAIN OF CUSTODY
ADDRESS:	1560 E. CERINI AVENUE	**SAMPLE TIME:**	7:10
CITY, STATE:	LAYTON, CA	**SAMPLE CONTAINERS:**	2 POLY - 1000 ML. / 250 ML.
SITE CONTACT:	JOSH ZONNEVELD	**PRESERVATIVES:**	1 NEAT / 1 - H2SO4
CONSULTANT:	IN HOUSE	**LAB. ANALYSIS BY:**	DELLAVALLE LABS/ FRESN

PROJECT MANAGER	JOSH ZONNEVELD *	**MONUMENT:**	POST	
SAMPLER:	DEL-TECH / DON LIGHT	**WELL CASING MATERIAL**	PVC	
SIGNED:	Don Light	**WELL CASING DIA. :**	2" /	0.1632
SAMPLE MEDIA:	GROUNDWATER	**P.I.D. READING / ODOR:**	N/A	NONE
TOP OF CASING ELEVATION:	MSL	**COLOR:**	BROWN	
DEPTH TO WATER: (feet.100th's)	88.98 FEET	**CALC. PURGE VOL.:**	2.99	GAL.
DEPTH OF WELL: (feet.100th's)	107.30 FEET	**TOTAL VOLUME PURGED:**	8.97	GAL.
STANDING WATER COLUMN:	18.32 FEET	**DEPTH OF PUMP:**	N/A	FEET

FIELD PARAMETERS

TIME	CUMULATIVE CASING VOLUME PER PURGE	DRAW DOWN (D.T.W.)	PUMPING RATE (GPM/LPM)	pH (units)	E. C. (UmMHOS)	TEMP. (Celsius)	O.R.P. (Mvolts)	DISSOLVED OXYGEN (PPM)	TURBIDITY COLOR (N.T.U.)
	0	N/A	N/A	6.12	1432	19.5	200	N/A	500
	2.99	"	"	6.50	1473	18.9	193	"	1000+
	5.98	"	"	6.51	1475	18.8	189	"	"
	8.97	"	"	6.55	1477	18.8	181	"	"

PURGE METHOD:	ELECTRONIC BAILER.		
SAMPLE METHOD:	ELECTRONIC BAILER.		
D. T. W. AFTER PURGE:		**D. T. W. AT SAMPLE TIME:**	91.16'
WELL INTEGRITY:	CAP & SEAL ARE SECURE.		
WELL LOCATION:	SEE SITE MAP.		
REMARKS:			
WEATHER:	CLEAR SKIES / HOT.	**WIND:**	NONE
QUALITY CONTROL:	*ALL PURGING EQUIPMENT AND SAMPLING EQUIPMENT WAS CLEANED IN THE FIELD WITH A STEAMCLEANER & ALCONOX SOAP. NEW NITRILE GLOVES.*		
CONTAINMENT:	*D.O.T. 17 55 GAL. STEEL DRUM OR 60 GAL. POLY DRUM.*		
INSTRUMENTATION:	Y.S.I. 3560 FLOWCELL	Y.S.I. DISSOLVED OXYGEN METER	
	SOLINIST SLOPE METER	THERMODINE 580B P.I.D.	
	KECK INTERFACE METER	TURBIDITY METER	

DEL-TECH GEOTECHNICAL SUPPORT
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ZONNEVELD DAIRY - MAPLE AVE. DAIRY
1500 EAST CERINI AVE. / LAYTON, CA.

MONITORING WELL FIELD SUMMARY LOG 2011
DEPTH TO WATER MEASUREMENTS

					TOTAL
DATE		[redacted]	[redacted]	06/10/11	DEPTH
		PREVIOUS	*YEARS*	*CURRENT*	
LOCATION					
MW- 1A		N/A	6.19	9.02	14.25'
MW- 1B		N/A	DRY	DRY	
MW- 1C		N/A	N/A	N/A	105.60'
MW- 2A		94.40	93.90	90.00	97.80'
MW- 2B		112.00	112.52	97.95	129.30'
MW- 3A		96.40	96.10	97.55	99.65'
MW- 3B		117.60	118.45	105.70	137.90'
MW- 4A		N/A	91.68	DRY	94.80'
MW- 4B		N/A	120.77	108.52	141.00'
MW- 5A		97.55	DRY	DRY	102.51'
MW- 5B		107.59	111.20	102.22	140.82'
MW- 7		108.74	DRY	DRY	111.90'
MW- 8		94.08	94.34	94.16	101.68'
MW- 9		DRY	DRY	DRY	93.90'
MW- 10		91.23	92.20	88.98	107.30'
SW- 1		N/A	DRY	DRY	82.45'
SW- 3		N/A	N/A	N/A	139.16'
SW- 4		N/A	MISSING	N/A	83.50'
SW- 6		N/A	N/A	DRY	87.90'

WELLS SAMPLED

NOTE:
ALL MEASUREMENTS ARE MADE FROM THE NORTH SIDE AND TOP EDGE OF THE WELL CASING. THE TOP OF CASING WITH A NOTCH OR PERMENANT MARKINGS, WHICH EVER ONE CONDITION IS APPROPRIATE.

APPENDIX B

Historical Groundwater Summary

ZONNEVELD DAIRIES - FRESNO COUNTY, CA

HISTORICAL GROUNDWATER MONITORING DATA

Monitoring Well Specifications:

Well ID	Top of Casing Elevation (ft)[1]	Diameter of Casing (in)	Screened Interval Level below top of casing (ft)	Total Depth of Well (ft)	Latitude	Longitude
MW1a	241.82	2	n/a	n/a	36°27'15.23"N	119°46'17.62"W
MW1b	241.82	2	n/a	n/a	36°27'15.23"N	119°46'17.62"W
MW1c	241.82	2	n/a	n/a	36°27'15.23"N	119°46'17.62"W
MW2a	242.88	2	95	146	36°27'35.96"N	119°45'12.73"W
MW2b	242.88	2	146	146	36°27'35.96"N	119°45'12.73"W
MW3a	243.22	2	102	144	36°27'35.75"N	119°45'29.08"W
MW3b	243.22	2	144	144	36°27'35.75"N	119°45'29.08"W
MW4a	242.86	2	99	144	36°27'35.71"N	119°45'44.72"W
MW4b	242.89	2	144	144	36°27'35.71"N	119°45'44.72"W
MW5a	243.53	2	100	143.5	36°27'22.68"N	119°45'28.97"W
MW5b	243.41	2	143.5	143.5	36°27'22.68"N	119°45'28.97"W
MW7	238.38	2	n/a	n/a	36°27'34.00"N	119°46'32.87"W
MW8	240.63	2	n/a	n/a	36°26'53.55"N	119°45'28.86"W
MW9	240.19	2	n/a	n/a	36°26'44.45"N	119°45'28.58"W
MW10	241	2	n/a	n/a	36°26'55.21"N	119°44'56.71"W

[1] - *Elevation of Well Casing based upon Relative Elevation, elevations should be verified by a licensed land surveyor*

Historical Depth to Groundwater

	MW1a		MW1c		MW2a		MW2b		MW3a		MW3b		MW4a	
Date:	Measured Depth (ft)	Relative Groundwater Elevation (ft)	Measured Depth (ft)	Relative Groundwater Elevation (ft)	Measured Depth (ft)	Relative Groundwater Elevation (ft)	Measured Depth (ft)	Relative Groundwater Elevation (ft)	Measured Depth (ft)	Relative Groundwater Elevation (ft)	Measured Depth (ft)	Relative Groundwater Elevation (ft)	Measured Depth (ft)	Relative Groundwater Elevation (ft)
10/1/2001	81.13	160.69	81.13	160.69	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
4/19/2002	80.11	161.71	80.11	161.71	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
6/5/2002	82.49	159.33	82.49	159.33	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
11/13/2002	87.86	153.96	87.86	153.96	76.42	166.46	77.39	165.49	78.3	164.92	80.72	162.50	81.21	161.65
1/31/2003	85.56	156.26	85.56	156.26	74.02	168.86	76.03	166.85	78.76	164.46	79.79	163.43	80.18	162.68
5/13/2003	88.25	153.57	88.25	153.57	79.7	163.18	81.86	161.02	84.14	159.08	85.96	157.26	83.87	158.99
12/17/2003	93.17	148.65	93.17	148.65	80.47	162.41	81.86	161.02	84.08	159.14	84.88	158.34	85.49	157.37
7/28/2004	97.16	144.66	97.16	144.66	90.81	152.07	n/a	n/a	96.85	146.37	n/a	n/a	91.62	151.24
11/16/2004	99.57	142.25	99.57	142.25	92.03	150.85	93.29	149.59	94.21	149.01	n/a	n/a	dry	n/a
10/6/2005	100.81	141.01	100.81	141.01	89.71	153.17	92.27	150.61	93.94	149.28	96.52	146.70	dry	n/a
7/30/2009	n/a	n/a	n/a	n/a	94.4	148.48	112	130.88	96.4	146.82	117.6	125.62	n/a	n/a
7/21/2010	n/a	n/a	n/a	n/a	93.9	148.98	112.52	130.36	96.1	147.12	118.45	124.77	91.68	151.18
6/10/2011	*n/a*	n/a	*n/a*	n/a	90.00	152.88	97.95	144.93	97.55	145.67	105.70	137.52	dry	n/a
Average:	***89.61***	***152.21***	***89.61***	***152.21***	***86.15***	***156.73***	***91.69***	***151.19***	***90.03***	***153.19***	***96.20***	***147.02***	***85.68***	***157.19***
Maximum:	***100.81***	***161.71***	***100.81***	***161.71***	***94.40***	***168.86***	***112.52***	***166.85***	***97.55***	***164.92***	***118.45***	***163.43***	***91.68***	***162.68***
Minimum:	***80.11***	***141.01***	***80.11***	***141.01***	***74.02***	***148.48***	***76.03***	***130.36***	***78.30***	***145.67***	***79.79***	***124.77***	***80.18***	***151.18***

	MW4b		MW5a		MW5b		MW7		MW8		MW9		MW10	
Date:	Measured Depth (ft)	Relative Groundwater Elevation (ft)	Measured Depth (ft)	Relative Groundwater Elevation (ft)	Measured Depth (ft)	Relative Groundwater Elevation (ft)	Measured Depth (ft)	Relative Groundwater Elevation (ft)	Measured Depth (ft)	Relative Groundwater Elevation (ft)	Measured Depth (ft)	Relative Groundwater Elevation (ft)	Measured Depth (ft)	Relative Groundwater Elevation (ft)
10/1/2001	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
4/19/2002	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
6/5/2002	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
11/13/2002	84.34	158.55	n/a	n/a	n/a	n/a	88.9	149.48	71.72	168.91	72.44	167.75	n/a	n/a
1/31/2003	84.69	158.20	76.52	167.01	77.07	166.34	86.91	151.47	71.77	168.86	71.69	168.50	n/a	n/a
5/13/2003	88.64	154.25	80.66	162.87	81.49	161.92	92.84	145.54	73.26	167.37	73.71	166.48	n/a	n/a
12/17/2003	88.61	154.28	81.51	162.02	82.08	161.33	92.85	145.53	77.58	163.05	77.83	162.36	n/a	n/a
7/28/2004	n/a	n/a	93.45	150.08	n/a	n/a	106	132.38	83.8	156.83	82.6	157.59	n/a	n/a

11/16/2004	n/a	n/a	90.25	153.28	n/a	n/a	102.64	135.74	86.47	154.16	85.69	154.50	n/a	n/a
10/6/2005	100.51	142.38	90.01	153.52	91.17	152.24	105.3	133.08	87.42	153.21	86.84	153.35	n/a	n/a
7/30/2009	n/a	n/a	97.55	145.98	107.59	135.82	108.74	129.64	94.08	146.55	dry	n/a	91.23	149.77
7/21/2010	120.77	122.12	dry	n/a	111.2	132.21	dry	n/a	94.34	146.29	dry	n/a	92.2	148.80
6/10/2011	108.52	134.37	dry	n/a	102.22	141.19	dry	n/a	94.16	146.47	dry	n/a	88.98	152.02
Average:	***96.58***	***146.31***	***87.14***	***156.39***	***93.26***	***150.15***	***98.02***	***140.36***	***83.46***	***157.17***	***78.69***	***161.50***	***90.80***	***150.20***
Maximum:	***120.77***	***158.55***	***97.55***	***167.01***	***111.20***	***166.34***	***108.74***	***151.47***	***94.34***	***168.91***	***86.84***	***168.50***	***92.20***	***152.02***
Minimum:	***84.34***	***122.12***	***76.52***	***145.98***	***77.07***	***132.21***	***86.91***	***129.64***	***71.72***	***146.29***	***71.69***	***153.35***	***88.98***	***148.80***

Historical Groundwater Quality

	Date:	pH	Electrical Conductivity (EC) *(uS/cm)*	Nitrate (NO_3N) (mg/l)	Ammonium (NH_4N) (mg/l)
MW1c MW1a (2010 - 2011)	10/1/2001	6.70	1100.00	2.90	< 1
	4/19/2002	6.90	1100.00	3.90	< 1
	11/13/2002	6.70	1300.00	7.90	< 1
	1/31/2003	6.80	1300.00	2.90	< 1
	5/13/2003	6.90	1300.00	3.90	< 1
	12/17/2003	7.40	1100.00	4.70	< 1
	10/6/2005	7.10	1241.00	2.10	< 1
	7/30/2009	n/a	n/a	n/a	n/a
	7/21/2010	7.70	340.25	n/a	n/a
	6/10/2011	7.10	316.00	8.00	< 1
	Average:	***7.03***	***1010.81***	***4.54***	***#DIV/0!***
	Maximum:	***7.70***	***1300.00***	***8.00***	***0.00***
	Minimum:	***6.70***	***316.00***	***2.10***	***0.00***

	Date:	pH	Electrical Conductivity (EC) *(uS/cm)*	Nitrate (NO_3N) (mg/l)	Ammonium (NH_4N) (mg/l)
MW2a	11/13/2002	8	490	1.1	< 1
	1/31/2003	8.3	240	1.3	< 1
	12/17/2003	8.1	290	2.2	< 1
	7/28/2004	8.5	160	2.2	< 1
	11/16/2004	8.2	180	2.9	< 1
	10/6/2005	8.2	370	7.1	< 0.1
	7/30/2009	n/a	n/a	n/a	n/a
	7/21/2010	7.91	645	n/a	n/a
	6/10/2011	7.90	586.00	18.20	< 0.5
	Average:	***8.14***	***370.13***	***5.00***	***#DIV/0!***
	Maximum:	***8.50***	***645.00***	***18.20***	***0.00***
	Minimum:	***7.90***	***160.00***	***1.10***	***0.00***

	Date:	pH	Electrical Conductivity (EC) *(uS/cm)*	Nitrate (NO_3N) (mg/l)	Ammonium (NH_4N) (mg/l)
MW2b	11/13/2002	8.8	160	0.8	< 1
	1/31/2003	8.9	140	0.6	< 1
	10/6/2005	9.3	154	1.1	< 0.1
	7/30/2009	n/a	n/a	n/a	n/a
	7/21/2010	n/a	n/a	n/a	n/a

	Date:	pH	Electrical Conductivity (EC) *(uS/cm)*	Nitrate (NO_3N) (mg/l)	Ammonium (NH_4N) (mg/l)
MW5a	1/31/2003	7.10	1200.00	40.00	< 1
	5/13/2003	7.30	1200.00	43.00	< 1
	12/17/2003	7.80	1400.00	45.00	< 1
	7/28/2004	7.70	1200.00	45.00	< 1
	11/16/2004	7.70	1100.00	42.00	< 1
	10/6/2005	7.50	1159.00	43.10	< 0.1
	7/30/2009	n/a	n/a	n/a	n/a
	7/21/2010	n/a	n/a	n/a	n/a
	6/10/2011	n/a	n/a	n/a	n/a
	Average:	***7.52***	***1209.83***	***43.02***	***#DIV/0!***
	Maximum:	***7.80***	***1400.00***	***45.00***	***0.00***
	Minimum:	***7.10***	***1100.00***	***40.00***	***0.00***

	Date:	pH	Electrical Conductivity (EC) *(uS/cm)*	Nitrate (NO_3N) (mg/l)	Ammonium (NH_4N) (mg/l)
MW5b	1/31/2003	7.6	1000	40	< 1
	10/6/2005	7.6	984	39.2	< 0.1
	7/30/2009	n/a	n/a	n/a	n/a
	7/21/2010	n/a	n/a	n/a	n/a
	6/10/2011	7.11	1079.25	44.40	< 0.5
	Average:	***7.44***	***1021.08***	***41.20***	***#DIV/0!***
	Maximum:	***7.60***	***1079.25***	***44.40***	***0.00***
	Minimum:	***7.11***	***984.00***	***39.20***	***0.00***

	Date:	pH	Electrical Conductivity (EC) *(uS/cm)*	Nitrate (NO_3N) (mg/l)	Ammonium (NH_4N) (mg/l)
MW7	11/13/2002	7.5	510	5.4	< 1
	1/31/2003	7.3	750	18	< 1
	5/13/2003	7.3	790	16	< 1
	12/17/2003	8	600	8.6	< 1
	7/28/2004	8.1	430	5	< 1
	11/16/2004	8	600	12	< 1
	10/6/2005	8.1	784	16.9	< 0.1
	7/30/2009	n/a	n/a	n/a	n/a
	7/21/2010	n/a	n/a	n/a	n/a
	6/10/2011	n/a	n/a	n/a	n/a

	6/10/2011	8.9	433	20.1	< 0.5
	Average:	***8.98***	***221.75***	***5.65***	***#DIV/0!***
	Maximum:	***9.30***	***433.00***	***20.10***	***0.00***
	Minimum:	***8.80***	***140.00***	***0.60***	***0.00***
MW3a	**Date:**	pH	Electrical Conductivity (EC) *(uS/cm)*	Nitrate (NO_3N) (mg/l)	Ammonium (NH_4N) (mg/l)
	11/13/2002	6.7	1100	41	< 1
	1/31/2003	6.9	1200	44	< 1
	12/17/2003	7.7	1000	40	< 1
	7/28/2004	8.1	520	5.9	< 1
	11/16/2004	7.7	810	29	< 1
	10/6/2005	7.7	693	23.7	< 0.1
	7/30/2009	n/a	n/a	n/a	n/a
	7/21/2010	7.38	785	n/a	n/a
	6/10/2011	7.7	874	37.3	< 0.5
	Average:	***7.49***	***872.75***	***31.56***	***#DIV/0!***
	Maximum:	***8.10***	***1200.00***	***44.00***	***0.00***
	Minimum:	***6.70***	***520.00***	***5.90***	***0.00***
MW3b	**Date:**	pH	Electrical Conductivity (EC) *(uS/cm)*	Nitrate (NO_3N) (mg/l)	Ammonium (NH_4N) (mg/l)
	11/13/2002	7.20	1100.00	36.00	< 1
	1/31/2003	6.90	1100.00	38.00	< 1
	10/6/2005	7.70	985.00	35.80	< 0.1
	7/30/2009	n/a	n/a	n/a	n/a
	7/21/2010	n/a	n/a	n/a	n/a
	6/10/2011	7.40	921.00	37.70	< 0.5
	Average:	***7.30***	***1026.50***	***36.88***	***#DIV/0!***
	Maximum:	***7.70***	***1100.00***	***38.00***	***0.00***
	Minimum:	***6.90***	***921.00***	***35.80***	***0.00***
MW4a	**Date:**	pH	Electrical Conductivity (EC) *(uS/cm)*	Nitrate (NO_3N) (mg/l)	Ammonium (NH_4N) (mg/l)
	11/13/2002	7.6	1200	12	< 1
	1/31/2003	7.4	1200	43	< 1
	5/13/2003	7.5	990	38	< 1
	12/17/2003	7.9	1000	60	< 1
	7/27/2004	8.1	470	51	< 1
	7/30/2009	n/a	n/a	n/a	n/a
	7/21/2010	8.05	1039	n/a	n/a
	6/10/2011	n/a	n/a	n/a	n/a
	Average:	***7.76***	***983.17***	***40.80***	***#DIV/0!***
	Maximum:	***8.10***	***1200.00***	***60.00***	***0.00***
	Minimum:	***7.40***	***470.00***	***12.00***	***0.00***
MW4b	**Date:**	pH	Electrical Conductivity (EC) *(uS/cm)*	Nitrate (NO_3N) (mg/l)	Ammonium (NH_4N) (mg/l)
	11/13/2002	7.4	970	36	< 1
	1/31/2003	7.3	990	36	< 1
	10/6/2005	7.6	944	31.3	< 0.1
	7/30/2009	n/a	n/a	n/a	n/a
	7/21/2010	n/a	n/a	n/a	n/a
	6/10/2011	7.3	969	33.5	< 0.5
	Average:	***7.40***	***968.25***	***34.20***	***#DIV/0!***
	Maximum:	***7.60***	***990.00***	***36.00***	***0.00***
	Minimum:	***7.30***	***944.00***	***31.30***	***0.00***

	Average:	***7.76***	***637.71***	***11.70***	***#DIV/0!***
	Maximum:	***8.10***	***790.00***	***18.00***	***0.00***
	Minimum:	***7.30***	***430.00***	***5.00***	***0.00***
MW8	**Date:**	pH	Electrical Conductivity (EC) *(uS/cm)*	Nitrate (NO_3N) (mg/l)	Ammonium (NH_4N) (mg/l)
	11/13/2002	7.4	590	12	< 1
	1/31/2003	7.5	590	11	< 1
	5/13/2003	7.3	490	14	< 1
	12/17/2003	8.1	580	9.5	< 1
	7/28/2004	8.1	610	12	< 1
	11/17/2004	8	530	11	< 1
	10/6/2005	7.7	513	9.9	< 0.1
	7/30/2009	n/a	n/a	n/a	n/a
	7/21/2010	7.935	935.5	n/a	n/a
	6/10/2011	6.6	1050	48.2	< 0.5
	Average:	***7.63***	***654.28***	***15.95***	***#DIV/0!***
	Maximum:	***8.10***	***1050.00***	***48.20***	***0.00***
	Minimum:	***6.60***	***490.00***	***9.50***	***0.00***
MW9	**Date:**	pH	Electrical Conductivity (EC) *(uS/cm)*	Nitrate (NO_3N) (mg/l)	Ammonium (NH_4N) (mg/l)
	11/13/2002	8.20	480.00	9.70	< 1
	1/31/2003	8.10	540.00	8.20	< 1
	5/13/2003	7.70	490.00	8.00	< 1
	12/17/2003	8.10	490.00	7.70	< 1
	7/28/2004	8.20	510.00	8.10	< 1
	11/17/2004	8.10	540.00	8.40	< 1
	10/6/2005	8.10	518.00	8.80	0.20
	7/30/2009	n/a	n/a	n/a	n/a
	7/21/2010	n/a	n/a	n/a	n/a
	6/10/2011	n/a	n/a	n/a	n/a
	Average:	***8.07***	***509.71***	***8.41***	***0.20***
	Maximum:	***8.20***	***540.00***	***9.70***	***0.20***
	Minimum:	***7.70***	***480.00***	***7.70***	***0.20***
MW10	**Date:**	pH	Electrical Conductivity (EC) *(uS/cm)*	Nitrate (NO_3N) (mg/l)	Ammonium (NH_4N) (mg/l)
	7/30/2009	n/a	n/a	n/a	n/a
	7/21/2010	7.2	1573	n/a	n/a
	6/10/2011	7.2	1620	81.6	< 0.5
	Average:	***7.20***	***1596.50***	***81.60***	***#DIV/0!***
	Maximum:	***7.20***	***1620.00***	***81.60***	***0.00***
	Minimum:	***7.20***	***1573.00***	***81.60***	***0.00***

RIC

DAS

SOILS ENGINEERING, INC.

SEMI-ANNUAL GROUNDWATER MONITORING REPORT

For:

Richmar Farms Dairy
1129 East Shafter Road
Bakersfield, CA 93307

File No. 02-9896

Prepared By:

Soils Engineering, Inc.
4400 Yeager Way
Bakersfield, CA 93313

July 2011

AUG 24 2011

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SOILS ENGINEERING, INC.

July 22, 2011

File Number 02-9896

Mr. David A. Sholes
Associate Engineering Geologist
California Regional Water Quality Control Board
Central Valley Region
1685 E Street
Fresno, CA 93706

Subject: Semi-Annual Groundwater Monitoring Report
Richmar Farms Dairy
1129 East Shafter Road
Bakersfield, CA 93307

Mr. Sholes:

This Semi-Annual Groundwater Monitoring Report (Report) is submitted by Soils Engineering, Inc. (SEI), as per the requirements of the California Regional Water Quality Control Board (Board), for the Richmar Farms Dairy located at 1129 East Shafter Road in Bakersfield, CA (Site). The following work was completed at the subject site.

SITE BACKGROUND

The site is located on the northeast corner of Bear Mountain Boulevard and Union Avenue occupying portions of Sections 17, 20 & 29, T31S, R28E, MDB&M (See Plate 1 for Location Map). The site consists of approximately 126 acres and is surrounded by agricultural land. There are currently five water supply wells located on the site.

REGIONAL GEOLOGY & HYDROLOGY

The site is located in the south-central area of the San Joaquin Valley. The regional area of the site has relatively flat relief with a gentle slope to the south. The project site rests on granitic alluvium, identified as recent Fan Deposits on geologic maps, at the southern end of the San Joaquin Valley. Near-surface soils identified in soil borings within the zone of influence consist of interbedded layers of silty sand, sandy silt, silty clay, sandy clay, clay, clayey sand and poorly-graded sand. These soils are described as SM, ML, CL, SC and

SP, respectively, in the Unified Soils Classification System (USCS). These sediments were derived from the Tehachapi Mountains to the east and southeast of the site. Subsurface layers of clayey soils comprise partial aquicludes to the penetration of seepage from surface sources.

According to the Kern County Water Agency's Water Supply Report, 1999, the depth to groundwater at the site location is approximately one hundred (100') feet bgs and the depth to shallow groundwater is approximately ten (10') feet bgs. The general groundwater gradient in the area of the site is to the southwest and the general shallow groundwater gradient is to the east (Water Supply Report, 1999, Kern County Water Agency).

During the preliminary soils investigation by SEI, twelve (12) soil borings were drilled to a maximum depth of thirty (30') feet bgs. The depth-to-shallow groundwater ranged from an approximate depth of seven (7') feet bgs in soil borings drilled in July of 1997 (Borings B-3 & B-4) to nineteen (19') feet bgs in a soil boring drilled in January of 1998 (Boring B-10).

SEI prepared a Groundwater Monitoring System Workplan, dated July 9, 2002, which was approved by the RWQCB. SEI installed a total of six (6) groundwater monitoring wells at three locations near the outside perimeter of the site (1 location up gradient and 2 down gradient), as a groundwater monitoring system. At each location, a shallow- and a deeper-zone monitoring well was installed. The wells were developed and sampled per SEI's Well Construction and Development and Groundwater Sampling standard operating guidelines. A Groundwater Monitoring System Post Construction Report, dated March 11, 2003, was prepared by SEI and contained the analytical results of the initial groundwater monitoring of the six (6) monitoring wells, the waste water retention pond and the existing water supply wells.

The latest groundwater monitoring event was conducted by SEI in October of 2010 and is summarized below.

WORK COMPLETED

Groundwater Gradient Determination

The six (6) groundwater monitoring wells were surveyed by a licensed surveyor for relative location and top of casing elevations (to the nearest hundredth foot) and tied into a local bench mark. Depth to water at each monitoring well was measured on June 1, 2011 and again on July 7, 2011, and recorded to the nearest hundredth-foot from the top of casing. Water levels measured or at or near historical highs. A groundwater gradient of 0.00122'/' in a S10E direction was calculated on June 1, 2011, based on recorded groundwater elevation measurements of the shallow monitoring wells MW-2, MW-4 and MW-6 and is presented graphically on Plate 3. A groundwater gradient of 0.00163'/' S30W was calculated on June 1, 2011 based on the recorded groundwater elevation measurements of the deeper monitoring wells MW-1, MW-3 and MW5 and is presented graphically as

Plate 4.

Groundwater Well Sampling
The following parameters were measured and recorded on SEI's Well Installation and Well Sampling Forms, while the monitoring wells were purged: electrical conductivity, temperature, pH and water level. Completed Well Installation and Sampling Forms are attached in Appendix A.

On June 1, 2011, a minimum of 3 well volumes were purged from each monitoring well or until monitoring parameters were consistent, after which the wells were allowed to recover to 80% of the original water levels measured before collecting water samples. Water samples were collected using disposable bailers, decanted into appropriate sample bottles, labeled, chilled and transported under a chain of custody to a state of California certified analytical laboratory. Each groundwater sample was analyzed in the analytical laboratory for the following constituents of concern: ammonium, calcium, potassium, sodium, magnesium, chloride, carbonate, bicarbonate, nitrate, nitrite, sulfate, total dissolved solids, total Kjeldahl nitrogen, and pH. Additional water samples were collected on July 7, 2011 at wells MW-1, MW-2, MW-3 and MW-4 after purging to further evaluate the results from June 2011. Copies of the original laboratory data and the chain of custody documents are attached in Appendix B.

See Plate 2 for a Plot Plan that shows the monitoring well locations.

Pond & Water Supply Well Sampling
On June 1, 2011, SEI collected a water sample (Pond) from the waste water retention pond by submerging a new water sample container into the pond and filling up the appropriate sample containers with this fluid. Four (4) water supply wells (AG-NE, DW (Ag-DB), Ag-W and Ag-SE) were also sampled on June 1, 2011. Well Ag-S was not sampled since it has recently been modified an a sampling spout was not installed yet. The wells were sampled by starting up the associated water well pumps and filling up appropriate containers with the water flowing out of open spigots along the flow pipe after. The sample containers were labeled, chilled and transported under a chain of custody to a state of California certified analytical laboratory. Each groundwater sample was analyzed by the analytical laboratory for the following constituents of concern: ammonium, calcium, potassium, sodium, magnesium, chloride, carbonate, bicarbonate, nitrate, nitrite, sulfate, total dissolved solids, total Kjeldahl nitrogen, and pH. Copies of the original laboratory data and the chain of custody documents are attached in Appendix B.

See Plate 2 for a Plot Plan, which shows the water supply wells and pond locations.

ANALYTICAL RESULTS

The analytical results for this sampling event are listed in Table 1, Current Groundwater Sample Analytical Results June & July, 2011. Table 2 shows the historical analytical results for the wells (monitoring and water supply) and the water retention ponds.

Groundwater Monitoring Wells

The concentrations of Total Dissolved Solids (TDS) range from 260 parts per million (ppm) in monitoring well MW-5 to 1700 parts per million in monitoring well MW-2. The concentrations of ammonium range from 0.038 ppm in monitoring well MW-3 to 0.26 ppm in monitoring well MW-4. The Total Kjeldahl Nitrogen (TKN) range was between <0.2 ppm in monitoring wells MW-1, MW-2 and MW-3 to 2.6 ppm in monitoring well MW-4. The concentrations of Nitrate ranged from <0.1 in MW-1 to 110 ppm in well MW-2. The concentrations of Nitrite ranged from 0.0087 ppm in well MW-5 to 0.51 ppm in well MW-4. Appendix C shows the graphed results of the nitrogen constituents overtime at each well location.

Water Supply Wells

The highest concentration of Total Dissolved Solids was 360 parts per million in the well DW (Ag-DB). The concentrations of ammonium ranged between 0.099 parts per million (ppm) in well DW to 0.17 ppm in sample Ag-W. The Total Kjeldahl Nitrogen (TKN) range was 0.031ppm to 0.042 ppm in the supply wells. The concentrations of Nitrite was <0.050 in all wells. Nitrate was 0.031ppm to 0.042 ppm in the supply wells.

Wastewater Retention Pond

The concentration of Total Dissolved Solids was 2000 ppm in the Pond sample. The concentration of ammonium and TKN were 290 and 250 ppm, respectively. Nitrate had a concentration of <0.1 ppm, and nitrite had a concentration of <0.25 ppm. No other constituents containing nitrogen were detected in the sample.

DISCUSSION

In a letter dated June 8, 2011 the RWQCB issued a Notice of Violation (NOV) for the site based on increasing nitrogen constituents in some of the monitoring wells indicating potential impact to the shallow groundwater beneath the site. A seepage study and remedial plans to rectify the potential impact to the groundwater has been requested. Based on the follow-up water sampling of wells MW-1 to MW-4, it appears that significant fluctuations in the concentrations of nitrogen constituents are possible in these wells. This is evident at well MW-1 that had Nitrate go from 42 ppm in June 2011 to <0.05 ppm in July 2011 and well MW-4 that had Nitrate go from 0.16 ppm in June 2011 to 60 ppm in July 2011.

RECOMMENDATIONS

A Workplan for future assessment of the water conditions around the ponds will be prepared. This will include the installation of additional monitoring wells and water sampling around the ponds to evaluate the area for seepage.

Please call Soils Engineering, Inc. at (661) 831-5100 if you have any questions concerning this Report.

Respectfully Submitted,

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Enclosures: Table 1, Current Groundwater and Wastewater Sample Results
Table 2, Historical Groundwater and Waste Water Sample Results
Plate 1, Location Map
Plate 2, Site Map
Plate 3, Shallow Groundwater Gradient Map – June 2011
Plate 4, Groundwater Gradient Map – June 2011

Appendix A, Well Installation and Sampling Forms
Appendix B, Laboratory data and chain of custody documents
Appendix C, Graphed Nitrogen Constituent Results Overtime in Monitoring Wells

TABLE 1
CURRENT GROUNDWATER SAMPLE AND WASTEWATER ANALYTICAL RESULTS
RICHMAR FARMS DAIRY
June & July 2011

						Constituents of Concern (ppm)													
Sample Date (2008)	Well No. & Sample ID	Top of Casing Elev. (ft.)	Depth Of Well (ft.)	Depth to Water (ft.)	Water Elev. (ft.)	Ammonium	Calcium	Chloride	Magnesium	pH (pH units)	Potassium	Sodium	Sulfate	Total Dissolved Solids	Total Kjeldahl Nitrogen	Nitrate as N	Nitrite as N	Bicarbonate	Carbonate
6/1/2011	MW-1	319.95	44	8.95	311	0.099	43	100	10	8.18	2	360	160	1200	0.39	43	0.049	530	<5
7/7/2011	MW-1			9.07	310.88	0.2	59	120	10	7.78	2.7	350	300	1200	<0.2	<0.10	<0.050	610	<5
6/1/2011	MW-2	318.03	13	6.92	311.11	0.13	35	150	14	7.99	1.6	530	160	1700	0.2	110	0.014	660	<5
7/7/2011	MW-2			6.52	311.51	0.087	21	130	9.5	7.89	1.4	530	140	1600	<0.2	86	0.019	750	<5
6/1/2011	MW-3	312.38	58	5.71	306.67	0.061	58	72	12	8.10	2.5	180	140	730	<0.2	0.26	<0.050	390	<5
7/7/2011	MW-3			5.51	306.87	0.038	64	74	12	7.74	3.3	170	130	740	<0.2	3.80	0.039	420	<5
6/1/2011	MW-4	312.11	13	4.14	307.97	0.095	58	73	12	8.07	2.4	180	140	730	0.19	0.16	<0.050	390	<5
7/7/2011	MW-4			5.11	307	0.26	100	53	18	7.46	25	94	82	850	2.6	60	0.51	220	<5
6/1/2011	MW-5	319.64	58	11.52	308.12	0.054	38	13	6.1	7.94	2.8	35	28	260	0.095	4.0	0.0087	150	<5
7/7/2011	MW-5			11.12	308.52	Not Sampled													
6/1/2011	MW-6	319.9	15	9.65	310.25	0.053	48	16	6.3	7.27	5.4	31	19	300	0.68	12.0	0.016	150	<5
7/7/2011	MW-6			9.63	310.27	Not Sampled													
6/1/2011	Pond	NA	NA	NA	NA	290	84	200	63	8.06	400	130	20	2000	250	<0.1	<0.250	2000	<5
6/1/2011	Ag-NE	NA	NA	NA	NA	0.15	13	17	0.24	8.58	1.1	59	40	210	0.084	0.042	<0.050	89	5.7
6/1/2011	DW (Ag-DB)	NA	NA	NA	NA	0.099	46	47	3.3	8.17	1.7	64	62	360	<0.2	0.031	<0.050	150	<5
6/1/2011	Ag-W	NA	NA	NA	NA	0.17	43	24	3.0	8.23	1.3	61	59	330	0.09	<0.10	0.011	190	<5
6/1/2011	Ag-SE	NA	NA	NA	NA	0.13	34	61	1.3	8.61	1.9	61	31	270	0.2	0.04	<0.050	100	<5

ppm = parts per million (mg/l)

TABLE 2

HISTORICAL GROUNDWATER AND WASTEWATER SAMPLE ANALYTICAL RESULTS
RICHMAR FARMS DAIRY
Constituents of Concern (reported in ppm)

Sample Date	Well No. & Sample ID	Depth Of Well (ft.)	Ammonium	Calcium	Chloride	Magnesium	pH (pH units)	Potassium	Sodium	Sulfate	Total Dissolved Solids	Total Kjeldahl Nitrogen	Nitrate as N	Nitrite as N	Bicarbonate	Carbonate
1/28/2003	MW-1	44	0.31	62	120	9.2	6.9	3.9	340	290	1300	<1	<2	<1	570	0
5/25/2004			<0.1	67	140	11	7.6	3.8	430	320	1300	<1	<0.5	<0.4	670	0
12/22/2004			0.31	78	140	10	6.9	3.6	360	290	1200	<1	<0.5	<0.4	610	0
5/6/2005			0.22	38	120	8.4	8.1	5	340	250	1220	<1	0.52	<0.4	540	0
11/23/2005			0.24	19	110	3.4	7.5	1.6	150	260	1050	0.68	0.51	<0.4	430	<10
5/4/2006			0.13	75	120	9.9	7.6	4.1	340	290	1270	0.85	<10	<0.80	540	<10
11/6/2006			0.11	78	110	13	7.9	3.9	340	260	1130	<0.40	<0.50	<0.4	500	<10
5/17/2007			0.3	42	120	11	7.6	4.3	360	280	1050	0.85	<0.50	<0.4	400	<10
11/20/2007			<0.10	51	91	9.1	8.8	4	NA	230	990	<0.40	<0.5	0.95	340	46
6/2/2008			0.082	28	81	9.6	8.1	2.6	340	200	1100	<0.20	<0.50	<0.4	340	46
11/3/2008			<0.065	49	96	10	8	2.5	310	240	1000	<0.20	0.16	<0.4	540	30
5/8/2009			0.093	23	88	8.6	8.2	2.6	290	200	840	0.21	0.18	0.05	540	<5.0
11/3/2009			0.14	47	87	8.9	7.9	2.4	270	200	890	0.15	<0.10	<0.050	520	<5.0
5/5/2010			<0.065	36	86	9.2	8.1	2.1	290	180	960	0.13	0.14	<0.050	510	<2.5
10/5/2010			0.065	44	78	8	7.9	2.2	220	170	800	<0.2	0.26	<0.050	420	<5
6/1/2011			0.099	43	100	10	8.2	2	360	160	1200	0.39	43	0.049	530	<5
7/7/2011			0.2	59	120	10	7.8	2.7	350	300	1200	<0.2	<0.10	<0.050	610	<5
1/28/2003	MW-2	13	0.18	8.8	45	5.4	7.6	3.4	560	99	1700	<1	<2	<1	1300	0
5/25/2004			<0.1	8.5	41	42	8	1.7	610	110	1400	<1	<2	<0.4	970	0
12/22/2004			0.15	24	44	6.4	6.6	2.9	570	110	1500	<1	0.77	<0.4	580	0
5/6/2005			<0.1	11	32	4.7	8	2.1	500	120	1490	<1	<2	<0.4	1200	0
11/23/2005			0.27	17	41	5.5	7.4	1.9	500	120	1230	0.49	6.1	<0.4	740	<10
5/4/2006			0.13	21	42	7.1	7.7	2.3	480	130	1330	0.89	6	<0.40	880	<10
11/6/2006			<0.10	22	40	8.4	8.2	2.6	540	130	1340	<0.40	4.8	<0.4	930	<10
5/17/2007			0.27	13	54	5	8	2.2	560	110	1340	0.66	13	<0.4	850	<10
11/20/2007			<0.10	20	39	8	8.9	2.7	NA	110	1200	<0.40	19	1.2	630	78
6/2/2008			<0.065	10	40	5.1	8.3	1.6	450	100	1300	0.2	20	<0.4	930	34
11/3/2008			<0.065	13	44	5.2	8.2	1.5	460	110	1200	0.23	16	<0.4	990	<10
5/8/2009			0.049	8.5	49	3.9	8.1	0.96	450	110	1200	0.24	22	0.01	950	<5.0
11/3/2009			0.12	28	74	7.4	8.1	2.2	360	170	1100	0.96	5.4	0.028	720	<5.0
5/5/2010			<0.065	13	45	5.4	8.2	1.2	490	110	1200	0.18	13	<0.05	1000	<2.5
10/5/2010			0.061	9.4	46	5.6	8.00	1.3	550	120	1500	0.29	16	0.044	1100	<5
6/1/2011			0.13	35	150	14	7.99	1.6	530	160	1700	0.2	110	0.014	660	<5
7/7/2011			0.087	21	130	9.5	7.89	1.4	530	140	1600	<0.2	86	0.019	750	<5
1/28/2003	MW-3	58	0.18	42	44	5.5	7.1	2.5	150	100	1100	<1	<2	<1	340	0
5/25/2004			<0.1	46	49	6.3	7.5	2.3	190	98	620	<1	<0.5	<0.4	370	0
12/22/2004			0.28	77	69	9.3	6.6	2.9	190	76	740	<1	<0.5	<0.4	510	0
5/6/2005			<0.1	57	62	7.8	7.7	3.4	150	110	670	<1	<0.5	<0.4	380	0
11/23/2005			0.36	40	78	5.2	6.4	1.4	78	74	800	0.55	<0.5	<0.4	590	<10
5/4/2006			0.17	110	79	13	7.4	4.2	210	83	890	0.97	<.50	<.40	570	<10
11/6/2006			0.12	140	77	21	7.6	4	220	81	840	<0.40	<0.50	<0.4	620	<10
5/17/2007			0.12	120	100	17	7.3	4.6	260	86	990	0.96	<0.50	<0.4	610	<10
11/20/2007			0.16	62	74	15	8.4	3.6	NA	83	650	0.4	<0.5	0.82	320	<10
6/2/2008			0.13	100	86	19	7.7	3.2	190	95	880	0.3	<0.50	<0.4	680	<10
11/3/2008			0.21	86	76	15	7.7	2.6	190	99	750	0.3	<0.10	<0.4	560	<10
5/8/2009			0.085	66	90	14	7.8	2.4	170	120	760	0.2	0.68	<0.050	480	<5.0
11/4/2009			0.18	76	76	14	7.7	2.4	190	130	740	0.2	<0.10	<0.05	480	<5.0
5/5/2010			<0.065	72	88	16	8.1	2.7	190	120	740	<0.2	0.22	<0.05	440	<2.5
10/5/2010			0.061	67	74	12	7.69	2.3	180	140	740	0.16	0.23	<0.050	420	<5
6/1/2011			0.061	58	72	12	8.10	2.5	180	140	730	<0.2	0.26	<0.050	390	<5
7/7/2011			0.038	64	74	12	7.74	3.3	170	130	740	<0.2	3.80	0.039	420	<5
1/28/2003	MW-4	13	0.11	95	71	16	6.5	2.7	110	130	1800	2.6	44	<1	600	0
5/25/2004			12	320	160	65	7.5	50	240	92	1500	<1	5.2	<0.4	1100	0
12/22/2004			3.3	190	100	37	6.5	21	220	30	1100	4.1	0.74	<0.4	900	0
5/6/2005			<0.1	180	120	39	7.2	11	140	69	1020	1.9	0.56	<0.4	770	0
11/23/2005			0.56	94	78	13	7.2	3.7	220	74	770	1.2	<0.50	<0.4	570	<10
5/4/2006			21	280	180	51	7	83	200	28	1520	27.0	6.9	<0.4	1100	<10
11/6/2006			4.4	300	170	59	7.3	36	220	32	1260	6.5	2	<0.4	890	<10
5/17/2007			4.4	230	160	46	7	23	200	49	1480	6.0	1.3	<0.4	750	<10
11/20/2007			1.7	230	160	44	8.1	18	NA	52	1020	2.6	<0.5	1.2	500	<10
6/2/2008			2.5	170	150	36	7.5	12	160	42	1000	4.8	<0.5	<0.4	870	<10
11/3/2008			2.3	180	150	39	7.3	12	170	47	880	3.8	0.12	<0.4	820	<10
5/8/2009			1.2	140	140	29	7.4	7.7	140	73	940	2.3	<0.10	0.014	710	<5.0
11/4/2009			1.5	170	76	36	7.3	9.3	150	120	940	2.5	<0.10	<0.050	780	<5.0
5/5/2010			1.6	160	130	33	7.5	7.1	160	86	880	3.2	<0.10	<0.050	660	<2.5
10/5/2010			0.18	160	150	29	7.5	12	160	120	1300	1.8	73	0.3	330	<5
6/1/2011			0.095	58	73	12	8.1	2.4	180	140	730	0.19	0.16	<0.050	390	<5
7/7/2011			0.26	100	53	18	7.5	25	94	82	850	2.6	60	0.51	220	<5

TABLE 2

HISTORICAL GROUNDWATER AND WASTEWATER SAMPLE ANALYTICAL RESULTS
RICHMAR FARMS DAIRY
Constituents of Concern (reported in ppm)

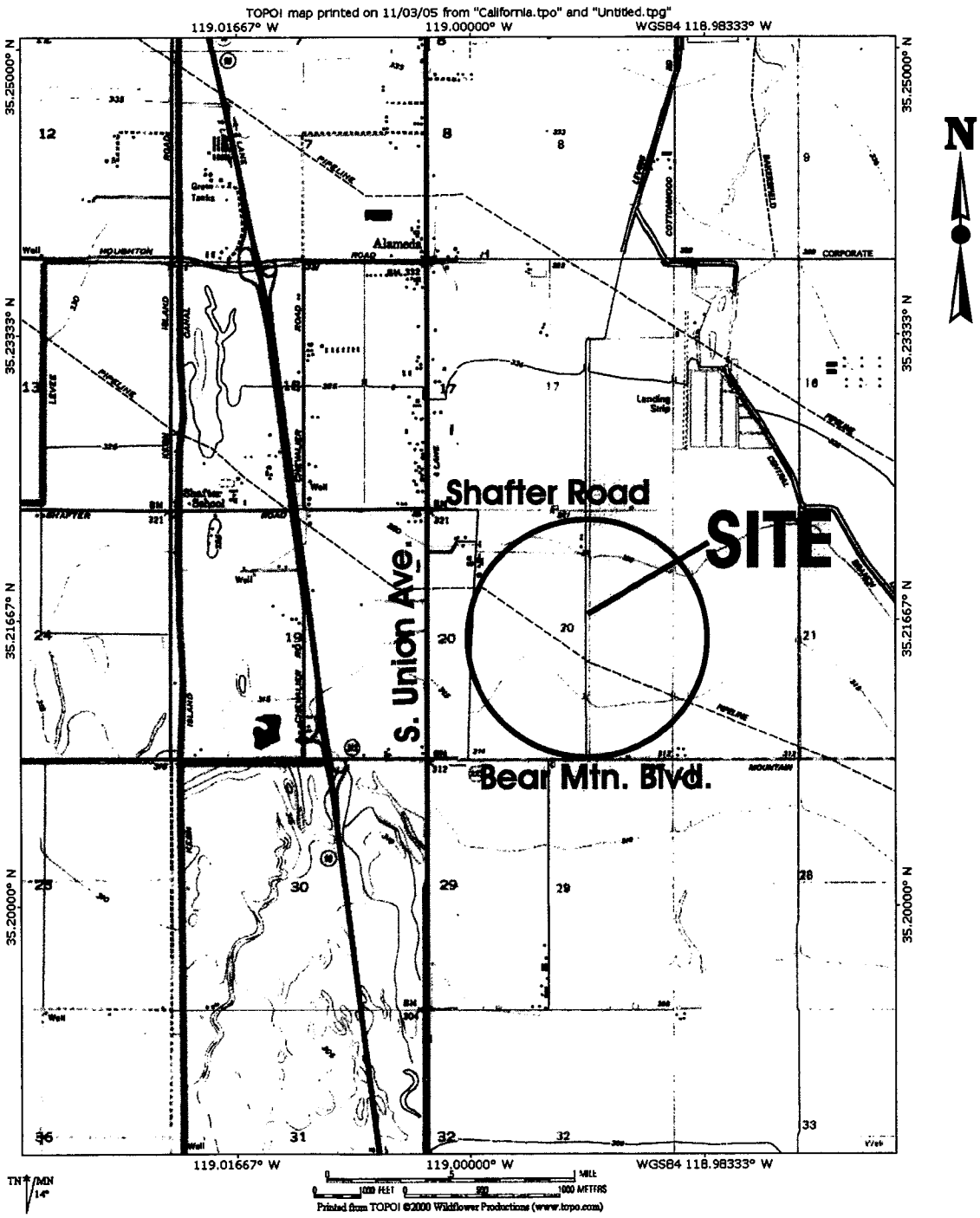
Sample Date	Well No. & Sample ID	Depth Of Well (ft.)	Ammonium	Calcium	Chloride	Magnesium	pH (pH units)	Potassium	Sodium	Sulfate	Total Dissolved Solids	Total Kjeldahl Nitrogen	Nitrate as N	Nitrite as N	Bicarbonate	Carbonate
1/28/2003	MW-5	58	0.11	47	21	6	6.8	2.4	79	56	430	<1	4.5	<1	230	0
5/25/2004			0.19	64	33	8.2	7.2	2.1	84	87	470	<1	0.72	<0.4	280	0
12/22/2004			<0.10	66	33	7.3	6.3	1.9	85	77	420	<1	<0.5	<0.4	250	0
5/6/2005			<0.1	54	12	6.6	7.5	2.2	32	31	300	<1	5.5	<0.4	150	0
11/23/2005			0.19	20	11	5	8.6	30	46	27	230	0.53	3.3	<0.4	63	36
5/4/2006			0.2	35	17	4.1	7.5	1.6	51	38	310	0.85	<.50	<0.40	150	<10
11/6/2006			<0.10	35	14	5.9	8.4	4.8	52	33	230	<0.40	0.61	<0.4	160	<10
5/17/2007			<0.10	37	31	4.7	7.1	2.1	51	35	240	0.66	0.61	<0.4	210	<10
11/20/2007			0.11	6.2	7.9	1.4	8.7	42	NA	21	270	<0.40	2.8	0.42	120	<10
6/2/2008			0.069	35	15	5.2	8	3.4	49	30	260	<0.20	<0.50	<0.4	190	<10
11/3/2008			<0.065	55	22	5.5	7.3	4.5	35	33	290	0.51	6.3	<0.4	160	<10
5/8/2009			<0.065	39	18	5.8	7.7	1.4	33	27	270	0.12	4	<0.050	180	<2.5
11/4/2009			<0.065	41	13	6.2	7.8	1.8	30	26	240	0.12	3.3	<0.050	160	<2.5
5/5/2010			0.08	38	14	5.9	8	1.8	29	25	230	0.09	3.1	<0.050	140	<2.5
10/5/2010			0.27	1.2	12	0.1	11	36	65	25	290	0.48	3.5	0.01	<5	51
6/1/2011			0.054	38	13	6.1	7.9	2.8	35	28	260	0.095	4.0	0.009	150	<5
1/28/2003	MW-6	15	<0.1	25	10	3.4	6.2	2.2	31	25	200	<1	8.7	<1	89	0
5/25/2004			0.16	59	25	7.2	6.8	2.5	65	69	390	<1	3.9	<0.4	230	0
12/22/2004			<0.1	39	16	3.2	6	2.2	27	32	210	<1	2.4	<0.4	99	0
5/6/2005			0.16	33	12	3.9	6.9	2.7	26	69	230	<1	6.5	<0.4	90	0
11/23/2005			1.7	28	7.1	2.3	6.4	1.9	14	16	200	5.6	3.1	<0.4	79	<10
5/4/2006			0.21	41	12	3.7	6.6	4.3	24	20	150	<0.40	8.6	<0.40	72	<10
11/6/2006			<0.10	42	8.0	6.0	7.0	3.2	22	16	190	1.3	6.5	<0.4	120	<10
5/17/2007			<0.10	38	26	4.4	6.4	2.5	15	16	170	0.9	1.2	<0.4	110	<10
11/20/2007			0.11	63	19.0	7.5	8.3	4.6	NA	24	290	0.7	10	0.47	120	<10
6/3/2008			<0.065	45	17	4.6	7.4	3.0	34	33	280	0.4	7.1	<0.4	140	<10
11/3/2008			<0.065	42	18	6.6	7.7	1.6	31	24	260	<0.20	3.3	<0.4	180	<10
5/8/2009			Dry													
11/4/2009			Dry													
5/5/2010			0.08	56	26	6.2	7.2	3.7	46	53	330	0.5	8.8	<0.4	150	<2.5
10/5/2010			<0.065	24	6.8	3.2	7.2	4.3	23	17	200	0.87	2.8	<0.050	100	<5
6/1/2011			0.053	48	16	6.3	7.3	5.4	31	19	300	0.68	12.0	0.016	150	<5
2/4/2003	Pond	NA	660	95	340	43	7.8	660	210	5.8	3400	410	<0.5	<0.4	4000	0
5/25/2004			430	250	630	110	8.1	1400	520	120	6500	160	<0.5	<0.4	4800	0
12/22/2004			490	89	520	66	7.5	1100	390	28	5600	200	<0.5	<0.4	4300	0
5/6/2005			400	220	550	86	8	1200	410	140	5820	290	<0.5	<0.4	4000	0
11/23/2005			270	170	620	89	8.2	1200	430	140	4610	280	2.2	<0.4	2500	<10
5/4/2006			340	120	460	98	8.2	1000	360	57	4590	410	<1.0	<0.80	110	<10
11/6/2006			230	130	210	83	8.1	580	220	44	2940	440	1.3	<0.4	2000	<10
5/17/2007			230	200	250	82	8	660	240	31	2760	210	<0.5	<0.4	1800	<10
11/20/2007			390	130	370	70	8.3	880	NA	46	2800	670	<0.5	<0.4	2700	<10
6/2/2008			370	120	610	100	8.1	1300	340	110	5600	550	0.93	<0.4	1900	<10
11/3/2008			310	89	930	140	8.4	1800	560	160	5600	440	<0.5	<0.4	4000	<10
5/8/2009			360	110	480	66	8	930	280	50	4100	450	<0.20	<0.050	3300	<25
11/3/2009			480	130	610	94	8.2	1300	330	72	5000	510	<1.0	<0.25	3700	<5.0
5/3/2010			490	140	600	96	7.9	1400	390	44	6600	720	<1.0	<0.05	4300	<2.5
10/5/2010			350	130	500	140	8	1200	410	67	3800	540	0.5	<0.250	3100	<5
6/1/2011			290	84	200	63	8.1	400	130	20	2000	250	<0.1	<0.250	2000	<5
2/4/2003	Ag-S	NA	0.17	40	36	1.5	7	0.83	53	63	300	<1	<0.5	<0.4	150	0
6/2/2004			0.12	43	37	1.5	6	0.83	55	61	290	<1	<0.5	<0.4	170	0
12/22/2004			0.21	51	38	1.4	6.4	0.9	55	62	380	<1	<0.5	<0.4	160	0
5/10/2005			0.12	47	40	1.6	7.8	1	58	62	190	<1	<0.5	<0.4	150	0
11/22/2005			0.86	47	37	1.5	6.9	1	55	60	280	0.82	<0.5	<0.4	130	<10
5/4/2006			0.12	49	37	1.6	7.7	1.1	60	59	290	0.58	<.50	<0.40	130	<10
11/6/2006			<0.10	54	37	2	8	1.2	67	60	300	<0.40	<0.5	<0.4	140	<10
5/17/2007			<0.10	54	54	2	7.6	1.3	67	62	270	0.66	<0.5	<0.4	240	<10
11/20/2007			0.11	47	36	1.7	8	1.4	NA	66	320	0.43	<0.5	0.52	120	<10
6/2/2008			0.12	43	33	1.7	8.2	<1.0	59	59	320	<0.20	<0.5	<0.4	170	<10
11/3/2008			0.12	63	26	4.2	8.1	1.4	73	68	370	<0.20	<0.10	<0.4	240	<10
5/8/2009			0.058	41	38	1.5	8.2	0.69	60	63	340	<0.20	<0.10	<0.050	160	<2.5
11/3/2009			0.07	45	34	1.7	8.2	0.82	61	60	310	0.24	<0.10	<0.050	170	<2.5
5/3/2010			Not Sampled													
10/5/2010			Not Sampled													
6/1/2011			Not Sampled													

TABLE 2

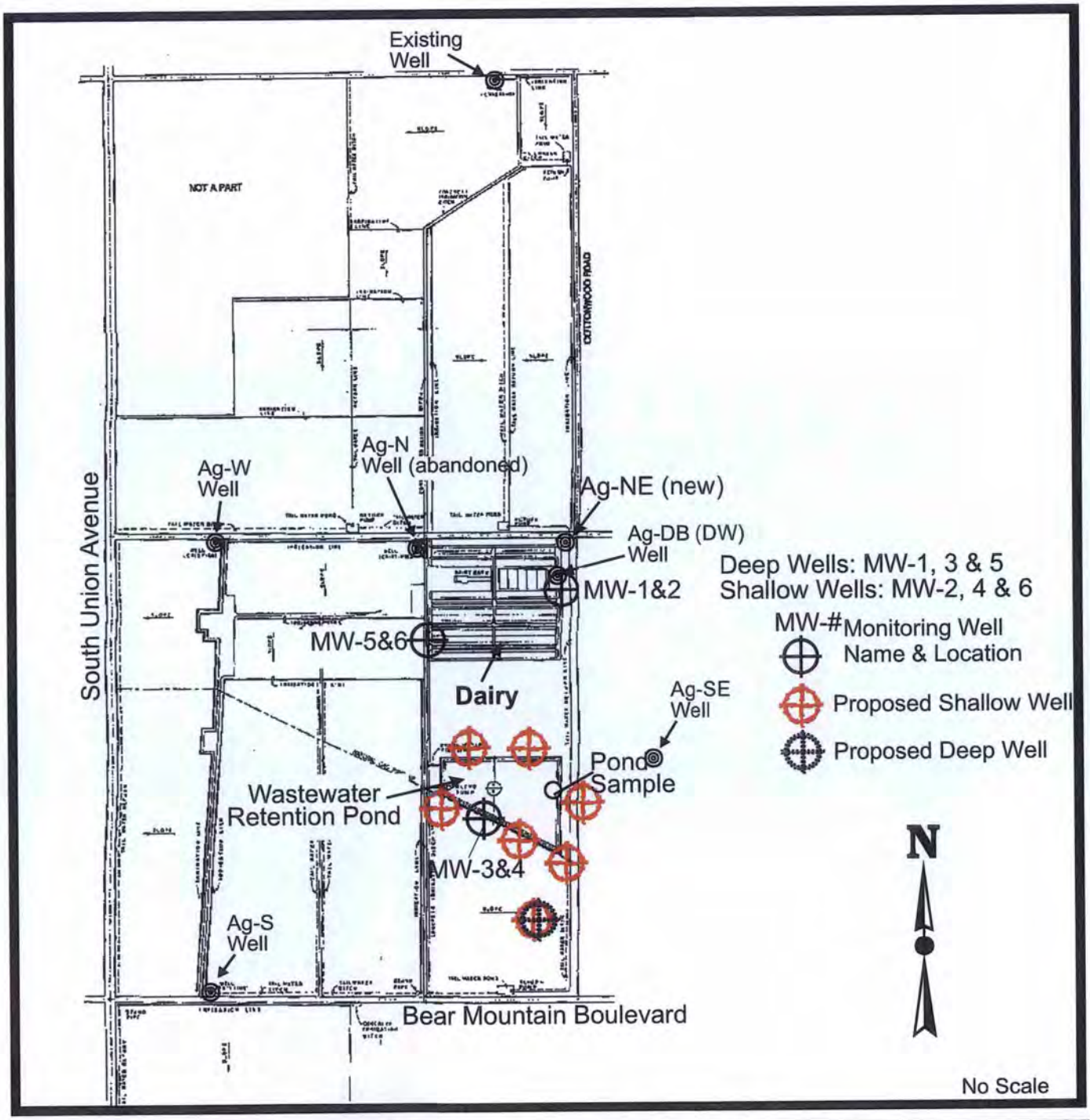
HISTORICAL GROUNDWATER AND WASTEWATER SAMPLE ANALYTICAL RESULTS
RICHMAR FARMS DAIRY
Constituents of Concern (reported in ppm)

Sample Date	Well No. & Sample ID	Depth Of Well (ft.)	Ammonium	Calcium	Chloride	Magnesium	pH (pH units)	Potassium	Sodium	Sulfate	Total Dissolved Solids	Total Kjeldahl Nitrogen	Nitrate as N	Nitrite as N	Bicarbonate	Carbonate
2/4/2003	Ag-N	NA	0.51	44	40	3.7	7	1.7	57	75	290	<1	<0.5	<0.4	160	0
6/2/2004	Ag-NE	NA	<0.1	12	19	0.2	6.2	1	48	42	190	<1	<0.5	<0.4	110	0
12/22/2004			<0.1	20	20	0.2	6.7	1.1	52	43	190	<1	<0.5	<0.4	110	0
5/10/2005			<0.1	15	20	0.2	7.9	1.1	55	43	190	<1	<0.5	<0.4	100	0
11/28/2005			0.35	17	19	0.2	7.2	1.1	51	42	220	0.42	<0.5	<0.4	86	<10
5/4/2006			0.65	22	22	0.6	0.7	3.4	58	42	260	1.80	<.50	<0.40	100	<10
11/6/2006			<0.10	17	20	0.3	8.4	1.3	60	42	170	4.30	<0.5	<0.4	87	<10
5/17/2007			<0.10	19	39	0.3	6.9	1.4	65	45	260	0.60	<0.5	<0.4	210	<10
11/20/2007			<0.10	19	19	0.3	8	1.6	NA	47	220	0.43	<0.5	<0.4	88	<10
6/2/2008			0.11	14	18	0.3	8.5	1.2	58	42	210	<0.20	<0.5	<0.4	93	8.0
11/3/2008			0.12	15	18	0.3	8.6	1.1	61	41	200	<0.20	<0.10	<0.4	97	<10
5/8/2009			0.088	13	20	0.3	8.7	0.87	56	45	210	0.06	<0.10	<0.050	93	14.0
11/3/2009			0.1	13	18	0.2	8.8	1	57	41	200	0.10	<0.10	<0.050	91	7.3
5/3/2010			0.08	13	18	0.3	8.8	1	54	38	210	<0.20	<0.10	<0.050	91	5.5
10/5/2010			0.08	13	17	0.2	8.7	0.9	54	40	220	<0.2	<0.10	<0.050	91	4.7
6/1/2011			0.15	13	17	0.2	8.6	1.1	59	40	210	0.084	0.042	<0.050	89	5.7
2/4/2003	Ag-DB	NA	<0.1	43	46	2.6	6.8	1.6	54	65	320	<1	<0.5	<0.4	150	0
5/25/2004	DW		<0.1	45	43	2.6	6.8	1.7	58	61	300	<1	<0.5	<0.4	150	0
12/22/2004	(Ag-DB)		<0.1	50	48	2.6	6.4	1.8	58	63	350	<1	<0.5	<0.4	180	0
5/6/2005			<0.1	56	51	3	7.7	2.8	60	64	360	<1	<0.5	<0.4	150	0
11/23/2005			0.38	46	46	2.4	6.9	1.8	57	61	320	0.51	<0.5	<0.4	130	<10
5/4/2006			0.22	47	43	2.5	7.7	1.9	61	58	270	1.10	<.50	<0.40	130	<10
11/6/2006			<0.10	51	44	3.1	8	2.1	68	61	310	<0.40	<0.5	<0.4	140	<10
5/17/2007			<0.10	50	59	2.8	7.2	2.1	66	62	320	0.68	<0.5	<0.4	210	<10
11/20/2007			<0.10	49	<2.0	3.2	8.4	2.5	NA	20	330	<0.40	<0.5	0.51	130	<10
6/2/2008			<0.065	46	43	3.3	7.8	1.9	63	62	330	<0.20	<0.5	<0.4	170	<10
11/3/2008			0.11	48	45	3.6	8.2	1.8	66	62	350	<0.20	<0.10	<0.4	160	<10
5/8/2009			<0.065	41	50	2.8	7.6	1.5	60	65	340	<0.20	<0.10	<0.050	160	<2.5
11/4/2009			0.11	46	45	3.4	8	1.6	63	64	340	0.21	<0.10	<0.050	160	<2.5
5/3/2010			<0.065	45	47	3.2	7.8	1.6	63	59	340	<0.20	<0.10	<0.050	150	<2.5
10/5/2010			<0.065	46	47	3.3	8.14	1.6	60	61	360	<0.2	<0.10	<0.050	150	<5
6/1/2011			0.099	46	47	3.3	8.17	1.7	64	62	360	<0.2	0.031	<0.050	150	<5
2/4/2003	Ag-W	NA	0.21	46	26	2.8	7	1.2	52	65	340	<1	<0.5	<0.4	200	0
6/2/2004			<0.1	59	31	3.5	6	1.3	61	73	400	<1	<0.5	<0.4	240	0
12/22/2004			0.64	56	29	2.8	6.5	1.3	57	63	330	<1	<0.5	<0.4	200	0
5/10/2005			<0.1	55	28	3.4	7.9	1.5	60	64	320	<1	<0.5	<0.4	190	0
11/22/2005			0.76	47	27	2.8	7.1	1.3	54	62	330	0.91	<0.5	<0.4	160	<10
5/4/2006			0.24	61	26	3.7	7.5	1.6	64	56	290	35.00	0.74	<0.40	140	<10
11/6/2006			<0.10	52	26	3.2	8	1.5	66	57	300	4.30	<0.5	<0.4	170	<10
5/17/2007			<0.10	50	42	2.9	8	1.7	66	57	260	0.63	<0.5	<0.4	250	<10
11/20/2007			<0.10	66	27	4.2	8.5	1.9	NA	72	380	0.44	<0.5	0.57	160	19
6/2/2008			0.17	58	26	3.9	8.1	1.5	67	74	380	<0.20	<0.5	<0.4	230	<10
11/3/2008			Not Sampled													
5/8/2009			<0.065	46	28	3.1	8.1	1	62	66	350	0.06	<0.10	<0.050	210	<2.5
11/3/2009			0.1	36	27	3	8.2	1.2	63	74	290	0.11	<0.10	<0.050	170	<2.5
5/3/2010			0.06	56	28	4.1	8.1	1.2	63	68	380	<0.20	<0.10	<0.050	220	<2.5
10/5/2010			<0.065	40	22	2.4	8.18	1.1	59	55	320	0.2	<0.10	<0.050	170	<5
6/1/2011			0.17	43	24	3.0	8.23	1.3	61	59	330	0.09	<0.10	0.011	190	<5
2/4/2003	Ag-SE	NA	0.15	33	52	1.4	6.8	1.0	49	50	320	<1	<0.5	<0.4	120	0
6/2/2004			0.11	39	60	1.6	5.9	1.5	55	50	310	<1	<0.5	<0.4	120	0
12/22/2004			<0.1	48	57	1.6	6.3	2.1	52	50	290	<1	<0.5	<0.4	120	0
5/10/2005			0.11	43	59	1.7	7.6	1.7	57	50	250	<1	<0.5	<0.4	110	0
11/28/2005			0.38	37	56	1.5	6.8	1.4	53	50	280	0.47	<0.5	<0.4	99	<10
5/4/2006			0.15	42	58	1.9	7.8	1.6	59	50	290	0.49	<.50	<0.40	93	<10
11/6/2006			<0.10	41	58	1.9	7.9	1.4	60	50	300	<0.40	<0.5	<0.4	110	<10
5/17/2007			<0.10	34	50	2.0	8.0	7.0	45	16	200	3.30	<0.5	<0.4	210	<10
11/20/2007			<0.10	47	59	2.2	7.8	1.8	NA	54	290	0.43	<0.5	0.46	88	<10
6/2/2008			<0.065	39	55	1.8	8.1	1.4	60	49	300	<0.20	<0.5	<0.4	130	<10
11/3/2008			Not Sampled													
5/8/2009			0.044	24	21	3.8	7.8	3.4	28	30	150	0.06	0	<0.050	110	<2.5
11/3/2009			0.059	40	60	1.9	8.2	1.2	59	51	310	<0.20	<0.10	<0.050	120	<2.5
5/3/2010			0.17	40	64	1.9	8.1	1.5	59	47	320	<0.20	<0.10	<0.050	120	<2.5
10/5/2010			0.07	40	69	2.0	8.02	1.5	60	51	330	<0.2	<0.10	<0.050	110	<5
6/1/2011			0.13	34	61	1.3	8.61	1.9	61	31	270	0.2	0.04	<0.050	100	<5

ppm = parts per million (mg/l)



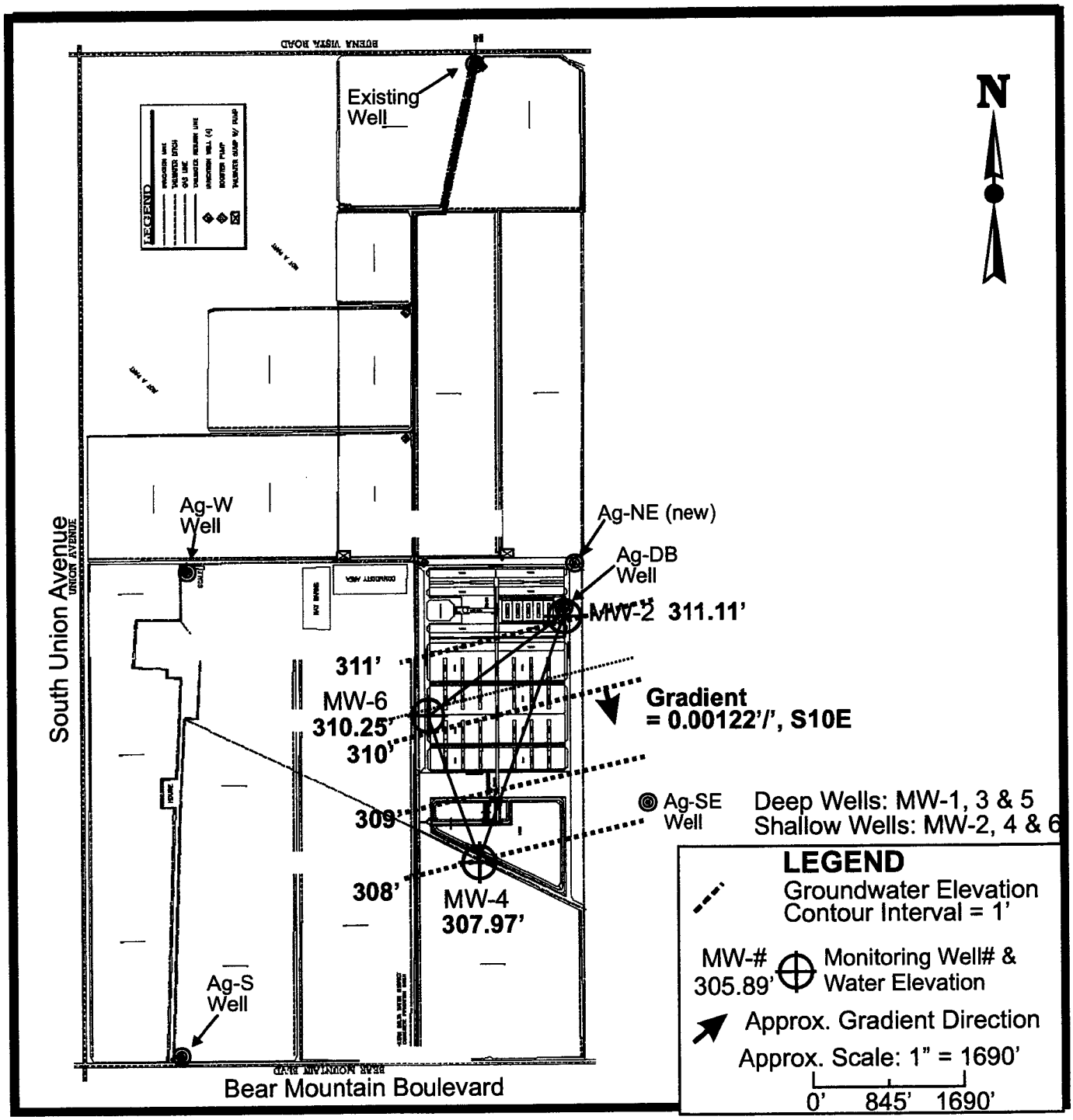
SOILS ENGINEERING, INC. **4400 Yeager Way** **Bakersfield, CA 93313** **(661) 831 - 5100** *File No. 02-9896*	**RICHMAR FARMS DAIRY** East Shafter Road Kern County, CA LOCATION MAP	**PLATE** **1**



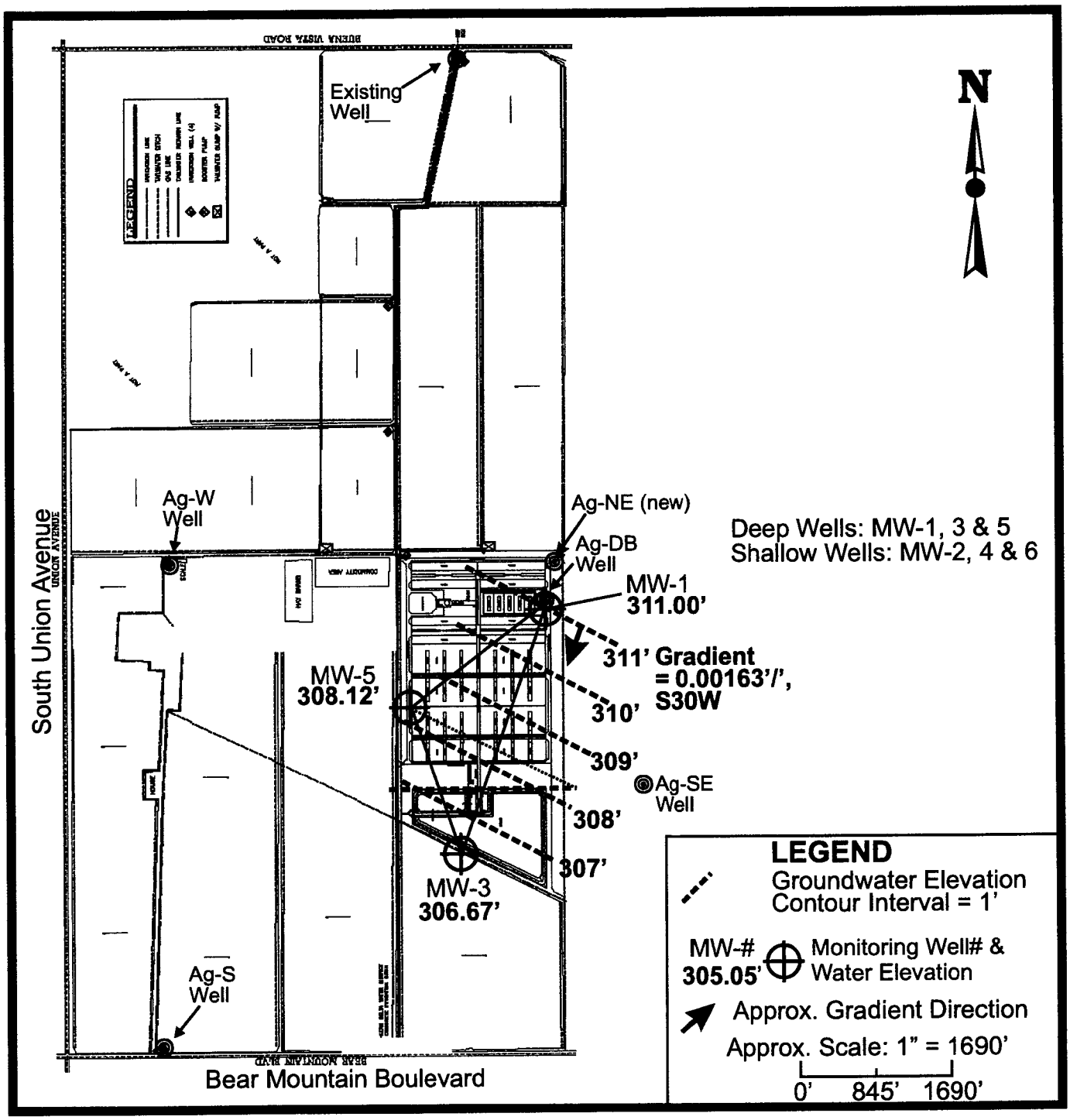
SOILS ENGINEERING, INC. **4400 Yeager Way** **Bakersfield, CA 93313** **(661) 831 - 5100** ***File No.: 9896***	**RICHMAR FARMS DAIRY** East Shafter Road Kern County, CA SITE MAP with Proposed Monitoring Wells	**PLATE** **2**

Richmar Farms Dairy
Bakersfield, CA

File No. 02-9896



SOILS ENGINEERING, INC. **4400 Yeager Way** **Bakersfield, CA 93313** **(661) 831 - 5100** ***File No.: 9896***	**RICHMAR FARMS DAIRY** East Shafter Road Kern County, CA SHALLOW GROUNDWATER GRADIENT MAP 6/1/11	**PLATE** **3**



SOILS ENGINEERING, INC. **4400 Yeager Way** **Bakersfield, CA 93313** **(661) 831 - 5100** ***File No.: 9896***	**RICHMAR FARMS DAIRY** East Shafter Road Kern County, CA DEEP GROUNDWATER GRADIENT MAP 6/1/11	**PLATE** **4**

APPENDIX "A"

Appendix A

Well Installation and Sampling Forms

WELL INSTALLATION & DEVELOPMENT FORM

Monitoring Well Installation

Project #:	9896	Drill Rig:	CME 65	Drill Crew:	Galvan/Carolina
Well #:	MW-1	Auger Dia.:	8 in.	Logger:	Carrisalez
Install Date:	10/14/2002	Well Casing:	2" PVC	Depth to Water:	8.95
Well Depth:	44'	Screen Interval:	24' - 44'	Top of Casing Elev.:	319.95'

Monitoring Well Development

WELL	PURGE TIME (Min.)	TEMP. (oC)	CONDUCTIVITY (mOhms/cm)	pH	Depth To Water (')	Turbidity	Date
	5	23.6	1300	7.25		876	6/1/2011
Surge/Purge Time	10	24	1280	7.26		867	
	15	24.1	1265	7.26		864	
Pump Depth	20	24.1	1260	7.25		863	
Purge Rate							
Gallons Purged							
Well Volume							

SAMPLING

Method: Disposable Bailer

Sample #: MW - 1 **Date:** 6/1/2011 **Time:** 11:55

Sampled By: T.H.
R.M.

Comments:

Monitoring Well Installation

Project #:	9896	Drill Rig:	CME 65	Drill Crew:	Galvan/Carolina
Well #:	MW-2	Auger Dia.:	8 in.	Logger:	Carrisalez
Install Date:	10/16/2002	Well Casing:	2" PVC	Depth to Water:	6.92
Well Depth:	13'	Screen Interval:	4' - 13'	Top of Casing Elev.:	318.03'

Monitoring Well Development

WELL	PURGE TIME (Min.)	TEMP. (oC)	CONDUCTIVITY (mOhms/cm)	pH	Depth To Water (')	Turbidity	Date
	5	23.5	2225	7.3		1585	6/1/2011
Surge/Purge Time	10	24.0	2205	7.34		1572	
	15	24.1	2203	7.35		1570	
Pump Depth	20	24.1	2200	7.34		1569	
Purge Rate							
Gallons Purged							
Well Volume							

SAMPLING

Method: Disposable Bailer

Sample #: MW - 2 **Date:** 6/1/11 **Time:** 12:15

Sampled By: T.H.
R.M.

Comments:

WELL INSTALLATION & DEVELOPMENT FORM

Monitoring Well Installation

Project #:	9896	**Drill Rig:**	CME 65	**Drill Crew:**	Galvan/Carolina
Well #:	MW-3	**Auger Dia.:**	8 in.	**Logger:**	Carrisalez
Install Date:	10/16/2002	**Well Casing:**	2" PVC	**Depth to Water:**	5.71
Well Depth:	58'	**Screen Interval:**	28' - 58'	**Top of Casing Elev.:**	312.38'

Monitoring Well Development

WELL	PURGE TIME (Min.)	TEMP. (oC)	CONDUCTIVITY (mOhms/cm)	pH	Depth To Water (')	Turbidity	Date
	5	25.1	1462	7.04		1093	6/1/2011
Surge/Purge Time	10	23.6	1457	7.04		1094	
60 min.	15	23.5	1450	7.05		1091	
Pump Depth	20	23.5	1451	7.05		1090	
56'							
Purge Rate							
Gallons Purged							
Well Volume							
9 gal							

SAMPLING

Method: Disposable Bailer

Sample #: MW - 3 **Date:** 6/1/11 **Time:** 12:35

Sampled By: T. Hollenbeck/R. McKinney

Comments:

Monitoring Well Installation

Project #:	9896	**Drill Rig:**	CME 65	**Drill Crew:**	Galvan/Carolina
Well #:	MW-4	**Auger Dia.:**	8 in.	**Logger:**	Carrisalez
Install Date:	10/17/2002	**Well Casing:**	2" PVC	**Depth to Water:**	4.14
Well Depth:	13'	**Screen Interval:**	3' - 13'	**Top of Casing Elev.:**	312.11'

Monitoring Well Development

WELL	PURGE TIME (Min.)	TEMP. (oC)	CONDUCTIVITY (mOhms/cm)	pH	Depth To Water (')	Turbidity	Date
	5	27.0	1253	7.06		900	6/1/2011
Surge/Purge Time	10	26.2	1252	6.98		822	
	15	26.2	1240	6.96		816	
Pump Depth	20	26.1	1240	6.94		815	
Purge Rate							
Gallons Purged							
Well Volume							

SAMPLING

Method: Disposable Bailer

Sample #: MW - 4 **Date:** 6/1/11 **Time:** 12:55

Sampled By: T. Hollenbeck/R. McKinney

Comments:

WELL INSTALLATION & DEVELOPMENT FORM

Monitoring Well Installation

Project #:	9896	Drill Rig:	CME 65	Drill Crew:	Galvan/Carolina
Well #:	MW-5	Auger Dia.:	8 in.	Logger:	Carrisalez
Install Date:	10/17/2002	Well Casing:	2" PVC	Depth to Water:	11.52
Well Depth:	58'	Screen Interval:	28' - 58'	Top of Casing Elev.:	319.64'

Monitoring Well Development

WELL	PURGE TIME (Min.)	TEMP. (oC)	CONDUCTIVITY (mOhms/cm)	pH	Depth To Water (')	Turbidity	Date
	5	23.7	605	8.74		390	6/1/2011
Surge/Purge Time	10	23.6	580.0	8.90		389	
	15	23.7	581	9.00		389	
Pump Depth	20	23.6	581	9.01		390	
Purge Rate							
Gallons Purged							
Well Volume							

SAMPLING

Method: Disposable Bailer

Sample #: MW - 5 **Date:** 6/1/11 **Time:** 10:54

Sampled By: T. Hollenbeck/R. McKinney

Comments:

Monitoring Well Installation

Project #:	9896	Drill Rig:	CME 65	Drill Crew:	Galvan/Carolina
Well #:	MW-6	Auger Dia.:	8 in.	Logger:	Carrisalez
Install Date:	10/17/2002	Well Casing:	2" PVC	Depth to Water:	9.65
Well Depth:	15'	Screen Interval:	5' - 15'	Top of Casing Elev.:	319.9'

Monitoring Well Development

WELL	PURGE TIME (Min.)	TEMP. (oC)	CONDUCTIVITY (mOhms/cm)	pH	Depth To Water (')	Turbidity	Date
	5	24.1	389	8.1		205	6/1/2011
Surge/Purge Time	10	24.5	376	7.76		208	
	15	24.8	383	7.76		209	
Pump Depth	20	24.8	384	7.72		212	
Purge Rate							
Gallons Purged							
Well Volume							

SAMPLING

Method:

Sample #: MW - 6 **Date:** 6/1/11 **Time:** 11:25

Sampled By: T. Hollenbeck/R. McKinney

Comments:

WELL INSTALLATION & DEVELOPMENT FORM

Monitoring Well Installation

Project #:	9896	**Drill Rig:**	CME 65	**Drill Crew:**	Galvan/Carolina
Well #:	MW-1	**Auger Dia.:**	8 in.	**Logger:**	Carrisalez
Install Date:	10/14/2002	**Well Casing:**	2" PVC	**Depth to Water:**	9.07
Well Depth:	44'	**Screen Interval:**	24' - 44'	**Top of Casing Elev.:**	319.95'

Monitoring Well Development

WELL	PURGE TIME (Min.)	TEMP. (oC)	CONDUCTIVITY (mOhms/cm)	pH	Depth To Water (')	Turbidity	Date
	5	29.1	1801	5.94		1249	7/7/2011
Surge/Purge Time	10	27.3	1794	6.26		1248	
	15	26.7	1792	6.38		1247	
Pump Depth	20	25.6	1791	6.44		1248	
	25	25.1	1793	6.53		1250	
Purge Rate							
Gallons Purged							
Well Volume							

SAMPLING

Method: Disposable Bailer

Sample #: MW - 1 **Date:** 7/7/2011 **Time:** 12:15

Sampled By: T.H.
R.M.

Comments:

Monitoring Well Installation

Project #:	9896	**Drill Rig:**	CME 65	**Drill Crew:**	Galvan/Carolina
Well #:	MW-2	**Auger Dia.:**	8 in.	**Logger:**	Carrisalez
Install Date:	10/16/2002	**Well Casing:**	2" PVC	**Depth to Water:**	6.52
Well Depth:	13'	**Screen Interval:**	4' - 13'	**Top of Casing Elev.:**	318.03'

Monitoring Well Development

WELL	PURGE TIME (Min.)	TEMP. (oC)	CONDUCTIVITY (mOhms/cm)	pH	Depth To Water (')	Turbidity	Date
	5	26.4	2548	7.05		1831	7/7/2011
Surge/Purge Time	10	25.9	2572	6.92		1852	
	15	25.6	2590	6.89		1862	
Pump Depth	20	25.4	2600	6.89		1877	
	25	25.5	2603	6.88		1880	
Purge Rate							
Gallons Purged							
Well Volume							

SAMPLING

Method: Disposable Bailer

Sample #: MW - 2 **Date:** 7/7/11 **Time:** 12:30

Sampled By: T.H.
R.M.

Comments:

WELL INSTALLATION & DEVELOPMENT FORM

Monitoring Well Installation

Project #:	9896	**Drill Rig:**	CME 65	**Drill Crew:**	Galvan/Carolina
Well #:	MW-3	**Auger Dia.:**	8 in.	**Logger:**	Carrisalez
Install Date:	10/16/2002	**Well Casing:**	2" PVC	**Depth to Water:**	5.51
Well Depth:	58'	**Screen Interval:**	28' - 58'	**Top of Casing Elev.:**	312.38'

Monitoring Well Development

WELL	PURGE TIME (Min.)	TEMP. (oC)	CONDUCTIVITY (mOhms/cm)	pH	Depth To Water (')	Turbidity	Date
	5	25.1	1590	7.07		1106	7/7/2011
Surge/Purge Time	10	23.9	1595	6.98		1109	
60 min.	15	23.6	1605	6.90		1118	
Pump Depth	20	23.3	1628	6.85		1120	
56'	25	23.2	1630	6.82		1124	
Purge Rate							
Gallons Purged							
Well Volume							
9 gal							

SAMPLING

Method: Disposable Bailer

Sample #: MW - 3 **Date:** 7/7/11 **Time:** 12:50

Sampled By: T. Hollenbeck/R. McKinney

Comments:

Monitoring Well Installation

Project #:	9896	**Drill Rig:**	CME 65	**Drill Crew:**	Galvan/Carolina
Well #:	MW-4	**Auger Dia.:**	8 in.	**Logger:**	Carrisalez
Install Date:	10/17/2002	**Well Casing:**	2" PVC	**Depth to Water:**	5.11
Well Depth:	13'	**Screen Interval:**	3' - 13'	**Top of Casing Elev.:**	312.11'

Monitoring Well Development

WELL	PURGE TIME (Min.)	TEMP. (oC)	CONDUCTIVITY (mOhms/cm)	pH	Depth To Water (')	Turbidity	Date
	5	27.3	1284	7.36		878	7/7/2011
Surge/Purge Time	10	27.3	1290	7.23		882	
	15	27.3	1296	7.15		885	
Pump Depth	20	27.6	1299	7.07		888	
	25	27.7	1300	7.05		889	
Purge Rate							
Gallons Purged							
Well Volume							

SAMPLING

Method: Disposable Bailer

Sample #: MW - 4 **Date:** 7/7/11 **Time:** 1:05

Sampled By: T. Hollenbeck/R. McKinney

Comments:

APPENDIX "B"

SIE

REPORT ON RESULTS OF NEW MONITOR WELL INSTALLATION AT THE SIERRA VIEW DAIRY NEAR TULARE

Prepared for
Ken DeGroot
Sierra View Dairy
Tulare, California

by
Kenneth D. Schmidt and Associates
Groundwater Quality Consultants
Fresno, California

June 2006

JUN 15 2006

KENNETH D. SCHMIDT AND ASSOCIATES
GROUNDWATER QUALITY CONSULTANTS
600 WEST SHAW, SUITE 250
FRESNO, CALIFORNIA 93704
TELEPHONE (559) 224-4412

June 6, 2006

Mr. Ken DeGroot
Sierra View Dairy
13376 Avenue 224
Tulare, CA 93274

Re: New Monitor Well

Dear Ken:

Submitted herewith is our report on the new monitor well at the Sierra View Dairy.

Sincerely Yours,

Kenneth D. Schmidt
Geologist No. 1578
Certified Hydrogeologist
No. 176

KDS/pe

REGISTERED GEOLOGIST
KENNETH D. SCHMIDT
NO. 1578
STATE OF CALIFORNIA

REGISTERED GEOLOGIST
KENNETH D. SCHMIDT
NO. 176
CERTIFIED
HYDROGEOLOGIST
STATE OF CALIFORNIA

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ATTACHMENT A GEOLOGIC LOG AND ELECTRIC LOG

ATTACHMENT B WELL COMPLETION DIAGRAM

ATTACHMENT C WATER WELL DRILLERS REPORT

ATTACHMENT D FIELD MEASUREMENTS

ATTACHMENT E LABORATORY ANALYSES AND CHAIN-OF-CUSTODY FORM

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2	Water-Level Elevations and Direction of Groundwater Flow (April 8, 2006)	7

REPORT ON RESULTS OF NEW MONITOR WELL INSTALLATION AT THE SIERRA VIEW DAIRY NEAR TULARE

INTRODUCTION

Kenneth D. Schmidt and Associates (KDSA) prepared a work plan in November 2005 for installing a new monitor well at the Sierra View Dairy. The well was installed during April 6-7, 2006. Figure 1 shows the locations of the three pre-existing monitor wells and the new well (MW-4). MW-1 was installed near the west edge of the property, to serve as a downgradient monitor well for the dairy facilities. MW-2 was installed south of the wastewater ponds to serve as a downgradient well for the ponds. MW-3 was installed near the north boundary of the property to serve as an upgradient well. MW-4 was installed south of the confined animal area to serve as a downgradient well. Haynes & Sons of Hanford installed MW-4 by the direct rotary method. KDSA logged the drill cuttings, observed the electric logging, and prepared a geologic log for the new monitor well. KDSA also observed the monitor well construction and prepared a well completion diagram. The initial monitoring round for MW-4 was conducted by KDSA on April 18, 2006. All four of the monitor wells were sampled by Del-Tech of Oakdale on April 26, 2006.

WELL INSTALLATION

For MW-4, a 12-inch diameter hole was drilled to the total

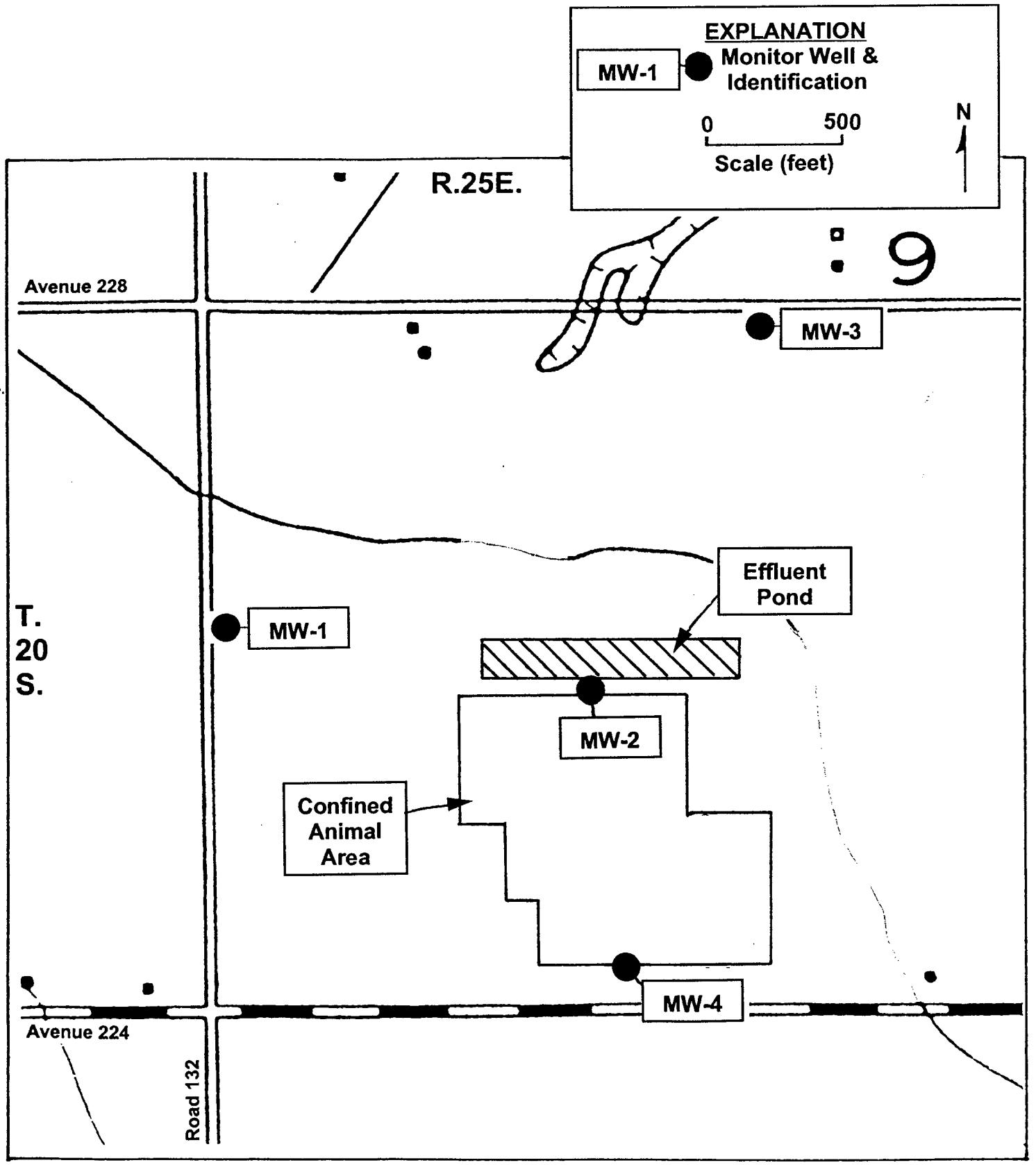


FIGURE 1-LOCATIONS OF DAIRY FACILITIES AND MONITOR WELLS

depth (134 feet). Because the well site was about five feet above the elevation of the other wells, the well was completed about five feet deeper than proposed in the work plan. The hole was then electric logged by Welenco. Groundwater was encountered at a depth of about 88 feet below ground surface at MW-4. The saturated water-producing deposits were primarily sand. Attachment A contains the geologic and electric log for MW-4.

Four-inch diameter Schedule 40 PVC casing was then installed in the hole to a depth of 129 feet. The casing was perforated from 89 feet to 129 feet in depth. The gravel pack was extended for nine feet above the top of the perforations. After the gravel pack was installed, six feet of bentonite were placed in the annular space above the gravel pack. The remainder of the annular seal was then placed above the bentonite by pumping cement through a tremie pipe, from the top of the bentonite to the land surface. The annular seal extended from 80 feet in depth to the surface, and was allowed to set up for 24 hours, prior to resuming activity. Table 1 summarizes construction data for the four monitor wells. The well completion diagram for MW-4 is provided in Attachment B, and the completion report is provided in Attachment C.

WELL DEVELOPMENT

Preliminary well development of MW-4 was by air-lifting about 5 to 10 gpm of water for three hours during April 7, 2006. Further

TABLE 1-CONSTRUCTION DATA FOR MONITOR WELLS

Well No.	Date Completed	Drilled Depth (feet)	Cased Depth (feet)	Perforated Interval (feet)	Gravel Pack (feet)	Annular Seal (feet)
MW-1	11/23/04	124	124	84-124	82-124	0-82
MW-2	05/13/03	108	108	68-108	67-108	0-67
MW-3	11/19/04	123	123	83-123	81-123	0-81
MW-4	04/04/06	134	129	89-124	80-134	0-80

MW-1 through MW-3 were constructed by Consolidated Testing Labs of Porterville and have 2-inch diameter Schedule 40 PVC casings. MW-4 was constructed by Haynes & Sons of Hanford and has a 4-inch diameter Schedule 40 PVC casing.

development was completed on April 7 by installing a submersible pump and pumping at a rate of about 5 gpm for two hours. The pumping rate was measured by periodically timing the filling of a five-gallon container. Following development, the well was pumped continuously on April 8, 2006 until five well volumes were removed prior to the collection of the initial water sample for laboratory analysis.

WATER LEVELS

Static water levels in the four monitor wells were measured on April 8, 2006. Depth to water ranged from 85.6 to 91.1 feet. Measuring points for the monitor wells were surveyed by R. L. Schafer and Associates of Visalia. Table 2 contains the water-level data for April 8, 2006. Figure 2 is a water-level elevation contour and direction of groundwater flow map for April 8, 2006. The highest water-level elevation was at MW-3 and the lowest was at MW-1. The direction of groundwater flow was to the west.

WATER SAMPLING

A submersible pump was installed in MW-4 to near the bottom of the perforated interval. A portable generator was used to pump the well continuously. The water was discharged an adequate distance from the well so as to not influence the pumping results. The time of the filling of a container of known volume was used to measure

TABLE 2-WATER-LEVEL DATA FOR MONITOR WELLS
(APRIL 8, 2006)

Well	Measuring Point Elevation (feet)	Depth to Water (feet)	Water-Level Elevation (feet)
MW-1	297.71	87.85	209.86
MW-2	298.48	86.32	212.16
MW-3	299.63	85.60	214.03
MW-4	304.65	91.11	213.54

Measuring points were surveyed by R. L. Schafer and Associates of Visalia.

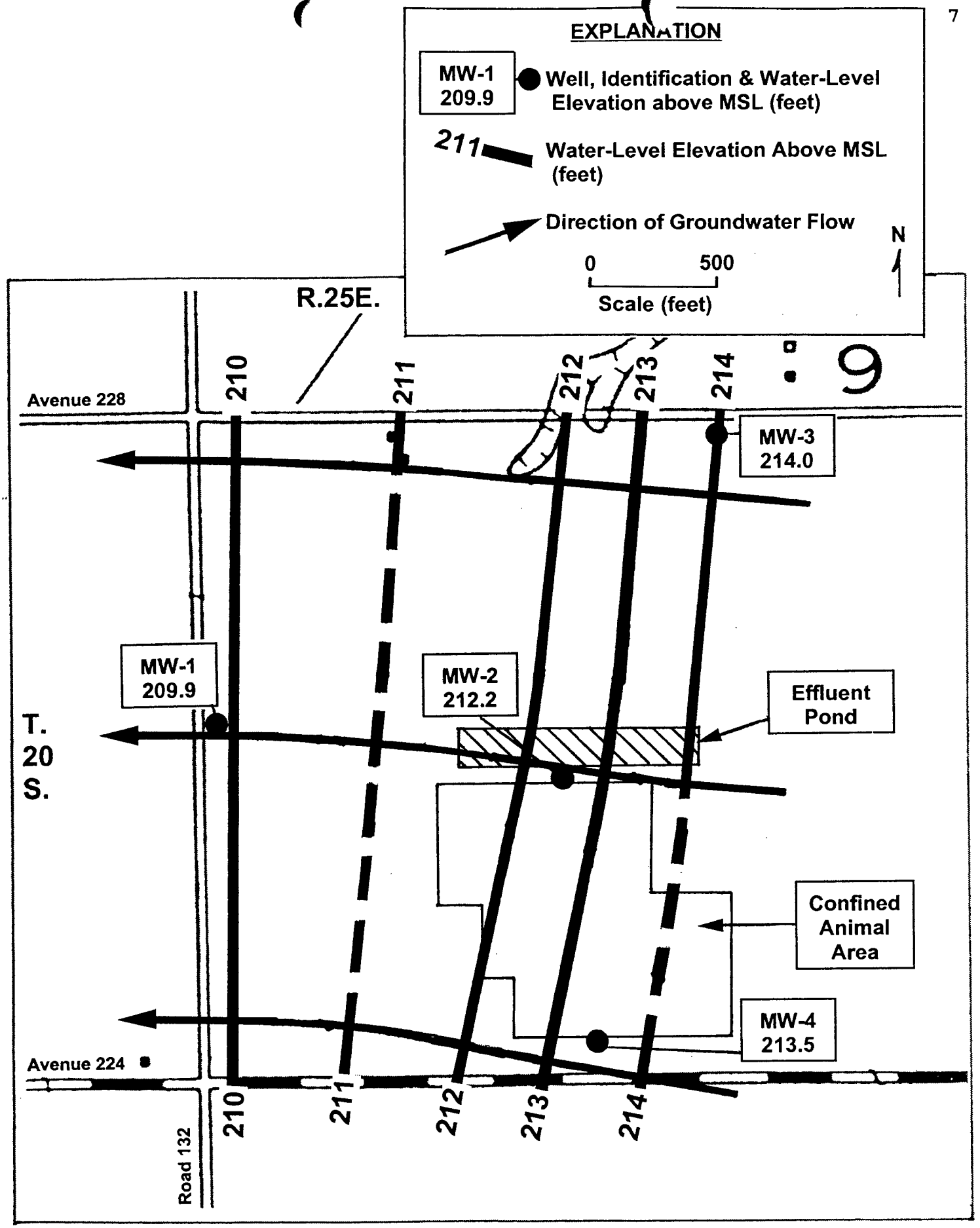


FIGURE 2-WATER-LEVEL ELEVATIONS AND DIRECTION OF GROUNDWATER FLOW (APRIL 8, 2006)

the pumping rate. The well was pumped at 5 gpm for 28 minutes, in order to remove 138 gallons prior to collecting the initial water sample for laboratory analysis. This amount corresponded to five well volumes. Attachment D provides field measurements for the pH, electrical conductivity, and water temperature, which were measured frequently during pumping of MW-4. Sample containers and preservatives were as specified in the KDSA work plan. The sample was preserved and hand delivered to FGL Environmental for analyses.

Table 3 contains the results of chemical analyses of water from the monitor wells. The analysis for the initial sample from MW-4 and sampling results for April 26, 2006 by Del-Tech for all of the monitor wells are shown. Copies of the analytical sheets and chain-of-custody form are provided in Attachment E. Total dissolved solids (TDS) concentrations ranged from 540 to 1,230 mg/l. TDS concentrations were the highest in water from MW-1 and MW-2. Chloride concentrations ranged from 20 to 80 mg/l, and were lowest at MW-3. Nitrate concentrations ranged from 138 to 443 mg/l, exceeding the MCL of 45 mg/l for public water supplies. The highest nitrate concentration was in water from MW-1 and the lowest was in water from MW-3. Iron concentrations were less than 0.05 mg/l in water from all of these wells, well below the recommended MCL of 0.3 mg/l. Manganese concentrations were less than 0.01 mg/l, below the recommended MCL of 0.05 mg/l. Arsenic concentrations were

TABLE 3-CHEMICAL ANALYSES OF WATER FROM MONITOR WELLS

Constituent (mg/l)	MW-1	MW-2	MW-3	MW-4	
Calcium	155	214	88	96	99
Magnesium	38	75	30	33	34
Sodium	128	105	31	73	76
Potassium	3	6	3	6	4
Carbonate	<10	<10	<10	<10	<10
Bicarbonate	1,050	940	300	190	430
Sulfate	47	20	39	35	23
Chloride	45	80	20	51	50
Nitrate	443	203	138	157	167
Ammonia-Nitrogen	<0.2	<0.2	<0.2	0.2	<0.2
Total Kjeldahl Nitrogen	<0.5	<0.5	<0.5	<0.5	<0.5
Organic Nitrogen	<0.5	<0.5	<0.5	<0.5	<0.5
pH	6.8	6.4	7.2	7.4	7.0
Electrical Conductivity (micromhos/cm @ 25°C)	1,740	1,970	836	1,060	1,130
Total Dissolved Solids (@ 180° C)	1,190	1,230	540	660	740
Iron	<0.05	<0.05	<0.05	<0.05	<0.05
Manganese	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	<0.002	<0.002	0.0002	0.0002	<0.002
Total Organic Carbon	1.9	2.1	0.5	1.4	0.7
Temperature (°F)	66	68	66	71	68
Date	4/26/06	4/26/06	4/26/06	4/8/06	4/26/06
Perforated Interval (ft)	84-124	68-108	83-123	89-124	

Chemical analyses by FGL Environmental of Santa Paula.

0.002 mg/l or less, well below the new MCL of 0.01 mg/l. Organic nitrogen and ammonia-nitrogen concentrations were non-detectable in water from the monitor wells. Total organic carbon concentrations ranged from 1.9 to 2.1 mg/l in water from MW-1 and MW-2, and from 0.5 to 1.4 mg/l in water from MW-3 and MW-4. The quality of water from MW-4 largely appears to be representative of background conditions.

REFERENCES

Kenneth D. Schmidt and Associates, 2005, "Workplan for New Monitor Well at the Sierra View Dairy Near Tulare", prepared for Sierra View Dairy, 8p.

ATTACHMENT A

GEOLOGIC LOG AND ELECTRIC LOG

GEOLOGIC LOG FOR
SIERRA VIEW DAIRY MW-4

Depth (feet)	Description	USC
0-3	Brown silty and sandy clay	CL
3-8	Brown silty fine to medium sand	SM
8-14	Brown clay	CL
14-23	Brown silty clay	CL
23-35	Brown medium to coarse sand	SP
35-42	Brown fine to medium sand	SP
42-52	Brown sandy clay	CL
52-57	Brown fine to medium silty sand	SM
57-61	Brown fine sand	SP
61-66	Brown medium sand	SP
66-70	Brown fine silty sand	SM
70-82	Brown medium to coarse sand	SP
82-98	Brown fine to medium silty sand	SM
98-108	Brown medium sand	SP
108-125	Brown fine to medium silty sand	SM
125-131	Brown medium sand	SP
131-134	Brown clay	CL

Depth to Water: 88 feet
Date Drilled: April 6, 2006

Cheryl Lassotovitch
Cheryl Lassotovitch
Geologist No. 7689

April 11, 2006
April 11, 2006

welenco

5201 Woodmere Drive, Bakersfield, CA 93313– www.welenco.com–(800) 445-9914
California Contractor's License No. 722373

ELECTRIC LOG

FILING NO.

COMPANY: Sierra View Dairy
WELL: MW-4
FIELD: Tulare
STATE: California COUNTY: Tulare

LOCATION: 60" South of Avenue 224 East of Road 132

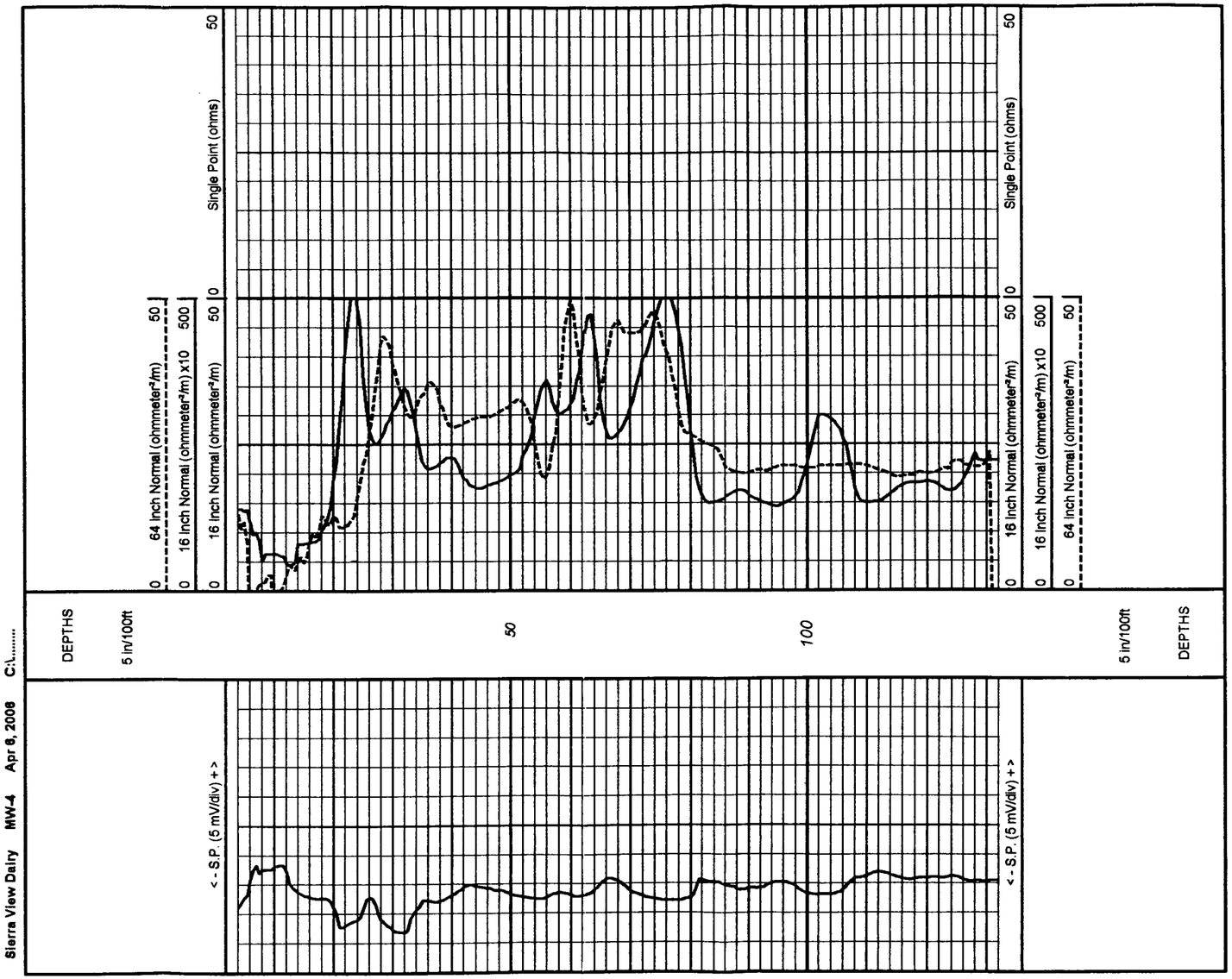
OTHER SERVICES: None

JOB NO. 5906

SEC: 9 TWP: 20S RGE: 25E LAT.: 36° 11' 48.8" LONG.: 119° 16' 23.8" MERIDIAN: Mt. Diablo

Permanent Datum: Ground Level, Elev. ____ Ft. Elev.: K.B. ____ Ft.
Log Measured From: Ground Level, 0 Ft. Above Perm. Datum D.F. ____ Ft.
Drilling Measured From: Ground Level G.L. ____ Ft.

Run No.	One			
Date	Apr. 06, 2006			
Depth-Driller	134 Ft	Ft	Ft	Ft
Depth-Logger	131 Ft	Ft	Ft	Ft
Top Logged Interval	4 Ft	Ft	Ft	Ft
Btm. Logged Interval	131 Ft	Ft	Ft	Ft
Casing-Driller	In @ Ft	In @ Ft	In @ Ft	In @ Ft
Casing-Logger	In @ Ft	In @ Ft	In @ Ft	In @ Ft
Bit Size	12 In	In	In	In
Time On Bottom				
Type Fluid In Hole	water			
Density / Viscosity				
pH / Fluid Loss	ml	ml	ml	ml
Source of Sample	Pit			
Rm @ Measured Temp.	26.2 @ 75 °F	@ °F	@ °F	@ °F
Rmf @ Measured Temp.	26.2 @ 75 °F	@ °F	@ °F	@ °F
Rmc @ Measured Temp.	@ °F	@ °F	@ °F	@ °F
Source Rmf / Rmc				
Rm @ BHT	@ °F	@ °F	@ °F	@ °F
Time Since Circulation	1 Hr	Hr	Hr	Hr
Max. Rec. Temp.	°F	°F	°F	°F
Van No. / Location	L-10 / Bfld			
Recorded By	Larry Hock			
Witnessed By	C. Lassotovitch			



ATTACHMENT B

WELL COMPLETION DIAGRAM

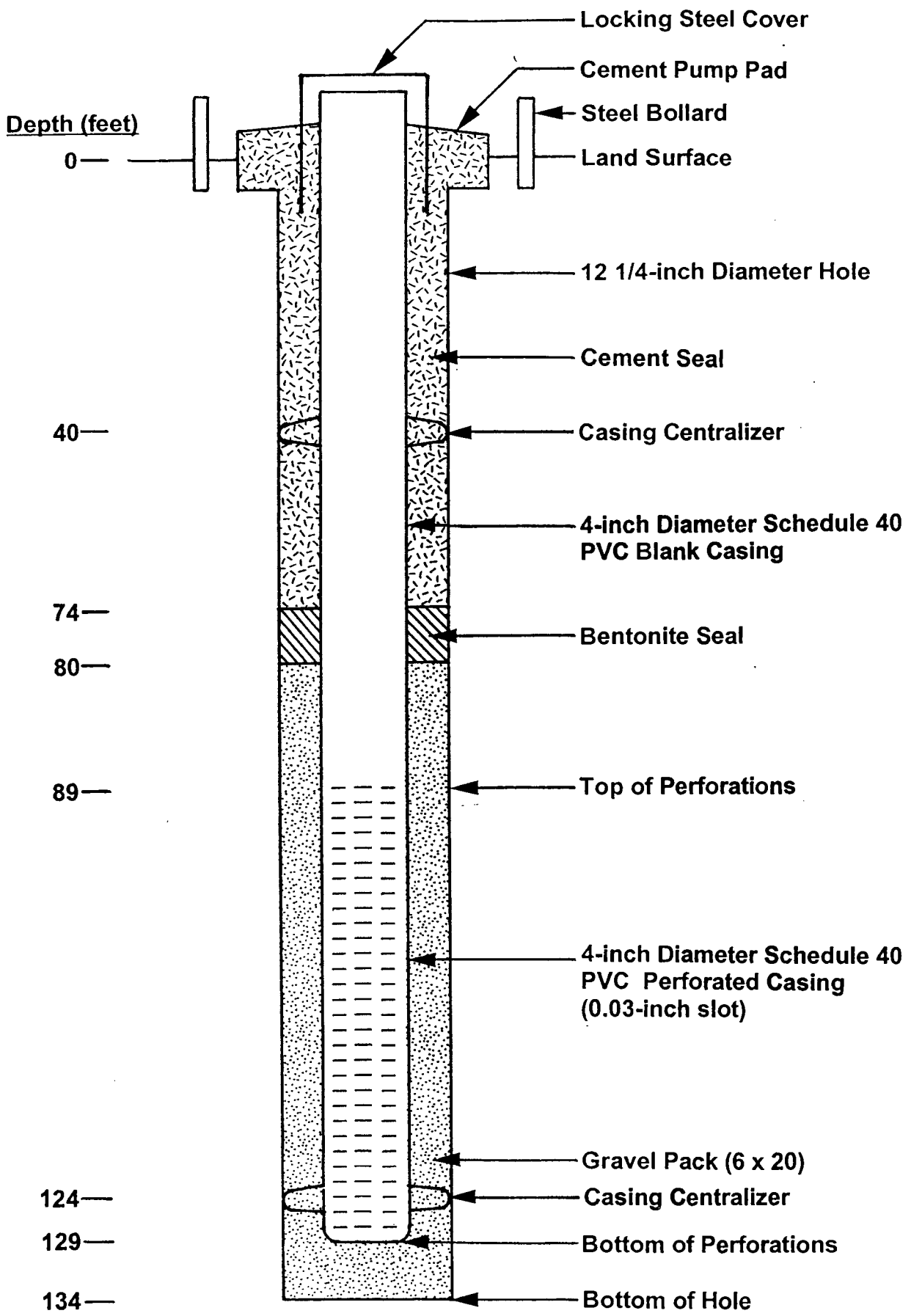


DIAGRAM FOR MW-4

ATTACHMENT C

WATER WELL DRILLERS REPORT

*The free Adobe Reader may be used to view and complete this form. However, software must be purchased to complete, save and reuse a saved form.

File Original with DWR

AMENDED

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e036511

Page 1 of 5

Owner's Well Number MW-4

Date Work Began 4/6/06 Date Work Ended 4/8/06

Local Permit Agency Tulare County

Permit Number 60929 Permit Date 3/29/06

DWR Use Only – Do Not Fill In

State Well Number/Site Number

Latitude N Longitude W

APN/TRS/Other

Geologic Log

Orientation ☒ Vertical ○ Horizontal ○ Angle Specify

Drilling Method Rotary Drilling Fluid Water

Depth from Surface Feet	to Feet	Description: Describe material, grain size, color, etc
0	3	Brown silty and sandy clay
3	8	Brown silty fine-med sand
8	14	Brown clay
14	23	Brown silty clay
23	35	Brown medium-coarse sand
35	42	Brown fine to med. sand
42	52	Brown sandy clay
52	57	Brown fine-med. silty sand
57	61	Brown fine sand
61	66	Brown medium sand
66	70	Brown fine silty sand
70	82	Brown medium to coarse sand
82	98	Brown fin e-med. silty sand
98	108	Brown medium sand
108	125	Brown fine-med. silty sand
125	131	Brown medium sand
131	134	Brown clay

Total Depth of Boring 134 Feet

Total Depth of Completed Well 129 Feet

Well Owner

Name Ken DeGroot

Mailing Address 13376 Ave. 224

City Tulare State CA Zip 93274

Well Location

Address 13376 Ave. 224

City Tulare County Tulare

Latitude Deg. Min. Sec. N Longitude Deg. Min. Sec. W

Datum Decimal Lat. Decimal Long.

APN Book 195 Page 120 Parcel 06

Township 20S Range 25E Section 9

Location Sketch

(Sketch must be drawn by hand after form is printed)

North

See Map

West East

South

Sketch or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Show the nearest cross street.

Activity

☒ New Well

○ Modification/Repair

○ Deepen

○ Other

○ Destroy

Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply

☐ Domestic ☐ Public

☐ Irrigation ☐ Industrial

○ Cathodic Protection

○ Dewatering

○ Heat Exchange

○ Injection

☒ Monitoring

○ Remediation

○ Sparging

○ Test Well

○ Vapor Extraction

○ Other

Water Level and Yield of Completed Well

Depth to first water (Feet below surface)

Depth to Static Water Level 88 (Feet) Date Measured 4/6/06

Estimated Yield * (GPM) Test Type

Test Length (Hours) Total Drawdown (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)
0	89	12.25	Blank	PVC	SCH40	4	slot	0.03
89	129	12.25	green	PVC	SCH40	4	Slot	0.03

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0	74	X	Cement
74	80		Bentonite
80	134	X	Gravel

Attachments

☒ Geologic Log

☒ Well Construction Diagram

☐ Geophysical Log(s)

☐ Soil/Water Chemical Analyses

☒ Other Well Site Map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name Haynes & Sons Well Drilling

Address 13827 Houston Ave. City Hanford State CA Zip 93230

Signed [signature] Date Signed 5/9/06 C-57 License Number 737156

C-57 Licensed Water Well Contractor

DWR 188 REV. 12/99

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

ATTACHMENT D

FIELD MEASUREMENTS

FIELD MEASUREMENTS
SIERRA VIEW DAIRY
MONITORING (04/08/06)

MW-4 T.D. 129'. 04/08/06
SWL: 91.11' below top of PVC. Top of PVC is 3.08' above l.s.
SWL: 88.03' below l.s. 4" diam PVC.
(129 - 88.03) ft = 41.0 ft x 0.68 gal/ft = 27.9 gal
27.9 gal = 1 well volume
27.9 gal x 5 = 140 gallons to be removed.

Time	T(°F)	EC (umhos)	Color	Q (gpm)	PWL (ft)
9:35am Begin Pumping					
9:38	71	1,090	Clear	5	93.73
9:40	-	-	-	-	94.12
9:42	71	1,080	Clear	-	-
9:57	71	1,075	Clear	5	94.27
9:59	-	-	-	-	94.50
10:01	71	1,070	Clear	-	-

Sample collected at 10:03am

ATTACHMENT E

LABORATORY ANALYSES AND CHAIN-OF-CUSTODY FORM

ENVIRONMENTAL

ACCREDITED IN ACCORDANCE WITH nelac

ANALYTICAL CHEMISTS

May 23, 2006

Ken Schmidt & Associates
600 W. Shaw
Suite 250
Fresno, Ca 93704

Description : MW-4
Project : Sierra View Dairy

Lab ID : VI 640504-01
Customer ID: 4-17846

Sampled On : April 8, 2006-10:03
Sampled By : Ken Elliott
Received On: April 11, 2006-11:00
Matrix : Ground Water

Sample Results - Inorganic

Constituent	Results	PQL	Units	Note	Sample Preparation Method	Sample Preparation Date/ID	Sample Analysis Method	Sample Analysis Date/ID
Metals, Diss P:1								
Arsenic	0.002	0.002	mg/L		200.8	04/17/06:A204	200.8	04/26/2006:A02
Calcium	96	1	mg/L		200.7	04/13/06:A203	200.7	04/13/2006:A00
Copper	0.003	0.001	mg/L		200.8	04/17/06:A204	200.8	04/26/2006:A02
Iron	ND	0.05	mg/L		200.7	04/13/06:A203	200.7	04/13/2006:A00
Magnesium	33	1	mg/L		200.7	04/13/06:A203	200.7	04/13/2006:A00
Manganese	ND	0.01	mg/L		200.7	04/13/06:A203	200.7	04/13/2006:A00
Mercury	ND	0.00002	mg/L		7470A	04/12/06:A212	245.1	04/13/2006:A00
Potassium	6	1	mg/L		200.7	04/13/06:A203	200.7	04/13/2006:A00
Sodium	73	1	mg/L		200.7	04/13/06:A203	200.7	04/13/2006:A00
Zinc	0.01	0.01	mg/L		200.8	04/17/06:A204	200.8	04/26/2006:A02
Wet Chemistry P:1,4								
Alkalinity (as CaCO3)	170	10	mg/L		2320B	05/18/06:B202	2320B	05/19/2006:A02
Bicarbonate	190	10	mg/L		2320B	05/18/06:B202	2320B	05/19/2006:A02
Carbonate	ND	10	mg/L		2320B	05/18/06:B202	2320B	05/19/2006:A02
Hydroxide	ND	10	mg/L		2320B	05/18/06:B202	2320B	05/19/2006:A02
Bromide	0.1	0.1	mg/L		300.0	04/11/06:A215	300.0	04/11/2006:A00
Chloride	51	1	mg/L		300.0	04/11/06:A215	300.0	04/11/2006:A00
Conductivity	1060	1	umhos/cm		2510B	04/12/06:B212	2510B	04/12/2006:A00
Fluoride	ND	0.1	mg/L		300.0	04/11/06:A215	300.0	04/11/2006:A00
Nitrate	157	2♦	mg/L		4500NO3F	04/19/06:B220 07:42	4500NO3F	05/01/2006:A07 17:37
Nitrate Nitrogen	35.5	0.5♦	mg/L		4500NO3F	04/19/06:B220 07:42	4500NO3F	05/01/2006:A07 17:37
Nitrite	ND	0.3	mg/L		300.0	04/11/06:A215 12:30	300.0	04/11/2006:A00 14:27
Nitrite Nitrogen	ND	0.1	mg/L		300.0	04/11/06:A215 12:30	300.0	04/11/2006:A00 14:27
Nitrogen, Organic	ND	0.5	ppm		Calculation		Calculation	
Ammonia Nitrogen	0.2	0.2	mg/L		4500NH3H	04/13/06:A203	4500NH3H	04/20/2006:A05
Kjeldahl Nitrogen	0.5	0.5	mg/L		351.1	04/13/06:A242	351.1	04/19/2006:A04
pH	7.4	--♦	units		4500-H B	04/11/06:A246		04/11/2006:A00 16:19

Table continued next page...

Corporate Offices & Laboratory
P.O. Box 272 / 853 Corporation Street
Santa Paula, CA 93061-0272
TEL: (805) 392-2000
FAX: (805) 525-4172
CA NELAP Certification No. 01110CA
CA ELAP Certification No. 1573

Office & Laboratory
2500 Stagecoach Road
Stockton, CA 95215
TEL: (209) 942-0181
FAX: (209) 942-0423
CA ELAP Certification No. 1563

Field Office
Visalia, California
TEL: (559) 734-9473
FAX: (559) 734-8435
Mobile: (559) 737-2399

SO2

DAS

Job No. 11800201

EST. 1968
PROVOST & PRITCHARD INC
ENGINEERING GROUP

WATER
WASTEWATER
STREETS & ROADS
STORM DRAINAGE
LAND DEVELOPMENT
IRRIGATION DISTRICTS
AGRICULTURE
ENERGY SERVICES

286 W. Cromwell Avenue
Fresno, CA 93711-6162
559 449-2700 FAX 559 449-2715
e-mail: dikemiya@ppeng.com

RESPONSE LETTER

To: David Sholes
CA Regional Water Quality Control Board
1685 E St.
Fresno CA 93706

From: Donald Ikemiya DI

Subject: Degroot & Visser Dairy
Regional Board Comments regarding the Groundwater Monitoring Results

Date: May 6, 2003

On behalf of the Degroot & Visser Dairy, the following information is submitted in response to the Regional Board's request for information dated 26 November 2002.

A. Well Construction

BSK Associates constructed four monitoring wells on the following dates and to the following depths:

Monitoring Well #1- Drilled on 3/26/03 to a depth of 73 feet.
Monitoring Well #2- Drilled on 3/31/03 to a depth of 72 feet.
Monitoring Well #3- Drilled on 4/01/03 to a depth of 74.5 feet.
Monitoring Well #4- Drilled on 4/02/03 to a depth of 73 feet.

All four wells were constructed in the same manner. This consisted of a drill rig using 8" O.D. Hollow Stem augers. At the termination of drilling, 2" PVC casing was inserted with 30 feet of 0.020 inch slotted screen.

See **Attachment 1** for monitoring well locations.

RECEIVED
MAY 09 2003
RWQCB-CVR
FRESNO, CALIF.

See **Attachment 2** for well construction details.

B. Well Development

Each well was baled for approximately 4 hrs at a baling rate of .67 gal/min. This gives us a total of 160 gallons per well.

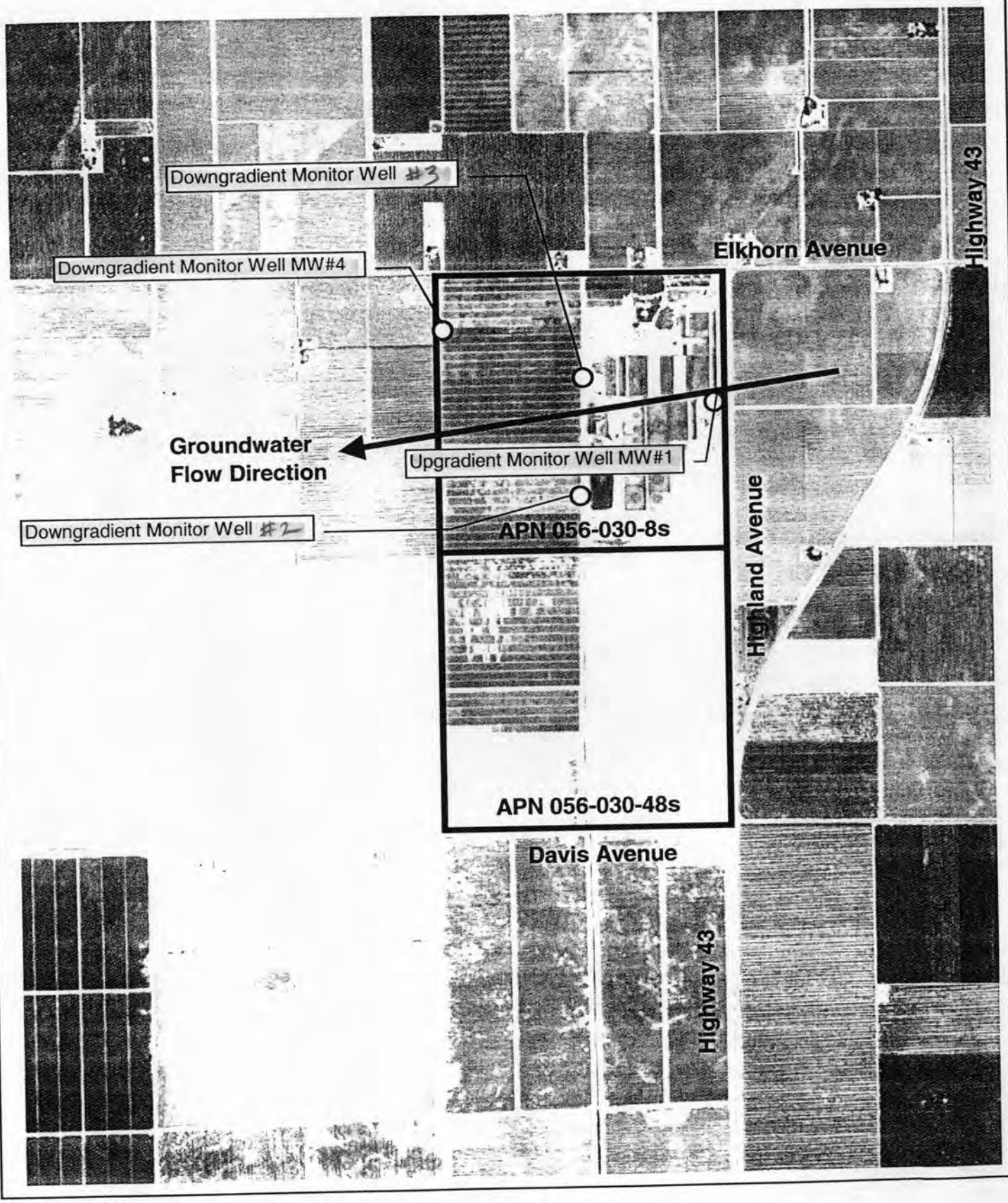
C. Well Surveying

See **Attachment 3** for well surveying data.

Appendix A contains Permits and Well Completion Reports

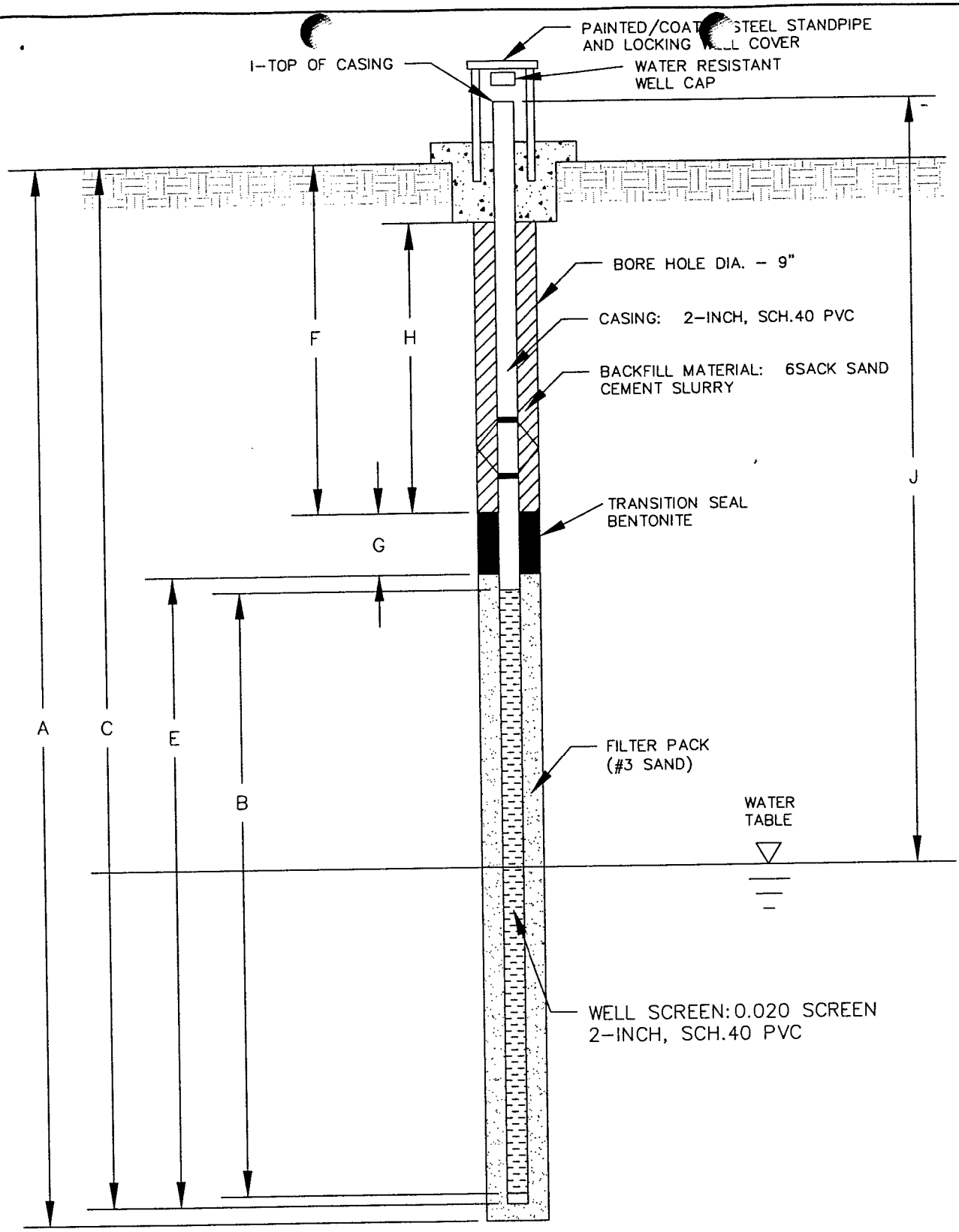
cc: Mr. Dan Visser, Degroot & Visser Dairy, Fresno County

DEGROOT & VISSER DAIRY
Monitor Well Location Map



I:\Clients\Degroot Vissser Dairy - 1180\1180-0201 Monitor Well Locations.xls

Attachment 1



	DATE DRILLED	A DEPTH DRILLED	B LENGTH OF SCREEN	C CASING BOTTOM	D TOP OF SAND PACK	E THICKNESS OF SAND PACK	F TOP OF BENTONITE SEAL	G THICKNESS OF SEAL	H THICKNESS OF CONC. GROUT	I ELEVATION TOP OF CASING	J DEPTH TO GROUND WATER
MW #1	3/26/03	75'	30'	73'	38'	37'	34'	4'	34'	271.43'	48' 3/26/03
MW #2	3/31/03	75'	30'	72'	37'	38'	33'	4'	33'	269.48'	47' 4/01/03
MW #3	4/01/03	75'	30'	74.5'	39.5'	35.5'	35.5'	4'	35.5'	270.14'	49' 4/01/03
MW #4	4/02/03	75'	30'	73'	36'	37'	32'	4'	32'	269.15'	49' 4/02/03

MONITORING WELL INSTALLATION
WASTEWATER RECLAMATION
DEGROOT & VISSER DAIRY
FRESNO COUNTY, CA

SCALE NTS
DRAWN BY TNH
REVISED

MONITORING WELL DIAGRAM

AS BUILT DETAIL

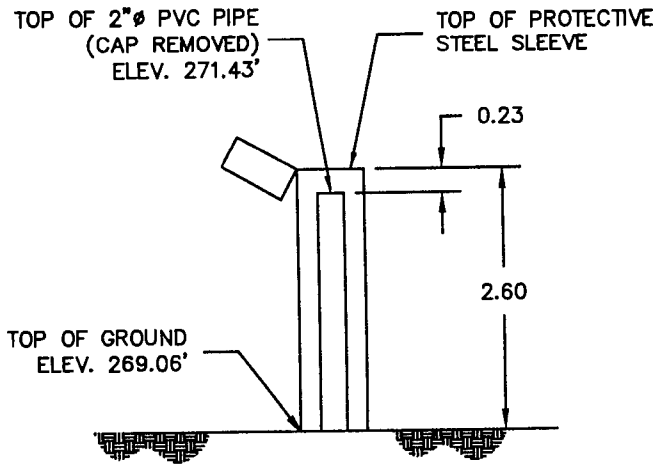
PROVOST & PRITCHARD ENGINEERING GROUP
EST. 1968
300 WEST CROWELL AVENUE
FRESNO, CALIFORNIA 93711-6162
559/449-2700 FAX 559/449-2715

DESIGN ENGINEER DONALD IKEMIYA
DATE 5/6/2003 C.E. LICENSE NO. 56630

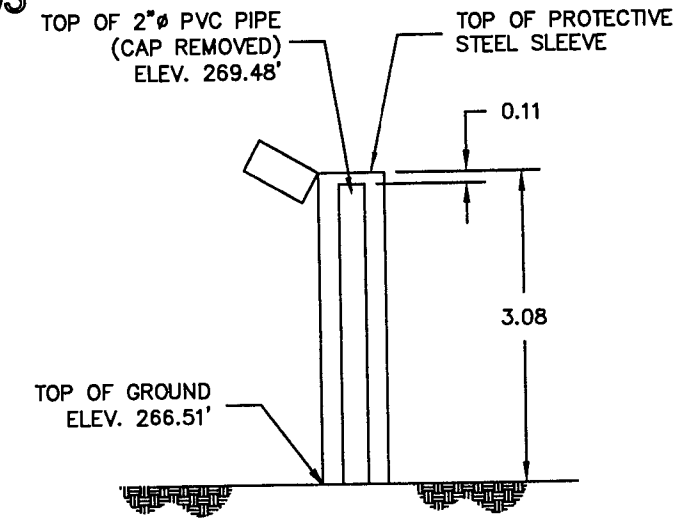
Job No. 11800201
Dwg. No.
Date Revised
Approval

Attachment 2

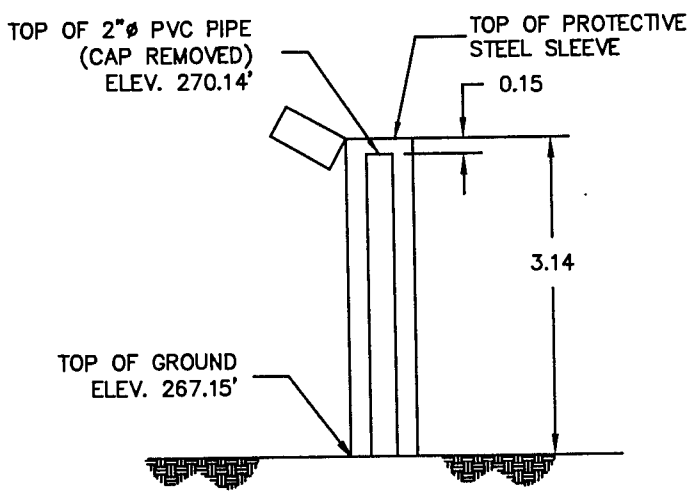
DEGROOT & VISSER - ELEVATIONS OF GROUNDWATER MONITORING WELLS
REVISED 4/30/03



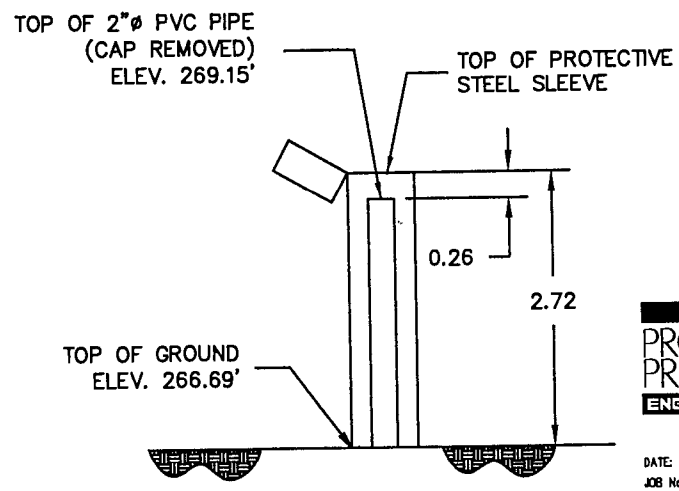
MONITORING WELL #1



MONITORING WELL #2



MONITORING WELL #3



MONITORING WELL #4

EST. 1958
PROVOST & PRITCHARD
ENGINEERING GROUP

DATE: 04/30/03
JOB No. 11800201
DWG. No. Well Elev.dwg
DWG. LOC. I:\Clients\Degroot & Visser Dairy - 1180
DRAWN BY: TH

Attachment 3

NOTE: MEASUREMENTS FROM FCBCM ⊙ NE COR T17S-R21E-SEC 1-ELEV. 271.081'

D0301D10F

FRESNO COUNTY HUMAN SERVICES SYSTEM
DEPARTMENT OF COMMUNITY HEALTH, ENVIRONMENTAL HEALTH SYSTEM

P.O. Box 11800, Fresno, California 93775-1800 Tel: (559) 445-3357 FAX: (559) 445-3290
Website: www.fresnohumanservices.org

PERMIT TO CONSTRUCT, DEEPEN, DESTROY, RECONDITION, OR REPAIR A WELL

Note: This permit is non-transferable and is valid for 180 days

3/21/03 Application Date — 3/26/03 Estimated Starting Date

T: 17S R: 21E S: 6

APN: 056 , 030 , 85

OFFICE USE ONLY
Specialist: MOSS Permit Number: D-1409
Census Tract: _____ Record ID #: _____ Facility ID #: _____
Depth To Corcoran Clay (special annular seal requirements apply) _____

Owner's Well ID Number Or Designation: 1

Job Address / Location: 8469 E. ELKHORN, SELMA Parcel Size: _____

Owner Name: DENNIS VISSER Owner Phone: 891-1556

Owner Address: 8469 E. ELKHORN City: SELMA State: CA Zip: 93667

Contractor Name: BSK ASSOCIATES License #: 490942 Phone: 497-2868

TYPE OF WORK ☒ New Well ☐ Replacement Well ☐ Reconstruction/Deepening ☐ Test Hole Only ☐ Destruction

INTENDED USE ☐ Domestic Private ☐ Agricultural ☐ Industrial ☐ Cathodic ☒ Monitoring ☐ Soil Boring ☐ Domestic Public System Name _____

WELL CONSTRUCTION ☐ Casing Driven ☐ Cable Tool ☐ Hardrock ☒ Auger ☐ Direct Rotary ☐ Reverse Rotary

Conductor Casing Material: NONE Diameter: _____ In Depth: 70 Ft 8" HOLLOW STEM AUGER

Well Casing Material: PVC Diameter: 2 In Gauge: SCH 40

Annular Seal Depth: 35 Ft ☐ Neat Cement ☒ Sand Cement ☐ Concrete

☐ Bentonite _____ ☐ Mixed With Water ☐ Dry Application

Manufacturer And Product Name

Seal Placement Method ☐ Pumped ☐ Free Fall (allowed only when the interval to be sealed is dry and less than 30 feet in depth) TREMIE PIPE PLACEMENT

WELL DESTRUCTION ☐ Open Bottom ☐ Gravel Packed ☐ Uncased ☐ Other _____

Diameter _____ In Total Depth _____ Ft Depth To Water _____ Ft ☐ Casing To Be Perforated _____ Ft To _____ Ft

Destruction Seal ☐ Neat Cement ☐ Sand Cement ☐ Concrete Fill Material Below Seal _____

☐ Bentonite _____ ☐ Mixed With Water ☐ Dry Application

Manufacturer And Product Name

☐ Seal Interval _____ Feet Below Grade To Top Of Casing ☐ Seal Bottom Of Well To Top Of Casing

☐ Casing Cut Off _____ Feet Below Grade (6 feet maximum allowed)

Seal Placement Method ☐ Pumped ☐ Free Fall (allowed only when the interval to be sealed is dry and less than 30 feet in depth)

☐ Oil-lubricated pump. Any oil in the well will be removed and properly disposed of prior to destruction.

SETBACKS (in feet) ☐ All Setbacks Exceed 300 Feet Other Wells >300' Leach Lines >300' Septic Tank >300'
Cesspool >300' Seepage Pits >300' Sewer Lines >300' Designated Sewage Replacement Area >300'
Animal/Fowl Enclosure 50' Flood Control Basins >300' Waste Water Disposal Ponds 100' Lakes, Streams >300'

SPECIAL SUBDIVISION, TRACT RESTRICTIONS Tract Name, Number _____
☐ Setbacks (specify type, e.g. well-to-well, etc. and required distance) _____
☐ Designated Engineered Sewage Disposal Areas (enclose tract map showing designated areas on each parcel)

Fee Amount ☐ $344 ☐ $377 ☒ No Charge (Destructions, Monitoring Wells Only)
Payment Method ☐ Cash ☐ Check ☐ Credit Card*
*Authorization on file with the Business Office of the Fresno County Human Services System

I hereby certify that the information described herein is correct. I understand that all work is to be done in accordance with the California Well Standards Ordinance and the conditions of this permit application, including any conditions which are added by the Environmental Health System upon review of this application and issuance of the permit. I certify that I have a current C-57 Contractor's License and, if I employ workers, a current certificate of Workers' Compensation Insurance. I further understand that any permit issued pursuant to this application is subject to such further conditions as may be deemed necessary to ensure compliance with the Ordinance.

CONTRACTOR SIGNATURE: John Murney DATE: 3/21/03

OFFICE USE ONLY

Permission is hereby granted to perform the work as set forth on this application.

Approved: JF Date: 3/21/0

Final Inspection: _____ Date: _____

Filed Complete: _____ Date: _____

Filed Incomplete: _____ Date: _____

Supervisor: _____

Business Office Use | Envision Clerical Use

Appendix A

D0301010F

FRESNO COUNTY HUMAN SERVICES SYSTEM
DEPARTMENT OF COMMUNITY HEALTH, ENVIRONMENTAL HEALTH SYSTEM

P.O. Box 11800, Fresno, California 93775-1800 Tel: (559) 445-3357 FAX: (559) 445-3290
Website: www.fresnohumanservices.org

PERMIT TO CONSTRUCT, DEEPEN, DESTROY, RECONDITION, OR REPAIR A WELL

Note: This permit is non-transferable and is valid for 180 days

D-1411

3/21/03 Application Date — 3/26/03 Estimated Starting Date

T: 17S R: 21E S: 6

APN: 056 , 030 , 85

OFFICE USE ONLY
Specialist: MOSS Permit Number: ~~D-1411~~
Census Tract: _____ Record ID #: _____ Facility ID #: _____
Depth To Corcoran Clay (special annular seal requirements apply) _____

Owner's Well ID Number Or Designation: 2

Job Address / Location: 8469 E. ELKHORN, SELMA Parcel Size: _____

Owner Name: DENNIS VISSER Owner Phone: 891-1556

Owner Address: 8469 E. ELKHORN City: SELMA State: CA Zip: 93662

Contractor Name: BSK ASSOCIATES License #: 490942 Phone: 4972868

TYPE OF WORK ☒ New Well ☐ Replacement Well ☐ Reconstruction/Deepening ☐ Test Hole Only ☐ Destruction

INTENDED USE ☐ Domestic Private ☐ Agricultural ☐ Industrial ☐ Cathodic ☒ Monitoring ☐ Soil Boring ☐ Domestic Public System Name _____

WELL CONSTRUCTION ☐ Casing Driven ☐ Cable Tool ☐ Hardrock ☒ Auger ☐ Direct Rotary ☐ Reverse Rotary

Conductor Casing Material: NONE Diameter: _____ In Depth: 70 Ft 8" HOLLOW STEM AUGER

Well Casing Material: PVC Diameter: 2 In Gauge: SCH 40

Annular Seal Depth: 35 Ft ☐ Neat Cement ☐ Sand Cement ☐ Concrete

☐ Bentonite _____ ☐ Mixed With Water ☐ Dry Application

Manufacturer And Product Name

Seal Placement Method ☐ Pumped ☐ Free Fall (allowed only when the interval to be sealed is dry and less than 30 feet in depth) TREMIE PIPE PLACEMENT

WELL DESTRUCTION ☐ Open Bottom ☐ Gravel Packed ☐ Uncased ☐ Other _____

Diameter _____ In Total Depth _____ Ft Depth To Water _____ Ft ☐ Casing To Be Perforated _____ Ft To _____ Ft

Destruction Seal ☐ Neat Cement ☐ Sand Cement ☐ Concrete Fill Material Below Seal _____

☐ Bentonite _____ ☐ Mixed With Water ☐ Dry Application

Manufacturer And Product Name

☐ Seal Interval _____ Feet Below Grade To Top Of Casing ☐ Seal Bottom Of Well To Top Of Casing

☐ Casing Cut Off _____ Feet Below Grade (6 feet maximum allowed)

Seal Placement Method ☐ Pumped ☐ Free Fall (allowed only when the interval to be sealed is dry and less than 30 feet in depth)

☐ Oil-lubricated pump. Any oil in the well will be removed and properly disposed of prior to destruction.

SETBACKS (in feet) ☐ All Setbacks Exceed 300 Feet Other Wells >300' Leach Lines >300' Septic Tank >300'
Cesspool >300' Seepage Pits >300' Sewer Lines >300' Designated Sewage Replacement Area _____
Animal/Fowl Enclosure 50' Flood Control Basins >300' Waste Water Disposal Ponds >100' Lakes, Streams >300'

SPECIAL SUBDIVISION, TRACT RESTRICTIONS Tract Name, Number _____
☐ Setbacks (specify type, e.g. well-to-well, etc. and required distance) _____
☐ Designated Engineered Sewage Disposal Areas (enclose tract map showing designated areas on each parcel)

Fee Amount ☐ $344 ☐ $377 ☒ No Charge (Destructions, Monitoring Wells Only)
Payment Method ☐ Cash ☐ Check ☐ Credit Card*
*Authorization on file with the Business Office of the Fresno County Human Services System

I hereby certify that the information described herein is correct. I understand that all work is to be done in accordance with the California Well Standards Ordinance and the conditions of this permit application, including any conditions which are added by the Environmental Health System upon review of this application and issuance of the permit. I certify that I have a current C-57 Contractor's License and, if I employ workers, a current certificate of Workers' Compensation Insurance. I further understand that any permit issued pursuant to this application is subject to such further conditions as may be deemed necessary to ensure compliance with the Ordinance.

CONTRACTOR SIGNATURE: John Murray DATE: 3/21/03

OFFICE USE ONLY

Permission is hereby granted to perform the work as set forth on this application.

Approved: J.F. Date: 3/21/03
Final Inspection: _____ Date: _____
Filed Complete: _____ Date: _____
Filed Incomplete: _____ Date: _____
Supervisor: _____

Business Office Use — Envision Clerical Use

D030101F

FRESNO COUNTY HUMAN SERVICES SYSTEM
DEPARTMENT OF COMMUNITY HEALTH, ENVIRONMENTAL HEALTH SYSTEM

P.O. Box 11800, Fresno, California 93775-1800 Tel: (559) 445-3357 FAX: (559) 445-3290
Website: www.fresnohumanservices.org

PERMIT TO CONSTRUCT, DEEPEN, DESTROY, RECONDITION, OR REPAIR A WELL

Note: This permit is non-transferable and is valid for 180 days

D-1412

3/21/03 Application Date — 3/26/03 Estimated Starting Date

T: 17S R: 21E S: 6

APN: 056 , 030 , 85

OFFICE USE ONLY
Specialist: _____ Permit Number: D 1413
Census Tract: _____ Record ID #: _____ Facility ID #: _____
Depth To Corcoran Clay (special annular seal requirements apply) _____

Owner's Well ID Number Or Designation: 3

Job Address / Location: 8469 E ELKHORN SELMA

Parcel Size: _____

Owner Name: DENNIS VISSER

Owner Phone: 891-1556

Owner Address: 8469 E ELKHORN City: SELMA State: CA Zip: 93662

Contractor Name: BSK ASSOCIATES License #: 490942 Phone: 497 2868

TYPE OF WORK ☑ New Well ☐ Replacement Well ☐ Reconstruction/Deepening ☐ Test Hole Only ☐ Destruction

INTENDED USE ☐ Domestic Private ☐ Agricultural ☐ Industrial ☐ Cathodic ☑ Monitoring
☐ Soil Boring ☐ Domestic Public System Name _____

WELL CONSTRUCTION ☐ Casing Driven ☐ Cable Tool ☐ Hardrock ☐ Auger ☐ Direct Rotary ☐ Reverse Rotary

Conductor Casing Material: NONE Diameter: _____ In Depth: 70 Ft 8" Hollow
Well Casing Material: PVC Diameter: 2 In Gauge: SCH 40 STEM
Annular Seal Depth: 35 Ft ☐ Neat Cement ☐ Sand Cement ☐ Concrete AUGER.
☐ Bentonite _____ ☐ Mixed With Water ☐ Dry Application
Manufacturer And Product Name
Seal Placement Method ☐ Pumped ☐ Free Fall (allowed only when the interval to be sealed is dry and less than 30 feet in depth) TREMIE PIPE PLACEMENT

WELL DESTRUCTION ☐ Open Bottom ☐ Gravel Packed ☐ Uncased ☐ Other _____
Diameter _____ In Total Depth _____ Ft Depth To Water _____ Ft ☐ Casing To Be Perforated _____ Ft To _____ Ft
Destruction Seal ☐ Neat Cement ☐ Sand Cement ☐ Concrete Fill Material Below Seal _____
☐ Bentonite _____ ☐ Mixed With Water ☐ Dry Application
Manufacturer And Product Name
☐ Seal Interval _____ Feet Below Grade To Top Of Casing ☐ Seal Bottom Of Well To Top Of Casing
☐ Casing Cut Off _____ Feet Below Grade (6 feet maximum allowed)
Seal Placement Method ☐ Pumped ☐ Free Fall (allowed only when the interval to be sealed is dry and less than 30 feet in depth)
☐ Oil-lubricated pump. Any oil in the well will be removed and properly disposed of prior to destruction.

SETBACKS (in feet) ☐ All Setbacks Exceed 300 Feet Other Wells >300' Leach Lines 300' Septic Tank >300'
Cesspool >300' Seepage Pits >300' Sewer Lines >300' Designated Sewage Replacement Area _____
Animal/Fowl Enclosure 50' Flood Control Basins _____ Waste Water Disposal Ponds 100' Lakes, Streams >300'

SPECIAL SUBDIVISION, TRACT RESTRICTIONS Tract Name, Number _____
☐ Setbacks (specify type, e.g. well-to-well, etc. and required distance) _____
☐ Designated Engineered Sewage Disposal Areas (enclose tract map showing designated areas on each parcel)

Fee Amount ☐ $344 ☐ $377 ☒ No Charge (Destructions, Monitoring Wells Only)
Payment Method ☐ Cash ☐ Check ☐ Credit Card*
*Authorization on file with the Business Office of the Fresno County Human Services System

I hereby certify that the information described herein is correct. I understand that all work is to be done in accordance with the California Well Standards Ordinance and the conditions of this permit application, including any conditions which are added by the Environmental Health System upon review of this application and issuance of the permit. I certify that I have a current C-57 Contractor's License and, if I employ workers, a current certificate of Workers' Compensation Insurance. I further understand that any permit issued pursuant to this application is subject to such further conditions as may be deemed necessary to ensure compliance with the Ordinance.

CONTRACTOR SIGNATURE: John Shimey DATE: 3/21/03

Business Office Use

OFFICE USE ONLY

Permission is hereby granted to perform the work as set forth on this application.

Approved: J.F Date: 3/21/0

Final Inspection: _____ Date: _____

Filed Complete: _____ Date: _____

Filed Incomplete: _____ Date: _____

Supervisor: _____

Envision Clerical Use

FRESNO COUNTY HUMAN SERVICES SYSTEM
DEPARTMENT OF COMMUNITY HEALTH, ENVIRONMENTAL HEALTH SYSTEM
P.O. Box 11800, Fresno, California 93775-1800 Tel: (559) 445-3357 FAX: (559) 445-3290
Website: www.fresnohumanservices.org

PERMIT TO CONSTRUCT, DEEPEN, DESTROY, RECONDITION, OR REPAIR A WELL

Note: This permit is non-transferable and is valid for 180 days

3/21/03 Application Date — 3/26/03 Estimated Starting Date

T: 17S R: 21E S: 6

APN: 056 , 030 , 85

OFFICE USE ONLY
Specialist: MOSS Permit Number: D-1410
Census Tract: _____ Record ID #: _____ Facility ID #: _____
Depth To Corcoran Clay (special annular seal requirements apply) _____

Owner's Well ID Number Or Designation: 4

Job Address / Location: 8469 E ELKHORN SELMA Parcel Size: _____
Owner Name: DENNIS VISSER Owner Phone: 897 1556
Owner Address: 8469 E ELKHORN City: SELMA State: CA Zip: 93662
Contractor Name: BSK ASSOCIATES License #: 490942 Phone: 497 28 68

TYPE OF WORK ☒ New Well ☐ Replacement Well ☐ Reconstruction/Deepening ☐ Test Hole Only ☐ Destruction

INTENDED USE ☐ Domestic Private ☐ Agricultural ☐ Industrial ☐ Cathodic ☐ Monitoring ☐ Soil Boring ☐ Domestic Public System Name _____

WELL CONSTRUCTION ☐ Casing Driven ☐ Cable Tool ☐ Hardrock ☐ Auger ☐ Direct Rotary ☐ Reverse Rotary
Conductor Casing Material: NONE Diameter: _____ In Depth: TD Ft 8" HOLLOW
Well Casing Material: PVC Diameter: 2 In Gauge: SCH 40
Annular Seal Depth: 35 Ft ☐ Neat Cement ☐ Sand Cement ☐ Concrete STEAM
☐ Bentonite _____ ☐ Mixed With Water ☐ Dry Application
Manufacturer And Product Name TREMIE PIP PLACEMENT AUGER
Seal Placement Method ☐ Pumped ☐ Free Fall (allowed only when the interval to be sealed is dry and less than 30 feet in depth)

WELL DESTRUCTION ☐ Open Bottom ☐ Gravel Packed ☐ Uncased ☐ Other _____
Diameter _____ In Total Depth _____ Ft Depth To Water _____ Ft ☐ Casing To Be Perforated _____ Ft To _____ Ft
Destruction Seal ☐ Neat Cement ☐ Sand Cement ☐ Concrete Fill Material Below Seal _____
☐ Bentonite _____ ☐ Mixed With Water ☐ Dry Application
Manufacturer And Product Name
☐ Seal Interval _____ Feet Below Grade To Top Of Casing ☐ Seal Bottom Of Well To Top Of Casing
☐ Casing Cut Off _____ Feet Below Grade (6 feet maximum allowed)
Seal Placement Method ☐ Pumped ☐ Free Fall (allowed only when the interval to be sealed is dry and less than 30 feet in depth)
☐ Oil-lubricated pump. Any oil in the well will be removed and properly disposed of prior to destruction.

SETBACKS (in feet) ☐ All Setbacks Exceed 300 Feet Other Wells 7300' Leach Lines 7300' Septic Tank 7300'
Cesspool 7300' Seepage Pits 300' Sewer Lines 7300' Designated Sewage Replacement Area 7300'
Animal/Fowl Enclosure 50' Flood Control Basins 7300' Waste Water Disposal Ponds 100' Lakes, Streams 7300'

SPECIAL SUBDIVISION, TRACT RESTRICTIONS Tract Name, Number _____
☐ Setbacks (specify type, e.g. well-to-well, etc. and required distance) _____
☐ Designated Engineered Sewage Disposal Areas (enclose tract map showing designated areas on each parcel)

Fee Amount ☐ $344 ☐ $377 ☒ No Charge (Destructions, Monitoring Wells Only)
Payment Method ☐ Cash ☐ Check ☐ Credit Card*
*Authorization on file with the Business Office of the Fresno County Human Services System

I hereby certify that the information described herein is correct. I understand that all work is to be done in accordance with the California Well Standards Ordinance and the conditions of this permit application, including any conditions which are added by the Environmental Health System upon review of this application and issuance of the permit. I certify that I have a current C-57 Contractor's License and, if I employ workers, a current certificate of Workers' Compensation Insurance. I further understand that any permit issued pursuant to this application is subject to such further conditions as may be deemed necessary to ensure compliance with the Ordinance.

CONTRACTOR SIGNATURE: John Murray DATE: 3/21/03

Business Office Use

OFFICE USE ONLY
Permission is hereby granted to perform the work as set forth on this application.
Approved: JF Date: 3/21/03
Final Inspection: _____ Date: _____
Filed Complete: _____ Date: _____
Filed Incomplete: _____ Date: _____
Supervisor: _____

Envision Clerical Use

ORIGINAL
File with DWR

Page 1 of 1

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. 817711

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. MW-1
Date Work Began 03-26-03 Ended 03-26-03
Local Permit Agency DEPARTMENT OF COMMUNITY HEALTH, ENV HEALTH
Permit No. D-1409 Permit Date 03-21-03

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DRILLING METHOD Hollow Stem FLUID None

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0	4	Silty Sand, fine to med grained, olive brown
5	15	Mottled silty SAND, fine to med grained
15	20	Grayish brown silty SAND
20	25	Grayish brown silty SAND, fine to med grained
25	29	Gray SAND
29	33	Grayish brown silty CLAY, wet
33	50	Tan brown SAND, fine to med grained
50	72	Grayish brown SAND, fine to med. grained
72	75	Gray sandy SILT

TOTAL DEPTH OF BORING 75 (Feet)
TOTAL DEPTH OF COMPLETED WELL 73 (Feet)

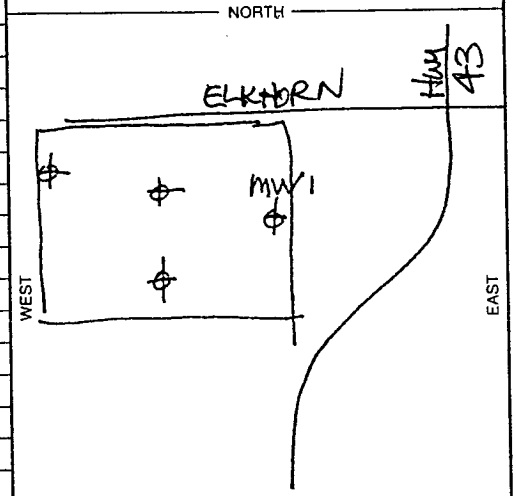
WELL OWNER

Name Dennis Visser
Mailing Address 8469 E. Elkhorn
CITY Selma STATE CA ZIP 93662

WELL LOCATION

Address 8469 E. Elkhorn
City Selma
County Fresno
APN Book 056 Page 030 Parcel 85
Township 17S Range 21E Section 6
Latitude 36 DEG. 29 MIN. 8 SEC. NORTH Longitude 119 DEG. 38 MIN. 8 SEC. WEST

LOCATION SKETCH



Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. ***PLEASE BE ACCURATE & COMPLETE.***

ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY *(Describe Procedures and Materials Under "GEOLOGIC LOG")*

PLANNED USES (✓)
WATER SUPPLY
___ Domestic ___ Public
___ Irrigation ___ Industrial
MONITORING ✓
TEST WELL ___
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 48 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL ___ (Ft.) & DATE MEASURED ___
ESTIMATED YIELD * ___ (GPM) & TEST TYPE ___
TEST LENGTH ___ (Hrs.) TOTAL DRAWDOWN ___ (Ft.)
** May not be representative of a well's long-term yield.*

CASING (S)

DEPTH FROM SURFACE Ft. to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
~~0 to 73~~	~~8"~~								n/a
0 to 43	8"	✓				40	2.0	.154 in.	n/a
43 to 73	8"		✓			40	2.0	.154 in.	.02

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft. to Ft.	TYPE: CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0 to 34	✓			
34 to 38		✓		
38 to 73				Lonestar #3

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analyses
___ Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME BSK Associates (PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
ADDRESS 1415 Tuolomne St., CITY Fresno STATE CA ZIP 93706
Signed [signature] WELL DRILLER/AUTHORIZED REPRESENTATIVE
DATE SIGNED 4-4-03
C-57 LICENSE NUMBER 490942

DWR 188 REV. 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

ORIGINAL
File with DWR

Page 1 of 1

Owner's Well No. MW2

Date Work Began 3-31-03 Ended 4-1-03

Local Permit Agency Dept of Community Health, Env Health

Permit No. D-1410 Permit Date 3-21-03

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. 817713

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)

DRILLING METHOD ___ FLUID ___

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0	6	Brown silty SAND, fine to med. grained
6	22	Grayish brown SAND, fine to med. grained
22	36.5	Olive brown and yellowish brown silty SAND, fine-med
36.5	75	Light gray to grayish brown SAND, fine to coarse

TOTAL DEPTH OF BORING 75 (Feet)

TOTAL DEPTH OF COMPLETED WELL 72 (Feet)

WELL OWNER

Name Dennis Visser

Mailing Address 8469 E. Elkhorn

City Selma State CA Zip 93662

WELL LOCATION

Address 8469 E Elkhorn

City Selma

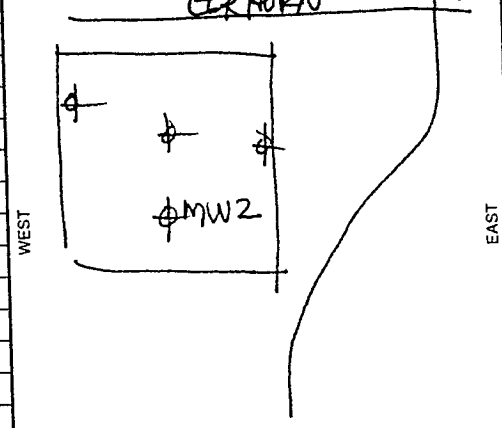
County Fresno

APN Book 056 Page 030 Parcel 8s

Township 17S Range 21E Section 6

Latitude 36 DEG. 28 MIN. 35 SEC. NORTH Longitude 119 DEG. 38 MIN. 27 SEC. WEST

LOCATION SKETCH



Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. ***PLEASE BE ACCURATE & COMPLETE.***

ACTIVITY (✓)

✓ NEW WELL

MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)

___ DESTROY (*Describe Procedures and Material Under "GEOLOGIC LOG"*)

PLANNED USES (✓)

WATER SUPPLY
___ Domestic ___ Public
___ Irrigation ___ Industrial

MONITORING ✓
TEST WELL ___
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 47 (Ft.) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL ___ (Ft.) & DATE MEASURED ___

ESTIMATED YIELD * ___ (GPM) & TEST TYPE ___

TEST LENGTH ___ (Hrs.) TOTAL DRAWDOWN ___ (Ft.)

* *May not be representative of a well's long-term yield.*

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	42	8	✓				40	2	.154 in.	N/A
42	72	8		✓			40	2	.154 in.	.102

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE: CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	38	✓			
38	37		✓		Sand Lonestar #[illegible]
37	75				

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analyses
___ Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME BSK Associates (PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

ADDRESS 1415 Tuolumne St., Fresno CA 93706 (CITY, STATE, ZIP)

Signed [signature] WELL DRILLER/AUTHORIZED REPRESENTATIVE

DATE SIGNED 4-4-06 C-57 LICENSE NUMBER 490942

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

ORIGINAL
File with DWR

Page 1 of 1

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. 817712

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. MW3
Date Work Began 4-1-03 Ended 4-1-03
Local Permit Agency Dept of Community Health, Env. Health
Permit No. D-1411 Permit Date 3-21-03

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DRILLING METHOD ___ FLUID ___

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0	2	Brown Sandy SILT,
2	9	Gray sandy SILT
9	31	Gray SAND, fine to med grained some coarse
31	54	Tan brown to olive brown silty SAND, fine to med grain
54	70	Light gray to gray SAND, fine to med. grained
70	75	Gray sandy CLAY

TOTAL DEPTH OF BORING 75 (Feet)
TOTAL DEPTH OF COMPLETED WELL 74.5 (Feet)

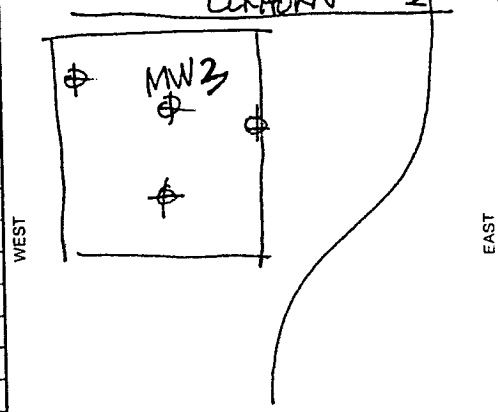
WELL OWNER

Name Dennis Visser
Mailing Address 8469 E. Elkhorn
CITY Selma STATE CA ZIP 93662

WELL LOCATION

Address 8469 E Elkhorn
City Selma
County Fresno
APN Book 056 Page 030 Parcel 85
Township 17S Range 21E Section 6
Latitude 36 DEG. 29 MIN 11 SEC. NORTH Longitude 119 DEG. 38 MIN 26 SEC. WEST

LOCATION SKETCH

NORTH


SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. ***PLEASE BE ACCURATE & COMPLETE.***

ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY *(Describe Procedures and Materials Under "GEOLOGIC LOG")*

PLANNED USES (✓)

WATER SUPPLY
___ Domestic ___ Public
___ Irrigation ___ Industrial
MONITORING ✓
TEST WELL ___
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 49 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL ___ (Ft.) & DATE MEASURED ___
ESTIMATED YIELD * ___ (GPM) & TEST TYPE ___
TEST LENGTH ___ (Hrs.) TOTAL DRAWDOWN ___ (Ft.)
** May not be representative of a well's long-term yield.*

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	44.5	8	✓				40	2	.154 in	N/a
44.5	74.5	8		✓			40	2	.154 in	.02

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BEN-TONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	35.5	✓			
35.5	39.5		✓		
39.5	75				SAND #3

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analyses
___ Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME BSK Associates (PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
ADDRESS 1415 Tuolumne St., CITY Fresno STATE CA ZIP 93706
Signed [signature] WELL DRILLER/AUTHORIZED REPRESENTATIVE
DATE SIGNED 4-4-03
C-57 LICENSE NUMBER 490942

DWR 188 REV. 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

ORIGINAL
File with DWR

Page 1 of 1

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. 817714

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. MW4
Date Work Began 4-2-03 Ended 4-2-03
Local Permit Agency Dept of Community Health, Env Health
Permit No. D-1412 Permit Date 3-21-03

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DRILLING METHOD ___ FLUID ___

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0	15	Olive brown silty SAND, fine to medium grained
15	75	Light gray to gray SAND, fine to med grained, some coarse grained

TOTAL DEPTH OF BORING 75 (Feet)
TOTAL DEPTH OF COMPLETED WELL 73 (Feet)

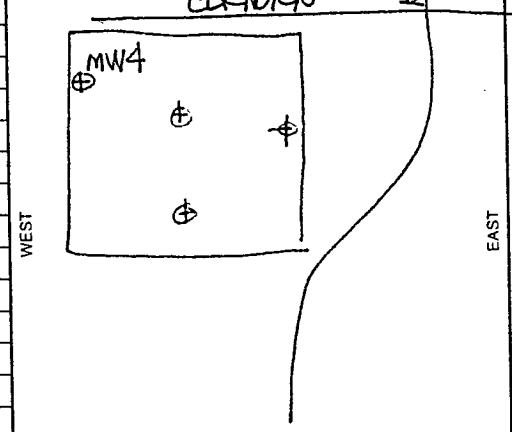
WELL OWNER

Name Dennis Visser
Mailing Address 8469 E Elkhorn
Selma CA 93662
CITY STATE ZIP

WELL LOCATION

Address 8469 E Elkhorn
City Selma
County Fresno
APN Book 056 Page 030 Parcel 85
Township 17S Range 21E Section 6
Latitude 36 DEG. 29 MIN. 15 SEC. NORTH Longitude 119 DEG. 38 MIN. 39 SEC. WEST

LOCATION SKETCH



Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. ***PLEASE BE ACCURATE & COMPLETE.***

ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY *(Describe Procedures and Materials Under "GEOLOGIC LOG")*

PLANNED USES (✓)

WATER SUPPLY
___ Domestic ___ Public
___ Irrigation ___ Industrial
MONITORING ✓
TEST WELL ___
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 49 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL ___ (Ft.) & DATE MEASURED ___
ESTIMATED YIELD * ___ (GPM) & TEST TYPE ___
TEST LENGTH ___ (Hrs.) TOTAL DRAWDOWN ___ (Ft.)
** May not be representative of a well's long-term yield.*

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	43	8	✓				40	2	.154	n/a
43	73	8		✓			40	2	.154	.02

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CE-MENT (✓)	BEN-TONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	32	✓			
32	36		✓		
36	73				SAND #3

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analyses
___ Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

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(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
ADDRESS 1415 Tuolomne St. CITY Fresno STATE CA ZIP 93706
Signed [signature] WELL DRILLER/AUTHORIZED REPRESENTATIVE
DATE SIGNED 4-4-03
C-57 LICENSE NUMBER 490942

DWR 188 REV. 11-97

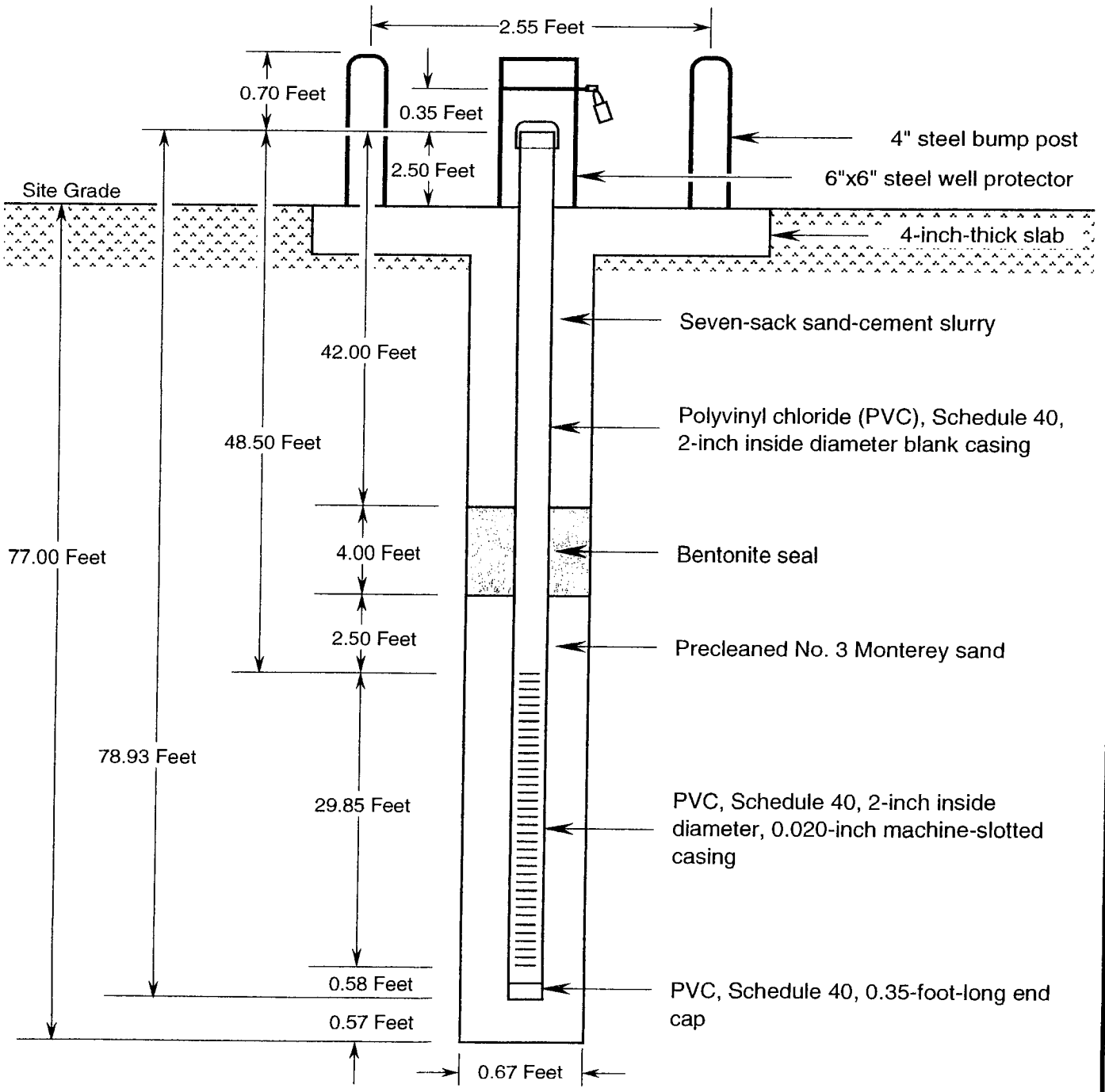
IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

SOJ

PROPOSED
MONITORING WELL MW1

Freitas View Holsteins Dairy
13019 South Clovis Avenue
Selma, California, 93662
Project Number 877-02

NOTES: Top of Casing Elevation:
Date of Installation: 2-26-02



Freitas View Holstiens Dairy
13019 South Clovis Avenue
Selma, CA 93662

Associated Soils Analysis, Inc.
1141 Batavia Court • Tulare, California 93274
Phone: (559) 688-1011 • Fax: (559) 688-1195

PROJECT: 877-02
DATE: 02/26/02
LOGGED BY: L. Young

BORING NO.: MW1

DEPTH	SAMPLE	BLOW COUNTS	FID READING	REC. IN FEET	SOIL GROUP	SOIL DESCRIPTION
0'						
5'		5 7 10		1.00	SW	WELL-GRADED SAND; light olive brown (2.5Y, 5/3); moist; medium-grained; nonplastic fines.
10'		10 8 12		1.00	SM	SILTY SAND; light yellowish brown (2.5Y, 6/3); moist; very fine-grained; 90 percent sand; 10 percent silt; nonplastic fines.
15'		5 8 10		1.00	SM	SILTY SAND; light brownish gray (2.5Y, 6/2); moist; very fine-grained; 90 percent sand; 10 percent silt; nonplastic fines.
20'		15 12 14		1.00	SP	POORLY-GRADED SAND; light brownish gray (2.5Y, 6/2); moist; very fine-grained; nonplastic fines.
25'		10 12 15		1.00	SM	SILTY SAND; olive (5Y, 5/3); moist; very fine-grained; 60 percent sand; 40 percent silt; nonplastic fines.
30'		10 18				

LOCATION: See Site Map
EQUIPMENT: Acker Soil Max truck-mounted drill rig equipped with 4.25-inch hollow-stem augers.
DRILLERS: Scott TenBroeck, driller; Scotty TenBroeck, driller's helper

Freitas View Holstiens Dairy
13019 South Clovis Avenue
Selma, CA 93662

Associated Soils Analysis, Inc.
1141 Batavia Court • Tulare, California 93274
Phone: (559) 688-1011 • Fax: (559) 688-1195

PROJECT: 877-02
DATE: 02/26/02
LOGGED BY: L. Young

BORING NO.: MW1

DEPTH	SAMPLE	BLOW COUNTS	FID READING	REC. IN FEET	SOIL GROUP	SOIL DESCRIPTION
30'		20		1.00	SM	SILTY SAND; light yellowish brown (2.5Y, 6/3); moist; very fine-grained; 55 percent sand; 45 percent silt; nonplastic fines.
35'		8 10 15		0.50	SP	POORLY-GRADED SAND; light brownish gray (2.5Y, 6/2); moist; fine-grained; nonplastic fines.
40'		6 10 10		1.50	SP	POORLY-GRADED SAND; light olive brown (2.5Y, 5/4); moist; fine-grained; 95 percent sand; 5 percent silt; nonplastic fines.
45'		7 8 10		1.50	SM	SILTY SAND; light olive brown (2.5Y, 5/3); saturated; very fine-grained; 85 percent sand; 15 percent silt; nonplastic fines; Middle .5 ft only, sand above and below
50'		8 15 20		1.50	SW	WELL-GRADED SAND; light olive brown (2.5Y, 5/3); moist; fine-grained; 95 percent sand; 5 percent silt; nonplastic fines.
▽ = 55'		8 10 10		1.50	SW	WELL-GRADED SAND; light olive brown (2.5Y, 5/3); moist; medium-grained; nonplastic fines.
60'						Not logged below 55 feet BSG.

LOCATION: See Site Map
EQUIPMENT: Acker Soil Max truck-mounted drill rig equipped with 4.25-inch hollow-stem augers.
DRILLERS: Scott TenBroeck, driller; Scotty TenBroeck, driller's helper

Freitas View Holstiens Dairy
13019 South Clovis Avenue
Selma, CA 93662

Associated Soils Analysis, Inc.
1141 Batavia Court • Tulare, California 93274
Phone: (559) 688-1011 • Fax: (559) 688-1195

PROJECT: 877-02
DATE: 02/26/02
LOGGED BY: L. Young

BORING NO.: MW1

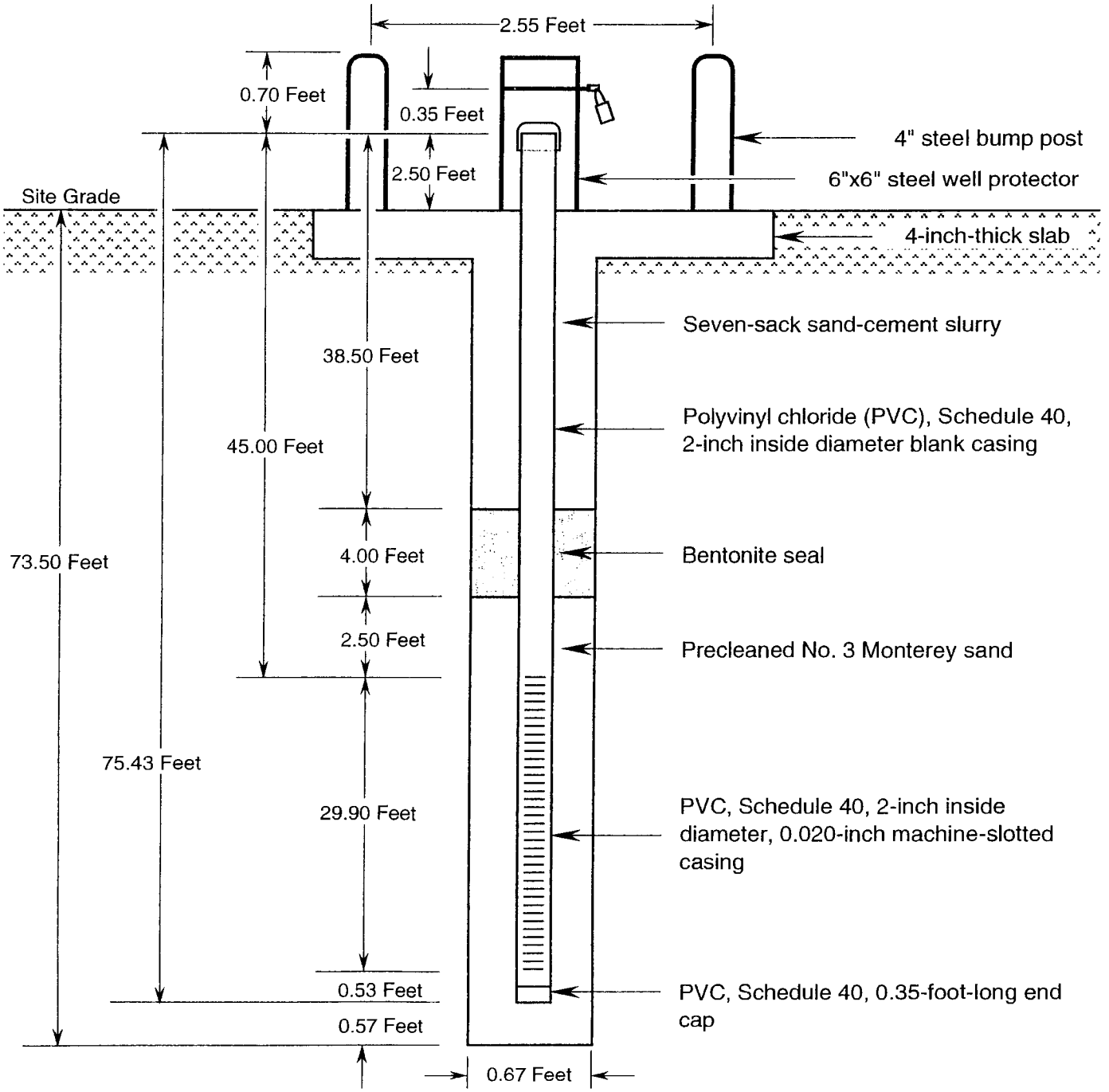
DEPTH	SAMPLE	BLOW COUNTS	FID READING	REC. IN FEET	SOIL GROUP	SOIL DESCRIPTION
60'						
65'						
70'						
						Bottom of boring approximately 74 feet BSG.
75'						
						Logged under the direct supervision of:
80'						
						Bartolome J. Racca, C57 License # 727748
85'						
90'						

LOCATION: See Site Map
EQUIPMENT: Acker Soil Max truck-mounted drill rig equipped with 4.25-inch hollow-stem augers.
DRILLERS: Scott TenBroeck, driller; Scotty TenBroeck, driller's helper

PROPOSED
MONITORING WELL MW2

Freitas View Holsteins Dairy
13019 South Clovis Avenue
Selma, California, 93662
Project Number 877-02

NOTES: Top of Casing Elevation:
Date of Installation: 2-28-02



Freitas View Holstiens Dairy
13019 South Clovis Avenue
Selma, CA 93662

Associated Soils Analysis, Inc.
1141 Batavia Court • Tulare, California 93274
Phone: (559) 688-1011 • Fax: (559) 688-1195

PROJECT: 877-02
DATE: 02/28/02
LOGGED BY: L Young

BORING NO.: MW2

DEPTH	SAMPLE	BLOW COUNTS	FID READING	REC. IN FEET	SOIL GROUP	SOIL DESCRIPTION
0'						
5'		10 10 10		1.50	SW	WELL-GRADED SAND; brown (10YR, 5/3); moist; medium-grained; 80 percent sand; 20 percent silt; nonplastic fines.
10'		5 10 14		1.50	ML	SILT; olive gray (5Y, 5/2); low moisture; very fine-grained; 5 percent sand; 95 percent silt; nonplastic fines.
15'		4 5 5		1.50	SM	SILTY SAND; pale yellow (2.5Y, 7/3); moist; fine-grained; 90 percent sand; 10 percent silt; nonplastic fines.
20'		4 7 8		1.50	SM	SILTY SAND; light olive brown (2.5Y, 5/3); low moisture; very fine-grained; 55 percent sand; 45 percent silt; nonplastic fines.
25'		6 6 6		1.50	SM	SILTY SAND; light brownish gray (2.5Y, 6/2); moist; very fine-grained; 80 percent sand; 20 percent silt; nonplastic fines.
30'		5 6				

LOCATION: See Site Map
EQUIPMENT: Acker Soil Max truck-mounted drill rig equipped with 4.25-inch hollow-stem augers.
DRILLERS: Scott TenBroeck, driller; Scotty TenBroeck, driller's helper

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Selma, CA 93662

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1141 Batavia Court • Tulare, California 93274
Phone: (559) 688-1011 • Fax: (559) 688-1195

PROJECT: 877-02
DATE: 02/28/02
LOGGED BY: L Young

BORING NO.: MW2

DEPTH	SAMPLE	BLOW COUNTS	FID READING	REC. IN FEET	SOIL GROUP	SOIL DESCRIPTION
30'	/	10		1.50	SW	WELL-GRADED SAND; light gray (10YR, 7/1); moist; medium-grained; 95 percent sand; 5 percent silt; nonplastic fines.
35'	/ / /	4 4 4		1.50	ML	SILT; light olive brown (2.5Y, 5/4); saturated; very fine-grained; 5 percent sand; 95 percent silt; nonplastic fines; Middle .5 ft only, sand above and below.
40'	/ / /	4 10 15		1.50	SW	WELL-GRADED SAND; light gray (2.5Y, 7/2); moist; medium-grained; 95 percent sand; 5 percent silt; nonplastic fines.
45'	/ / /	6 10 15		1.50	SW	WELL-GRADED SAND; light gray (2.5Y, 7/2); moist; medium-grained; 95 percent sand; 5 percent silt; nonplastic fines.
50'	/ / /	15 15 15		1.50	SW	WELL-GRADED SAND; light brownish gray (2.5Y, 6/2); moist; medium-grained; 95 percent sand; 5 percent silt; nonplastic fines.
∇ = 55'						Not logged below 50 feet BSG.
60'						

LOCATION: See Site Map
EQUIPMENT: Acker Soil Max truck-mounted drill rig equipped with 4.25-inch hollow-stem augers.
DRILLERS: Scott TenBroeck, driller; Scotty TenBroeck, driller's helper

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13019 South Clovis Avenue
Selma, CA 93662

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1141 Batavia Court • Tulare, California 93274
Phone: (559) 688-1011 • Fax: (559) 688-1195

PROJECT: 877-02
DATE: 02/28/02
LOGGED BY: L Young

BORING NO.: MW2

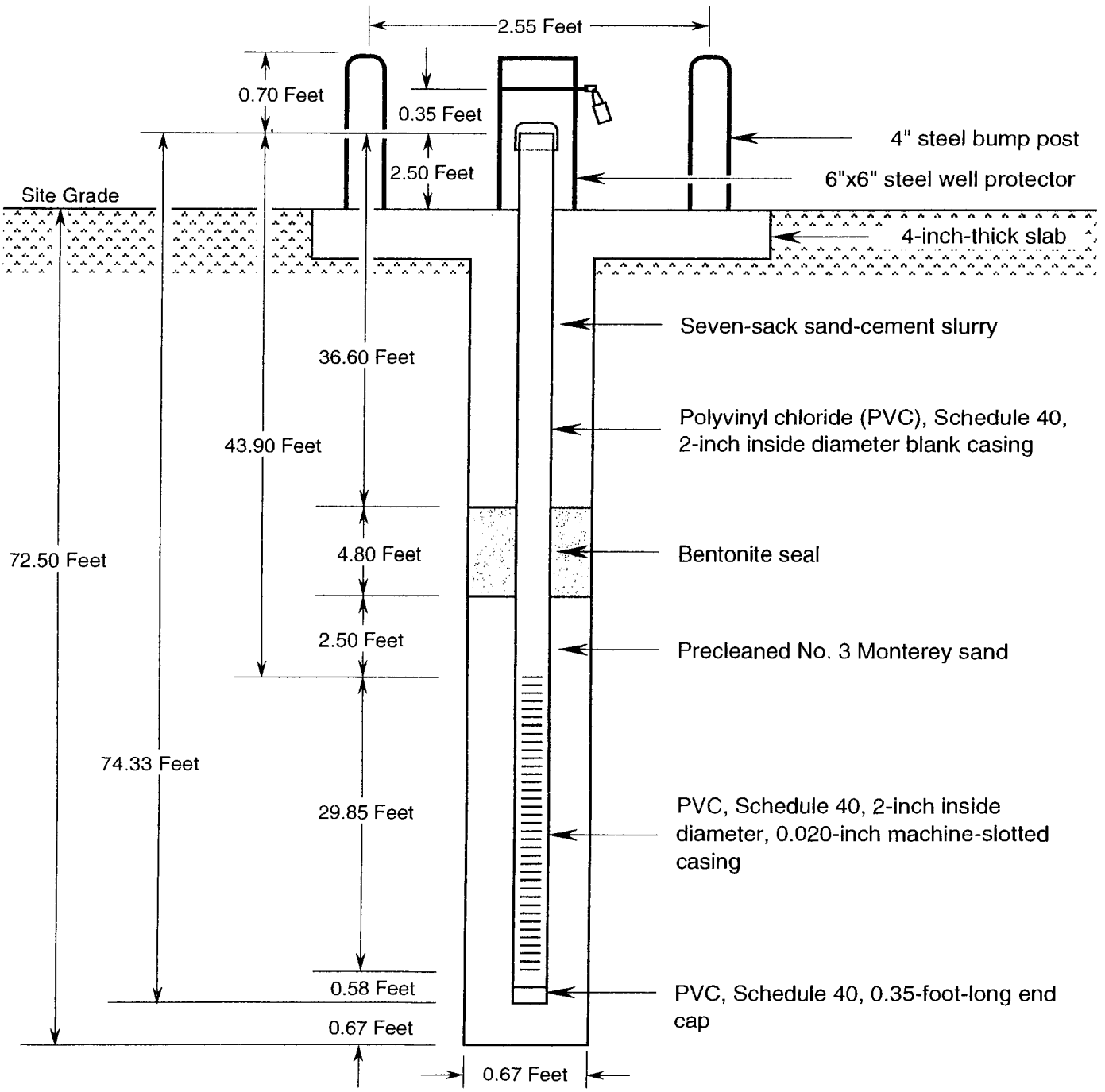
DEPTH	SAMPLE	BLOW COUNTS	FID READING	REC. IN FEET	SOIL GROUP	SOIL DESCRIPTION
60'						
65'						
70'						
						Bottom of boring approximatly 74 feet BSG.
75'						Logged under the direct supervision of:
80'						Bartalome J. Racca, CSF License #727748
85'						
90'						

LOCATION: See Site Map
EQUIPMENT: Acker Soil Max truck-mounted drill rig equipped with 4.25-inch hollow-stem augers.
DRILLERS: Scott TenBroeck, driller; Scotty TenBroeck, driller's helper

PROPOSED
MONITORING WELL MW3

Freitas View Holsteins Dairy
13019 South Clovis Avenue
Selma, California, 93662
Project Number 877-02

NOTES: Top of Casing Elevation:
Date of Installation: 2-27-02



Freitas View Holstiens Dairy
13019 South Clovis Avenue
Selma, CA 93662

Associated Soils Analysis, Inc.
1141 Batavia Court • Tulare, California 93274
Phone: (559) 688-1011 • Fax: (559) 688-1195

PROJECT: 877-02
DATE: 02/27/02
LOGGED BY: Jim Meier

BORING NO.: MW3

DEPTH	SAMPLE	BLOW COUNTS	FID READING	REC. IN FEET	SOIL GROUP	SOIL DESCRIPTION
0'						
5'	/	10 15 18		1.50	SW	WELL-GRADED SAND; brown (10YR, 4/3); moist; fine-grained; 95 percent sand; 5 percent silt; nonplastic fines.
10'	/	5 5 5		1.50	SW	WELL-GRADED SAND; brown (10YR, 4/3); moist; fine-grained; 5 percent sand; 95 percent silt; nonplastic fines.
15'	/	5 7 9		1.50	SW	WELL-GRADED SAND; brown (10YR, 5/3); moist; medium-grained; 95 percent sand; 5 percent silt; nonplastic fines.
20'	/	5 7 11		1.50	SM	SILTY SAND; light olive brown (2.5Y, 5/4); low moisture; very fine-grained; 55 percent sand; 45 percent silt; nonplastic fines.
25'	/	5 7 10		1.50	SM	SILTY SAND; light yellowish brown (2.5Y, 6/3); moist; very fine-grained; 75 percent sand; 25 percent silt; nonplastic fines.
30'	/	5 5				

LOCATION: See Site Map
EQUIPMENT: Acker Soil Max truck-mounted drill rig equipped with 4.25-inch hollow-stem augers.
DRILLERS: Scott TenBroeck, driller; Scotty TenBroeck, driller's helper

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PROJECT: 877-02
DATE: 02/27/02
LOGGED BY: Jim Meier

BORING NO.: MW3

DEPTH	SAMPLE	BLOW COUNTS	FID READING	REC. IN FEET	SOIL GROUP	SOIL DESCRIPTION
30'		9		1.50	SW	WELL-GRADED SAND; light olive brown (2.5Y, 5/6); moist; medium-grained; 90 percent sand; 10 percent silt; nonplastic fines.
35'		6 6 4		1.50	ML	SILT; olive (5Y, 5/3); saturated; very fine-grained; 5 percent sand; 95 percent silt; nonplastic fines; Middle .5 ft only, sand above and sandy-silt below.
40'		5 10 12		1.50	ML	SANDY SILT; pale olive (5Y, 6/4); moist; very fine-grained; 85 percent sand; 15 percent silt; nonplastic fines.
45'		4 10 10		1.50	SW	WELL-GRADED SAND; light yellowish brown (2.5Y, 6/3); moist; medium-grained; 95 percent sand; 5 percent silt; nonplastic fines.
50'		3 5 10		1.50	SW	WELL-GRADED SAND; light yellowish brown (2.5Y, 6/3); saturated; medium-grained; 95 percent sand; 5 percent silt; nonplastic fines.
∇ = 55'						Not logged below 50 feet BSG.
60'						

LOCATION: See Site Map
EQUIPMENT: Acker Soil Max truck-mounted drill rig equipped with 4.25-inch hollow-stem augers.
DRILLERS: Scott TenBroeck, driller; Scotty TenBroeck, driller's helper

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PROJECT: 877-02
DATE: 02/27/02
LOGGED BY: Jim Meier

BORING NO.: MW3

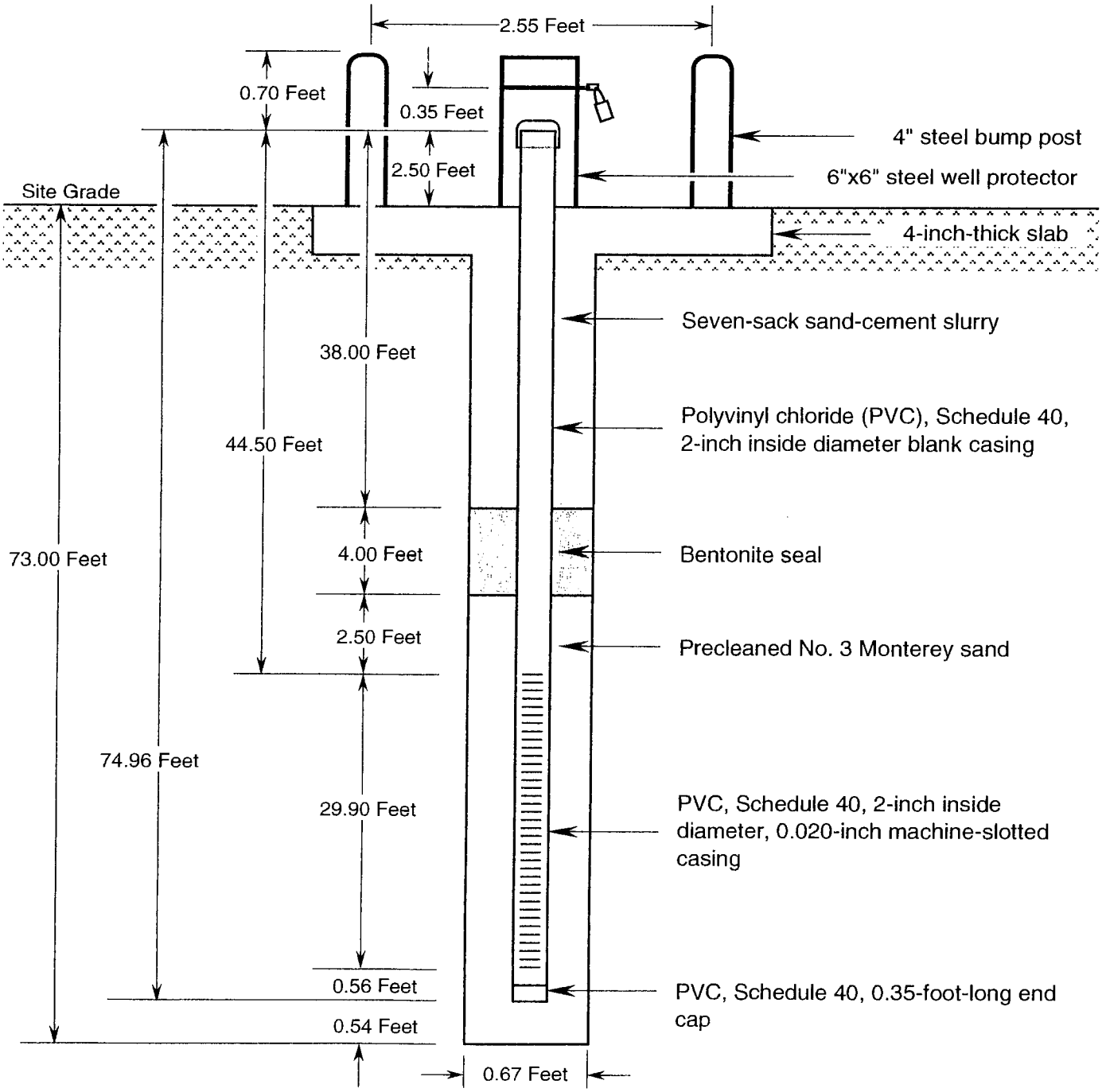
DEPTH	SAMPLE	BLOW COUNTS	FID READING	REC. IN FEET	SOIL GROUP	SOIL DESCRIPTION
60'						
65'						
70'						
						Bottom of boring approximatly 74 feet BSG.
75'						
						Logged under the direct supervision of:
80'						
85'						Bartolome J. Racca, C57 License #727748
90'						

LOCATION: See Site Map
EQUIPMENT: Acker Soil Max truck-mounted drill rig equipped with 4.25-inch hollow-stem augers.
DRILLERS: Scott TenBroeck, driller; Scotty TenBroeck, driller's helper

PROPOSED
MONITORING WELL MW4

Freitas View Holsteins Dairy
13019 South Clovis Avenue
Selma, California, 93662
Project Number 877-02

NOTES: Top of Casing Elevation:
Date of Installation: 2-27-02



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1141 Batavia Court • Tulare, California 93274
Phone: (559) 688-1011 • Fax: (559) 688-1195

PROJECT: 877-02
DATE: 02/27/02
LOGGED BY: Jim Meier

BORING NO.: MW4

DEPTH	SAMPLE	BLOW COUNTS	FID READING	REC. IN FEET	SOIL GROUP	SOIL DESCRIPTION
0'						
5'		15 15 15		1.50	ML	SILT; gray (10YR, 6/1); moist; very fine-grained; 5 percent sand; 95 percent silt; nonplastic fines.
10'		5 8 9		1.50	SP	POORLY-GRADED SAND; light brownish gray (10YR, 6/2); moist; very fine-grained; 95 percent sand; 5 percent silt; nonplastic fines.
15'		4 4 8		1.50	SP	POORLY-GRADED SAND; brownish yellow (10YR, 6/8); moist; medium-grained; 95 percent sand; 5 percent silt; nonplastic fines.
20'		5 10 15		1.50	ML	SILT; gray (10YR, 6/1); moist; very fine-grained; 5 percent sand; 95 percent silt; nonplastic fines; Middle .5 ft only, sand above and below.
25'		7 10 10		1.50	SW	WELL-GRADED SAND; gray (10YR, 5/1); moist; fine-grained; 95 percent sand; 5 percent silt; nonplastic fines.
30'		10 15				

LOCATION: See Site Map
EQUIPMENT: Acker Soil Max truck-mounted drill rig equipped with 4.25-inch hollow-stem augers.
DRILLERS: Scott TenBroeck, driller; Scotty TenBroeck, driller's helper

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PROJECT: 877-02
DATE: 02/27/02
LOGGED BY: Jim Meier

BORING NO.: MW4

DEPTH	SAMPLE	BLOW COUNTS	FID READING	REC. IN FEET	SOIL GROUP	SOIL DESCRIPTION
30'	/	18		1.50	SM	SILTY SAND; dark yellowish brown (10YR, 4/6); moist; medium-grained; 70 percent sand; 30 percent silt; nonplastic fines.
35'	/ / /	5 7 7		1.50	ML	SILT; gray (10YR, 5/1); moist; very fine-grained; 5 percent sand; 95 percent silt; nonplastic fines.
40'	/ / /	7 8 9		1.50	SP	POORLY-GRADED SAND; very pale brown (10YR, 8/2); moist; fine-grained; 95 percent sand; 5 percent silt; nonplastic fines.
45'	/ / /	5 10 15		1.50	SP	POORLY-GRADED SAND; very pale brown (10YR, 8/2); moist; fine-grained; 95 percent sand; 5 percent silt; nonplastic fines.
50'	/ / /	5 8 10		1.50	SP	POORLY-GRADED SAND; light gray (10YR, 7/1); moist; medium-grained; 95 percent sand; 5 percent silt; nonplastic fines.
∇ =						Not logged below 50 feet BSG.
55'						
60'						

LOCATION: See Site Map
EQUIPMENT: Acker Soil Max truck-mounted drill rig equipped with 4.25-inch hollow-stem augers.
DRILLERS: Scott TenBroeck, driller; Scotty TenBroeck, driller's helper

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PROJECT: 877-02
DATE: 02/27/02
LOGGED BY: Jim Meier

BORING NO.: MW4

DEPTH	SAMPLE	BLOW COUNTS	FID READING	REC. IN FEET	SOIL GROUP	SOIL DESCRIPTION
60'						
65'						
70'						
75'						Bottom of boring approximatly 75 feet BSG.
80'						Logged under the direct supervision of:
85'						Bartalome J. Racca, C57 License #727748
90'						

LOCATION: See Site Map
EQUIPMENT: Acker Soil Max truck-mounted drill rig equipped with 4.25-inch hollow-stem augers.
DRILLERS: Scott TenBroeck, driller; Scotty TenBroeck, driller's helper

ORIGINAL
File with DWR
Page 1 of 1
Owner's Well No. MW1 - MW4
Date Work Began 2/19/02, Ended 2/22/02
Local Permit Agency County Environmental Health Dept.
Permit No. N/A Permit Date

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. 764465

DWR USE ONLY - DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) X VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DEPTH TO FIRST WATER ___ (Ft.) BELOW SURFACE

DEPTH FROM SURFACE Ft. to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0 75	Silty Sand, lt brn, moist-saturated, fine-med grain non-cemented

TOTAL DEPTH OF BORING 56.5 (Feet)
TOTAL DEPTH OF COMPLETED WELL 0 (Feet)

WELL OWNER
Name Mr. Carlos Freitas
Mailing Address 13019 South Clovis Avenue
Selma California 93662
CITY STATE ZIP

WELL LOCATION
Address 13019 South Clovis Avenue
City Selma
County 0
APN Book ___ Page ___ Parcel ___
Township ___ Range ___ Section ___
Latitude ___ DEG MIN. SEC. NORTH Longitude ___ DEG. MIN. SEC. ST

LOCATION SKETCH
NORTH
WEST See Attachments EAST
SOUTH
Illustrate or Describe Distance of Well from Landmarks such as Roads, Buildings, Fences, Rivers, etc.
PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)
___ NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY *(Describe Procedures and Materials Under "GEOLOGIC LOG")*

PLANNED USE (S) (✓)
___ MONITORING
WATER SUPPLY
___ Domestic
___ Public
___ Irrigation
___ Industrial
___ "TEST WELL"
___ CATHODIC PROTECTION
X OTHER Soil boring

DRILLING METHOD Hollow-stem Auger FLUID N/A

WATER LEVEL & YIELD OF COMPLETED WELL
DEPTH OF STATIC WATER LEVEL 51 Feet BSG (Ft.) & DATE MEASURED 3/5/02
ESTIMATED YIELD* N/A (GPM) & TEST TYPE N/A
TEST LENGTH N/A (Hrs.) TOTAL DRAWDOWN N/A (Ft.)
** May not be representative of a well's long-term yield.*

CASING(S)

DEPTH FROM SURFACE Ft. to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL/ GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
See Attachments									

ANNUALAR MATERIAL

DEPTH FROM SURFACE Ft. to Ft.	TYPE* CE-MENT (✓)	BEN-TONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)

ATTACHMENTS (✓)
X Geologic Log
X Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analyses
X Other site plan
ATTACH ADDITIONAL INFORMATION IF IT EXISTS.

CERTIFICATION STATEMENT
I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME SOILPROBE
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
1141 EAST BATAVIA COURT, TULARE, CA, 93274
ADDRESS CITY STATE ZIP
Signed [signature]
WELL DRILLER/AUTHORIZED REPRESENTATIVE
DATE SIGNED 03/06/02
C-57 LICENSE NUMBER 727748

DWR 188 REV. 7-90
IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

Associated Soils Analysis, Inc.
1141 Batavia Court • Tulare, California 93274
(559) 688-1011 • FAX (559) 688-1195

MONITORING WELL DEVELOPMENT RECORD

Location: Freitas View Holsteins Dairy, 13019 S. Clovis Ave., Selma Project No. 877-02					
Sampler Name: Mr. Elias Flores				Date: March 4, 2002	
Sample Location	MW1	MW2	MW3	MW4	
Wellhead Elevation (feet)	NA	NA	NA	NA	
Casing Diameter (inches)	2	2	2	2	
Slotted Casing Interval (feet)	48.50-78.35	44.50-74.40	43.90-73.75	44.50-74.40	
Depth to Groundwater (feet)	59.18	ND	51.78	53.96	
Relative Groundwater Elev.	NA	ND	NA	NA	
Well Sounding Depth (feet)	74.21	ND	58.92	73.00	
Well Volumes (gallons)	2.57	ND	1.22	3.25	
First Well Volume Purged					
Time	1:40 PM	ND	2:55 PM	4:00 PM	
Product Sheen	No	ND	No	No	
Detectable Odor	No	ND	No	No	
Product Thickness (feet)	0.00	ND	0.00	0.00	
Product Removed (gallons)	0.00	ND	0.00	0.00	
Temperature (°F)	78.1	ND	73.0	70.0	
pH	6.63	ND	6.76	6.69	
Electrical Conductivity	710	ND	640	840	
Volume Removed (gallons)	7.17	ND	4.50	6.58	
Second Well Volume Purged					
Time	1:50 PM	ND	3:00 PM	4:20 PM	
Temperature (°F)	70.7	ND	68.3	66.4	
pH	6.78	ND	6.97	7.09	
Electrical Conductivity (EC)	530	ND	600	810	
Volume Removed (gallons)	7.17	ND	4.50	6.58	
Third Well Volume Purged					
Time	2:00 PM	ND	3:05 PM	4:40 PM	
Temperature (°F)	68.9	ND	67.9	66.2	
pH	7.00	ND	6.78	6.80	
Electrical Conductivity (EC)	520	ND	590	830	
Volume Removed (gallons)	7.17	ND	4.50	6.58	
Sample Time	NS	ND	NS	NS	
Purging System Used: Electric bailer					
NA = Not available					
ND = Not developed					
NS = Not sampled					
Barrels on Site:	Soil:	Water:	Full:	Empty:	

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MONITORING WELL DEVELOPMENT RECORD

Location: Freitas View Holsteins Dairy, 13019 S. Clovis Ave., Selma Project No. 877-02
Sampler Name: Mr. Elias Flores Date: March 5, 2002

Sample Location	MW1	MW2	MW3	MW4	
Wellhead Elevation (feet)	NA	NA	NA	NA	
Casing Diameter (inches)	2	2	2	2	
Slotted Casing Interval (feet)	48.50-78.35	44.50-74.40	43.90-73.75	44.50-74.40	
Depth to Groundwater (feet)	ND	55.25	ND	ND	
Relative Groundwater Elev.	ND	NA	ND	ND	
Well Sounding Depth (feet)	ND	74.43	ND	ND	
Well Volumes (gallons)	ND	3.27	ND	ND	
First Well Volume Purged					
Time	ND	9:25 AM	ND	ND	
Product Sheen	ND	No	ND	ND	
Detectable Odor	ND	No	ND	ND	
Product Thickness (feet)	ND	0.00	ND	ND	
Product Removed (gallons)	ND	0.00	ND	ND	
Temperature (°F)	ND	68.8	ND	ND	
pH	ND	7.70	ND	ND	
Electrical Conductivity	ND	580	ND	ND	
Volume Removed (gallons)	ND	7.25	ND	ND	
Second Well Volume Purged					
Time	ND	9:40 AM	ND	ND	
Temperature (°F)	ND	67.1	ND	ND	
pH	ND	7.60	ND	ND	
Electrical Conductivity (EC)	ND	510	ND	ND	
Volume Removed (gallons)	ND	7.25	ND	ND	
Third Well Volume Purged					
Time	ND	9:55 AM	ND	ND	
Temperature (°F)	ND	67.9	ND	ND	
pH	ND	7.46	ND	ND	
Electrical Conductivity (EC)	ND	540	ND	ND	
Volume Removed (gallons)	ND	7.25	13.25	ND	
Sample Time	ND	NS	ND	ND	

Purging System Used: Electric bailer
NA = Not available
ND = Not developed
NS = Not sampled
Note: Additional groundwater was purged from monitoring well MW3 because of the apparent depth to the bottom of the well measured on March 4, 2002.

Barrels on Site:	Soil:	Water:	Full:	Empty:	

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MONITORING WELL DEVELOPMENT RECORD

Location: Freitas View Holsteins Dairy, 13019 S. Clovis Ave., Selma Project No. 877-02
Sampler Name: Mr. Elias Flores Date: March 4, 2002

Sample Location	MW1	MW2	MW3	MW4	
Wellhead Elevation (feet)	NA	NA	NA	NA	
Casing Diameter (inches)	2	2	2	2	
Slotted Casing Interval (feet)	48.50-78.35	44.50-74.40	43.90-73.75	44.50-74.40	
Depth to Groundwater (feet)	59.18	ND	51.78	53.96	
Relative Groundwater Elev.	NA	ND	NA	NA	
Well Sounding Depth (feet)	74.21	ND	58.92	73.00	
Well Volumes (gallons)	2.57	ND	1.22	3.25	
First Well Volume Purged					
Time	1:40 PM	ND	2:55 PM	4:00 PM	
Product Sheen	No	ND	No	No	
Detectable Odor	No	ND	No	No	
Product Thickness (feet)	0.00	ND	0.00	0.00	
Product Removed (gallons)	0.00	ND	0.00	0.00	
Temperature (°F)	78.1	ND	73.0	70.0	
pH	6.63	ND	6.76	6.69	
Electrical Conductivity	710	ND	640	840	
Volume Removed (gallons)	7.17	ND	4.50	6.58	
Second Well Volume Purged					
Time	1:50 PM	ND	3:00 PM	4:20 PM	
Temperature (°F)	70.7	ND	68.3	66.4	
pH	6.78	ND	6.97	7.09	
Electrical Conductivity (EC)	530	ND	600	810	
Volume Removed (gallons)	7.17	ND	4.50	6.58	
Third Well Volume Purged					
Time	2:00 PM	ND	3:05 PM	4:40 PM	
Temperature (°F)	68.9	ND	67.9	66.2	
pH	7.00	ND	6.78	6.80	
Electrical Conductivity (EC)	520	ND	590	830	
Volume Removed (gallons)	7.17	ND	4.50	6.58	
Sample Time	NS	ND	NS	NS	

Purging System Used: Electric bailer
NA = Not available
ND = Not developed
NS = Not sampled

Barrels on Site:	Soil:	Water:	Full:	Empty:	

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MONITORING WELL DEVELOPMENT RECORD

Location: Freitas View Holsteins Dairy, 13019 S. Clovis Ave., Selma Project No. 877-02
Sampler Name: Mr. Elias Flores Date: March 5, 2002

Sample Location	MW1	MW2	MW3	MW4	
Wellhead Elevation (feet)	NA	NA	NA	NA	
Casing Diameter (inches)	2	2	2	2	
Slotted Casing Interval (feet)	48.50-78.35	44.50-74.40	43.90-73.75	44.50-74.40	
Depth to Groundwater (feet)	ND	55.25	ND	ND	
Relative Groundwater Elev.	ND	NA	ND	ND	
Well Sounding Depth (feet)	ND	74.43	ND	ND	
Well Volumes (gallons)	ND	3.27	ND	ND	
First Well Volume Purged					
Time	ND	9:25 AM	ND	ND	
Product Sheen	ND	No	ND	ND	
Detectable Odor	ND	No	ND	ND	
Product Thickness (feet)	ND	0.00	ND	ND	
Product Removed (gallons)	ND	0.00	ND	ND	
Temperature (°F)	ND	68.8	ND	ND	
pH	ND	7.70	ND	ND	
Electrical Conductivity	ND	580	ND	ND	
Volume Removed (gallons)	ND	7.25	ND	ND	
Second Well Volume Purged					
Time	ND	9:40 AM	ND	ND	
Temperature (°F)	ND	67.1	ND	ND	
pH	ND	7.60	ND	ND	
Electrical Conductivity (EC)	ND	510	ND	ND	
Volume Removed (gallons)	ND	7.25	ND	ND	
Third Well Volume Purged					
Time	ND	9:55 AM	ND	ND	
Temperature (°F)	ND	67.9	ND	ND	
pH	ND	7.46	ND	ND	
Electrical Conductivity (EC)	ND	540	ND	ND	
Volume Removed (gallons)	ND	7.25	13.25	ND	
Sample Time	ND	NS	ND	ND	

Purging System Used: Electric bailer
NA = Not available
ND = Not developed
NS = Not sampled
Note: Additional groundwater was purged from monitoring well MW3 because of the apparent depth to the bottom of the well measured on March 4, 2002.

Barrels on Site:	Soil:	Water:	Full:	Empty:	

RECEIVED
JUL 08 2011
RWQCB-CVR
FRESNO, CALIF.

2010 Monitoring Well Sampling & Analyses Report

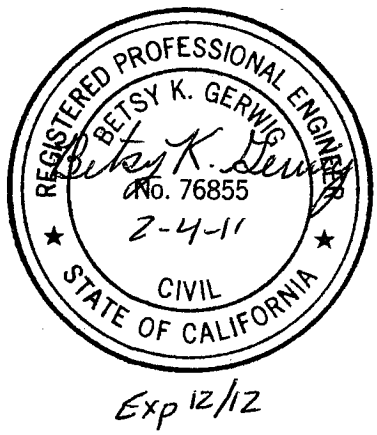
for

Sozinho Jerseys

(Formerly Freitas View Holsteins Dairy)
13259 S. Clovis Avenue
Selma, California 93662
(Fresno County)

Report Date: January 2011

Prepared By:
JMLord, Inc.
Agricultural Scientists
Consulting Engineers
267 N. Fulton
Fresno, CA 93701



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Annual Sampling & Analyses

On April 5, 2010 and December 13, 2010, JMLord, Inc. staff visited the Sozinho Jerseys (formerly Freitas View Holsteins Dairy) for the purpose of collecting water samples from four groundwater monitoring wells for analyses to be performed by BSK Analytical Laboratories, an ELAP laboratory.

In 2010, all four monitoring wells were dry during both sampling events. Thus, no water level was recorded. The groundwater elevation could not be determined for each well, as summarized in Table 1. Also, no water samples were collected for analysis.

Sampling Protocol

Depth to Groundwater

The depth to first-encountered groundwater in each monitoring well is measured by using a Powers Well Sounder. The wellhead casing elevation has been established at a point on the north side of the wellhead casing. The bottom of the well is determined by sounding the well. This data is recorded on the Monitoring Well Sampling Record form.

Once the depth of the groundwater and the depth to the bottom of each well are established, well volume calculations are made. Well volumes are determined using the following formula:

Water column in feet x 0.1632 (2.0 inch "ID" diameter well casing) = One well volume in gallons. A minimum of three well volumes are removed prior to taking a final sample.

Sampling Methods

Well casing volumes are removed by using an EnviroTech submersible pump with a 3/8" tubing line. A minimum of 1 gallon is purged from the pump before collecting any well volumes or samples to remove water left in the tubing line after cleaning. The pump is allowed to run continuously between well volumes. After sampling a well, the pump is placed in fresh water and run to clean the pump and tubing line. Approximately 1-2 gallons is used for this task. After all sampling is completed, the pump and tubing is rinsed with fresh water.

SAMPLE COLLECTION

A minimum of three well volumes are purged from each monitoring well before any samples are collected. As each well volume is purged; pH, electrical conductivity (EC), and temperature are measured using an Oakton pH/conductivity meter. The meter is rinsed with de-ionized water after each reading is taken. All readings are recorded on the Monitoring Well Sampling Record form.

Well Purging continues until a minimum of three well volumes are removed and pH, EC and temperature have stabilized within 10 percent of the previous recordings. The well is sampled when the groundwater surface recovers to approximately 90 percent of the original depth. When the final sample is taken, pH, EC and temperature are recorded. During the removal of groundwater, observations for odor or other notable characteristics are recorded. All readings and notes are recorded on the Monitoring Well Sampling Record form for each sample taken.

All samples are collected in containers provided by a certified laboratory under the Environmental Laboratory Accreditation Program (ELAP). Sample containers are labeled in the field. Sample labels contain the well number, project name, date, and time. Samples are immediately placed in a pre-cooled storage chest maintained between 32 and 36 degrees Fahrenheit. Chain-of-custody records show sampling date and time, sample identification name or number, project name and address, name of sampler and requested analysis.

DOCUMENTATION AND REPORTING

All sampling notes for each monitoring well are recorded on the Monitoring Well Sampling Record form.

An annual sampling and analysis report is prepared and submitted to the California Regional Water Quality Control Board. The report includes field records, laboratory analysis, and a groundwater flow map (if produced) for the current year and an overall summary of laboratory analyses with graphs from previous events.

RESULTS

The depth to groundwater in each monitoring well was measured during each sampling event. In 2010, all four monitoring wells were dry during each sampling event. Thus, no water level was recorded. The groundwater elevation could not be determined for each well, as summarized in Table 1.

Groundwater flow direction is typically determined by using a three point solution method as defined in the Water Well Journal, February 2003 as published by the NGWA. A minimum of three water level readings is necessary to determine the groundwater flow direction. The direction of groundwater flow and gradient could not be determined as all monitoring wells were dry during both sampling events in 2010.

Table 1: 2010 Monitoring Well Groundwater Elevation Summary

Monitoring Well ID	Measuring Point Elevation (ft)	Spring 2010 Groundwater Elevation (ft)	Fall 2010 Groundwater Elevation (ft)
MW-1	284.45	Dry*	Dry
MW-2	278.47	Dry	Dry
MW-3	275.51	Dry	Dry
MW-4	275.55	Dry	Dry

*Dry = Monitoring well was dry, no water in well casing. Groundwater elevation was at or below the bottom of the monitoring well. Groundwater elevation could not be determined because two or more wells were dry.

Since all monitoring wells were dry in April and December, no samples were collected from the four wells. Attachment A contains the field records of all measurements taken during each sampling event and a site map with the monitoring well locations.

ANALYSIS SUMMARY

Table 2 a summary of the semi-annual groundwater elevations from 2006-2010 at the Freitas View Holsteins Dairy. A graph of the groundwater elevation follows the tables. Table 3 is a summary of the laboratory results from 2006-2010 for the four monitoring wells, including a domestic well and wastewater sampled previously. Some constituents are no longer analyzed and others are only periodically analyzed. Graphs of the four constituents, EC, NO_3, Ammonia, and pH, which have been continuously analyzed in the four monitoring wells, follow these tables.

Table 2: Groundwater Elevation Summary (2006-2010)

Monitoring Well ID	Groundwater Elevation (ft)									
	5/12/2006	11/7/2006	4/4/2007	1/14/2008	4/10/2008	12/11/2008	3/18/2009	12/23/2009	4/5/2010	12/13/2010
MW-1	216.45	221.9	222.50	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW-2	213.37	217.4	218.70	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW-3	215.31	221.4	220.28	209.0	Dry	Dry	Dry	Dry	Dry	Dry
MW-4	211.75	216.2	216.63	206.5	Dry	Dry	Dry	Dry	Dry	Dry
Flow Direction & Gradient	SW Gradient = 0.0034	SSW Gradient = 0.0048	SW Gradient = 0.00353	NA*	NA*	NA*	NA*	NA*	NA*	NA*

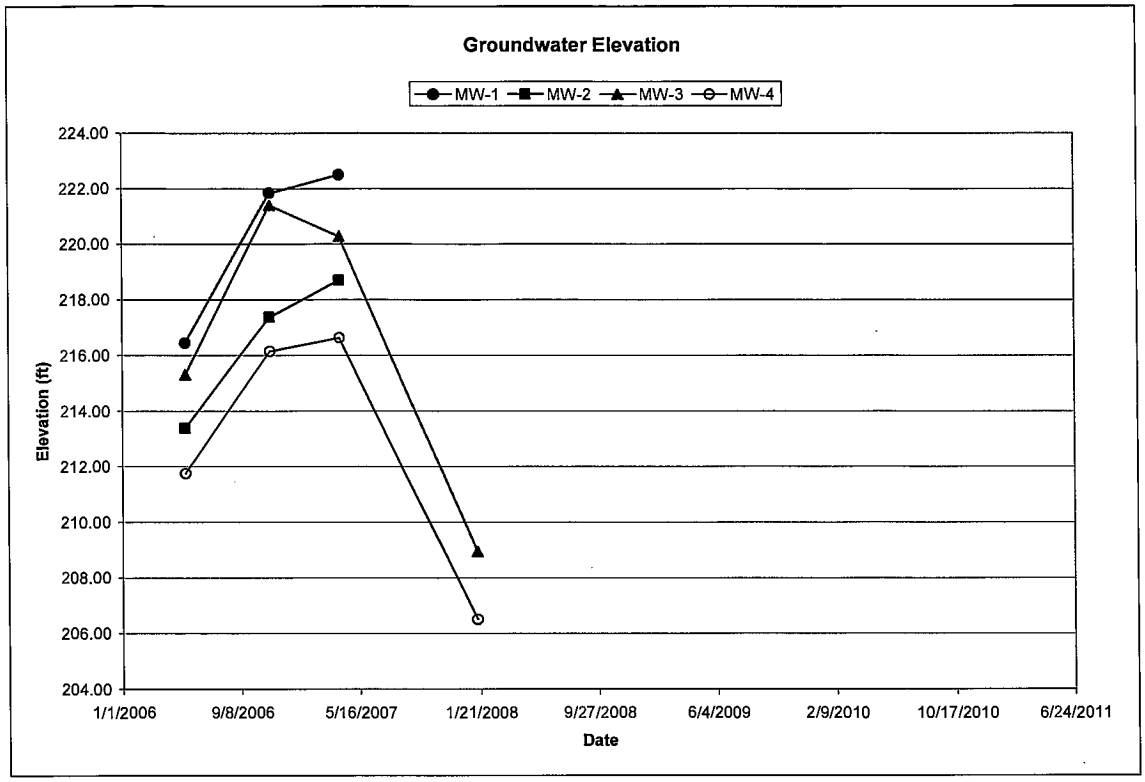
Dry = No measurable water level in well. Water level was at or below the bottom of the well.
*At least two monitoring wells were dry. Groundwater elevation could not be determined. Thus, groundwater flow direction could not be established.

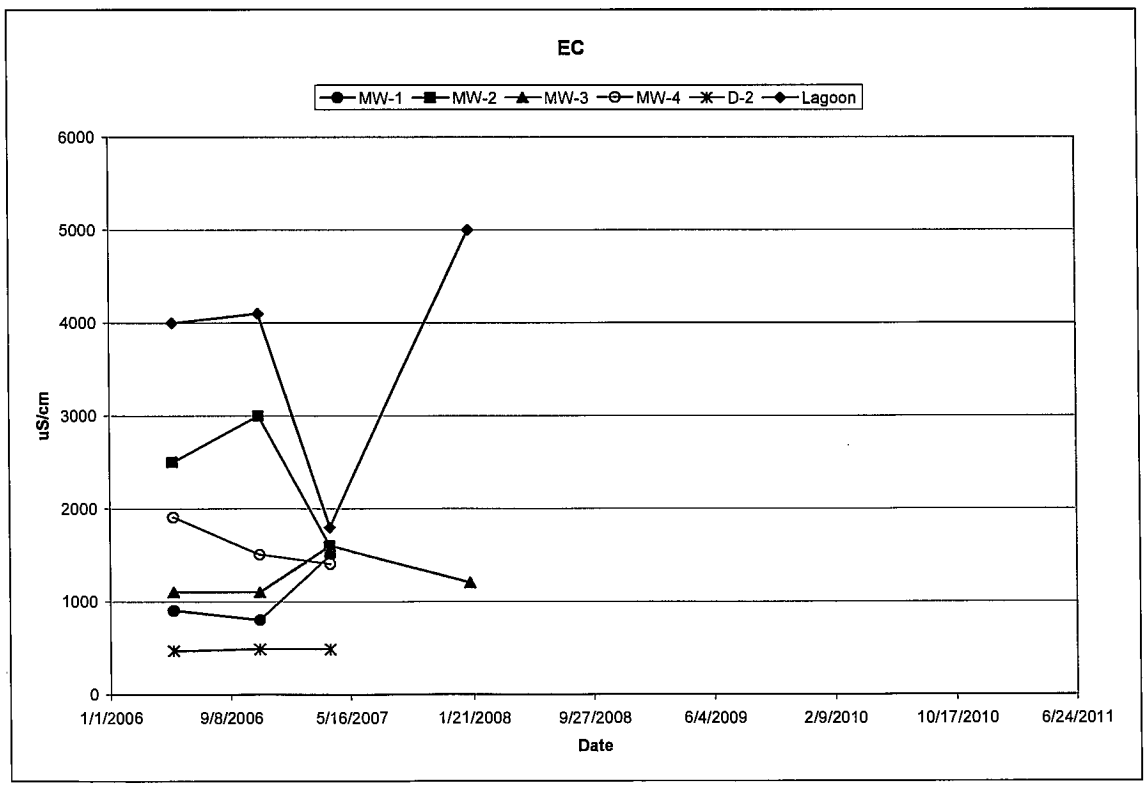
Table 5: All Constituent Analysis from 2006-2010

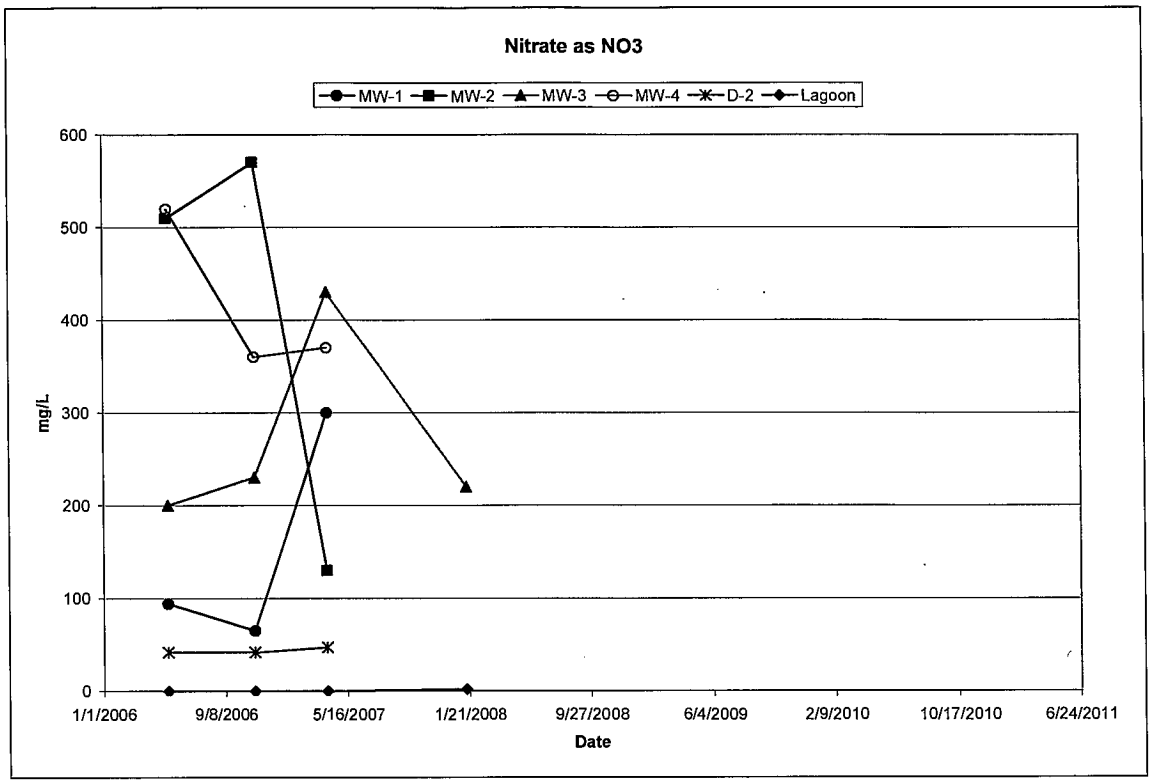
Well	Date	EC (µS/cm)	NO_3 (mg/L)	Ammonia (mg/L)	pH	Bicarbonate Alkalinity (mg/L)	Carbonate Alkalinity (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Ca (mg/L)	Mg (mg/L)	Na (mg/L)	NO_2 (mg/L)	TKN (mg/L)	TDS (mg/L)	Total Alkalinity (mg/L)	Fe (mg/L)	Mn (mg/L)	K (mg/L)
MW-1	5/12/2006	900	94	ND	7.1	410	ND	67	23	120	25	58	ND	1.6	670	340	ND	ND	5.8
MW-1	11/7/2006	800	65	ND	7.2	440	ND	49	18	100	24	65	ND	1.7	580	360	ND	ND	5.4
MW-1	4/4/2007	1500	300	ND	7.2	420	ND	170	57	200	47	79	ND	1.4	1100	350	ND	ND	8.4
MW-1	1/14/2008	Monitoring Well #1 was dry during these events. No samples were collected.																	
MW-1	4/10/2008																		
MW-1	12/11/2008																		
MW-1	3/18/2009																		
MW-1	12/23/2009																		
MW-1	4/5/2010																		
MW-1	12/13/2010																		
MW-2	5/12/2006	2500	510	ND	6.6	950	ND	53	140	350	97	110	ND	4.6	1800	780	ND	ND	11
MW-2	11/7/2006	3000	570	ND	6.9	1200	ND	54	190	410	120	150	ND	7.8	2200	990	ND	0.05	11
MW-2	4/4/2007	1600	130	ND	6.8	810	ND	48	88	200	68	98	ND	2.6	1000	670	ND	0.056	9.6
MW-2	1/14/2008	Monitoring Well #2 was dry during these events. No samples were collected.																	
MW-2	4/10/2008																		
MW-2	12/11/2008																		
MW-2	3/18/2009																		
MW-2	12/23/2009																		
MW-2	4/5/2010																		
MW-2	12/13/2010																		
MW-3	5/12/2006	1100	200	ND	7	420	ND	58	58	150	31	48	ND	2	770	340	ND	ND	6.8
MW-3	11/7/2006	1100	230	ND	7.1	450	ND	56	35	170	36	55	ND	4.2	850	370	ND	ND	6.7
MW-3	4/4/2007	1600	430	ND	6.9	560	ND	62	60	240	55	64	ND	2.3	1100	460	ND	ND	9.3
MW-3	1/14/2008	1200	220	ND	7.2	430	ND	60	47	170	34	55	Not Analyzed.						
MW-3	4/10/2008	Monitoring Well #3 was dry during these events. No samples were collected.																	
MW-3	12/11/2008																		
MW-3	3/18/2009																		
MW-3	12/23/2009																		
MW-3	4/5/2010																		
MW-3	12/13/2010																		
MW-4	5/12/2006	1900	520	ND	7	590	ND	77	76	240	71	92	ND	2.6	1500	480	ND	ND	11
MW-4	11/7/2006	1500	360	ND	7.2	530	ND	59	52	180	57	84	ND	4.6	1100	440	ND	ND	8.3
MW-4	4/4/2007	1400	370	ND	7	460	ND	64	49	170	54	77	ND	ND	970	380	ND	ND	9
MW-4	1/14/2008	Monitoring Well #4 was dry during these events. No samples were collected.																	
MW-4	4/10/2008																		
MW-4	12/11/2008																		
MW-4	3/18/2009																		
MW-4	12/23/2009																		
MW-4	4/5/2010																		
MW-4	12/13/2010																		

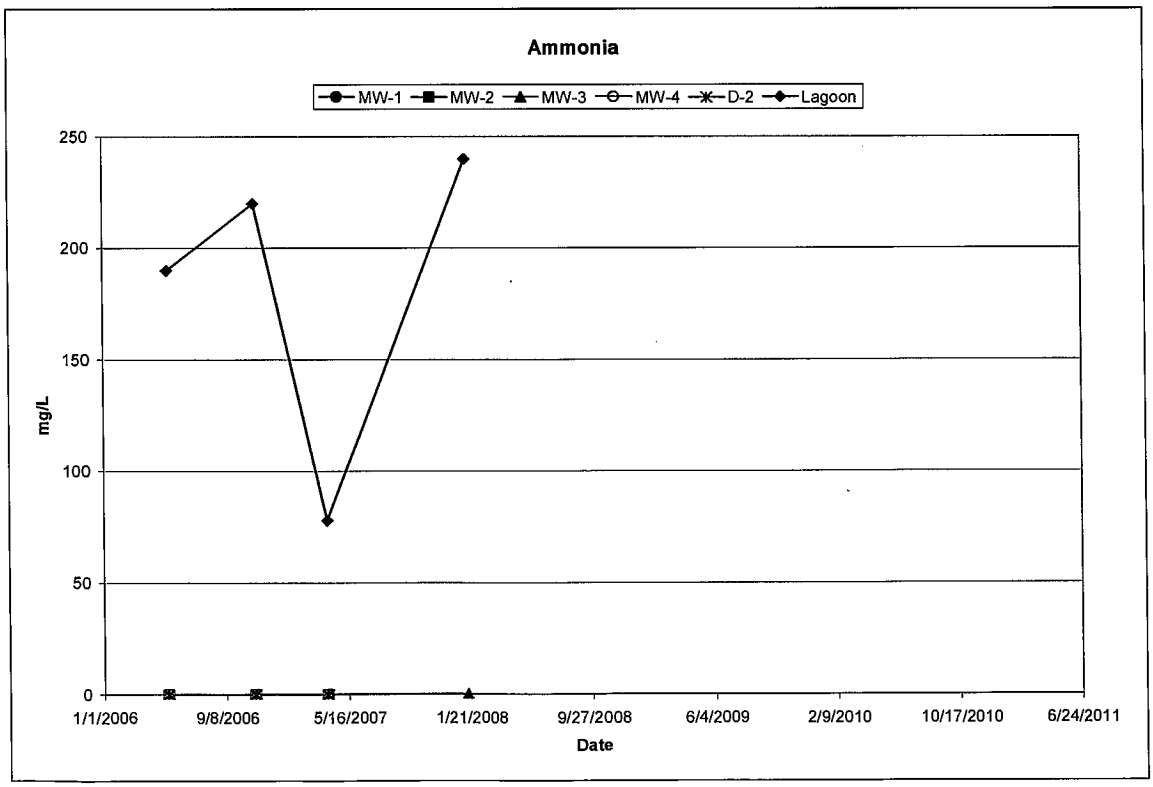
Table 5: Continued

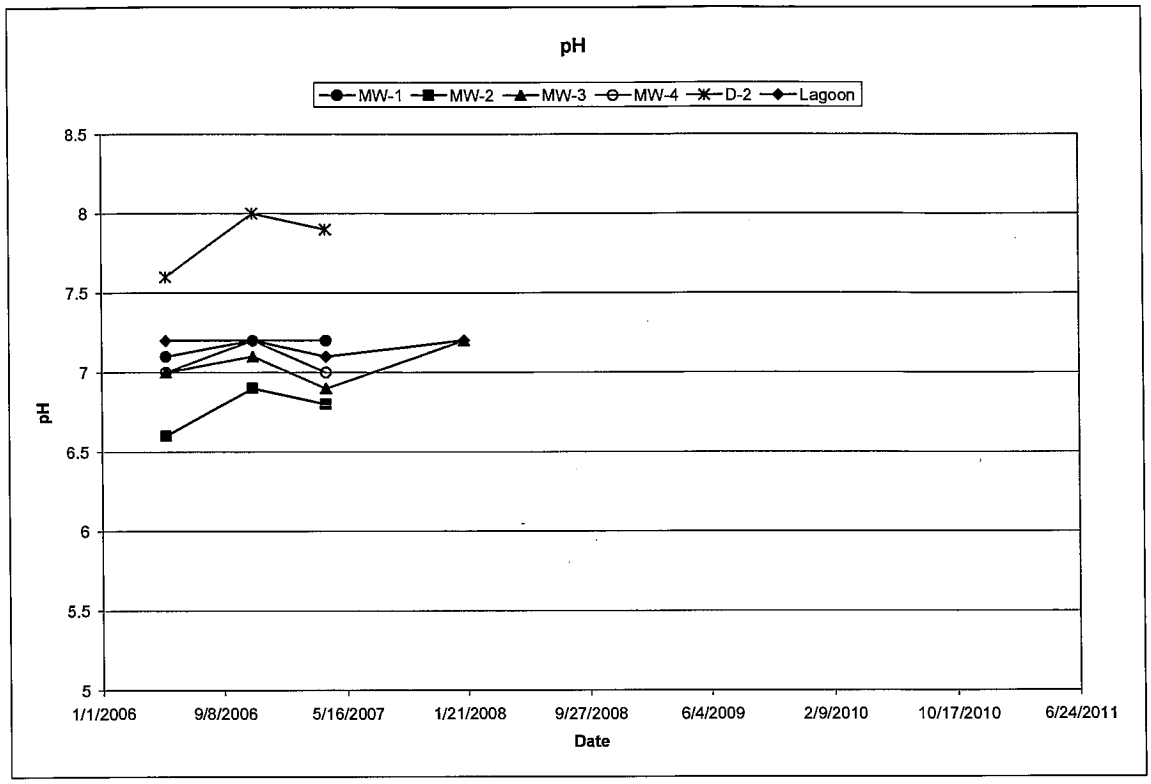
Well	Date	EC (µS/cm)	NO_3 (mg/L)	Ammonia (mg/L)	pH	Bicarbonate Alkalinity (mg/L)	Carbonate Alkalinity (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Ca (mg/L)	Mg (mg/L)	Na (mg/L)	NO_2 (mg/L)	TKN (mg/L)	TDS (mg/L)	Total Alkalinity (mg/L)	Fe (mg/L)	Mn (mg/L)	K (mg/L)
D-2	5/12/2006	470	42	ND	7.6	210	ND	32	8.8	53	9.3	37	ND	2.2	320	170	ND	ND	4.3
D-2	11/7/2006	490	42	ND	8	220	ND	36	12	54	9.6	43	ND	1.2	320	180	ND	ND	4.2
D-2	4/4/2007	490	47	ND	7.9	210	ND	35	11	56	10	39	ND	ND	320	180	ND	ND	4.6
Lagoon	5/12/2006	4000	ND	190	7.2	2900	ND	ND	89	140	78	130	ND	340	2400	2300	ND	0.4	390
Lagoon	11/7/2006	4100	ND	220	7.2	2400	ND	ND	85	170	78	140	ND	300	2600	2000	ND	0.45	370
Lagoon	4/4/2007	1800	ND	78	7.1	1100	ND	21	44	91	38	59	ND	110	780	930	ND	0.31	150
Lagoon	1/14/2008	5000	2	240	7.2	3200	ND	15	190	170	110	190	Not Analyzed.						


Groundwater Elevation
MW-1
MW-2
MW-3
MW-4
224.00
222.00
220.00
218.00
216.00
214.00
212.00
210.00
208.00
206.00
204.00
Elevation (ft)
1/1/2006
9/8/2006
5/16/2007
1/21/2008
9/27/2008
6/4/2009
2/9/2010
10/17/2010
6/24/2011
Date


EC
MW-1
MW-2
MW-3
MW-4
D-2
Lagoon
6000
5000
4000
3000
2000
1000
0
uS/cm
1/1/2006
9/8/2006
5/16/2007
1/21/2008
9/27/2008
6/4/2009
2/9/2010
10/17/2010
6/24/2011
Date


Nitrate as NO3
MW-1
MW-2
MW-3
MW-4
D-2
Lagoon
600
500
400
300
200
100
0
mg/L
1/1/2006
9/8/2006
5/16/2007
1/21/2008
9/27/2008
6/4/2009
2/9/2010
10/17/2010
6/24/2011
Date


Ammonia
MW-1
MW-2
MW-3
MW-4
D-2
Lagoon
250
200
150
100
50
0
mg/L
1/1/2006
9/8/2006
5/16/2007
1/21/2008
9/27/2008
6/4/2009
2/9/2010
10/17/2010
6/24/2011
Date


pH
MW-1
MW-2
MW-3
MW-4
D-2
Lagoon
8.5
8
7.5
7
6.5
6
5.5
5
pH
1/1/2006
9/8/2006
5/16/2007
1/21/2008
9/27/2008
6/4/2009
2/9/2010
10/17/2010
6/24/2011
Date

CERTIFICATION

This groundwater monitoring report was prepared by me or under my direction. All data was collected in accordance with professional engineering standards and applicable laws and regulations of the State of California. Laboratory analyses reported herein were performed by BSK Analytical Laboratories, which is certified by the State of California to perform the subject analyses.

Betsy K. Gerwig

Betsy K. Gerwig P.E.
RCE 76855

2-4-2011
Date

Attachment A

Monitoring Well Map &

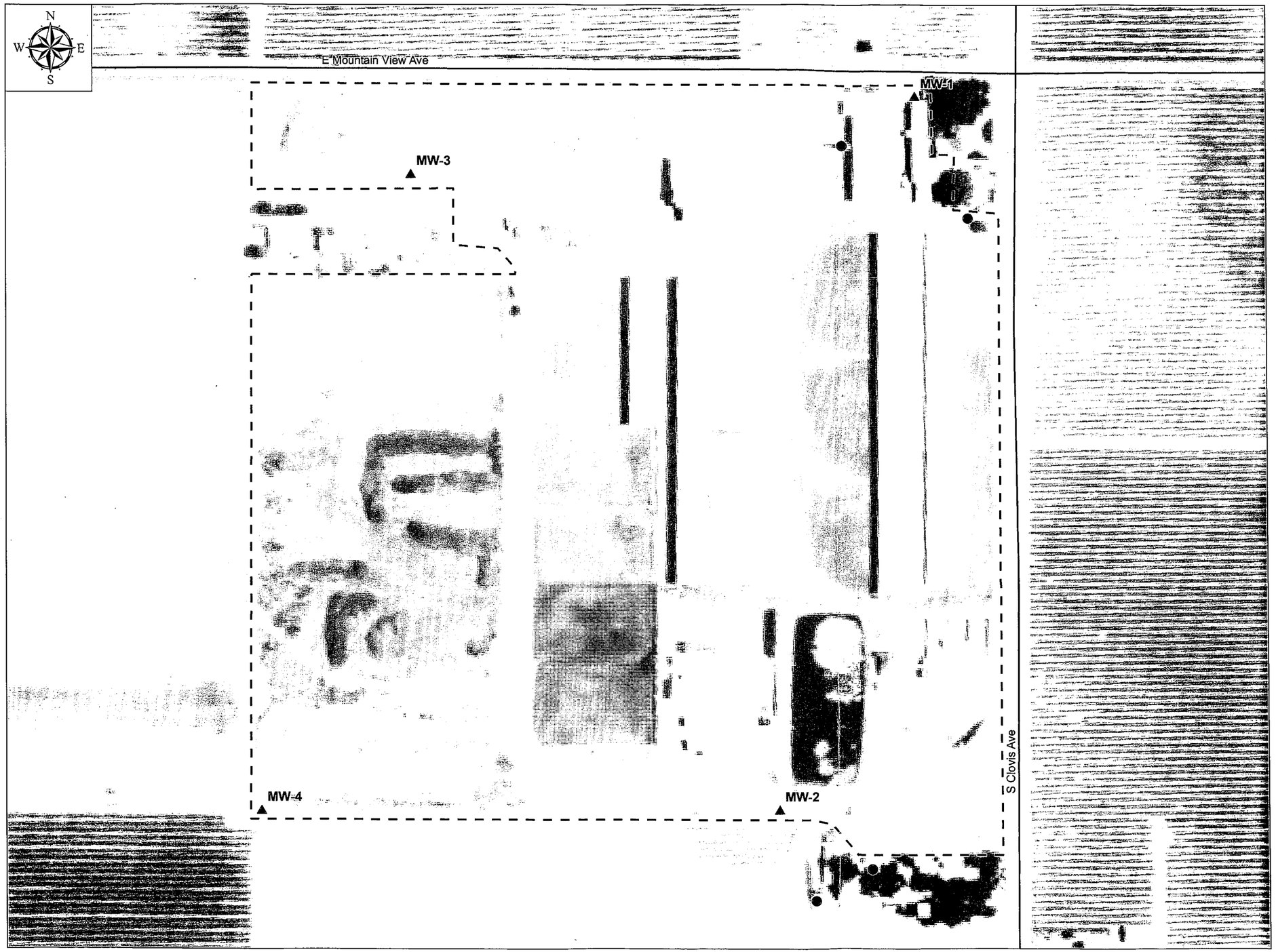
Sampling Record Forms

Spring & Fall Sampling for 2010

Sozinho Jerseys

Fresno Co.

Monitoring Well Map



LEGEND

- Sozinho Jerseys
- Wells
- Monitoring Wells

0 0.025 0.05 0.1 0.15 0.2 0.25 Miles

Aerial photo provided by NAIP and taken in August 2009.

Prepared By
JMLord, Inc.
January 2011

MONITORING WELL SAMPLING RECORD

PROJECT: Carlos Freitas

DATE: 4-5-10

WELL ID: MW-1

SAMPLER: Matt DeGroot

Well Depth (ft):	69.25
Depth to Groundwater (ft):	NA
Difference (ft):	

Well Volume (gal): _____

Note: 2" ID well casing = 0.1632 gal/linear ft.)

Purge No. _____

Time	
Temperature (°C)	
pH	
Electrical Conductivity (µS or mS)	
Volume Removed (gal)	

Purge No. _____

Time	
Temperature (°C)	
pH	
Electrical Conductivity (µS or mS)	
Volume Removed (gal)	

*Are levels within 10% of last reading? Yes No

Purge No. _____

Time	
Temperature (°C)	
pH	
Electrical Conductivity (µS or mS)	
Volume Removed (gal)	

Purge No. _____

Time	
Temperature (°C)	
pH	
Electrical Conductivity (µS or mS)	
Volume Removed (gal)	

*Are levels within 10% of last reading? Yes No

Purge No. _____

Time	
Temperature (°C)	
pH	
Electrical Conductivity (µS or mS)	
Volume Removed (gal)	

*Are levels within 10% of last reading? Yes No

Purge No. _____

Time	
Temperature (°C)	
pH	
Electrical Conductivity (µS or mS)	
Volume Removed (gal)	

*Are levels within 10% of last reading? Yes No

Sample Properties at Time of Sampling

Time	1330
Temperature (°C)	NA
pH	
Electrical Conductivity (µS or mS)	

Sample: NA

Weather: Sunny with Some Clouds, Breezy

Notes: Wet Sand on tip of Sounder, Well is Dry.

Sampler Signature: [signature]

MONITORING WELL SAMPLING RECORD

PROJECT: Carlos Freitas DATE: 4-5-10

WELL ID: MW-2 SAMPLER: Matt Dolf

Well Depth (ft):	68.63
Depth to Groundwater (ft):	NA
Difference (ft):	

Well Volume (gal): _____

Note: 2" ID well casing = 0.1632 gal/linear ft.)

Purge No._____

Time	
Temperature (°C)	
pH	
Electrical Conductivity (µS or mS)	
Volume Removed (gal)	

Purge No. _____

Time	
Temperature (°C)	
pH	
Electrical Conductivity (µS or mS)	
Volume Removed (gal)	

*Are levels within 10% of last reading? Yes No

Purge No._____

Time	
Temperature (°C)	
pH	
Electrical Conductivity (µS or mS)	
Volume Removed (gal)	

Purge No. _____

Time	
Temperature (°C)	
pH	
Electrical Conductivity (µS or mS)	
Volume Removed (gal)	

*Are levels within 10% of last reading? Yes No

Purge No._____

Time	
Temperature (°C)	
pH	
Electrical Conductivity (µS or mS)	
Volume Removed (gal)	

*Are levels within 10% of last reading? Yes No

Purge No. _____

Time	
Temperature (°C)	
pH	
Electrical Conductivity (µS or mS)	
Volume Removed (gal)	

*Are levels within 10% of last reading? Yes No

Sample Properties at Time of Sampling

Time	1320
Temperature (°C)	NA
pH	
Electrical Conductivity (µS or mS)	

Sample: NA

Weather: Sunny with Some Clouds, Breezy

Notes: Well Sealed on top of Sounder, well is Dry

Sampler Signature: Matt Dolf

MONITORING WELL SAMPLING RECORD

PROJECT: Carlos Freitas

DATE: 4-5-10

WELL ID: MW-3

SAMPLER: Matt DeGroot

Well Depth (ft): 68.14

Depth to Groundwater (ft):

Difference (ft):

Well Volume (gal): _____

Note: 2" ID well casing = 0.1632 gal/linear ft.)

Purge No._____

Time	
Temperature (°C)	
pH	
Electrical Conductivity (µS or mS)	
Volume Removed (gal)	

Purge No. _____

Time	
Temperature (°C)	
pH	
Electrical Conductivity (µS or mS)	
Volume Removed (gal)	

*Are levels within 10% of last reading? Yes No

Purge No._____

Time	
Temperature (°C)	
pH	
Electrical Conductivity (µS or mS)	
Volume Removed (gal)	

Purge No. _____

Time	
Temperature (°C)	
pH	
Electrical Conductivity (µS or mS)	
Volume Removed (gal)	

*Are levels within 10% of last reading? Yes No

Purge No._____

Time	
Temperature (°C)	
pH	
Electrical Conductivity (µS or mS)	
Volume Removed (gal)	

*Are levels within 10% of last reading? Yes No

Purge No. _____

Time	
Temperature (°C)	
pH	
Electrical Conductivity (µS or mS)	
Volume Removed (gal)	

*Are levels within 10% of last reading? Yes No

Sample Properties at Time of Sampling

Time	1249
Temperature (°C)	
pH	NA
Electrical Conductivity (µS or mS)	

Sample: NA

Weather: Some Clouds. Breezy

Notes: well Dry. wetsand on tip of Sounder

Sampler Signature: Matt DeGroot

MONITORING WELL SAMPLING RECORD

PROJECT: Carlos Fripitas

DATE: 4-5-10

WELL ID: MW-4

SAMPLER:

Well Depth (ft):	69.23
Depth to Groundwater (ft):	NA
Difference (ft):	

Well Volume (gal): _____

Note: 2" ID well casing = 0.1632 gal/linear ft.)

Purge No._____

Time	
Temperature (°C)	
pH	
Electrical Conductivity (µS or mS)	
Volume Removed (gal)	

Purge No. _____

Time	
Temperature (°C)	
pH	
Electrical Conductivity (µS or mS)	
Volume Removed (gal)	

*Are levels within 10% of last reading? Yes No

Purge No._____

Time	
Temperature (°C)	
pH	
Electrical Conductivity (µS or mS)	
Volume Removed (gal)	

Purge No. _____

Time	
Temperature (°C)	
pH	
Electrical Conductivity (µS or mS)	
Volume Removed (gal)	

*Are levels within 10% of last reading? Yes No

Purge No._____

Time	
Temperature (°C)	
pH	
Electrical Conductivity (µS or mS)	
Volume Removed (gal)	

*Are levels within 10% of last reading? Yes No

Purge No. _____

Time	
Temperature (°C)	
pH	
Electrical Conductivity (µS or mS)	
Volume Removed (gal)	

*Are levels within 10% of last reading? Yes No

Sample Properties at Time of Sampling

Time	1302
Temperature (°C)	NA
pH	
Electrical Conductivity (µS or mS)	

Sample: NA

Weather: Sunny with Some Clouds, Breezy

Notes: wet sand on tip of sounder. Well Dry

Sampler Signature: [illegible]

MONITORING WELL SAMPLING RECORD

PROJECT: Sozinho Jerseys DATE: 12-13-10

WELL ID: MW-1 SAMPLER: BLG

Well Depth (ft):	69.58 -0.12 = 69.46 ft (bottom of well)
Depth to Groundwater (ft):	NA No water.
Difference (ft):	

Well Volume (gal): NA

Note: 2" ID well casing = 0.1632 gal/linear ft.)

Purge No.		Purge No.	
Time		Time	
Temperature (°C)		Temperature (°C)	
pH		pH	
Electrical Conductivity (µS or mS)		Electrical Conductivity (µS or mS)	
Volume Removed (gal)		Volume Removed (gal)	
		*Are levels within 10% of last reading? Yes No	

Purge No.		Purge No.	
Time		Time	
Temperature (°C)		Temperature (°C)	
pH		pH	
Electrical Conductivity (µS or mS)		Electrical Conductivity (µS or mS)	
Volume Removed (gal)		Volume Removed (gal)	
		*Are levels within 10% of last reading? Yes No	

Purge No.		Purge No.	
Time		Time	
Temperature (°C)		Temperature (°C)	
pH		pH	
Electrical Conductivity (µS or mS)		Electrical Conductivity (µS or mS)	
Volume Removed (gal)		Volume Removed (gal)	
*Are levels within 10% of last reading? Yes No		*Are levels within 10% of last reading? Yes No	

Sample Properties at Time of Sampling

Time	~~[illegible]~~ 11:11 pm
Temperature (°C)	
pH	NA
Electrical Conductivity (µS or mS)	

Sample: No sample

Weather: Cool & cloudy

Notes: *sounder tip was dry, no water in well

Sampler Signature: Betsy K. Lemmy

MONITORING WELL SAMPLING RECORD

PROJECT: Sozinho Jerseys DATE: 12-13-10

WELL ID: MW-2 SAMPLER: BKG

Well Depth (ft):	68.37 -0.12 = 68.25ft
Depth to Groundwater (ft):	NA
Difference (ft):	

No water

Well Volume (gal): NA

Note: 2" ID well casing = 0.1632 gal/linear ft.)

Purge No.		Purge No.	
Time		Time	
Temperature (°C)		Temperature (°C)	
pH		pH	
Electrical Conductivity (µS or mS)		Electrical Conductivity (µS or mS)	
Volume Removed (gal)		Volume Removed (gal)	
		*Are levels within 10% of last reading? Yes No	

Purge No.		Purge No.	
Time		Time	
Temperature (°C)		Temperature (°C)	
pH		pH	
Electrical Conductivity (µS or mS)		Electrical Conductivity (µS or mS)	
Volume Removed (gal)		Volume Removed (gal)	
		*Are levels within 10% of last reading? Yes No	

Purge No.		Purge No.	
Time		Time	
Temperature (°C)		Temperature (°C)	
pH		pH	
Electrical Conductivity (µS or mS)		Electrical Conductivity (µS or mS)	
Volume Removed (gal)		Volume Removed (gal)	
*Are levels within 10% of last reading? Yes No		*Are levels within 10% of last reading? Yes No	

Sample Properties at Time of Sampling

Time	1:33 pm
Temperature (°C)	
pH	NA
Electrical Conductivity (µS or mS)	

Sample: No sample.

Weather: Cool & Cloudy.

Notes: Damp sand on sounder tip. No water in well.

Sampler Signature: Betsy K. Gurney

MONITORING WELL SAMPLING RECORD

PROJECT: Sozinho Jerseys DATE: 12-13-10

WELL ID: MW-3 SAMPLER: BKG

Well Depth (ft): 68.51 -0.12 = 68.39 ft

Depth to Groundwater (ft): NA

Difference (ft):

No water.

Well Volume (gal): NA

Note: 2" ID well casing = 0.1632 gal/linear ft.)

Purge No.		Purge No.	
Time		Time	
Temperature (°C)		Temperature (°C)	
pH		pH	
Electrical Conductivity (µS or mS)		Electrical Conductivity (µS or mS)	
Volume Removed (gal)		Volume Removed (gal)	
		*Are levels within 10% of last reading? Yes No	

Purge No.		Purge No.	
Time		Time	
Temperature (°C)		Temperature (°C)	
pH		pH	
Electrical Conductivity (µS or mS)		Electrical Conductivity (µS or mS)	
Volume Removed (gal)		Volume Removed (gal)	
		*Are levels within 10% of last reading? Yes No	

Purge No.		Purge No.	
Time		Time	
Temperature (°C)		Temperature (°C)	
pH		pH	
Electrical Conductivity (µS or mS)		Electrical Conductivity (µS or mS)	
Volume Removed (gal)		Volume Removed (gal)	
*Are levels within 10% of last reading? Yes No		*Are levels within 10% of last reading? Yes No	

Sample Properties at Time of Sampling

Time 1:16 pm

Temperature (°C)

pH NA

Electrical Conductivity (µS or mS)

Sample: No sample.

Weather: Cool & cloudy

Notes: Sounder tip was dry. No water in well.

Sampler Signature: Betsy K Lunsi

MONITORING WELL SAMPLING RECORD

PROJECT: Sozinho Jerseys DATE: 12-13-10

WELL ID: MW-4 SAMPLER: BKG

Well Depth (ft):	68.46 -0.12 = 68.34'
Depth to Groundwater (ft):	NA
Difference (ft):	

no water

Well Volume (gal): NA

Note: 2" ID well casing = 0.1632 gal/linear ft.)

Purge No.		Purge No.	
Time		Time	
Temperature (°C)		Temperature (°C)	
pH		pH	
Electrical Conductivity (µS or mS)		Electrical Conductivity (µS or mS)	
Volume Removed (gal)		Volume Removed (gal)	
		*Are levels within 10% of last reading? Yes No	

Purge No.		Purge No.	
Time		Time	
Temperature (°C)		Temperature (°C)	
pH		pH	
Electrical Conductivity (µS or mS)		Electrical Conductivity (µS or mS)	
Volume Removed (gal)		Volume Removed (gal)	
		*Are levels within 10% of last reading? Yes No	

Purge No.		Purge No.	
Time		Time	
Temperature (°C)		Temperature (°C)	
pH		pH	
Electrical Conductivity (µS or mS)		Electrical Conductivity (µS or mS)	
Volume Removed (gal)		Volume Removed (gal)	
*Are levels within 10% of last reading? Yes No		*Are levels within 10% of last reading? Yes No	

Sample Properties at Time of Sampling

Time	1:22 pm
Temperature (°C)	
pH	NA
Electrical Conductivity (µS or mS)	

Sample: No sample.

Weather: Cool & cloudy

Notes: Damp sand on tip. No water in well.

Sampler Signature: Betsy K. Gunig

DIE

MONITORING WELL CONSTRUCTION AND GROUNDWATER MONITORING

Bob Diepersloot Dairy
14221 Avenue 14
Madera County, California

Project No. 49-104-02
February 12, 2004

Prepared by:

ERWIN ENGINEERING

Geotechnical/Environmental Consultants
1625 Howard Road, Ste 301
Madera, California 93637
(559) 673-0923

FEB 17 2004

ERWIN ENGINEERING

Geotechnical/Environmental Consultants
1625 Howard Road, Ste 301, Madera, Ca., 93637
(559) 673-0923 Fax 673-0923

February 12, 2004

Bob Diepersloot Dairy
14221 Avenue 14
Madera, CA 93610

Attention: Mr. Len Houweling

RE: Monitoring Well Construction,
Groundwater Monitoring Report
Bob Diepersloot Dairy
14221 Avenue 14
Madera County, California

Pursuant to your request and as specified by the California Regional Water Quality Control Board's April 10 and June 19, 2003 letter, Erwin Engineering has completed this report for the Monitoring Well Construction and Groundwater Monitoring for the above-referenced subject dairy. The attached report summarizes the details of our findings.

Should you have any questions or if we may be of some additional service, please contact me at (559) 673-0923.

Respectfully submitted,

Erwin Engineering

Michael Erwin, PE
CE18625
GE297

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1.0 INTRODUCTION

This report presents the findings of Erwin Engineering's Monitoring Well Construction and Groundwater Monitoring for the Bob Diepersloot Dairy. The California Regional Water Quality Control Board's April 10 and June 19, 2003 letters, requested the construction of monitoring wells and the preparation of a Wastewater and Groundwater Monitoring Report for the subject dairy.

The Bob Diepersloot Dairy is located north of the intersection of Avenue 14 and Road 14 in Madera County, California (Figure 1). The subject site encompasses a portion of sections 23, 24 and 25 of T11S, R15E of MDB&M.

2.0 PURPOSE AND SCOPE OF SERVICES

The purpose of the monitoring well construction and sampling at the subject property was to analyze ground-water quality, and observe ground-water depths in order to assess gradient and direction of water flow beneath the subject property. In addition groundwater production wells and the wastewater are to be sampled and tested. A summary of the monitoring well construction and sampling test results are presented in this report.

The scope of our services was limited to obtaining one ground-water sample and depth measurement from each of the three constructed monitoring wells at the subject property. Each groundwater and wastewater sample was sent to the Fresno County Public Health Laboratory, a State-approved laboratory, for chemical analysis to detect the chemical constituent out lined by the CRWQCB.

The scope of this Wastewater and Groundwater Monitoring Plan is based on the California Regional Water Quality Control Board's (CRWQCB) April 10 and June 19, 2003 letters.

This report includes the following items:

- A vicinity map showing the approximate location of the site (Fig. 1), the subject ponds, the monitoring wells and the sampled production well;

- Monitoring well construction into the first encountered groundwater for groundwater monitoring and gradient with wells placed up and down gradient of the ponds and animal holding facilities;

- Determine the ground-water depth, and thereby assess the ground-water gradient and direction of water flow beneath the subject property at the time of sampling;

- Sample one existing water supply well to determine the quality of the groundwater used on the facility;

- A description of the groundwater gradient and flow direction;

- Present a diagram showing construction details for the constructed monitoring wells with details in accordance with the California Well Standards (DWR Bulletin 74-90);

- Outline groundwater sampling procedures and analytical methods;

- Preparation of a report summarizing the details of our findings.

3.0 SOIL PROFILE AND SUBSURFACE CONDITIONS

On December 03, 04 and 08, 2003 three exploratory soil boring were drilled with the borings constructed in to ground water monitoring wells. The monitoring wells were constructed in accordance with the California Well Standards (DWR Bulletin 74-90)

3.1 Drilling and Soil Sampling

The three monitoring wells were constructed on December 03, 04 and 08, 2003 by Twinning Laboratories of Fresno, California. The well construction utilized a truck-mounted drill rig equipped with hollow-stem auger. The exploratory soil borings for the ground water monitoring wells were drilled with 8-inch O.D. auger. An Erwin Engineering engineer was present during drilling to assist in obtaining samples of the subsurface materials, to maintain a log of borings, and to make observations of the site and well construction details. The samples obtained from the borings were classified according to the Unified Soil Classification System.

3.2 Log of Soil Borings

Based on the exploratory soil borings, soils beneath the site appear to be comprised principally of clayey silts, silty sands and fine-to-medium sands.

Silty sands with interbedded strata of sandy silt and fine-to-medium sands were encountered from the surface to a depth 20 to 30 feet below the existing grade. Below this horizon, predominantly alternating strata of sandy silt with interbedded strata of silty sand and fine to medium sands was encountered to a depth of approximately 50 to 70 feet below grade. Each strata were typically 10 to 20 feet thick. Below this level, interbedded silty sands, clayey sandy silt and fine-to-medium sands were encountered to the maximum depth of 130 feet. Typically the soils became finer grained with depth. The three borings were advanced approximately 20 feet below the static water surface for the construction of monitoring wells.

More detailed information regarding site soils may be found in the Logs of Borings included in the Appendix A of this report.

4.0 MONITORING WELL CONSTRUCTION

A total of 3 monitoring wells were constructed. Refer to Figure 2 for their approximate location. The groundwater monitoring wells were constructed into the unconfined aquifer below the subject site.

The 3 logs of borings in Appendix A shows the construction details of the monitoring wells. These details are for the constructed three monitoring wells. The monitoring wells were constructed in accordance with California Well Standards (DWR Bulletin 74-90, Supplement to Bulletin 74-81). The monitoring wells were constructed using 2 inch flush-thread pvc schedule 40 well pipe. Screened intervals were constructed utilizing flush-thread 0.020 inch well screen. The screened interval consisted of a 25 foot section of well screen, with 5 feet above the current ground water level and approximately 20 feet below. A number 2/16 graded sand was used as a filter media around the screened interval, and completed to an equivalent depth of 2 feet above the well screen. A seal composed of bentonite pellets would be placed to an approximate thickness of 3 feet above the sand filter media. A sand/cement slurry was added from the seal to the surface vault. A locking well head was installed, and a watertight surface vault was placed at grade for well security.

The wells were purged by means of bailing. Each well was developed until the discharge water was visually clear and free of obvious sand or silt, by removing approximately ten well-volumes. Prior to sampling, groundwater was observed for general clarity and measured for temperature, pH, and conductivity (EC) to evaluate equilibrium. Samples were obtained with a disposable bailer, with a new bailer used for each well.

5.0 MONITORING WELL SAMPLING AND TESTING

The three subject groundwater monitoring wells were developed on December 09, 2003. The wells were purged and sampled on December 12, 2003. The locations of the wells are shown on Figure 2. A minimum of three well volumes were purged from each well prior to sampling. Purging was accomplished by hand using a disposable teflon bailer. Prior to sampling, groundwater was observed for general clarity and measured for temperature, pH, and conductivity (EC) to evaluate equilibrium. Samples were obtained with a disposable bailer.

Groundwater depths were measured in each well prior to sampling. The measurements were obtained using an electronic depth sounder, referencing the top of the rim of the permanent well vault. The rim of each well vault was surveyed to provide an accurate reference elevation at the surface of each well head. The groundwater gradient assessment was evaluated with the sampling event.

The samples were maintained and transported in containers provided by the ELAP approved laboratory and transported in a cooler chest on "ice." Samples were accompanied by proper Chain-of-Custody to Fresno County Public Health Laboratories for chemical analysis (a copy of the Chain-of-Custody form is attached). The 3 monitoring well samples were analyzed to detect the presence and concentrations of chemical constituents. The results of the tests are shown in Table I.

TABLE I

Bob Diepersloot Dairy
Laboratory Results
Monitoring Well Samples
(measurements given in mg/L)

Constituents:	Sampling Dates & Monitoring Well No.			
	Date	MW 1	MW 2	MW 3
Bicarbonate (HCO_3)	12-12-03	339	291	284
Chloride (Cl)	12-12-03	58.8	85.1	97.6
Nitrate (NO_3)	12-12-03	65.0	37.4	49.7
Sulfate (SO_4)	12-12-03	27.3	29.9	43.3
Ammonia (NH_3)	12-12-03	<0.5	<0.5	<0.5
Calcium (Ca)	12-12-03	88	120	130
Magnesium (Mg)	12-12-03	41	45	48
Potassium (K)	12-12-03	8.	6.	2.
Sodium (Na)	12-12-03	68	74	93
pH	12-12-03	7.1	7.4	7.6
Carbonate (CaCO3)	12-12-03	<2	<2	<2
Nitrite (NO2-N)	12-12-03	<0.4	<0.4	<0.4
Total Dissolved Solids (TDS)	12-12-03	640	660	700
Total Kjeldahl Nitrogen, TKN	12-12-03	0.50	<0.2	1.83

For more information regarding chemical analyses, please refer to the certified analytical reports included in the Appendix of this report.

6.0 GROUND-WATER GRADIENT AND FLOW DIRECTION

Prior to sampling, ground-water depths were measured in each well using an electronic depth sounder. All depth measurements were correlated to a surveyed reference point at the top of each locking well cover casing. At the time of our field visit, the well surface vaults appeared to be in good condition. The current ground-water elevation monitoring events are summarized in Table II.

these are bad data per M. Erwin 3/9/05

TABLE II

~~Bob Diepersloot Dairy~~

Summary of Ground-water Depths

Well No.	Date	Top of Well Vault Elevation	Depth to Groundwater From Top of Vault	Groundwater Elevation
MW-1	12-12-03	139.07	112.66	26.41
MW-2	12-12-03	130.35	105.42	24.93
MW-3	12-12-03	133.16	95.60	37.56

The top of the well vaults referenced in the above table are approximately 28 inches above the ground surface.

The groundwater gradient was calculated for the subject property utilizing groundwater depth measurements and results of the survey conducted at each well vault. A groundwater gradient of approximately 0.00243 (2.43^{-3}) ~~ft/ft to the north northwest~~ was measured on December, 12 2003. Please refer to Figure 3 at the end of this report which illustrates the groundwater gradient and direction of flow beneath the site for the December, 12 2003 sampling event.

7.0 WATER SUPPLY WELL SAMPLING AND TESTING

One existing groundwater supply wells for the subject dairy operation and irrigation located south of the dairies new and original wastewater ponds. It is located approximately 100 feet south the ponds (Fig 2). The groundwater supply well reportedly pump from approximately the ~~400~~ to 500 foot level. 215 - 515 (see well log)

The groundwater supply well was sampled and tested. A sampling station near the discharge of the well was established where a representative sample of water supply was obtained. The sample was maintained and transported in containers provided by the ELAP approved laboratory. Samples were accompanied by proper Chain-of-Custody to Fresno County Public Health Laboratory for chemical analysis.

TABLE III

Bob Diepersloot Dairy Laboratory Results Production Well Sample (measurements given in mg/L)		
Constituents: NO EC or BOD ANALYSIS	Sampling Dates & Test Results	
	Date	Well
Bicarbonate (HCO_3)	12-12-03	158
Chloride (Cl)	12-12-03	65.3
Nitrate (NO_3)	12-12-03	5.4
Sulfate (SO_4)	12-12-03	4.1
Ammonia (NH_3)	12-12-03	<0.5
Calcium (Ca)	12-12-03	30
Magnesium (Mg)	12-12-03	19
Potassium (K)	12-12-03	3
Sodium (Na)	12-12-03	47
pH	12-12-03	7.8
Carbonate (CaCO3)	12-12-03	<2
Nitrite (NO2-N)	12-12-03	<0.400
Total Dissolved Solids (TDS)	12-12-03	310
Total Kjeldahl Nitrogen, TKN	12-12-03	<0.2

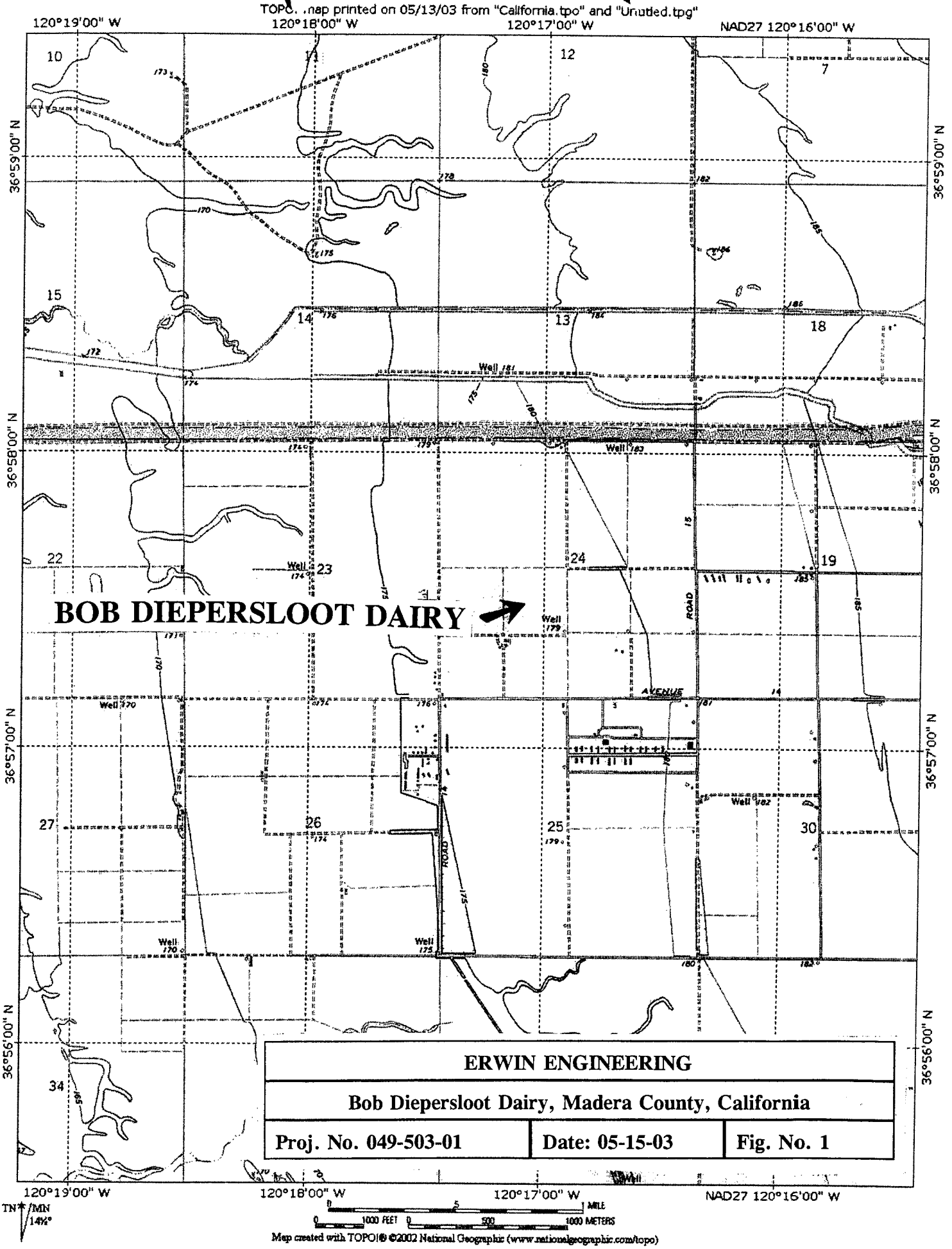
For more information regarding chemical analyses, please refer to the certified analytical reports included in the Appendix of this report.

Should you have any questions, please contact Erwin Engineering at (559) 673-0923.

Respectfully submitted,

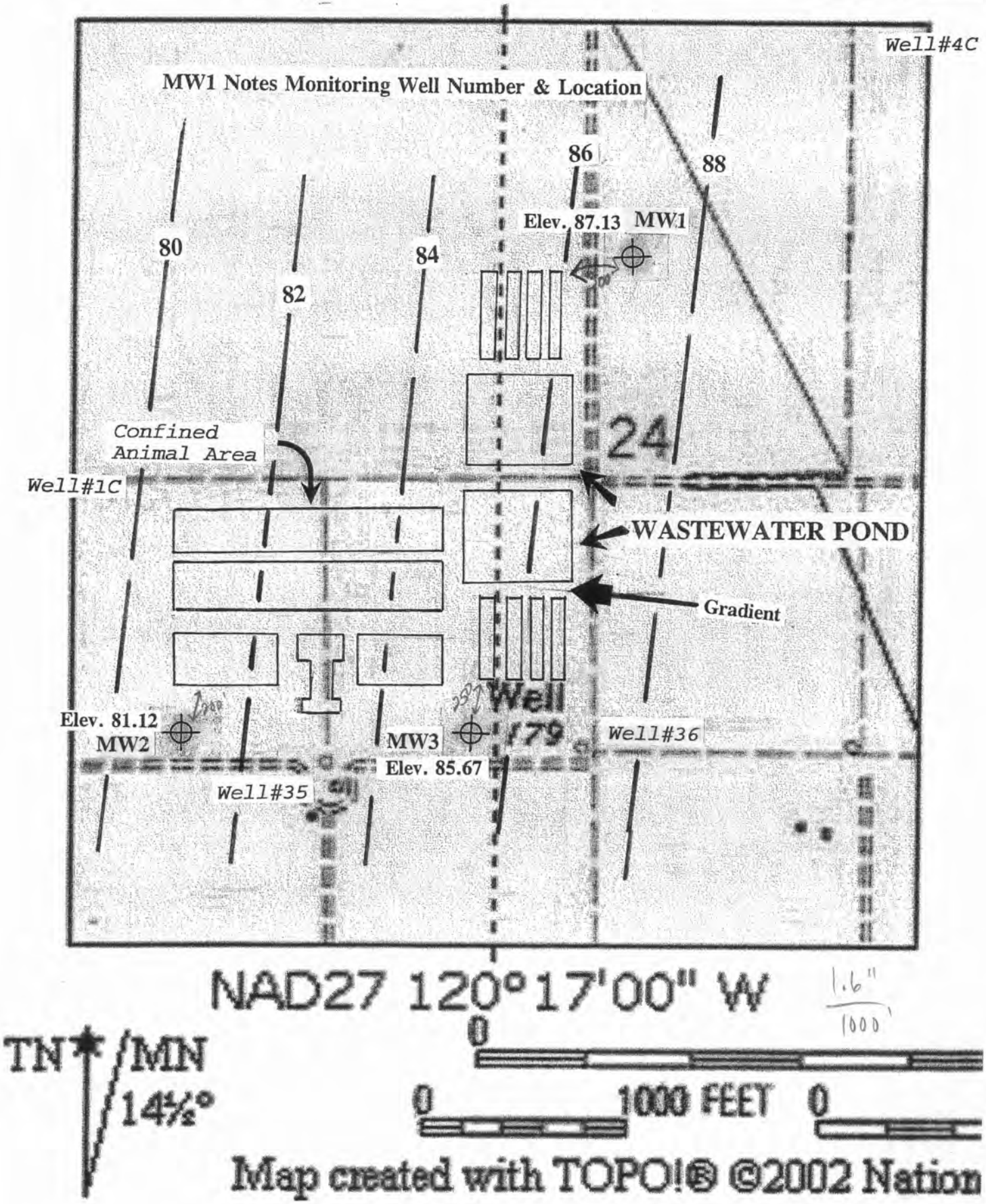
Erwin Engineering

Michael Erwin, PE
CE18625
GE297



ERWIN ENGINEERING		
Bob Diepersloot Dairy, Madera County, California		
Proj. No. 049-503-01	Date: 05-15-03	Fig. No. 1

ERWIN ENGINEERING		
Bob Diepersloot Dairy, Madera County, California		
Proj. No. 049-503-01	December 3, 2003	Fig. No. 2



APPENDIX A

LOG OF BORING

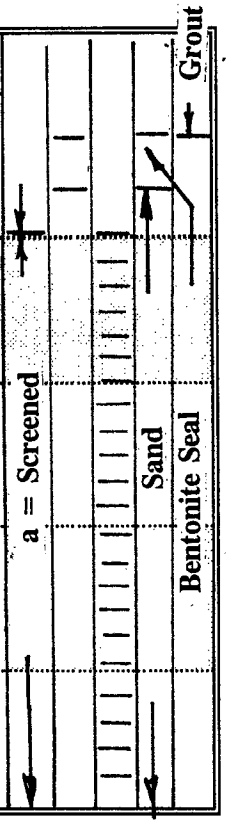
Client: Diepersloot Dairy
Job No.: 049-104-02
Monitoring Well No. MW-1
Date drilled: December 8, 2003
Elevation: 181.13

R	USC	Depth	Description	
	SM	0	Silty Sand, tan, damp	b = Blank Casing; Grout
	SW		Fine to Medium Sand, tan, damp	
	SM	10	Silty Sand, tan, damp	
	SW		@ 12 ft, Fine to Medium Sand	
	SM		@ 15 ft, Sandy Silt, tan, damp	
	SM	20	Sand Silt, tan, damp	
	SM		Silty Sand, brn, damp	
	SW	30	Fine to Medium Sand, brn, damp	
	SW		Silty Sand, brn, damp	
	SW	40	Fine to Medium Sand, brn, damp	
	SW		Fine to Medium Sand, brn, damp	
	SM	50	Silty Sand brn, damp	
	SM		Silty Sand, tan/brn, damp	
	SM	60	Silty Sand, tan, damp	
	SM		Silty Sand, tan, damp	
	SM	70	Sand Silt, tan, damp	
	SM		Sandy Silt, tan, damp	

LOG OF BORING

Client: Diepersloot Dairy
Job No.: 049-104-02
Monitoring Well No. MW-1
Date drilled: December 8, 2003
Elevation: 181.13

R	USC	Depth	Description
	SW	80	Fine to Medium Sand, tan damp
	SM		Silty Sand, brn, damp
	SM	90	Silty Sand, brn, wey
	SM		Silty Sand, brn, wet
	SM	100	Silty Sand, brn, sat, GW @ 100
	SM		Silty Sand, brn, sat
	SM	110	Silty Sand, brn, sat
	SM	120	Silty Sand, brn, sat
			Bottom of Boring at 120 feet



a = 30 feet (90 to 120 feet)
b = 90 feet to surface
Cement Grout 83 feet to surface
Bentonite Seal 83 to 87 feet
Sand 87 to 120 feet

Legend:

R Sampling Resistance
USC Uniform Soil Classification

Erwin Engineering

LOG OF BORING

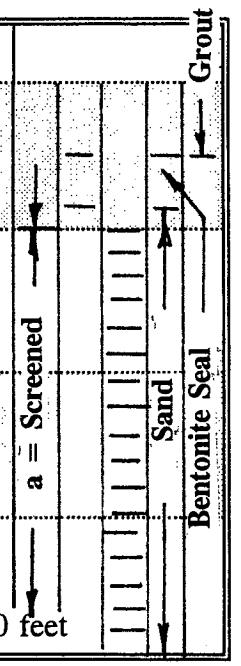
Client: Diepersloot Dairy
Job No.: 049-104-02
Monitoring Well No. MW-2
Date drilled: December 3, 2003
Elevation: 178.12

R	USC	Depth	Description					
	SM	0	Silty Sand, tan, damp	b = Blank Casing				Grout
	SW		@ 8 ft, Fine to Medium Sand, tan, damp					
	SW SM	10	Fine to Medium Sand, tan, damp @ 12 ft, Silty Sand, tan, damp					
	SM	20	Sandy Silt, tan, damp					
	SM		Sandy Silt, tan, damp					
	SM	30	Sandy Silt, tan, damp					
	SM		Sandy Silt, tan, damp					
	SM	40	Sandy Silt, tan, damp					
	SM		Sandy Silt, tan, damp					
	SM	50	Sandy Silt, tan, damp					
	SM		Sandy Silt, tan, damp					
	SM	60	Sandy Silt, tan, damp					
	SM		Sandy Silt, tan, damp					
	SM	70	Sandy Silt, tan, damp					
	SM		Silty Sand, tan, damp					
	SM	80	Silty Sand, tan damp					
	SM		Silty Sand, tan damp					

LOG OF BORING

Client: Diepersloot Dairy
Job No.: 049-104-02
Monitoring Well No. MW-2
Date drilled: December 3, 2003
Elevation: 178.12

R	USC	Depth	Description
	CL	90	Clayey Silt, brn, wet
	CL		Clayey Silt, brn, wet
	CL	100	Clayey Silt, brn, sat GW @ 105 ft
	SM		Sandy Silt, brn, sat
	SM	110	Sandy Silt, brn, sat
			Clayey Silt, brn, sat
	CL	120	Clayey Silt, brn, sat
	CL	130	Clayey Silt, brn, sat, Bottom of Boring at 130 feet



a = 30 feet (100 to 130 feet)
b = 100 feet to surface
Cement Grout 95 feet to surface
Bentonite Seal 95 to 98 feet
Sand 98 to 130 feet

Legend:

R Sampling Resistance
USC Uniform Soil Classification

Erwin Engineering

LOG OF BORING

Client: Diepersloot Dairy
Job No.: 049-104-02
Monitoring Well No. MW-3
Date drilled: December 4, 2003
Elevation: 178.51

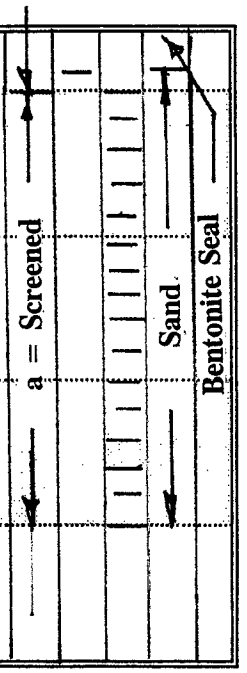
R	USC	Depth	Description					
	SM	0	Silty Sand, tan, damp	b = Blank Casing				Grout
	SM		@ 8 ft, Sandy Silt, tan, damp					
	SW	10	@ 13 ft, Fine to Medium Sand					
	SM		@ 18 ft, Silty Sand, tan, damp					
	SM	20	Silty Sand, tan, damp					
	SM		Silty Sand, brn, damp					
	SM	30	Silty Sand, brn, damp					
	SW		Fine to Medium Sand, brn, damp					
	SM	40	Sandy Silt, brn, damp					
	SM							
	SM	50	Sandy Silt, brn, damp					
	SM		Silty Sand, brn, damp					
	SM	60	Silty Sand, tan, damp					
	SM		Silty Sand, tan, damp					
	SM	70	Silty Sand, tan, damp					
	SM		Silty Sand, tan, damp					
	SM	80	Silty Sand, tan, damp					
	SM		Silty Sand, tan, damp					

Erwin Engineering

LOG OF BORING

Client: Diepersloot Dairy
Job No.: 049-104-02
Monitoring Well No. MW-3
Date drilled: December 4, 2003
Elevation: 178.51

R	USC	Depth	Description
	SM	90	Silty Sand, tan, wet
			GW @ 95
	SM		Silty Sand, tan, sat
	SM	100	Silty Sand, tan, sat
	SM		Silty Sand, tan, sat
	SM	110	Silty Sand, tan, sat
	SM		
	SM	120	Silty Sand, tan, sat
			Bottom of Boring at 120 feet



a = 30 feet (90 to 120 feet)
b = 90 feet to surface
Cement Grout 85 feet to surface
Bentonite Seal 85 to 88 feet
Sand 88 to 120 feet

Legend:

R Sampling Resistance
USC Uniform Soil Classification

Erwin Engineering

APPENDIX B

Field Notes

Project Name: Diepersloot Dairy
Project Number: B86701.01
Project Manager: Jerry K.

Date: 1/19/03
Field Technician: Josh East

TIME	DESCRIPTION
8:00	Loading Truck
8:20	left yard
9:00	Arrived onsite, met w/ Terry - was shown well locations
	Set up on MW-2
	tagged water @ 95.42 . Hand Bailed 5 gallons w/ S.S. Bailer,
	lowered Development pump
9:57	started Development Pump
10:00	5 gallons purged
11:05	Stopped Pump. Total of 55 gallons purged.
	water mostly clear.
	Measured water @ 92.68' and bottom of well #3 @ 108'
	Set up on MW-3, Hand Bailed 5 gallons w/ S.S. Bailer, lowered
	development pump.
11:31	Started Development pump
11:37	purged 5 gallons
12:45	turned off Pump.
	Approximately 62 gallons purged
	Measured water @ 97.32 in MW-1 and bottom @ 123.5'
	Hand bailed 5 gallons w/ S.S. Bailer, lowered pump.
13:15	Started Pump.
13:31	5 gallons purged
13:45	ran out of gas in compressor.
14:13	started pump again
15:09	stopped pump. Approximately 65 gallons purged
	loading up
15:25	left site
16:05	arrived back at lab unloading equipment

Dairy

12-12-02

53	7.4	610
54	7.4	640
54	7.4	640

California Planning and Engineering Corporation

Civil Engineering Land Planning Land Surveying RESIDENTIAL COMMERCIAL DAIRY

724 N. BEN MADDOX WAY VISALIA, CA 93292 PH (559)625-5233 FAX (559)625-4457 WWW.CALPLANNING.COM

Since 1977

AARON L. CANVASSER
RCE 21182

ALFREDO REYNOSO H.
RCE 62638

January 27, 2004

Attn:Michael Erwin
Erwin Engineering
1625 Howard Road, Ste 301
Fresno, CA 93637

RE: Bob Diepersloot Dairy -

Dear Mr. Erwin,

After our site visit on January 14, 2004, we found the following:

MONITOR WELL #1 REFERENCE POINT IS AT ELEVATION 181.13
MONITOR WELL #2 REFERENCE POINT IS AT ELEVATION 178.12
MONITOR WELL #3 REFERENCE POINT IS AT ELEVATION 178.51

All elevations are based on the NGVD 1929 Datum per: The NE/4 FIREBAUGH QUAD MAP. Bench Mark used: top of concrete slab at the NW corner of the well located 2000 feet east of the milk barn, with an elevation of 179.0 feet.

Any questions please call 625-5233

Sincerely,

California Planning and Engineering Corp.

Jose Reyes

CC: BOB DIEPESRLOOT

PERMIT VALID WHEN NUMBER IS ASSIGNED
Permit not valid after six months

PERMIT #: 9/5/03
FEE: $150
DATE: 11-15-03
CHK #: 3431

MADERA COUNTY ENVIRONMENTAL HEALTH

216 W. 6th. Street, Madera, CA 93637-3502
(559) 675-7823 FAX (559) 675-7919

WELL/SEWAGE SYSTEM APPLICATION

NAME OF APPLICANT [illegible] PHONE

MAILING ADDRESS [illegible] JOB ADDRESS [illegible]

CONTRACTOR'S NAME [illegible] PHONE [illegible] APN# [illegible]

Must be installed by licensed Driller.

SEWAGE SYSTEM

Soil Type
Bedrooms
Fixture Units
Water Supply Source
New
Repair

SEPTIC TANK	AEROBIC UNIT
Size	MFG
Gallons	Model #
Precast Conc	Size
Poured Conc	
Fiberglass	
MFG	

DISPOSAL FIELD	SEEPAGE PIT
Absorption	Number
Trench -	Diameter
Width	Depth
Length	
Number	
Rock Below Line	
Tons of Rock	

WATER WELL

Intended Use
- Domestic
- Agricultural
- Industrial
- Community
- (3) Monitoring / ~~Soil Boring~~ wells

Type of Work
- New Well
- Deepening
- Repair
- Destruction

Construction Information

Type of Well

Cable tool ____ Rotary X Gravel Pack ____
Hardrock ____ Other ____
Casing Diameter [illegible] Causing Gauge [illegible]
Casing Material [illegible]
Annular Seal Material [illegible] Seal Depth [illegible] feet
Comments

PLOT PLAN - Show street, nearest intersection, distances from buildings and property lines, location of septic tanks, leach fields, pits, buildings, and contamination sources.

Wells must be installed in accordance with work plan approved by the Regional Water Quality Control Board.

Original: Env. Health
Yellow: Engineering
Pink: Permit
Goldenrod: Applicant

Permit Approved [signature] Date 11/18/03
Inspection Date

FRESNO COUNTY PUBLIC HEALTH LABORATORY

1221 Fulton Mall, Fresno CA 93721 P.O. Box 11867 Fresno, CA 93775
Phone: (559)445-3407 Alt. Phone: (559)445-3397 Fax: (559)445-3580
ELAP Certification Number: 1888 James J. Spolsdoff, Laboratory Director

0312-15071	12770	12/12/2003	12/12/2003	8:00 AM	Mike Erwin
Lab Number	Account #	Date Received	Date Collected	Time Collected	Collector/Inspector

Erwin Engineering
1625 Howard Rd #301
Madera,CA 93637

Attn: Mike Erwin

SystemType: 99
Sample Type: Routine
Water Sys #:
Census Tract:
Well Number:
APN:

Sample Site: Diepersloot Dairy (Production Well)

WASTEWATER ANALYSES

Analysis	Method	Result	Units	DLR	Chemist	Date Analyzed
Calcium	3111B	30 mg/L	mg/L	2	K. Lor, PHC	12/29/2003
Magnesium	3111B	19 mg/L	mg/L	2	K. Lor, PHC	12/30/2003
Potassium	3111B	3 mg/L	mg/L	1	K. Lor, PHC	12/16/2003
Sodium	3111B	47 mg/L	mg/L	2	K. Lor, PHC	12/16/2003
Chloride	300.0	65.3 mg/L	mg/L	2	L. Asatryan, PHC	12/17/2003
Nitrate (Ion)	300.0	5.4 mg/L	mg/L	2	L. Asatryan, PHC	12/17/2003
Nitrite (as N)	300.0	<400 µg/L	µg/L	400	L. Asatryan, PHC	12/17/2003
Sulfate	300.0	4.1 mg/L	mg/L	0.5	L. Asatryan, PHC	12/17/2003
Bicarbonate (HCO3)		158 mg/L	mg/L	2	L. Roth, PHC	12/16/2003
Carbonate (CO3)		<2 mg/L	mg/L	2	L. Roth, PHC	12/16/2003
TDS	2540C	310 mg/L	mg/L	1	L. Roth, PHC	12/22/2003
Ammonia	4500-NH3B,F/G	<0.5 mg/L	mg/L	0.5	L. Roth, PHC	12/16/2003
pH	4500-H+B	7.8 pH	Std Units		L. Roth, PHC	12/12/2003
S.E.C.	2510B	470 µmho/cm	µmho/cm	20	K. Lor, PHC	12/12/2003
TSS (Total Suspended Solids)	2540D	<4 mg/L	mg/L	4	L. Roth, PHC	12/16/2003
Kjeldahl Nitrogen	4500-NH3 F/G	<0.2 mg/L	mg/L	0.2	L. Roth, PHC	12/16/2003

DLR = Detection Level for Reporting
QNS = Quantity Not Sufficient for Analysis
NTP = No Test Performed on Sample

Director / Chemistry Supervisor / QA Officer
Date Reported: 1/5/2004

FRESNO COUNTY PUBLIC HEALTH LABORATORY

1221 Fulton Mall, Fresno CA 93721 P.O. Box 11867 Fresno, CA 93775
Phone: (559)445-3407 Alt. Phone: (559)445-3397 Fax: (559)445-3580
ELAP Certification Number: 1888 James J. Spolsdoff, Laboratory Director

0312-15068	12770	12/12/2003	12/12/2003	8:30 AM	Mike Erwin
Lab Number	Account #	Date Received	Date Collected	Time Collected	Collector/Inspector

Erwin Engineering
1625 Howard Rd #301
Madera,CA 93637

Attn: Mike Erwin

SystemType: 99
Sample Type: Routine
Water Sys #:
Census Tract:
Well Number:
APN:

Sample Site: Diepersloot Dairy (MW-1)

WASTEWATER ANALYSES

Analysis	Method	Result	Units	DLR	Chemist	Date Analyzed
Calcium	3111B	88 mg/L	mg/L	2	K. Lor, PHC	12/29/2003
Magnesium	3111B	41 mg/L	mg/L	2	K. Lor, PHC	12/30/2003
Potassium	3111B	8 mg/L	mg/L	1	K. Lor, PHC	12/22/2003
Sodium	3111B	68 mg/L	mg/L	2	K. Lor, PHC	12/31/2003
Chloride	300.0	58.8 mg/L	mg/L	2	L. Asatryan, PHC	12/17/2003
Nitrate (Ion)	300.0	65.0 mg/L	mg/L	2	L. Asatryan, PHC	12/17/2003
Nitrite (as N)	300.0	<400 µg/L	µg/L	400	L. Asatryan, PHC	12/17/2003
Sulfate	300.0	27.3 mg/L	mg/L	0.5	L. Asatryan, PHC	12/17/2003
Bicarbonate (HCO3)		339 mg/L	mg/L	2	L. Roth, PHC	12/16/2003
Carbonate (CO3)		<2 mg/L	mg/L	2	L. Roth, PHC	12/16/2003
TDS	2540C	640 mg/L	mg/L	1	L. Roth, PHC	12/22/2003
Ammonia	4500-NH3B,F/G	<0.5 mg/L	mg/L	0.5	L. Roth, PHC	12/16/2003
pH	4500-H+B	7.1 pH	Std Units		L. Roth, PHC	12/12/2003
S.E.C.	2510B	940 µmho/cm	µmho/cm	20	K. Lor, PHC	12/12/2003
TSS (Total Suspended Solids)	2540D	2900 mg/L	mg/L	4	L. Roth, PHC	12/16/2003
Kjeldahl Nitrogen	4500-NH3 F/G	0.50 mg/L	mg/L	0.2	L. Roth, PHC	12/16/2003

DLR = Detection Level for Reporting
QNS = Quantity Not Sufficient for Analysis
NTP = No Test Performed on Sample

L I Friano
Director / Chemistry Supervisor / QA Officer
Date Reported: 01/05/2004

FRESNO COUNTY PUBLIC HEALTH LABORATORY

1221 Fulton Mall, Fresno CA 93721 P.O. Box 11867 Fresno, CA 93775
Phone: (559)445-3407 Alt. Phone: (559)445-3397 Fax: (559)445-3580
ELAP Certification Number: 1888 James J. Spolsdoff, Laboratory Director

0312-15069	12770	12/12/2003	12/12/2003	9:30 AM	Mike Erwin
Lab Number	Account #	Date Received	Date Collected	Time Collected	Collector/Inspector

Erwin Engineering
1625 Howard Rd #301
Madera,CA 93637

Attn: Mike Erwin

SystemType: 99
Sample Type: Routine
Water Sys #:
Census Tract:
Well Number:
APN:

Sample Site: Diepersloot Dairy (MW-2)

WASTEWATER ANALYSES

Analysis	Method	Result	Units	DLR	Chemist	Date Analyzed
Calcium	3111B	120 mg/L	mg/L	2	K. Lor, PHC	12/29/2003
Magnesium	3111B	45 mg/L	mg/L	2	K. Lor, PHC	12/30/2003
Potassium	3111B	6 mg/L	mg/L	1	K. Lor, PHC	12/22/2003
Sodium	3111B	74 mg/L	mg/L	2	K. Lor, PHC	12/31/2003
Chloride	300.0	85.1 mg/L	mg/L	2	L. Asatryan, PHC	12/17/2003
Nitrate (Ion)	300.0	37.4 mg/L	mg/L	2	L. Asatryan, PHC	12/17/2003
Nitrite (as N)	300.0	<400 µg/L	µg/L	400	L. Asatryan, PHC	12/17/2003
Sulfate	300.0	29.9 mg/L	mg/L	0.5	L. Asatryan, PHC	12/17/2003
Bicarbonate (HCO3)		291 mg/L	mg/L	2	L. Roth, PHC	12/16/2003
Carbonate (CO3)		<2 mg/L	mg/L	2	L. Roth, PHC	12/16/2003
TDS	2540C	660 mg/L	mg/L	1	L. Roth, PHC	12/22/2003
Ammonia	4500-NH3B,F/G	<0.5 mg/L	mg/L	0.5	L. Roth, PHC	12/16/2003
pH	4500-H+B	7.4 pH	Std Units		L. Roth, PHC	12/12/2003
S.E.C.	2510B	970 µmho/cm	µmho/cm	20	K. Lor, PHC	12/12/2003
TSS (Total Suspended Solids)	2540D	1990 mg/L	mg/L	4	L. Roth, PHC	12/16/2003
Kjeldahl Nitrogen	4500-NH3 F/G	<0.2 mg/L	mg/L	0.2	L. Roth, PHC	12/16/2003

DLR = Detection Level for Reporting
QNS = Quantity Not Sufficient for Analysis
NTP = No Test Performed on Sample

Director / Chemistry Supervisor / QA Officer
Date Reported: 1/5/2004

FRESNO COUNTY PUBLIC HEALTH LABORATORY

1221 Fulton Mall, Fresno CA 93721 P.O. Box 11867 Fresno, CA 93775
Phone: (559)445-3407 Alt. Phone: (559)445-3397 Fax: (559)445-3580
ELAP Certification Number: 1888 James J. Spolsdoff, Laboratory Director

0312-15070	12770	12/12/2003	12/12/2003	10:30 AM	Mike Erwin
Lab Number	Account #	Date Received	Date Collected	Time Collected	Collector/Inspector

SystemType: 99

Sample Type: Routine

Water Sys #:

Census Tract:

Well Number:

APN:

Erwin Engineering
1625 Howard Rd #301
Madera,CA 93637

Attn: Mike Erwin

Sample Site: Diepersloot Dairy (MW-3)

WASTEWATER ANALYSES

Analysis	Method	Result	Units	DLR	Chemist	Date Analyzed
Calcium	3111B	130 mg/L	mg/L	2	K. Lor, PHC	12/29/2003
Magnesium	3111B	48 mg/L	mg/L	2	K. Lor, PHC	12/30/2003
Potassium	3111B	2 mg/L	mg/L	1	K. Lor, PHC	12/22/2003
Sodium	3111B	93 mg/L	mg/L	2	K. Lor, PHC	12/31/2003
Chloride	300.0	97.6 mg/L	mg/L	2	L. Asatryan, PHC	12/17/2003
Nitrate (Ion)	300.0	49.7 mg/L	mg/L	2	L. Asatryan, PHC	12/17/2003
Nitrite (as N)	300.0	<400 µg/L	µg/L	400	L. Asatryan, PHC	12/17/2003
Sulfate	300.0	43.3 mg/L	mg/L	0.5	L. Asatryan, PHC	12/17/2003
Bicarbonate (HCO3)		284 mg/L	mg/L	2	L. Roth, PHC	12/16/2003
Carbonate (CO3)		<2 mg/L	mg/L	2	L. Roth, PHC	12/16/2003
TDS	2540C	700 mg/L	mg/L	1	L. Roth, PHC	12/22/2003
Ammonia	4500-NH3B,F/G	<0.5 mg/L	mg/L	0.5	L. Roth, PHC	12/16/2003
pH	4500-H+B	7.6 pH	Std Units		L. Roth, PHC	12/12/2003
S.E.C.	2510B	1000 µmho/cm	µmho/cm	20	K. Lor, PHC	12/12/2003
TSS (Total Suspended Solids)	2540D	370 mg/L	mg/L	4	L. Roth, PHC	12/16/2003
Kjeldahl Nitrogen	4500-NH3 F/G	1.83 mg/L	mg/L	0.2	L. Roth, PHC	12/16/2003

DLR = Detection Level for Reporting

QNS = Quantity Not Sufficient for Analysis

NTP = No Test Performed on Sample

Director / Chemistry Supervisor / QA Officer

Date Reported: 1/5/2004

15068 1203 15071 DEC 12 2003 DEC 12 AM 11:28

LAB NUMBER | DATE/TIME RECEIVED | ACCOUNT #

FRESNO COUNTY PUBLIC HEALTH LABORATORY

P.O. Box 11867, Fresno CA 93775 1221 Fulton Mall, Fresno CA 93721
Phone (559)445-3407 Alternate Phone # (559)445-3397 Fax (559)445-3580
ELAP Certification Number: 1888 James J. Spolsdoff, Laboratory Director

REQUEST FOR CHEMICAL AND BACTERIOLOGICAL ANALYSES OF DRINKING WATER

Erwin Engr. — Client (Name of Company, Institution, Agency or Person)
Mike Erwin — Attention (First and Last Name)
1625 Howard Rd #351 — Address of Client
Madera — City of Client
CA — State
93637 — Zip Code
673-0923 — Phone Number
Alt. Number
Same — Fax Number
Mike Erwin — Collector/Inspector
9/19/02 — Date Collected
Time Collected
See Attached — Sample Point (Description by Address, System, Sample Site, Location, etc.)
Reg Agency
Water Sys # or Producer #
Census Tract Number
A.P.N. Number
Well Number or Route

SYSTEM TYPE:
- [x] 01 Public Drinking Water
- [ ] 02 Private Drinking Water
- [ ] 03 Dairy
- [ ] 04 Labor Camp
- [ ] 99 Other

SAMPLE TYPE:
- [x] 01 Routine
- [ ] 02 Repeat
- [ ] 03 Replace
- [ ] 04 Special
- [ ] 99 Other

SAMPLE SOURCE:
- [ ] 01 Water Bacteriological Sample Site
- [ ] 02 Route
- [ ] 03 Well
- [ ] 04 Storage Tank
- [ ] 05 GAC
- [ ] 06 Surface Well
- [ ] 07 Lake/River/Creek/Canal/Pond
- [ ] 08 Spring Box
- [ ] 09 Swimming Pool
- [ ] 10 Spa
- [ ] 99 Other

Temperature of Sample Upon Receipt: [ ] 01 Refrigerated [ ] 02 Ambient [ ] 03 Frozen [ ] 04 Above Ambient Temp

Sample Preservation: [ ] 00 No Preservation [ ] 01 Sodium Thiosulfate [ ] 02 HNO3 [ ] 03 HCL [ ] 99 Other

Chain-of-Custody Report Requested: [ ] Yes Initiated By _____

Comments: SP1

CIRCLE TEST(S) AND/OR PANEL(S) REQUESTED

A. Primary Metals B. General Metals C. General Water Quality D. Anions D4. Nitrate D5. Nitrite
E. EPA Method 504 (DBCP& EDB) E1. DBCP Only E2. EDB Only E3. EPA Method 504.1 (DBCP, EDB & 1,2,3-TCP)
F1. EPA 505 F2. EPA 507 F3. EPA 508 F4. EPA 515 F5. EPA 525 F6. EPA 531 F7. EPA 547 F8. EPA 548
G. EPA Method 502.2 G1. EPA 502.2 (Single Analyte) G2. MTBE G3. Trihalomethanes G4. BTEX G5. TPH
H. Radiological Tests: H1: Gross Alpha H2: Gross Beta H3: Uranium H4: Radium-226 H5: Radium-228
I. Special Analyses: 1. Bicarbonate 2. Carbonate 3. Corrosivity 4. MBAS 5. Threshold Odor 6. TDS
7. Hydrogen Sulfide 8. Silica 9. Total Phosphorus 10. Ortho-Phosphate 11. Dissolved Phosphorus
12. Ammonia 13. Hydroxide 14. CTAS 15. Cyanide 16. Grease & Oil 17. Asbestos 18. TOC
J.1. 10-Tube MPN for Coliform & Fecal Coliform (48 hr) 2. 5-5-5 MPN for Coliform & Fecal Coliforms
3. Clark's Presence-Absence Test (48 hr) 4. Heterotrophic Plate Count
5. Colilert Test (Water Bacteriological Test/Presence-Absence Qualitative)
6. Colilert Test (Water Bacteriological Test/10-Tube Quantitative)
7. MPA/Giardia & Cryptosporidia 8. Iron/Sulfur Bacteria 9. Fecal Streptococcus 10. Pseudomonas
K.1. Inorganic Chemicals (Table 64447.2-A) Other Tests: _____
2. Secondary Standards (Table 64449-A)
3. Secondary Standards (Table 64449-B)

HGP	4
PNT	
SBB	
LBB	
40V	
BAC	
OTR	

8

FOR LABORATORY USE ONLY

Pay Code:_____ Total Charges: $ _____
[ ] Paid in Full: Date_____ Initial _____
Receipt _____

Billing Address if Different from Above Address

[ ] FAX [ ] PHONE [ ] ENTERED [ ] REPORTED

FCPHL Form 001211

Laboratory Number	Test Code	Source Code	Sample Type	Name of Collector	Time	Collection Site	Client Data Cl	Client Data Turb	Ent Rpt
03- 15068			well	Mike Erwin	8:30	Diepersloth Dairy MW-1			
03- 15069			"	"	9:30	" MW-2 "			
03- 15070			"	"	10:30	" MW-3 "			
			"						
03- 15071			"	"	8:00	" Production Well			

BSK

MONITORING WELL INSTALLATION REPORT

Robert Diepersloot Dairy
14221 Avenue 14
Madera, California

BSK E05.105.02F

Prepared for:

Mr. Robert Diepersloot
Robert Diepersloot Dairy
14221 Avenue 14
Madera, California 93637

May 31, 2006

Engineers, Geologists, Environmental Scientists

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Figure 2 Site Plan with Monitoring Well Location
Figure 3 Monitoring Well Construction Detail

APPENDICIES

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Appendix B Boring Logs
Appendix C Well Development Logs
Appendix D Piper Diagram
Appendix E Survey Information

MONITORING WELL INSTALLATION REPORT
ROBERT DIEPERSLOOT DAIRY
14221 AVENUE 14
MADERA, CALIFORNIA

1.0 INTRODUCTION

BSK Associates has prepared this report to document the installation of an additional upgradient monitoring well (MW-4) at the Diepersloot Dairy located at 14221 Avenue 14, Madera County, California (Site). This report was prepared in response to a March 18, 2005 correspondence titled *Review of Monitoring Well, Wastewater, and Groundwater Sampling Report, Bob Diepersloot Dairy, Madera County* (Site) from the California Regional Water Quality Control Board (RWQCB). In the letter the RWQCB stated that the existing location of monitoring well, MW-1, was too close to the existing wastewater retention system and that a new monitoring well should be located further upgradient from the wastewater retention system and away from cropland where dairy wastes are applied.

On September 6, 2005 BSK submitted our *Monitoring Well Installation Workplan* to the RWQCB for review and comment. The RWQCB approved the workplan in their September 19, 2005 correspondence, with a few comments and modifications.

2.0 SITE DESCRIPTION

The Diepersloot Dairy is located at 14221 Avenue 14, Madera County, California (Figure 1). The site is located near the intersection of Avenue 14 at Road 14, approximately 10 miles west of the City of Madera, California. The Site is located in Township 11 South, Range 15 East, Sections 23, 24, and 25. The Dairy includes the Diepersloot Residence along with several other residences, buildings associated with the dairy operations, wastewater retention ponds, and associated agricultural land used to grow crops for the dairy consumption.

3.0 PROJECT HISTORY

Based on the Monitoring and Reporting Program No. 5-01-830, three monitoring wells were installed at the site by Erwin Engineering (Figure 2). The monitoring wells have been sampled twice as part of the semi-annual sampling program which commenced in December 2003. Elevated concentrations of nitrate (NO_3) have been previously reported above the primary Maximum Contaminant Limit (MCL) set forth in Title 22 of the California Code of Regulations were reported in MW-1 and MW-3. Furthermore, elevated concentrations of total dissolved solids (TDS) and Specific Electrical Conductivity (SEC) were reported at concentrations above the secondary MCL standards in the three monitoring wells. Concentrations of Total Kjeldahl Nitrates (TKN) were reported in MW-1 and MW-3, although no MCL standard has been set for TKN at this time.

The depth to groundwater measurements conducted by Erwin between December 2003 and 2004 established a groundwater hydraulic gradient to the west-southwest with a depth to water in the three monitoring wells ranging from 97.10 feet in MW-3 to 100.55 in MW-2 measured in December 2004.

4.0 MONITORING WELL INSTALLATION

Based upon a request by the RWQCB, BSK installed one additional groundwater monitoring well (MW-4) in the upgradient direction from the waste-water retention ponds and from the crop land where dairy waste is applied. The monitoring well was originally slated to be installed in the northeast corner of field 3E, but due to the presence of underground irrigation lines, BSK moved the monitoring well location to the southeast corner of field 4E, approximately 30 feet north from the original proposed location. In addition, the dairy has agreed to limit the irrigation of the on-site surrounding fields (3E and 4E) so that dairy waste-laden crop water will not be discharged within a 100-foot radius of the new monitoring well. However, other dairy and agricultural land is located east (upgradient) of the site.

4.1 Permitting

Prior to beginning monitoring well installation procedures, BSK received an approved Well Construction Application for the additional groundwater monitoring well installation from the Madera County Resource Management Agency (MCRMA). A copy of the permit has been included in Appendix A.

4.2 Groundwater Monitoring Well Construction Details

The additional monitoring well was installed upgradient from the site in order to evaluate background groundwater quality in the area. The monitoring well was installed on October 26, 2005, near the northeast corner of the site, south of the Fresno River and in between two agricultural wells located in that area (Figure 2).

The monitoring well was installed using a BK-81 drill rig utilizing standard hollow-stem methodology. The boring was drilled to an approximate depth of 119 feet. The soils beneath the site consisted mostly of clays and silts with small interbeds of sand to an approximate depth of 96 feet where beds of groundwater-bearing silty sands were encountered. The depth to groundwater during drilling; however, was not readily apparent due to the amount of clay encountered. The boring logs show that the clay encountered at the depth of approximately 93 feet had reached the liquid limit and could no longer be rolled into threads, denoting wet soil conditions. Hence, the screened interval for the well was set from 88 feet to 118 feet bgs. A boring log for the well is included in Appendix B.

The monitoring well was constructed of 2-inch diameter, threaded, schedule-40 PVC pipe. The monitoring well was constructed with 30-feet of 0.02-slot PVC screen. The remainder of the casing consisted of PVC blank, a threaded end cap, and a locking well plug. A tremmie pipe was used to emplace a filter pack consisting of #3 Monterey sand, which extended from the bottom of the boring to 85 feet bgs. A two-foot transition seal consisting of hydrated bentonite chips was emplaced on top of the filter pack with a tremmie pipe. The remainder of the annulus was filled with Portland cement containing approximately 10% bentonite emplaced by a tremmie pipe to a depth of approximately 3-feet bgs. The surface completion of the well consisted of a 5-foot steel monument surrounded by a 2-foot by 2-foot concrete pad. Steel traffic bollards were placed around the perimeter of the monitoring well monument to protect the well from farm equipment. A monitoring well construction diagram is included as Figure 3.

4.3 Groundwater Monitoring Well Development

The new monitoring well was developed on October 28 2005, by BSK. The depth to groundwater was measured at 85.24 feet below top of casing. The depth to water in MW-4 was measured at approximately 6 feet higher than what was measured during the well installation, and approximately 10 to 15 feet higher than the other three monitoring wells at the site. The total depth of the well was measured at 98.38 feet, which indicated that nearly 20 feet of fines were present in the screened interval of the casing and probably entered the casing during installation. The well was developed by BSK using air-lift methods; however this method did not appear to be successful in removing all the fines from the casing. Groundwater development field logs are included in Appendix C.

BSK returned to the site on November 18, 2005 in a second attempt to purge the fines from the well, using an air-displacement pump; however the second attempt was not successful in removing the fines. The depth to water was measured at 86.89 feet with a total well depth of 98.51 feet.

BSK mobilized to the site on December 2, 2005 to remove the remaining amount of fines from the well casing using the air compressor on the drill rig for air lift methods and to power a displacement pump. In addition the well was bailed using a stainless steel bailer on the drill rig wire pulleys. BSK was successful in removing approximately 10 feet of fines from the well, but was unsuccessful in removing all the fines from the well.

When the BSK mobilized to the site on December 28, 2005 to collect the groundwater samples, the total depth of the well was measured at 104.80 feet. At that point, the BSK field technician was directed to purge at least 5 well casings and sample the well, to meet the annual monitoring schedule.

5.0 DISCUSSION OF FINDINGS

Monitoring well, MW-4, was installed on October 26, 2005. The monitoring well was relocated approximately 30 feet north from the proposed location in the work plan due to the presence of subsurface irrigation lines. The well was installed using a hollow-stem auger drill rig to a depth of approximately 118 feet. The depth to groundwater was measured at approximately 93 feet during installation. Flowing sands encountered at the approximate 97 foot depth came up into the augers during installation and appear to have flooded the lower portion of the screened interval. Several attempts were made by BSK to clean out the fines during development however, the attempts were largely unsuccessful in cleaning out all the fines.

At this point, it appears that the lower 15 feet of the well screened interval is impacted with fine sands and silts, which probably flooded the lower portion of the screened interval during installation. The three attempts to remove the fines using air lift, a displacement pump, bailing, and surging have been unsuccessful to date. It is BSK's opinion that the loss of 15 feet out of 30 of the screened interval will not adversely impact the quality of the groundwater samples collected from the well. In addition, during future sampling events, BSK will purge at least five casing volumes of water out of the well prior to sampling, to ensure a representative groundwater sample.

A piper diagram has been included with this report, which was generated from the analytical data for the December 2005 groundwater monitoring event. The piper diagram shows that the groundwater samples collected from the four monitoring wells are all from the same aquifer and is of similar quality. The piper diagram is included in Appendix D. The analytical results of the December 2005 groundwater monitoring event will be presented under a separate cover.

The monitoring well network at the site was re-surveyed by Blair, Church, and Flynn Consulting Engineers in March 2006. The survey work included locating the four monitoring wells using NAV83 coordinates and NAVD 88 datum. In addition, the top of casing of each well was surveyed for elevation in relation to mean sea level. The survey data has been included in Appendix E.

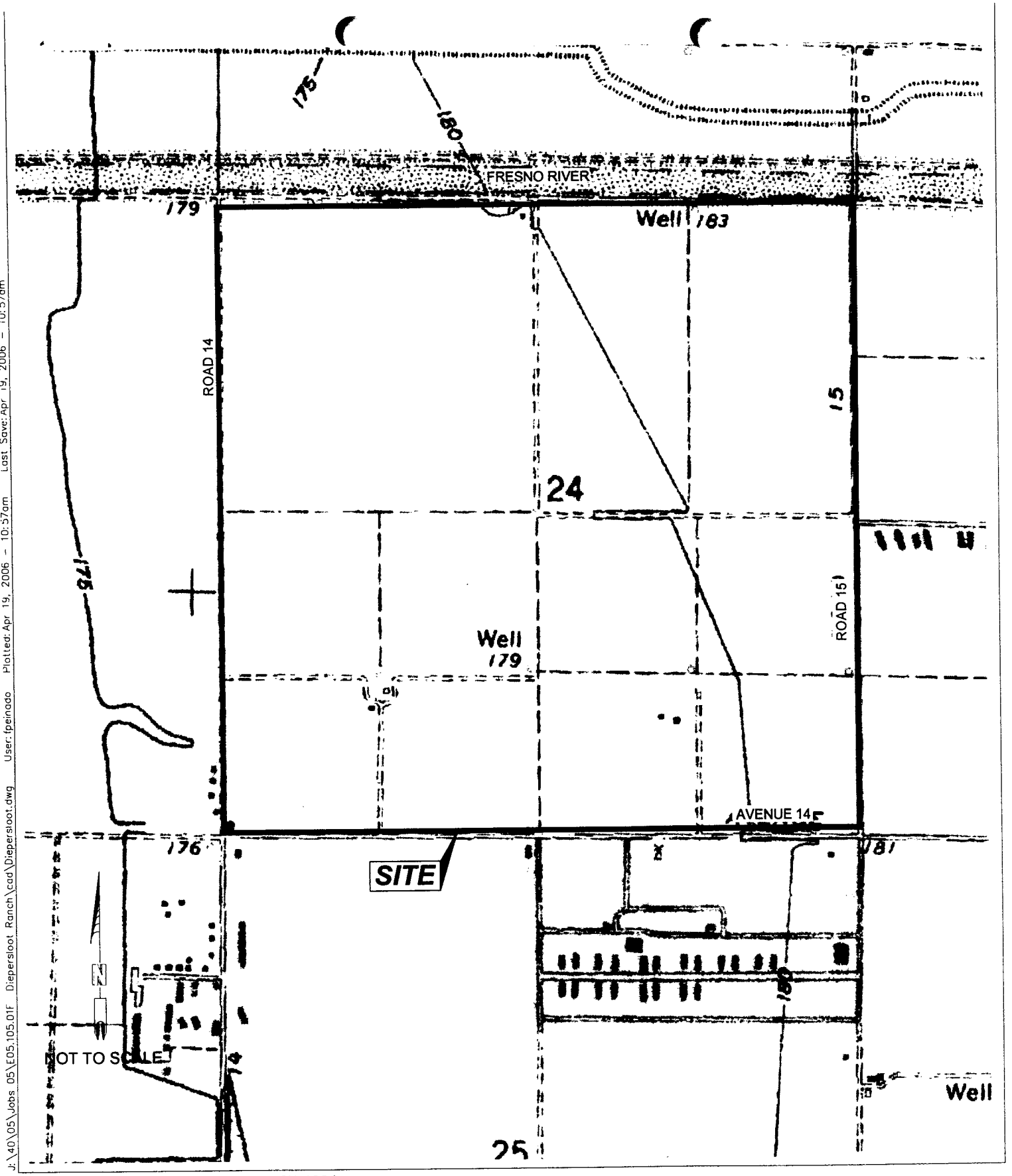
6.0 LIMITATIONS

This report has been prepared for the exclusive use of the Diepersloot Dairy in accordance with generally accepted environmental engineering practices in Madera County at the time the service were performed. BSK's services were performed solely for the purpose of evaluating environmental conditions of groundwater with respect to the RWQCB requirements for the laboratory analysis at the locations sampled.

No other warranties either express or implied are made as to the professional advice provided under the terms of BSK's agreement with the Diepersloot Dairy. The passage of time, natural processes, or human intervention on the facility or adjacent properties and changes in the regulations can cause changed conditions which can invalidate the findings and conclusions presented in this report.

FIGURES

BSK



REFERENCE:terraserver-usa.com 7/1/1984

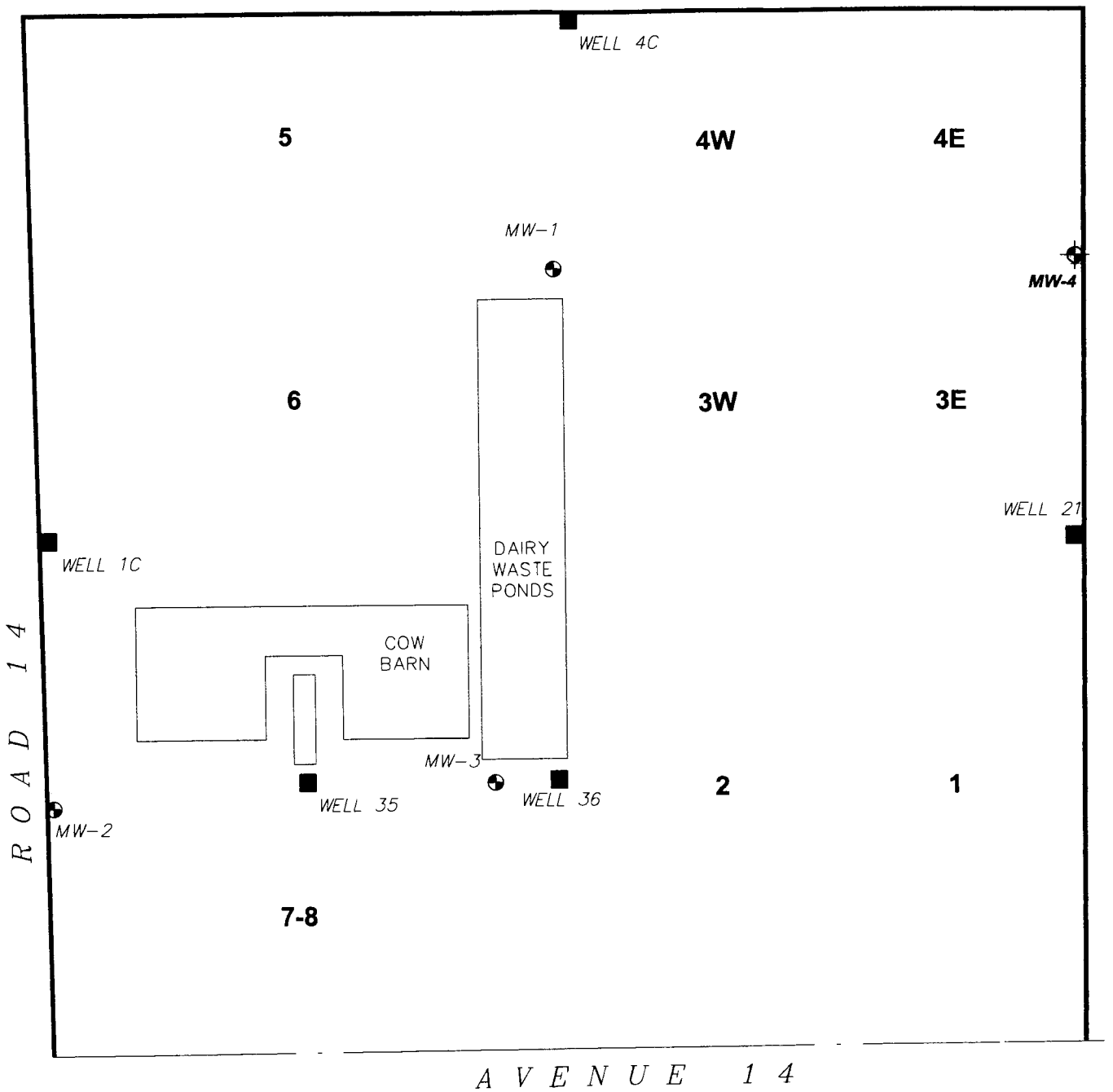
VICINITY MAP

Robert Diepersloot Dairy
14221 Avenue 14
Madera County, California

BSK

E05.105.01F FIP Diepersloot.dwg 08/23/05

FIGURE 1



LEGEND:

- NEW MONITORING WELL
- EXISTING MONITORING WELL
- AGRICULTURAL SUPPLY WELL
- 5 FIELD NUMBERS

J:\40\05\Jobs 05\E05.105.01F Diepersloot Ranch\cad\Diepersloot.dwg User: fpeinado Plotted: May 31, 2006 – 12:54pm Last Save: May 31, 2006 – 12:43pm

REFERENCE: Blair Church & Flynn 03/22/2006

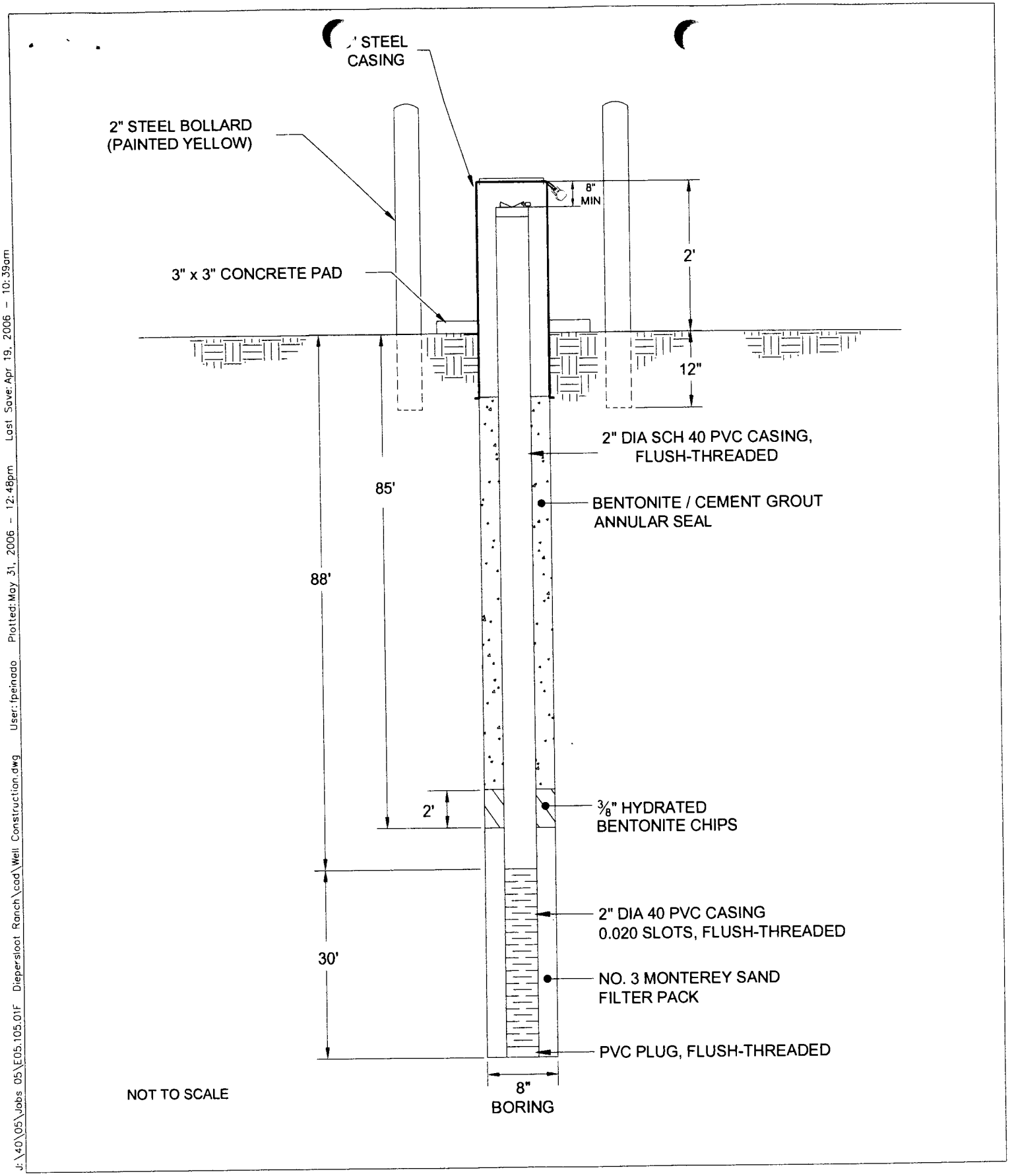
SITE PLAN

Robert Diepersloot Dairy
14221 Avenue 14
Madera County, California

BSK

E05.105.02F FIP Diepersloot.dwg 05/16/06

FIGURE 2



J:\40\05\Jobs 05\E05.105.01F Diepersloot Ranch\cad\Well Construction.dwg User: fpeinado Plotted: May 31, 2006 - 12:48pm Last Save: Apr 19, 2006 - 10:39am

MONITORING WELL MW-4 CONSTRUCTION DIAGRAM

Robert Diepersloot Dairy
14221 Avenue 14
Madera County, California

BSK

E05.105.01F FIP Well Construction.dwg 08/25/05

FIGURE 3

APPENDIX A

Well Permit

PERMIT IS VALID ONLY WHEN SIGNED & PERMIT # ISSUED

RESOURCE MANAGEMENT AGENCY

Environmental Health Department
2037 Cleveland, Madera, CA 93637-3502
(559) 661-6333 FAX (559) 675-7919

INSPECTION #	PERMIT # 80079
FEE	FEE 150 —
DATE	DATE
CHECK#	CHECK# 14434

WELL CONSTRUCTION APPLICATION

PROPERTY OWNER (S) ROBERT DIEPERSLOOT PHONE 43791

MAILING ADDRESS 14221 AVENUE 14 MADERA 93637 PARCEL MAP#

JOB ADDRESS SAME APN# 043 - 052 - 004 LOT #

CONTRACTOR'S NAME BSK PHONE 559.497.2880 EXT. 127

LICENSE TYPE: C-57 LICENSE # 490742

WATER WELL

Intended Use	Type of Work
Domestic	X New Well
Shared	Deepening
Agricultural	Repair
Industrial	Destruction
Community	Replacement Well
X Monitoring/Soil Boring	
Existing Well(s) y / n If yes #	

Applicant must:

- Submit a copy of the well log to Madera County Department of Environmental Health.
- Provide 24-hour notice for all seal placements. Community well seals are by appointment only.
- Unauthorized changes to the permit WILL RENDER IT VOID
- Maintain ALL County Setbacks.
- This permit is valid only for the property owner for the subject parcel and is nontransferable.

Construction Information

Type of Well

Cable Tool Rotary Gravel Pack Hardrock Other AUGER

Casing Diameter 2" Casing Material PVC

Casting Gauge / Schedule 40

Annular Seal Material CEMENT Seal Depth 85'

Comments:

Sewage Disposal

- ☐ Sewer
- ☐ Onsite Disposal

U.S.H.U.D. FLOOD HAZARD ZONE "A" FORM

ATTACHED. ☐ O.K. ☐

BY DATE

• SEE REVERSED SIDE FOR SYSTEM SETBACKS

☐ Setbacks variances requested and obtained.

Initial

PLOT PLAN -- For subject parcel and all affected adjacent lands, show street, nearest intersection, buildings, distances from buildings and property lines, easements, right of ways, all existing wells and applicable sewage system components as well as contamination sources.

Work start date 10/26/05

Original: Env. Health
Yellow:: Assessor
k: Permit
denrod: Applicant

Permit Approved: Janet Gardner Date 10-18-05

Inspection: Date

THIS PERMIT SHALL EXPIRE BY LIMITATION AND BECOME NULL AND VOID IF THE WORK IS NOT COMMENCED OR IF NO INSPECTIONS ARE CALLED FOR WITHIN 180 DAYS

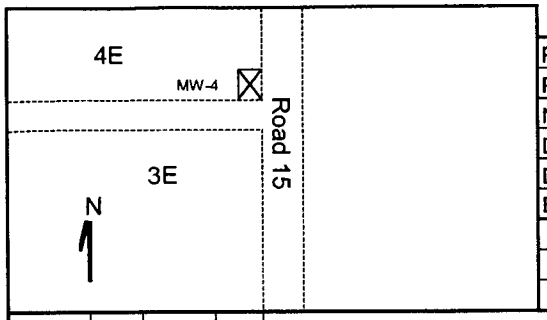
APPENDIX B

Boring Logs

BSK SOIL BORING LOG

BORING NO: MW-4

SHEET 1 OF 5



PROJECT NAME:	Diepersloot Dairy		
PROJECT NUMBER:	E05.105.02F	DATE:	10/26/2005
NORTHINGS:		EASTINGS:	
DRILLING COMPANY:	BSK Associates		
DRILLING METHOD:	Hollow-stem Auger	DRILL RIG TYPE:	BK-81
BORING DIAMETER:	8"	DEPTH:	119 feet

GROUNDWATER LEVELS

DATE	COMMENTS	DEPTH BGS
10/26/05	clays at liquid limit	~93 feet

DEPTH (FEET)	GRAPHIC LOG	Sample Interval	USCS	LITHOLOGIC DESCRIPTION	TIME	OVA	REMARKS
			ML	Sandy SILT, light brown, moist, fine to medium sand, non-plastic			
1							
2							
3							
4			CL	CLAY with Silt, dark gray, moist, medium plastic			
5							
6							
7							
8			CL	Silty CLAY with Sand, brown, moist, fine grained sand, medium plastic cl			
9							
10			CL	sand no longer present in sample			
1			CL	decreasing silt content, color change to dark brown			
2							
3							
4			CL	Increase in silt content, decreasing plasticity			
5							
6							
7			SC	Clayey SAND, brown, moist, fine to medium grained sand, medium plast			Reported change in drilling resistance at 17 feet
				clay			
8							
9							
20							
1							
2							
3			CL	CLAY with Silt, brown, moist, medium plastic, soft.			Reported change in drilling resistance at 23 feet
4							
25							

LOGGED BY: Mike McKenzie

BSK SOIL BORING LOG

BORING NO: MW-4

SHEET 2 OF 5

PROJECT NAME:	Diepersloot Dairy		
PROJECT NUMBER:	E05.105.02F	DATE:	10/26/2005
NORTHINGS:		EASTINGS:	
DRILLING COMPANY:	BSK Associates		
DRILLING METHOD:	Hollow-stem Auger	DRILL RIG TYPE:	BK-81
BORING DIAMETER:	8"	DEPTH:	119 feet

GROUNDWATER LEVELS

DATE	COMMENTS	DEPTH BGS

DEPTH (FEET)	GRAPHIC LOG	Sample Interval	USCS	LITHOLOGIC DESCRIPTION	TIME	OVA	REMARKS
26							
7							
8							
9							
30							
1							
2							
3							
4							
5			CL	Sandy CLAY, brown, moist, medium plastic clays, fine to medium grained sands			Reported change in drilling resistance at 35 feet
6							
7							
8							
9							
40			CL/CH	CLAY, dark brown, moist, medium to high plasticity			Reported change in drilling resistance at 39-40' much harder drilling
1			CL	Silty CLAY, brown, moist, medium plastic			Easy drilling reported at 41-42'
2							
3			CH	CLAY, dark brown, moist, medium to high plasticity			Hard drilling reported at 43'
4			CL	Silty CLAY, brown, moist, medium plastic			Easy drilling reported at 44-45'
5							
6							
7							
8							
9							
50							

LOGGED BY: Mike McKenzie

BSK SOIL BORING LOG

BORING NO: MW-4

SHEET 3 OF 5

PROJECT NAME:	Diepersloot Dairy		
PROJECT NUMBER:	E05.105.02F	DATE:	10/26/2005
NORTHINGS:		EASTINGS:	
DRILLING COMPANY:	BSK Associates		
DRILLING METHOD:	Hollow-stem Auger	DRILL RIG TYPE:	BK-81
BORING DIAMETER:	8"	DEPTH:	119 feet

GROUNDWATER LEVELS

DATE	COMMENTS	DEPTH BGS

DEPTH (FEET)	GRAPHIC LOG	Sample Interval	USCS	LITHOLOGIC DESCRIPTION	TIME	OVA	REMARKS
51							
			CL	color change to dark brown			
2							
3							
4							
5							
6							
7			CL	Sandy CLAY, dark brown, moist, fine grained sand, medium plastic clay			
8							
9			CL	Silty CLAY, brown, moist, medium plastic			
60							
1							
2							
3			CL/CH	CLAY, brown, moist, medium to high plasticity			
4							
5							
6							
7							
8			CL	Silty CLAY, brown, moist, medium plastic			Reported change in drilling resistance at 68'
9							
70							
1							
2							
3							
4							
75							

LOGGED BY: Mike McKenzie

BSK SOIL BORING LOG

BORING NO: MW-4

SHEET 5 OF 5

PROJECT NAME:	Diepersloot Dairy		
PROJECT NUMBER:	E05.105.02F	DATE:	10/26/2005
NORTHINGS:		EASTINGS:	
DRILLING COMPANY:	BSK Associates		
DRILLING METHOD:	Hollow-stem auger	DRILL RIG TYPE:	BK-81
BORING DIAMETER:	8"	DEPTH:	119'

GROUNDWATER LEVELS

DATE	COMMENTS	DEPTH BGS

DEPTH (FEET)	GRAPHIC LOG	Sample Interval	USCS	LITHOLOGIC DESCRIPTION	TIME	OVA	REMARKS
101							
2							
3							
4							
105			CL	CLAY with Silt, wet, soft, medium to high plasticity			
6							
7			SM	Silty SAND, brown, wet, fine to medium grained sand, non-plastic			Flowing sands
8							
9							
110							
1			CL	CLAY with Silt, brown, wet, soft, medium plastic			
2							
3			SM	Silty SAND, brown to gray, fine to medium sand, non-plastic			Flowing sands
4							
115							
6							
7							
8							
9							
120				Boring terminated at approximately 119 feet.			Driller reports 15 to 20 feet of groundwater present in the augers
1							
2							
3							
4							
125							

LOGGED BY: Mike McKenzie

BSK SOIL BORING LOG

ORING NO: MW-4

SHEET 4 OF 5

PROJECT NAME:	Diepersloot Dairy		
PROJECT NUMBER:	E05.105.02F	DATE:	10/26/2005
NORTHINGS:		EASTINGS:	
DRILLING COMPANY:	BSK Associates		
DRILLING METHOD:	Hollow-stem Auger	DRILL RIG TYPE:	BK-81
BORING DIAMETER:	8"	DEPTH:	119 feet

GROUNDWATER LEVELS

DATE	COMMENTS	DEPTH BGS

DEPTH (FEET)	GRAPHIC LOG	Sample Interval	USCS	LITHOLOGIC DESCRIPTION	TIME	OVA	REMARKS
76							
			CH	CLAY, brown, moist, medium to high plasticity			Reported change in drilling resistance at 76-77'
7							
8							
9							
80							
1							
2							
3							
4							
85							
6							
7			CL	Sandy CLAY, brown, very moist, fine grained sand, medium to high plasticity.			
8							
9							
90							
1							
2							
3							Clay is at the liquid limit
4							
95							
6			SM	Silty SAND, light gray to brown, wet, fine to medium grained sand, non-plastic, non-cemented.			Flowing sands
7							
8							
9							
100				very moist to wet soil, little to no sand in cuttings			

LOGGED BY: Mike McKenzie

APPENDIX C

Well Development Logs

WELL DEVELOPMENT LOG

Project Name: Dieper Sloot Dairy	Job #: E05.005.027	Field Personnel: WDP
Day: Mon Tu Wed Thur (Fri) Sat Sun (circle one)	Date: 10/28/05	Weather: Clear (Partly Cloudy) Overcast Rain (circle) Cold Cool (Warm) Hot Very Hot

Well:	MW-4	Water Level Measurement Technique: (Circle)	Electric Sounder Ser # 250s Not Measured
Static Depth to Water-Ft. (A)	85.24	Purge Method: (Circle)	Grundfos Submersible Pump Pneumatic Pump
Total Depth of Casing-Ft. (B)	98.38		Electric Pump Hand Bailed
Total Ft. of Water (B-A)	13.14		Other Airlift
Casing Dia-in.	(2") 4" Other		Dedicated System: Yes (No)
Casing Capacity-gal/ft (C)	(.163) .653	Dedicated System:	Yes X No
Gallons per Casing Volume	(B-A)*C 2.14	pH Calibration:	4.0 ✓ 7.0 ✓ 10.0 ✓ EC Calibration(µmhos)

Time	Gallons Purged	Casing Volumes	PH	EC (µmhos)	Temp (EF) (EC)	Turbidity NTU or D.O.mg/l	Remarks (Color, Odor, Turbidity, etc.)
12:30	0	0	-----	-----	-----	-----	Started Purge/Opened Sample Port
13:00	2.25	1	8.10	363 µmhos	21.9		lite brown Cloudy silty no odor
13:30	3.00	2	8.25	410 µmhos	23.1		Same brown Cloudy silty no odor
14:00	3.50	3	8.12	417 µmhos	24.5		liter brown Still Cloudy less silty
14:50	4.0	4	8.23	444 µmhos	24.8		liter brown Cloudy a little less silty
							DTB 99.69
							Final DTW: 89.92

							Sampled/Stopped
Chloride		Sulfate		Nitrate	X4.4		Other Field Results:

Purge Pump On	12:30	Discharge Measurement: (Circle) Bucket Tank Flowmeter ground
Purge Pump Off	14:50	Sample Collection Method: Direct From Discharge Hose
Total Gallons Purged		Teflon Bailer Disposable Bailer
Purge Rate (gpm)		Ice Chest Coolant Crushed Ice Blue Ice Ice Chest Temp (EC)

Sample Time	Analyses	Amount/Container Used	Sample Description
		no Sample taken Development only	

Well Vault Type:	Above ground	Floating Product: ___ Yes ___ No X NA
Lock Number/Type:	American lock	Thickness:
Drums Filled/Used:	n/A	Description:

Notes: Dave Smith gave me wellseal for well and I installed new lock on well seal

TOC-Top Of well Casing

WELL DEVELOPMENT LOG

Project Name: Dieperstead Dairy	Job #: E05.105.001F	Field Personnel: W Pannett
Day: Mon Tu Wed Thur (Fri) Sat Sun (circle one)	Date: 11/18/05	Weather: (Clear) Partly Cloudy Overcast Rain (circle) Cold Cool (Warm) Hot Very Hot

Well:	MW-4	Water Level Measurement Technique: (Circle) Electric Sounder Ser # 350 I Not Measured
Static Depth to Water-Ft. (A)	86.89	Purge Method: (Circle) Grundfos Submersible Pump Pneumatic Pump Electric Pump Hand Bailed Other Displacement pump / Air lift system
Total Depth of Casing-Ft. (B)	98.51	
Total Ft. of Water (B-A)	11.62	
Casing Dia-in.	(2") 4" Other	Dedicated System: Yes (No)
Casing Capacity-gal/ft (C)	.163 .653	Dedicated System: ___ Yes X No
Gallons per Casing Volume	(B-A)*C 1.89	pH Calibration: ✓4.0 ✓7.0 ___10.0 EC Calibration(µmhos)___

Time	Gallons Purged	Casing Volumes	PH	EC (µmhos)	Temp (EF) (EC)	Turbidity NTU or D.O.mg/l	Remarks (Color, Odor, Turbidity, etc.)
12:30	0	0	-----	-----	-----	-----	Started Purge/Opened Sample Port
13:00	7.5	1	7.82	180.4	24.3		lite brown Cloudy no odor
13:30	12.0	2	8.07	171.5	23.3		less Cloudy brown and less silts
13:55	14.0	3	8.07	165.6	23.2		less Cloudy + less silts
14:00							I blew the well wide open no top
15:45							lots of silts and sands had to wrap up to take back Air compressor
							Final DTW: 99.10
							Sampled/Stopped Final DTB 99.91
Chloride		Sulfate		Nitrate	X4.4		Other Field Results:

Purge Pump On	12:30	Discharge Measurement: (Circle) Bucket Tank Flowmeter
Purge Pump Off	15:45	Sample Collection Method: ___ Direct From Discharge Hose
Total Gallons Purged		___ Teflon Bailer ___ Disposable Bailer
Purge Rate (gpm)		Ice Chest Coolant ___ Crushed Ice ___ Blue Ice Ice Chest Temp (EC)___

Sample Time	Analyses	Amount/Container Used	Sample Description
	no sample taken Development only		

Well Vault Type:	Above ground	Floating Product: ___ Yes ___ No X NA
Lock Number/Type:	American	Thickness:___
Drums Filled/Used:	n/a	Description:___

Notes: @ 14:00 I pulled out Displacement pump and measured well Determined I have gained 1.27' I am going to try other Induction pump to Faster develop well that didn't work as well as I thought so I blew Directly on well and sprayed lots of silts and sands out all over

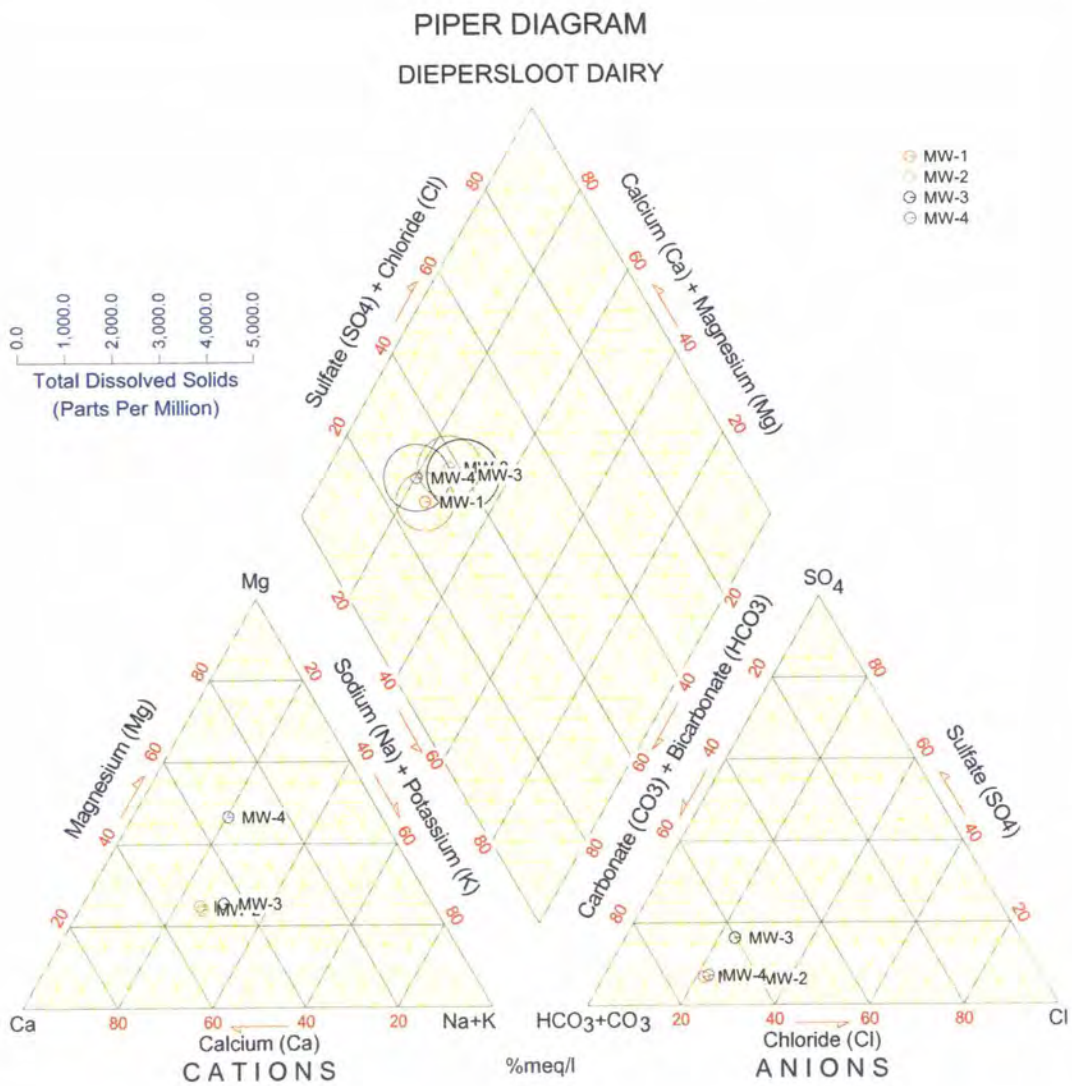
APPENDIX D

Piper Diagram

BSK

PIPER DIAGRAM

DIEPERSLOOT DAIRY



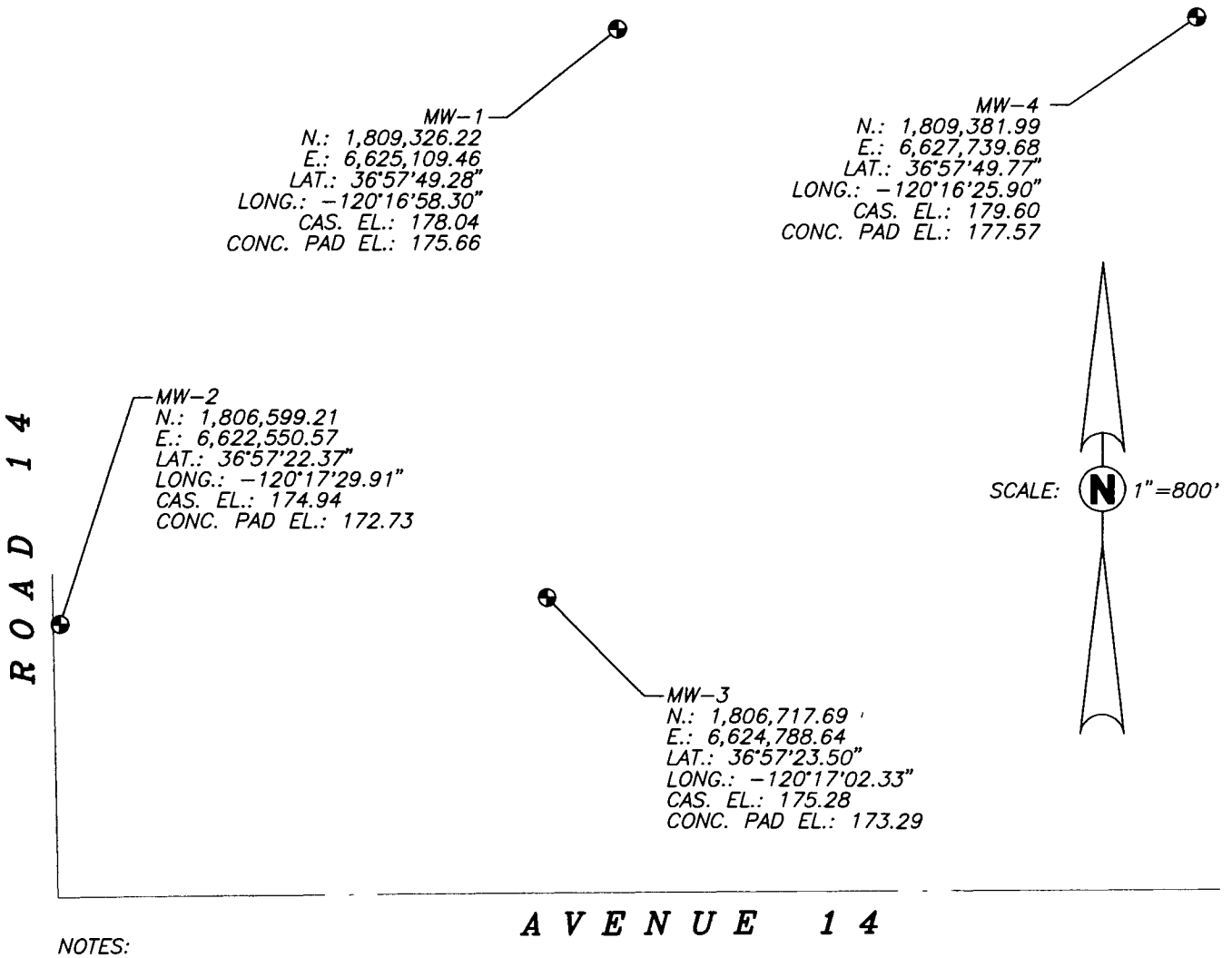
BSK

APPENDIX E

Survey Information

BSK

MONITORING WELL LOCATION DIAGRAM
ROBERT DIEPERSLOOT DAIRY
14221 AVENUE 14
MADERA COUNTY, CALIFORNIA



NOTES:

THE COORDINATES SHOWN HEREON ARE NAD83 ZONE 3 CALIFORNIA GRID COORDINATES. THE ELEVATIONS SHOWN HEREON ARE NAVD88 DATUM. THE COORDINATES AND ELEVATIONS DATUM WERE OBTAINED FROM A STATIC GPS SURVEY AND OPUS SOLUTION. A REAL TIME KINEMATIC (RTK) GLOBAL POSITIONING SURVEY (GPS) ALSO USED IN THIS SURVEY TO OBTAIN MONITORING WELL COORDINATES. A DIFFERENTIAL LEVEL INSTRUMENT WERE USED TO OBTAIN MONITORING WELL CASING ELEVATIONS.

LICENSED LAND SURVEYOR
HIMAWAN BRASALI
L.S. 7800
EXP. 12/31/07
STATE OF CALIFORNIA

Blair, Church Flynn
CONSULTING ENGINEERS

451 Clovis Avenue, Suite 200
Clovis, California 93612
Tel (559) 326-1400
Fax (559) 326-1500

PREPARED ON MARCH 22, 2006

BSK Associates
An Employee Owned Company

RECEIVED
JUN - 2 2006
RWCCB-CVR.
FRESNO, CALIF.

May 31, 2006

BSK E05.105.02F

Mr. Robert Diepersloot
ROBERT DIEPERSLOOT DAIRY
14221 Avenue 14
Madera, California 93637

SUBJECT: Monitoring Well Installation Report
Diepersloot Dairy
Madera County, California

Dear Mr. Diepersloot:

This report has been prepared to document the monitoring well, MW-4, installation conducted at the Diepersloot Dairy by BSK. The work was conducted in response to a request by the California Regional Water Quality Control Board (RWQCB) to install an upgradient monitoring well at the location, away from the waste retention ponds.

Please call Mike McKenzie at (559) 497-2880, extension 127 if you have any questions regarding this report.

Sincerely,
BSK ASSOCIATES

C. Michael McKenzie
Project Geologist

Amer A. Hussain, PE
Regional Manager

CMM/AAH/td

REGISTERED PROFESSIONAL ENGINEER
AMER A. HUSSAIN
No. C057343
EXP 12/31/07
CIVIL
STATE OF CALIFORNIA

cc: Mr. Steve Hulbert, California Regional Water Quality Control Board

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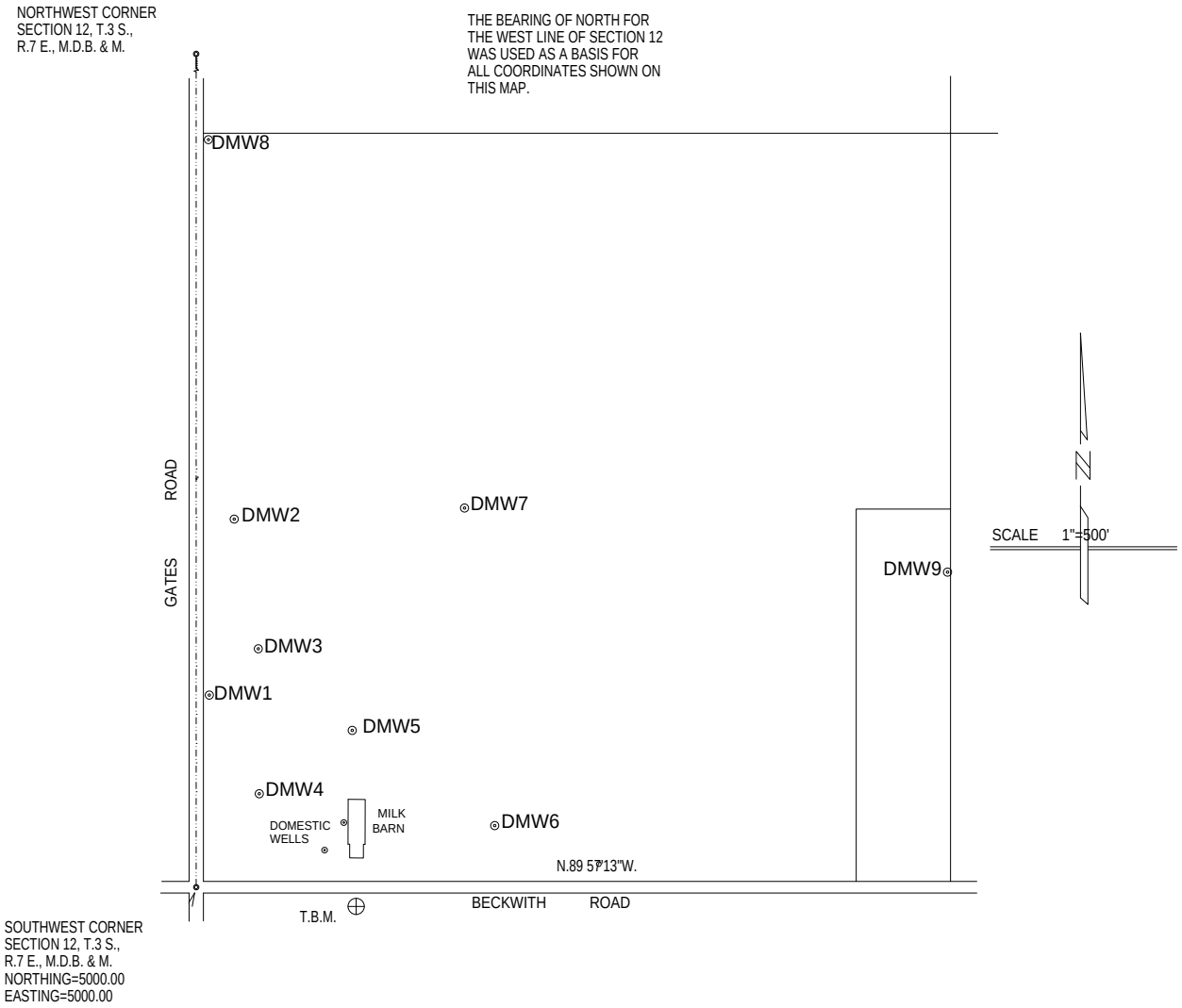
567 W. Shaw Avenue, Ste. B
Fresno, California 93704
(559) 497-2880
(559) 497-2886 fax
www.bskinc.com
www.bsklabs.com

DUR

MONITORING WELL LOCATIONS
FOR
DURRER DAIRY



WELL	NORTHING	EASTING	ELEVATION
DMW1	5672.861	5045.751	44.56
DMW2	6288.684	5133.092	45.94
DMW3	5834.582	5217.310	43.95
DMW4	5327.278	5220.896	43.24
DMW5	5548.978	5546.230	41.88
DMW6	5215.496	6044.574	41.95
DMW7	6327.567	5939.099	46.01
DMW8	7617.457	5042.778	43.97
DMW9	6103.261	7629.778	45.42

BENCH MARK:
BRASS PLATE ON M.I.D. LATERAL
NO. 7 AT DROP 22, WEST OF DUNN
ROAD.
ELEVATION: 48.40 M.I.D. DATUM

TEMPORARY BENCH MARK:
SPIKE IN NORTH FACE OF POWER POLE
SOUTH SIDE OF BECKWITH ROAD OPPOSITE
THE DURRER MILK BARN.
ELEVATION: 43.14 M.I.D. DATUM

MAP PREPARED BY:
DELAMARE - FULTZ
ENGINEERING AND SURVEYING
3421 TULLY ROAD, SUITE "J"
MODESTO, CALIFORNIA 95350
TELEPHONE: (209) 529-7450

Exploratory Boring Log

BORING NO.: DMW-1

Project: RWQCB Dairy Project
Site No.: DU-1
Location: Durrer Dairy Farm, Modesto, CA
Drilled By: Layne Western/Steve McCoy
Elevation: ~45'

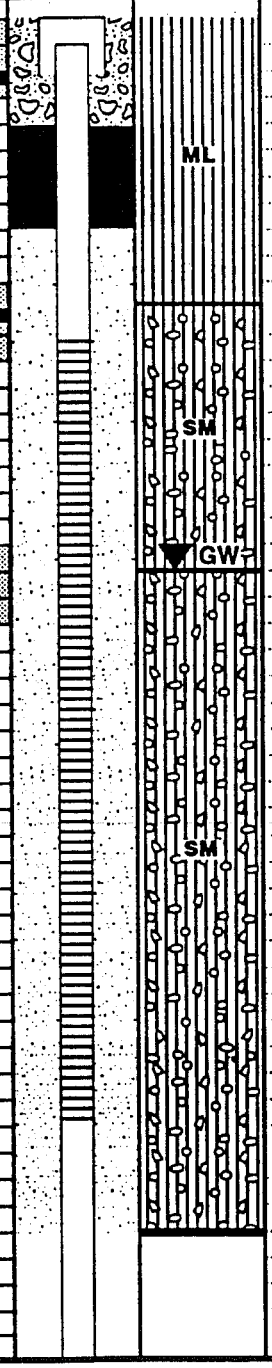
Job No.: 65584.02
Date: 6-3-93 Start: 0920 Finish: 0958
Logged By: M. Sands
Sampling Method: CA Mod. SS
Amb. Temp. (°F): ~70°F

METHOD OF DRILLING: [X] Hollow Stem Auger Other: _____ [ ] Directional Well

Size of Bit: 8" Type of Bit: HS Hammer: wt. 140 lb. Drop 30 in.
Total Depth: 23.0 Depth of Groundwater/Time/Date: 10.5/0945/6-3-93

Surface Description: Dirt, west bank of settling pond, between pond and road.

Sample Number	Blow Count/6"	Depth	Soil Group Symbol (USCS)	Description
DMW-1 1.0	5 7 12	0–4	ML	SANDY SILT (ML), ~30% very fine grain sand, dark greyish-brown, slightly moist, hard.
DMW-1 5.5	3 3 6	5–10	SM	SILTY SAND (SM), 75% fine grain sand, 5% medium grain sand, 20% silt, micaceous, brown, moist, medium dense.
		10	GW	Groundwater encountered at 10.5' bgs during drilling.
No Sample	2 4 7	11–23	SM	SILTY SAND (SM), 5% medium grain, 75% fine grain, 20% silt, micaceous, brown, saturated, medium dense.
		18		Easy drilling.
		23		Total depth - 23.0 feet bgs. Boring converted to monitoring well on 6-3-93.



URS Consultants

Exploratory Boring Log

BORING NO.: DMW-2

Project: RWQCB Dairy Project
Site No.: DU-2
Location: Durrer Dairy Farm, Modesto, CA
Drilled By: Layne Western/Steve McCoy
Elevation: ~45'

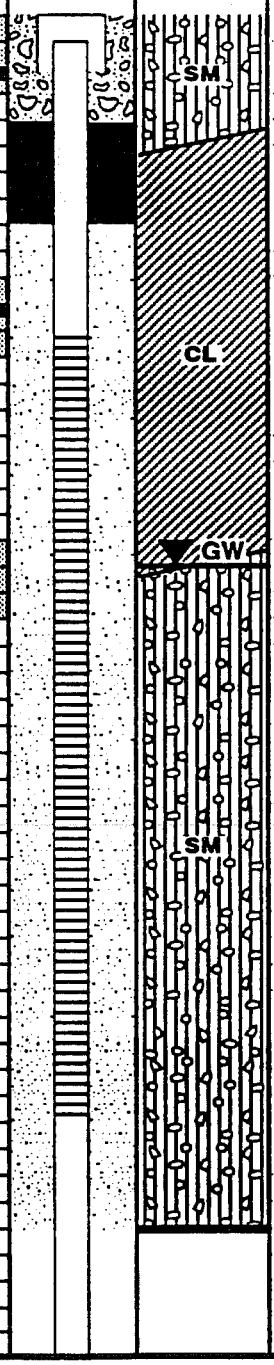
Job No.: 65584.02
Date: 6-3-93 Start: 1215 Finish: 1250
Logged By: M. Sands
Sampling Method: CA Mod. SS
Amb. Temp. (°F): ~75°F

METHOD OF DRILLING: [X] Hollow Stem Auger Other: _____ [ ] Directional Well

Size of Bit: 8" Type of Bit: HS Hammer: wt. 140 lb. Drop 30 in.
Total Depth: 23.0 Depth of Groundwater/Time/Date: 10.5/1230/6-3-93

Surface Description: Dirt, north side of settling pond, midway up bank.

Sample Number	Blow Count/6"	Depth	Soil Group Symbol (USCS)	Description
DMW-2 1.0	5 7 6	0–4	SM	SILTY SAND (SM), very fine grain, micaceous, dark brown, moist, medium dense.
DMW-2 5.5	4 7 10	5–10	CL	SANDY CLAY (CL), very fine grained sand, micaceous, dark brown, moist, moderately hard.
		10	GW	Groundwater encountered at 10.5' bgs during drilling.
No Sample	6 8 14	11–23	SM	SILTY SAND (SM), very fine grain, highly micaceous, orange and dark brown mottling, olive brown, saturated, dense.
		19		Easy drilling.
		23		Total depth - 23.0 feet bgs. Boring converted to monitoring well on 6-3-93.



URS Consultants

Exploratory Boring Log

BORING NO.: DMW-3

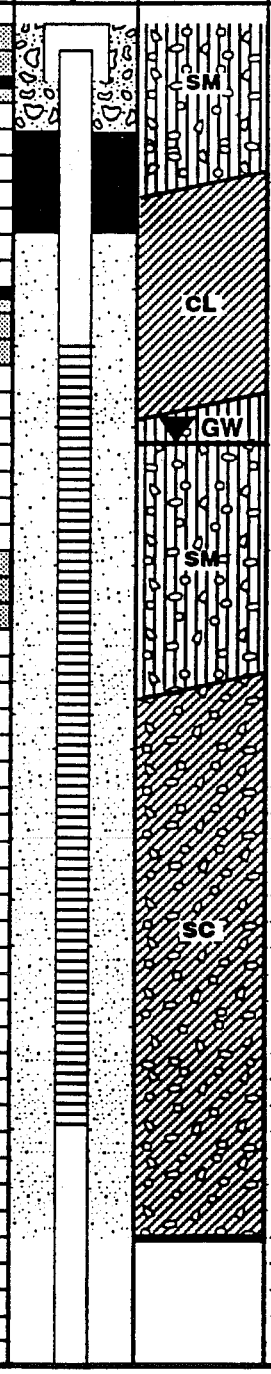
Project: RWQCB Dairy Project
Site No.: DU-3
Location: Durrer Dairy Farm, Modesto, CA
Drilled By: Layne Western/Steve McCoy
Elevation: ~45'

Job No.: 65584.02
Date: 6-3-93 Start: 1455 Finish: 1325
Logged By: M. Sands
Sampling Method: CA Mod. SS
Amb. Temp. (°F): ~75°F

METHOD OF DRILLING: [X] Hollow Stem Auger Other: _____ [ ] Directional Well

Size of Bit: 8" Type of Bit: HS Hammer: wt. 140 lb. Drop 30 in.
Total Depth: 23.0 Depth of Groundwater/Time/Date: 8.5/1510/6-3-93

Sample Number	Blow Count/6"	Depth	Well Completion Diagram	Soil Group Symbol (USCS)	Surface Description: Dirt, northern half of the east bank of the pond. Description:
DMW-3 1.0	4 4 7	0–4		SM	SILTY SAND (SM), very fine grain, dark brown, slightly moist, medium dense.
DMW-3 5.0		5–7		CL	SANDY CLAY (CL), ~50% fine grain sand, plastic, micaceous, brown, wet, hard.
		8		GW	Groundwater encountered at 8.0' bgs during drilling.
No Sample		9–13		SM	SILTY SAND (SM), with lenses of clay, well graded, 30% medium grain sand, 40% fine grain sand, 30% silt, micaceous, sub-angular, brown, saturated, clay pieces are plastic.
		14			Cuttings are very clayey. (SC)
		17–23		SC	Very fluid clayey sand-cuttings.
		23			Total depth - 23.0 feet bgs. Boring converted to monitoring well on 6-3-93.



URS Consultants

Exploratory Boring Log

BORING NO.: DMW-4

Project: RWQCB Dairy Project
Site No.: DU-4
Location: Durrer Dairy Farm, Modesto, CA
Drilled By: Layne Western/Steve McCoy
Elevation: ~45'

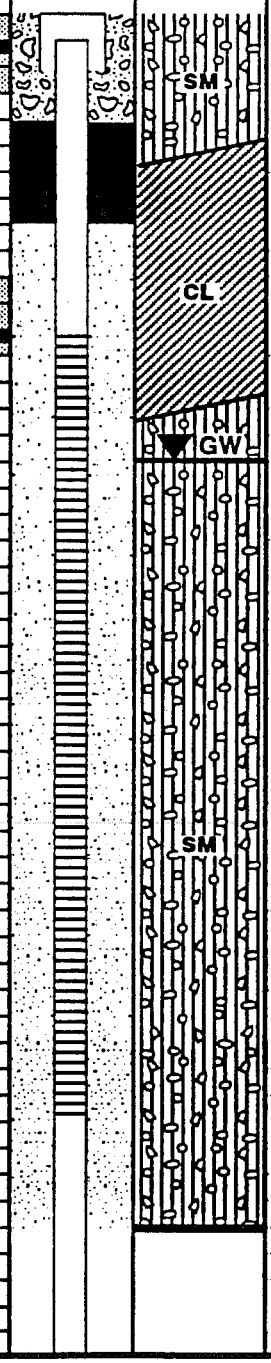
Job No.: 65584.02
Date: 6-4-93 Start: 0720 Finish: 0755
Logged By: M. Sands
Sampling Method: CA Mod. SS
Amb. Temp. (°F): ~65°F

METHOD OF DRILLING: [X] Hollow Stem Auger Other: _____ [ ] Directional Well

Size of Bit: 8" Type of Bit: HS Hammer: wt. 140 lb. Drop 30 in.
Total Depth: 23.0 Depth of Groundwater/Time/Date: 8.5/0735/6-4-93

Surface Description: Dirt, southern half of the east bank of the pond, between trees.

Sample Number	Blow Count/6"	Depth	Well Completion Diagram	Soil Group Symbol (USCS)	Description:
DMW-4 0.5	7 7 10	0–4		SM	SILTY SAND (SM), very fine grain, brown, slightly moist, dense.
DMW-4 6.0	8 10 14	5–8		CL	CLAY (CL), plastic, fine grain sand lenses, micaceous, pale olive with minor orange mottling, moist, hard.
		8		GW	8.5' BGS Groundwater GW encountered during drilling.
No Sample		10–23		SM	SILTY SAND (SM), well graded, 35% medium grain, 35% fine grain sand, 30% fines, sub-angular, very micaceous, brown, saturated, moderately dense.
		19			Easy drilling.
		23			Total depth - 23.0 feet bgs. Boring converted to monitoring well on 6-4-93.



URS Consultants

Exploratory Boring Log

BORING NO.: DMW-5

Project: RWQCB Dairy Project
Site No.: DU-5
Location: Durrer Dairy Farm, Modesto, CA
Drilled By: Layne Western
Elevation:

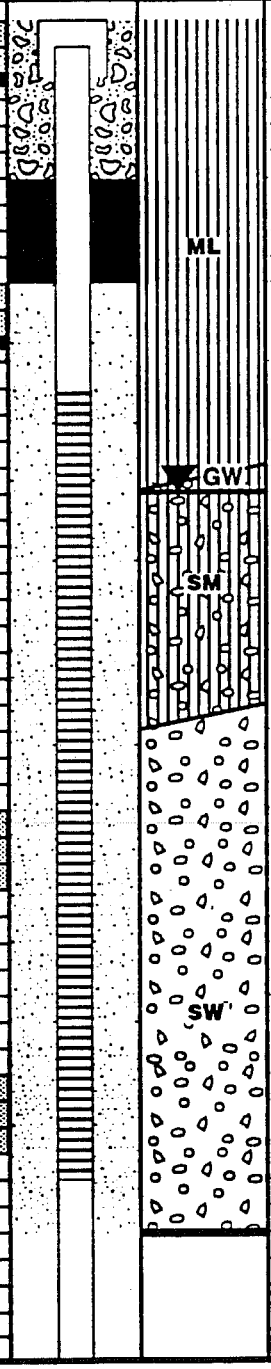
Job No.: 65584.02
Date: 6-8-93 Start: 1455 Finish: 1630
Logged By: P. A. Crispell
Sampling Method: CA Mod. SS
Amb. Temp. (°F): ~80°F

METHOD OF DRILLING: [X] Hollow Stem Auger Other: [ ] Directional Well

Size of Bit: 8.5" Type of Bit: HS Hammer: wt. 140 lb. Drop 30 in.
Total Depth: 23.0' Depth of Groundwater/Time/Date: 9.0/--/6-8-93

Surface Description: Corral, hardpack soils, southeast corner.

Sample Number	Blow Count/6"	Depth	Soil Group Symbol (USCS)	Description
DMW-5 1.0	5 8 16	0–4	ML	SANDY SILT (ML), poorly graded (0,20,60,20) non plastic, dry to moist, dark brown, stiff.
DMW-5 6.0	4 4 3	5–8	ML	Color change to tan-brown, mica flakes in silts.
		9	GW	Groundwater encountered at 9.0' bgs during drilling.
No Sample		10–14	SM	SILTY SAND (SM), well graded, (0,65,25,10) medium to very fine, subangular to rounded, mica quartz, foldspars, tan-brown, saturated, loose.
No Sample	3 4 7	15–19	SW	SAND (SW), well graded (0,90,5,5) course to very fine, subangular to rounded, quartz, micaecous grains, mafic grains, orthoclase, foldspars, black and white, saturated, loose.
No Sample	6 15 18	20–21	SW	
		23		Total depth - 23.0 feet bgs. Boring converted to monitoring well on 6-8-93.



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Exploratory Boring Log

BORING NO.: DMW-6

Project: RWQCB Dairy Project
Site No.: DU-6
Location: Durrer Dairy Farm, Modesto, CA
Drilled By: Layne Western
Elevation:

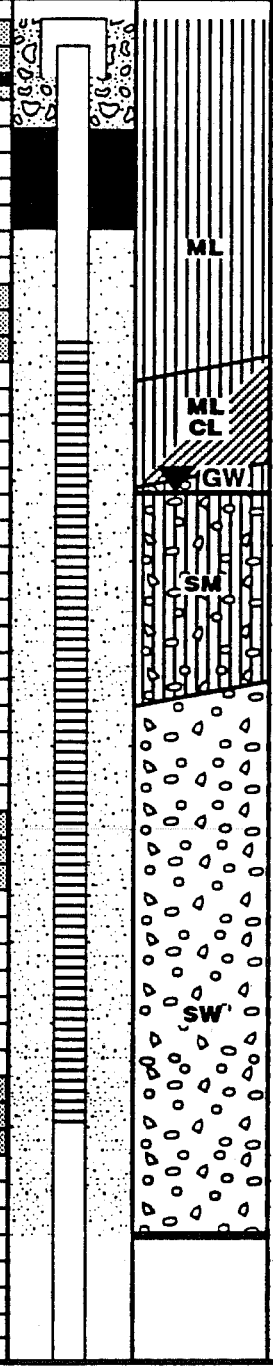
Job No.: 65584.02
Date: 6-8-93 Start: 1455 Finish: 1630
Logged By: P. A. Crispell
Sampling Method: CA Mod. SS
Amb. Temp. (°F): ~80°F

METHOD OF DRILLING: [X] Hollow Stem Auger Other: [ ] Directional Well

Size of Bit: 8.5" Type of Bit: HS Hammer: wt. 140 lb. Drop 30 in.
Total Depth: 23.0' Depth of Groundwater/Time/Date: 9.0/--/6-8-93

Surface Description: Grass covered soils, 4 feet off of corner, southeast of eastern most corral.

Sample Number	Blow Count/6"	Depth	Well Completion Diagram	Soil Group Symbol (USCS)	Description:
DMW-6 1.0	4 5 6	0–4		ML	SANDY SILT (ML), well graded (0,30,60,10) medium to fine, dark brown, moist, stiff.
No Sample	2 4 6	5–8		ML CL	CLAYEY SAND, moderately graded (0,50,25,25,) medium to fine tan-brown, moist, soft.
		9		GW	9.0' BGS Groundwater GW encountered during drilling.
		10–13		SM	SILTY CLAYEY SAND, well graded (0,65,15,20,) course to fine sub-angular to rounded, micaceous grains, wet to saturated.
	4 10 13	14–17		SW	SAND, poorly graded (0,85,10,5) course to fine sub-angular to rounded, mica, quartz, fspars, saturated, moderatly dense, red-brown. Lenses of silty sand 2" to 6".
	3 4 8	20–21		SW	SAND, well graded, (0,95,5,0) course to fine, sub-angular to rounded, mica, fspars, quartz, red-brown, saturated, loose.
		23			Total depth - 23.0 feet bgs. Boring converted to monitoring well on 6-8-93.



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Exploratory Boring Log

BORING NO.: DMW-7

Project: RWQCB Dairy Project
Site No.: DU-7
Location: Durrer Dairy Farm, Modesto, CA
Drilled By: Layne Western/Steve McCoy
Elevation: ~45'

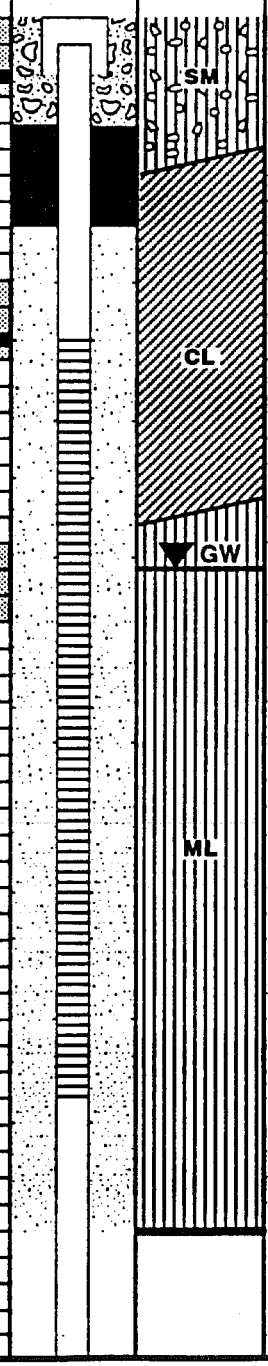
Job No.: 65584.02
Date: 6-2-93 Start: 1000 Finish: 1100
Logged By: M. Sands
Sampling Method: CA Mod. SS
Amb. Temp. (°F): ~70°F

METHOD OF DRILLING: [X] Hollow Stem Auger Other: _____ [ ] Directional Well

Size of Bit: 8" Type of Bit: HS Hammer: wt. 140 lb. Drop 30 in.
Total Depth: 23.0 Depth of Groundwater/Time/Date: 10.5/1012/6-2-93

Surface Description: Dirt, north side of Ag. well stovepipe.

Sample Number	Blow Count/6"	Depth	Soil Group Symbol (USCS)	Description
DMW-7 1.0	2 2 2	0–4	SM	SILTY SAND (SM), very fine grain, micaceous, dark brown, moist, loose.
DMW-7 6.0	2 3 5	5–9	CL	SANDY CLAY (CL), moderalty plastic, very fine grain sand, micaceous, dark brown, moist-wet, medium hard.
		10	GW	Groundwater encountered at 10.5' bgs during drilling.
No Sample	6 5 9	11–23	ML	SANDY SILT (ML) very fine grain, dark brown, saturated, loose, micaceous.
		19		Easy drilling.
		23		Total depth - 23.0 feet bgs. Boring converted to monitoring well on 6-3-93.



URS Consultants

Exploratory Boring Log

BORING NO.: DMW-8

Project: RWQCB Dairy Project
Site No.: DU-8
Location: Durrer Dairy Farm, Modesto, CA
Drilled By: Layne Western
Elevation:

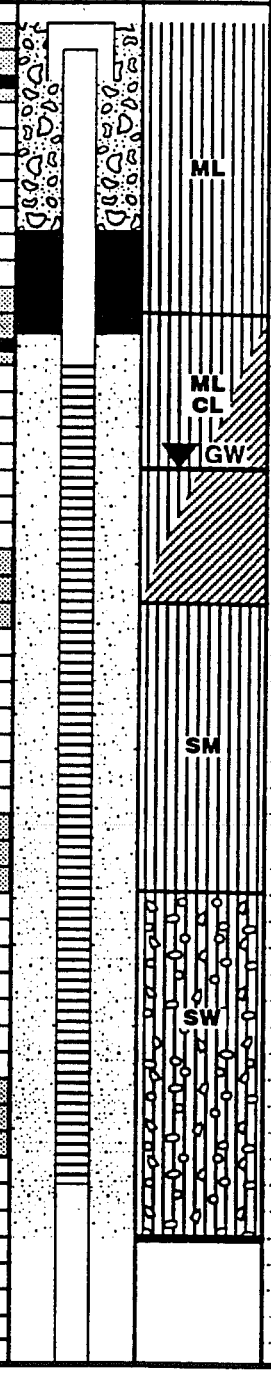
Job No.: 65584.02
Date: 6-8-93 Start: 1730 Finish: 2005
Logged By: P. A. Crispell
Sampling Method: CA Mod. SS
Amb. Temp. (°F): ~80°F

METHOD OF DRILLING: [X] Hollow Stem Auger Other: [ ] Directional Well

Size of Bit: 8.5" Type of Bit: HS Hammer: wt. 140 lb. Drop 30 in.
Total Depth: 23.0' Depth of Groundwater/Time/Date: 8.5/--/6-8-93

Surface Description: Sandy silt dirt road next to AG well valve, on east side of Gates Road.

Sample Number	Blow Count/6"	Depth	Soil Group Symbol (USCS)	Description
DMW-8 1.0	2 6 15	0–5	ML	SANDY SILT (ML), (0,20,65,15), non-plastic, organics, dark brown, dry to moist, stiff.
DMW-8 6.0	8 10 13	5–8	ML CL	SILTY CLAY, (0,5,35,60), moderalty plastic, tan-brown organics, moist to wet, stiff.
		8	GW	Groundwater encountered at 8.5' bgs during drilling.
	8 10 15	8–15	SM	SANDY SILT, (0,20,65,15), slightly plastic, tan-brown, saturated, stiff.
	6 7 11	15–23	SW	SILTY SAND, well graded, (0,60,30,10), subangular to rounded, mica, quartz, fspars, tan-brown, loose, saturated.
	8 12 15	20–23		
		23		Total depth - 23.0 feet bgs. Boring converted to monitoring well on 6-8-93.



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Exploratory Boring Log

BORING NO.: DMW-9

Project: RWQCB Dairy Project
Site No.: DU-9
Location: Durrer Dairy Farm, Modesto, CA
Drilled By: Layne Western/Steve McCoy
Elevation: ~45'

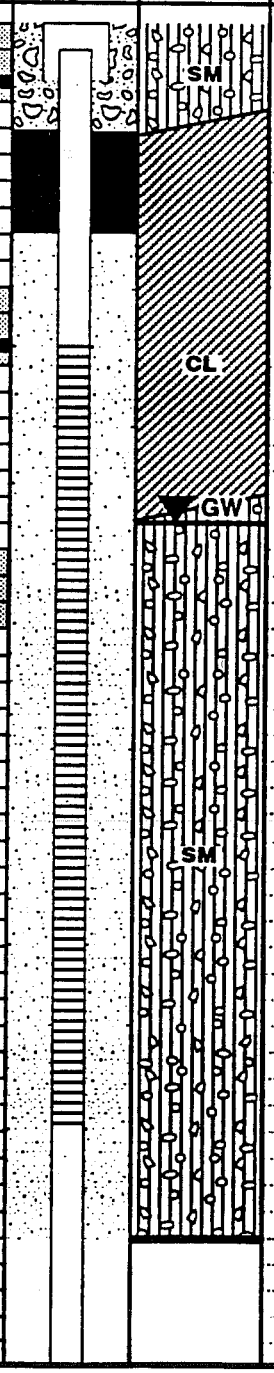
Job No.: 65584.02
Date: 6-2-93 Start: 0720 Finish: 0820
Logged By: M. Sands
Sampling Method: CA Mod. SS
Amb. Temp. (°F): ~65°F

METHOD OF DRILLING: [X] Hollow Stem Auger Other: _____ [ ] Directional Well

Size of Bit: 8" Type of Bit: HS Hammer: wt. 140 lb. Drop 30 in.
Total Depth: 23.0 Depth of Groundwater/Time/Date: 9.5/0740/6-2-93

Surface Description: Dirt, south side of square cement water tower (~10' high) between field of corn (west) and alfalfa (east).

Sample Number	Blow Count/6"	Depth	Well Completion Diagram	Soil Group Symbol (USCS)	Description
DMW-9 1.0	5 7 6	0–4		SM	SILTY SAND (SM), very fine grain, ~45% silt, micaceous, dark brown, moist, moderately dense, few course grains, subrounded.
		2–4			Slow drilling - clay in cuttings.
DMW-9 6.0	8 14 17	5–9		CL	SANDY CLAY (CL), moderately plastic, very fine grain, micaceous, yellowish-brwon, moist, hard, few course grains - subrounded.
		9		GW	Groundwater encountered at 10.5' bgs during drilling.
No Sample		10–14		SM	SILTY SAND (SM), moderately well graded, 25% medium grain, 45% fine grain, 30% silt, micaceous, subrounded, brown, saturated, loose.
No Sample		15–17		SM	Silty, clayey sand in cuttings.
		18–22			Easy drilling.
		23			Total depth - 23.0 feet bgs. Boring converted to monitoring well on 6-2-93.
		24–25			



URS Consultants

STATE OF CALIFORNIA
OFFICE MEMO
STD. 100 (REV. 10-91)

DATE 2/5/94

TO
T. Harter (cont)

ROOM/STA. NO.

FROM

PHONE NUMBER ATSS ☐

ROOM/STA. NO.

SUBJECT

Enclosed are:

Fig. 1-3 Dairy N Cycle
Table 2-8 Crop N Balances
Ch 3
Ch. 4
Table 5-8 Selected Soil Chem Data
Appendix C, D
Figs E-22 thru E-32
Appendices E + G
URS Exploratory Boring Log

Harley

STATE OF CALIFORNIA
OFFICE MEMO
STD. 100 (REV. 4-95)

DATE 2/5/94

TO
Thomas Harter
U.C. Kearney Ag. Center

ROOM/STA. NO.

FROM
Harley H. Davis
CVRWQCB

PHONE NUMBER CALNET ☐

ROOM/STA. NO.

SUBJECT Dairy Monitoring Data

Sorry that I was not able to meet with you on 2 Feb. However, I have enclosed sections of the draft report and appendices that you requested. Please use only as a reference ~~only~~ at this time. Thanks.

Thanks for the copies of your data/lab results.

Best Wishes
Harley

State of California
Environmental Protection Agency
California Regional Water Quality Control Board
Central Valley Region

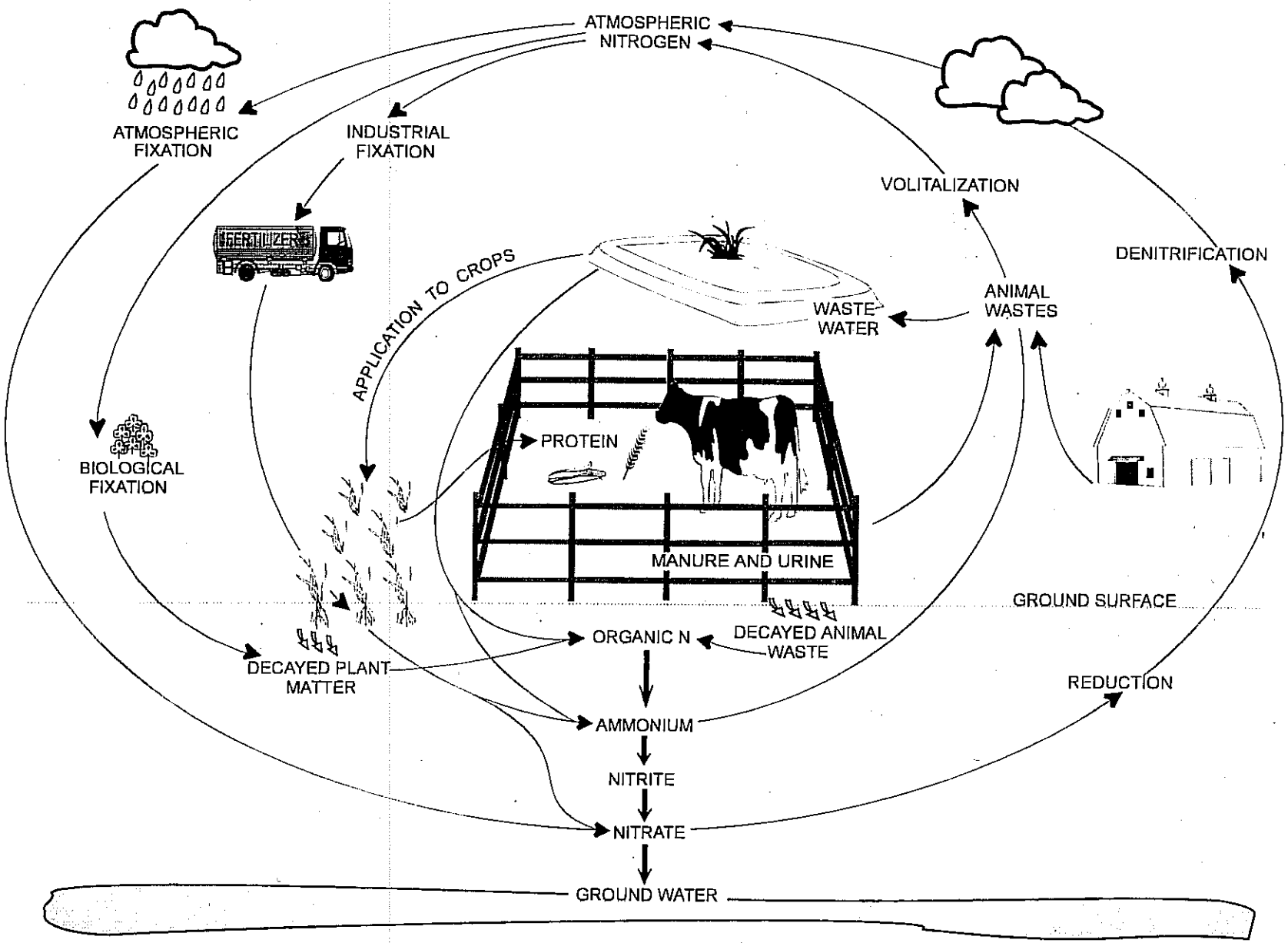
HARLEY H. DAVIS
Hydrologist, Soil Scientist

3443 Routier Road, Suite A
Sacramento, CA 95827-3098

(916) 255-3102
CALNET 494-3102
FAX 255-3015

DRAFT

Figure 1-3 Dairy Nitrogen Cycle



Filename:NCYCLE2
Date:8/1/95

3-1

DRAFT

Table 2-8 Preliminary Crop Nitrogen (N) Balances by Dairy in 1993 (in Thousand Pounds per Year)

filename: NBALCH2.XLS 9/12/95

Dairy	Animal Units	Estimated Nitrogen From Dairy Waste [1]			Purchased Fertilizer Nitrogen [5]	Total Nitrogen Available [6]	Crop Demand for Nitrogen [7]	Nitrogen Balance [8]
		Nitrogen From Cows [2]	Liquid Waste N [3]	N After Losses [4]				
C1	880	132	53	26	12	38	23	15
C2	1189	178	107	53	39	92	51	41
D	789	164	66	33	13	46	53	-7
G	1142	238	119	59	11	70	41	29
F	1109	231	115	58	0	58	42	16
TOTALS	5109	942	459	230	75	305	210	95

NOTES:

1. Estimated Nitrogen from dairy waste is based on Table 2-1 from the Livestock Waste Facilities Handbook, Midwest Plan Service (1980). Dairy waste for the study area is assumed to be of similar composition to the manure in this report.
2. Nitrogen produced from cows is based on the herd size, Animal Units and animal size. One Animal Unit weighs approximately 1,000 pounds at Dairies C-1and C-2 and 1400 pounds at Dairies D, G and F.
3. Liquid Waste N is estimated from the percent of manure handled wet versus dry as estimated by the dairymen. Liquid Waste N flows into the waste water pond.
4. N losses are those assumed losses (50%) of Liquid Waste N from denitrification and volatilization.
5. Fertilizer is the nitrogen applied to the fields as UN32, anhydrous ammonia, 6-20-20, ammonia sulfate or 3-10-10.
6. Total Nitrogen Available is the N produced by the dairy in the wastewater pond which is available for crops, plus fertilizer N.
7. Crop N are those estimated Crop Nitrogen needs in Appendix B from Table 4-1 in the Western Fertilizer Field Book (1995) and R.D. Meyer (1995).
8. Nitrogen Balance is the net liquid nitrogen at the dairy after crop demands have been met.

DRAFT

3.0 BACKGROUND CHARACTERISTICS

3.1 CLIMATE AND HYDROLOGIC CYCLE

Figure 3-1 illustrates a typical water cycle at a dairy. Precipitation increases surface and ground water while evaporation reduces the amount of precipitation contributing to them. Water on the surface evaporates. Crops and other plants transpire water to the atmosphere. The combination of evaporation and transpiration is termed evapotranspiration (ET). Atmospheric moisture forms clouds, resulting in precipitation.

As rain water infiltrates into the ground, it can carry soluble salts including nitrates. Rainfall, pond wastewater and fresh irrigation water can also infiltrate into the ground surface carrying various concentrations of soluble salts. These salts may continue to percolate into shallow ground water. Depending on geologic conditions, shallow ground water can either resurface as springs, discharge into streams or continue to move downward into deeper ground water zones.

3.1.1 Climate

Precipitation in the Sierra Nevada mountains, foothills and valley floor recharges ground water in the eastern Central Valley. Average annual precipitation for the mountains and foothills ranges from 20 to 80 inches. Snowfall is the primary form of precipitation in the winter at the higher elevations. Annual precipitation occurs as rainfall in the Central Valley and varies from over 30 inches per year in the northern Sacramento River Valley to less than 8 inches in the southern San Joaquin River Valley.

The closest major weather station to the study area is in Modesto. Table 3-1 summarizes climatic data for Modesto. As is typical of California, most of the rainfall occurs in the winter. Rainfall in Modesto averages between 11 and 12 inches per year. Air temperature is lowest in December when the average minimum temperature is 32°F. It is highest in July when the average maximum temperature is 94°F. Cloud cover is the greatest during the winter months where fog and clouds cover the sky 60 to 70 percent of the time. Relative humidity ranges from 40 to 70 percent. Wind direction varies with the time of year. In the spring and summer, the wind blows mostly from the northeast. In the fall, the wind is primarily from the west, but during the winter the wind blows mostly from the southeast.

Table 3-1 Average Annual and Monthly Climatic Data for Modesto

Filename: CLIMAT3.xls
Date 10/13/95

	PRECIPITATION[1] (inches)	AIR TEMPERATURE[2] Average (°F)	Maximum (°F)	Minimum (°F)	CLOUD COVER[1] (fraction)	RELATIVE HUMIDITY[1] (fraction)	WIND DIRECTION[3]	EVAPOTRAN-SPIRATION[4] (inches)
JAN	2.2	43	54	37	0.65	0.70	SE	0.9
FEB	1.6	47	61	41	0.60	0.60	SE	1.4
MAR	1.7	51	67	42	0.60	0.65	NW	3.2
APR	1.0	56	73	46	0.50	0.60	NW	4.7
MAY	0.2	63	81	51	0.45	0.50	NW	6.4
JUNE	0.1	70	88	56	0.25	0.50	NW	7.7
JULY	0.0	77	94	59	0.20	0.40	NW	8.2
AUG	0.1	75	92	58	0.20	0.45	NW	7.0
SEPT	0.3	71	88	55	0.20	0.45	W	5.3
OCT	0.7	62	78	49	0.30	0.55	W	3.4
NOV	1.6	52	64	42	0.50	0.60	W	1.4
DEC	1.8	44	54	32	0.70	0.70	SE	0.6
AVERAGE ANNUAL	11.3	59	75	47	0.43	0.56	NW	50.2

SOURCES:

1. Scott and Hetrick (1994). Modesto climate data file outputs from 1993 SESOIL MODEL.
2. California Air Resources Board (1984), Figures 1a-1d.
3. University of California, Cooperative Extension (1983).
4. Maps of Average Dairy Reference Evapotranspiration by Pruitt (1984). Evapotranspiration is reference evapotranspiration. It is defined as the amount of water transpired by a low growing green crop (about the same color as grass) completely covers the ground and has an unlimited supply of water (Pruitt *et al.* 1987).

3-2

Air temperature, cloud cover, humidity and wind affects evapotranspiration (ET). Infiltration and percolation to ground water results from precipitation plus applied water minus ET (see Figure 3-1). Table 3-1 shows the monthly reference ET for Modesto under unlimited moisture supply. Actual crop ET could be different than the reference ET because of variations in moisture supplies and crop transpiration rates.

Table 3-2 displays rainfall in Modesto for the study period. Water Year 1993, from October 1992 through September 1993, had above average rainfall. Annual rainfall was 19.4 inches with January having the most rainfall. Water Year 1994 had below-average rainfall at 9.8 inches. The most rainfall was in February with above average rainfall in April and May 1994.

3.1.2 Dairy Related Hydrologic Cycle

Water that enters a dairy as precipitation or irrigation supply leaves either as surface runoff, by ET or by percolation into the shallow ground water. Water movement will vary with location and season. For the study area near Modesto, which is typical of the Central Valley, little water movement is expected during the summer as a result of rainfall. However, irrigated cropland can have infiltration and percolation during the summer irrigation season. Pond releases occur in the summer as wastewater is applied to fields. ET will be greatest in the summer months.

Dairy corrals, which are not irrigated, should have little infiltration and percolation during the drier months of May through October. Most corral infiltration and percolation occurs during the wetter months of November through April. Exceptions could occur during unusually high summer rainfall events, overflows of the flush and pond system, cooling spray system malfunctions or similar events. Compacted corral areas slow infiltration, increase ponding and increase the potential for evaporation. Water may accumulate in low areas of corrals resulting in eventual evaporation and/or infiltration.

Dairy ponds contain a combination of rain water, wastewater from washing cows and flushing barns and alleys, and fresh water from surface and ground water sources. Pond water is released to irrigate cropland. Additional releases to croplands may occur during winter months if storage is insufficient. Wastewater from ponds can accidentally overflow and infiltrate into the soil and shallow ground water. Dairy pond wastewater can also infiltrate directly from the pond to the shallow ground water.

Fresh water flow to irrigation canals from Sierra-Nevada streams is low in salts and nitrates. The quality of irrigation water can be lowered as various return drainage water enters drainage canals and ditches (see Water Quality Section). Irrigation water is also pumped from district or on-farm wells.

Figure 3-1 Dairy Hydrologic Cycle

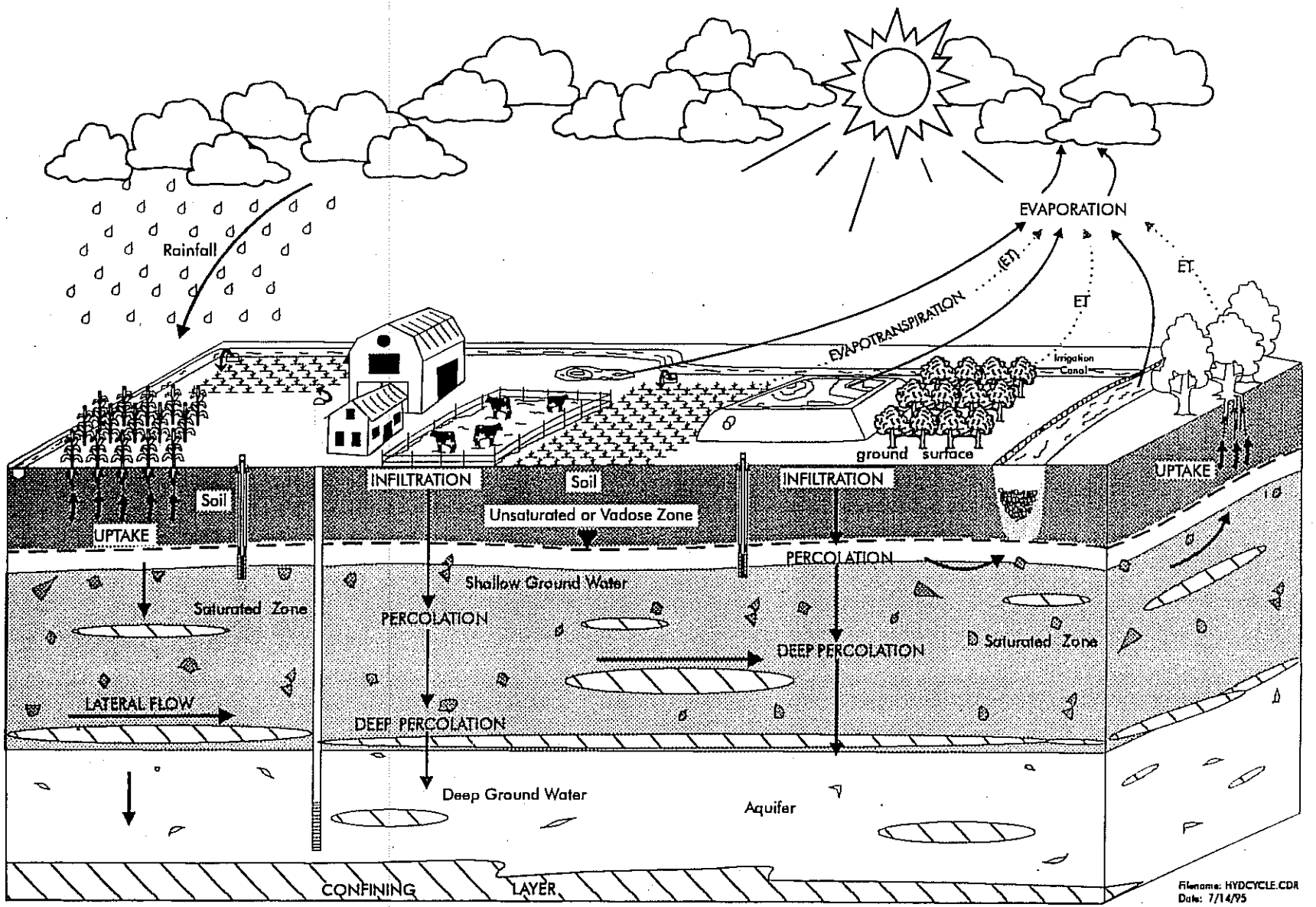
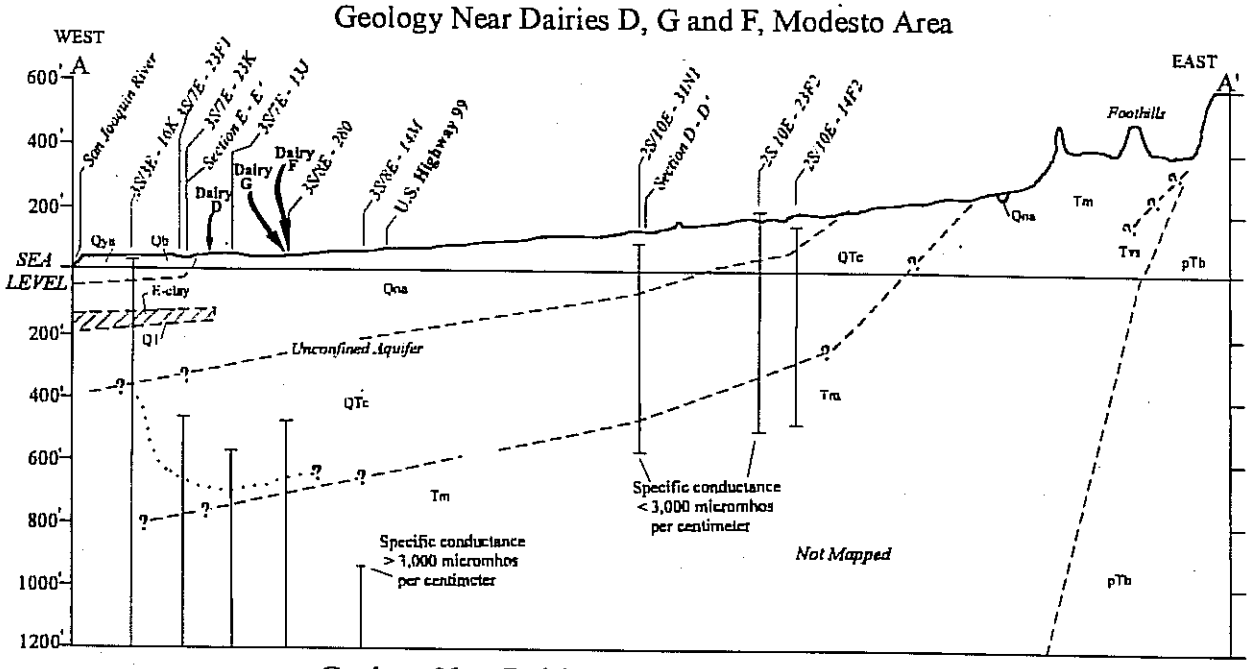


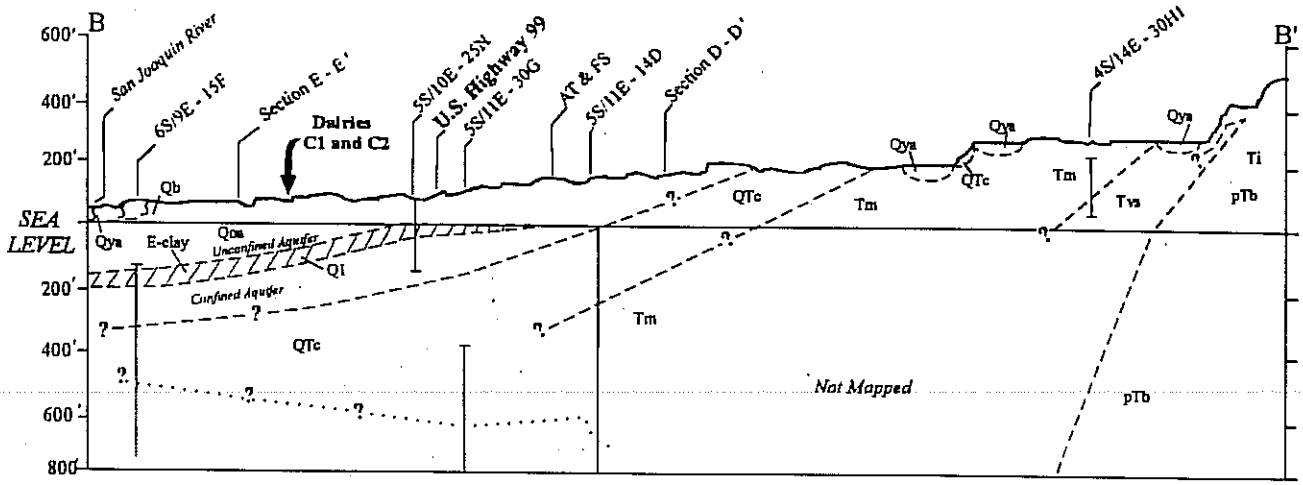
Figure 3-2 Geologic Cross Section of Dairy Study Area

(Source: Page and Balding 1973, Figures 5 and 6)

Geology Near Dairies D, G and F, Modesto Area



Geology Near Dairies C1and C2, Merced Area



EXPLANATION

Approximate base of water with specific conductance generally less than 3,000 micromhos per centimeter (Queried (?) where evidence is inconclusive)

Stratigraphic unit contact (Queried (?) where evidence is inconclusive)

East to West Scale

0 5 10 MILES

Datum is mean sea level

Verticle scale is exagerated.

TOP — BOTTOM — Well

See Page and Balding (1973) Figure 5 for cross section A-A' and B-B' locations on geological map.

UNCONSOLIDATED DEPOSITS

- Holocene: Qb Flood-basin deposits; Qya Younger alluvium
- Pleistocene and Holocene ?: Qna Older alluvium
- Pliocene and Pleistocene ?: QTc Continental deposits

QUATERNARY; TERTIARY AND QUATERNARY ?

CONSOLIDATED ROCKS

- Miocene and Pliocene: Tm Mehrten Formation
- Miocene: Tvs Valley Springs Formation
- UNCOMFORMITY
- Eocene: Ti Ione Formation

TERTIARY

- UNCOMFORMITY
- pTb Basement complex

PRE-TERTIARY

Filename: GEOXSECT.CDR
Date: 8/2/95

Table 3-2 Monthly Rainfall for Water Years 1992 Through 1994 at Modesto

Filename:RAIN9294.XLS 10/31/95

MONTH	WATER YEAR 1992/1993 inches	WATER YEAR 1993/1994 inches
OCT	0.77	0.21
NOV	0.12	0.87
DEC	4.04	1.16
JAN	5.52	1.46
MAR	3.47	0.01
APR	0.25	1.75
MAY	1.03	1.80
JUNE	0.36	0.00
AUG	0.00	0.00
SEPT	0.00	0.44
TOTAL	15.56	7.70

SOURCE:
March 1, 1995 Output from California Department of Water Resources, California Data Exchange Center.

The water table or highest zone of saturation is referred to as the shallow ground water zone. The water table will rise and fall depending on recharge and discharge characteristics, such as infiltration, percolation, and pumping. The unsaturated zone above the water table is termed the vadose zone. Most cropland soils are typically unsaturated except during periods of irrigation, rainfall and flooding. These soils are above the zone of saturation where plant roots draw water and nutrients. Soils are typically mapped and described in soil surveys to six feet deep (see Soils Section).

3.2 GEOLOGY

3.2.1 Regional Situation

Page and Balding (1973) and Page (1986) have described the regional geology for the Modesto-Merced Area of the San Joaquin Valley and the Central Valley of California, respectively. These reports provided background information on the hydrology of the dairy study area. A brief overview of the geology from these reports and as summarized by Lowry (1987) will outline the regional and local setting. The study area includes the area surrounding the two dairies in Merced County and three dairies in Stanislaus County.

The San Joaquin Valley is a topographic and structural trough which has received a thick accumulation of sediments from the Sierra Nevada in the east and the Coast Ranges in the west. The east side of the Valley is bounded by the Sierra Nevada fault block which slopes gently southwestwardly toward the valley trough. The west side of the Valley is bounded by the Coast Range.

The San Joaquin Valley is dominated by alluvial plains and fans. The Modesto and Merced areas in Stanislaus and Merced Counties have five topographic (physiographic) units: (1) Sierra Nevada, (2) dissected uplands, (3) low alluvial plains and fans, (4) river flood plains and (5) channels and overflow lands.

The surface features in the dairy study area consist of low alluvial plains and fans. The dairies reside mostly in the older alluvium that consists of gravel, sand, silt and clay. Topography is nearly flat in the study area near Hilmar, Merced County. Slope for the Hilmar area from U.S. Geological Survey (USGS) topographic maps is about 6 feet per mile to the west or southwest toward the Merced River. The slopes from USGS topographic maps in the Modesto, Stanislaus County area are nearly flat, sloping from 5 to 10 feet per mile. The ground surface slopes to the south or southwest toward either the Tuolumne or San Joaquin Rivers. Near the Stanislaus River, the ground surface slopes either to the north or west.

Sand dunes underlie the surface of the plains and fans south of Turlock. Younger alluvium occurs as a narrow band in flood plains and channels along the Merced, Tuolumne, Stanislaus and San Joaquin Rivers. Consolidated deposits consist of andesitic fluvial deposits of sandstone, breccia, conglomerate, turf, silt stone and clay stone. Its thickness is a maximum of 1,200 feet under the valley center and its upper surface occurs at about 300 feet below sea level, west of Highway 99 in Northern Merced County and Stanislaus County (Page and Balding, 1973).

Unconsolidated deposits consist of five layers as shown in Figure 3-2: (1) continental deposits (2) lake and marsh deposits (3) older alluvium (4) younger alluvium and (5) flood basin deposits. The continental deposits are the deepest of the unconsolidated deposits ranging from

300 to greater than 700 feet below sea level. They dip gently to the southwest and west beneath the older alluvium. The sediments in the continental deposits consist of poorly sorted gravel, sand, silt, and clay and are generally finer grained than the older alluvium. The thickness of the continental deposits in the study area ranges from 200 to about 450 feet (Page and Balding, 1973).

Lake and marsh deposits and older alluvial deposits lie above the continental deposits. The lake and marsh deposits form a confining layer that ranges in thickness from 5 to 65 feet, and are located from about 40 to 60 feet below sea level in the vicinity of the study area dairies. The bottom of the deposit in the vicinity of the dairy study area occurs between 50 and 200 feet below sea level as shown in Figure 3-2. These deposits consist of gray and blue silt, silty clay and clay. The clay is called "blue clay" by local drillers and is known technically as the E-clay. In most places the E-clay is most likely equivalent to the Corcoran Clay Member of the Tulare Formation (Lowry 1987).

The older alluvium extends from the ground surface east of Highway 99 to between 100 and 400 below the ground surface in the west. It consists of interlayered beds of silt, clay, sand, gravel and some hardpan. In some places, the older alluvium is coarser grained than the underlying deposits.

The younger alluvium and flood basin deposits occur near the surface above the older alluvium. The younger alluvium occurs as a narrow band along the rivers. It is up to 100 feet thick and consists of fine sand, sand, gravel and some silt and clay with little or no hardpan. The flood basin deposits consist of interspersed lenses of bluish-gray, brown and reddish-brown fine sand, silt and clay. They are up to 100 feet thick and are interbedded with younger and possibly older alluvium (Page and Balding, 1973).

3.2.2 Study Area Dairies

Page and Balding (1973) and Lowry (1987) were drawn upon to estimate the geologic situation at each of the study area dairies. Figure 3-2 was used to estimate geology of the dairies. Dairy locations are shown on Figure 3-2 based on distances from Highway 99 and other surface features contained in Figure 5 of Page and Balding (1973). Well drillers logs were also consulted for subsurface characteristics.

At Dairies C1 and C2, the topography from U.S. Geological Survey maps was flat, sloping about 7 and 9 feet per mile respectively toward the west and southwest. The corrals at these dairies are mostly flat (see Table 2-6). Low alluvial plains and fans compose the physiography. Surface geology is composed of younger and older alluvium. Sandy surface textures indicate depositional origins. The fields at the dairies have been leveled by laser methods to create slopes from 0.7 to 1.0 inches per 100 feet to improve flood irrigation.

Characteristics of deposits at Dairies C1 and C2 were estimated from Page and Balding (1973). A portion of the geologic cross sectional map from their report was reproduced as Figure 3-2. The approximate location of the dairies have been indicated on these cross sections. The older alluvium is 200 to 300 feet below the surface. The E-clay from lake and marsh deposits is approximately 40 to 60 feet thick. It is about 175 feet below sea level or 200 feet below the surface. Older alluvium is estimated to extend below the E-clay to about 350 feet below sea level. The continental deposits are about 350 feet below sea level to an unknown depth.

Surface geological features at Dairy D have been influenced by flood-basin deposits from the Stanislaus and San Joaquin Rivers. Topography is nearly flat, sloping to the west and south west at about 6 feet per mile. The corrals at the dairy are mostly sloped (see Table 2-6). The slopes of the fields at Dairy D have been modified to facilitate irrigation. According to the dairyman, recent laser leveling of the fields has resulted in slopes of one inch per 1000 feet.

Surface geology at Dairy D is likely older alluvium and flood basin deposits extending to 450 feet below the surface (see Figure 3-2 and Page and Balding, 1973). The E-clay layer may not extend as far east as Dairy D. The continental deposits are about 450 to 850 feet below the surface or about 400 to 800 feet below sea level.

Dairy G has a flat topography, sloping to the west about 10 feet per mile. The older corrals at Dairy G are mostly flat but the newer corrals are sloped (see Table 2-6). Low alluvial plains and fans compose the physiography. Surface geology is composed of younger and older alluvium. Laser leveling of the fields has resulted in slopes of one inch per 1000 feet.

Page and Balding (1973) showed that the older alluvium at Dairy G extends to about 400 feet below the surface (Figure 3-2). The E-clay does not appear to extend this far east. The continental deposits are about 400 to 850 feet below the surface.

Dairy F is similar to Dairies D and G but is influenced by being closer to a major stream, the Stanislaus River. It has a naturally flat topography sloping about 3 to 5 feet per mile from the dairy operations toward the southeast. The slope for the field nearest the dairy is 5 inches per 1000 feet. The grape fields (Fields 2 and 3) appear to be influenced by drainage patterns toward the San Joaquin and Stanislaus Rivers. The slopes on the grape fields were leveled to nearly flat. The slopes at the corrals vary (see Table 2-6). The corrals at the new facilities are sloped to allow runoff. The older facilities are nearly flat.

The surface geology at Dairy F is likely younger and older alluvium with flood basin deposits. Page and Balding (1973) showed that the surface layers extend about 200 feet below the surface or 150 feet below sea level (see Figure 3-2). The E-clay layer is about 40 to 60 feet thick. It extends to a depth of 250 feet below sea level. The continental deposits are about 375 to 800 feet below sea level.

Water well driller's reports are submitted to the California Department of Water Resources. Well logs from these reports describe the texture and color of the material encountered during drilling. Well logs were obtained for water wells drilled within a mile and a half of the cooperating dairies (Yamagata, 1993). These well depths vary from less than 100 feet to over 400 feet below the ground surface.

Well logs at or near Dairies C1 and C2 showed clay layers interspersed with sand. The blue clay layers, indicative of the E-clay layer, appear in the well logs from 165 to 260 feet below the ground surface.

Four logs were obtained for wells drilled at Dairies C1 and C2. Thin (2 to 5 feet) layers of clays were observed from 3 to 130 feet below the ground surface. A thicker clay layer was reported at 28 to 48 feet below the surface. Three of the wells were drilled to about 130 feet below the surface. The fourth well was drilled to 335 feet deep. The deeper well showed a thicker, probably E-clay layer, between 185 and 245 feet below the surface. Another thicker clay layer was observed at 275 to 295 feet deep.

The well logs for Dairies D, F and G in Stanislaus County showed clay layers interspersed with sand. Well logs for Dairies D and G indicated an E-clay layer. Two well logs were obtained for wells drilled at Dairy D. One well was 116 feet deep and other was 190 feet below ground surface. The clay layers were narrow (less than 5 feet thick) except for layers at 20 to 46 feet, 58 to 74 feet, 83 to 90 feet and 103 to 116 feet below ground surface at the shallower well. The deeper well showed clay at 43 to 57, 80 to 97, 115 to 145 and 157 to 190 feet below ground surface.

No well logs were obtained for wells drilled at Dairy G. However, a neighboring water well was drilled to 140 feet below the ground surface. The well log showed one clay layer over 10 feet thick at 24 to 90 feet below the ground surface.

Well logs were obtained for Dairy F and nearby locations. Four well logs located on the dairy property showed a blue clay indicative of the E-clay layer. The blue clay layer is between 180 and 230 feet below ground surface. These logs also show a clay layer of over 50 feet thick above these blue clay layers. A number of thick clay layers are found at shallower depths in these four and other nearby well logs. Clay layers were thicker than 15 feet at 7 to 35 feet, 68 to 85 and 95 to 120 feet below the surface.

To summarize the data from the well logs, a clay zone greater than 15 feet thick was found at 28 to 48 feet deep at Dairies C1 and C2, at 20 to 46 feet at Dairy D, at 28 to 48 feet at Dairy G, and 7 to 35 feet at Dairy F. Heavy clay deposits at less than 30 feet deep overlain by materials of high permeability could result in retarded downward movement and exaggerated lateral movement unless interfacing of clay and sand interrupts this lateral flow.

The detail and consistency of well logs vary with the person logging the wells. The description of the texture in the logs is gross, lumping-soil cores textures into either clays or sands. Therefore, water movement and porosity cannot be accurately estimated from the descriptions in the logs. In general, little difference in the wells logs was apparent among the dairy areas. The E-clay layer is apparent in the well logs at Dairies C1, C2 and F.

3.3 SOILS

3.3.1 General

The soils in the dairy study area were formed from unconsolidated alluvium, but vary between flood plain deposits, young alluvium, older terraces, and fans. The soil parent material deposits are geologically recent, falling into the holocene, and pleistocene stages of the quaternary periods. Soil physical and chemical characteristics affect the extent of nitrate and salt infiltration and percolation to shallow ground water.

The Merced Area Soil Survey and Eastern Stanislaus Area Soil Survey (U.S.D.A. Soil Conservation Service, 1962 and 1964) were used to determine generalized soil types at each of the dairies. Soil characteristics in the surveys were described to typically 5 feet deep. Hydrologic characteristics of each of the soil types were given in Table 2 of the Eastern Stanislaus Area Soil Survey. Definitions as condensed from the Soil Survey Manual (USDA, 1951) are as follows:

> Drainage -- refers to the rapidity and extent of the removal of water from the soil especially by surface runoff and by flow through the soil to voids. Soil drainage is also dependent upon infiltration and percolation rates. Infiltration refers to water moving *into* the soil from the surface. Percolation takes place once infiltration has occurred. Percolation refers to water movement *through* the soil profile into the shallow ground water (see Figure 3-1). Drainage is classified as *excessive* for sandy well drained soils. It is classified as *imperfect* to *poor* for flooded clayey soils.
>
> Permeability -- refers to the ability of the soil to enable water to move through it. Soil permeability is dependent both upon infiltration and percolation rates. Classes of possible permeability rates are *very slow* at less than 0.05, *moderate* from 0.8 to 2.5 and *very rapid* at over 10.00 inches per hour.
>
> Runoff -- refers to the relative rate in which water flows over the surface of the soil. Classes of runoff rates include *ponded* where water does not runoff, *slow* where water lies on the surface for long periods of time, *medium* where a moderate portion enters the soil profile and free water lies on the surface for a short period of time, and *rapid* where a large portion of the water moves rapidly over the surface of the soil and very little infiltrates.

The Eastern Stanislaus Area Soil Survey (1964) was used to determine the soil type at each of the three dairies (D, G and F) in Stanislaus County. The Merced Area California Soil Survey (1962) was used to determine the soil types at Dairies C1 and C2. Because of the level of detail of the soil surveys and the modification by scraping and construction operations, the exact percentages of soil types in each dairy is only a rough approximation. However, the relative proportion of each soil texture of characteristic should be an accurate estimate.

Soils in the dairies were generally formed from young alluvial fans. They include Hanford-Tunjunga, Hilmar-Delhi-Dello, Dinuba-Hanford and the Modesto-Chular associations. These soils are moderately deep to deep well drained soils to imperfectly drained soils on fans of the Stanislaus and Tuolumne Rivers with the exception of the Modesto-Chular soils. The Modesto-Chular soils are deep, slowly permeable soils between the river fans. The Hilmar-Delhi association is deep and coarse textured. This soil association has been deposited by wind. The saline-alkaline features most likely occurred during soil formation.

3.3.2 Dairies C1 and C2

In an interview with Regional Board staff, the dairyman stated that the soils are sandy with high infiltration rates. The Hilmar area around the C1 and C2 Dairies is well known for sandy soils.

The Merced Area California Soil Survey was used to determine soil types and mapping symbols. The characteristics by soil name were taken from the Eastern Stanislaus Area Soil Survey (1964) since the Madera survey did not have these characteristics.

SOIL SYMBOLS	SOIL NAME	CHARACTERISTICS			%
		Drainage	Permeability	Runoff	
DfA	Delhi Sand	excessive	v.rapid	v.slow	54
HgA	Hilmar Loamy Sand	imperfect	v.rapid	v.slow	41
DkA	Dello Sand	excessive	v.rapid	v.slow	5

note: The % is the approximate percentage of the entire dairy operation by soil series.

The corrals and the ponds at both of the dairies are mainly on sandy soils with some loamy sand. They have been modified by construction. The fields surrounding the dairy facilities are a mixture of all three soil types.

3.3.3 Dairy D

The dairyman stated that the soils were sandy in an interview with Regional Board staff. The Eastern Stanislaus Area Soil Survey (1964) was used to determine the soil types and mapping symbols.

SOIL SYMBOLS	SOIL SERIES NAME	CHARACTERISTICS			%
		Drainage	Permeability	Runoff	
DxA	Dinuba Fine Sandy Loam mod. saline-alkali	imperfect	v.slow	v.slow	3
DpA, DwA	Dinuba Sandy Loam slightly saline-alkali	imperfect	slow	v.slow	48
WbA	Waukena Fine Sandy Loam	imperfect	v.slow	v.slow	20
FrA, FpA	Fresno Fine Sandy Loam slightly-moderate saline-alkali	imperfect	v.slow	v.slow	20
HdA	Hanford Sandy Loam	good	rapid	v.slow	9
NOTES: The % is the approximate percent of the entire dairy operation by soil series.					

The dairy facilities include corrals which were built on a mixture of Fresno fine sandy loam and Dinuba sandy loam and have been modified by the construction of the dairy. The fields near the dairy are a mixture of all the above tabulated soils except DxA. The ponds were constructed on the Fresno, Dinuba and Waukena sandy loams and fine sandy loams.

3.3.4 Dairy G

The dairyman stated that the soils were sandy in an interview with Regional Board staff. The Eastern Stanislaus Area Soil Survey (1964) was used to determine the soil types and mapping symbols.

SOIL SYMBOLS	SOIL SERIES NAME	CHARACTERISTICS			%
		Drainage	Permeability	Runoff	
DrA, DwA	Dinuba Sandy Loam slightly saline-alkali	imperfect	moderate	v.slow	75
OaA	Oakdale Sandy Loam	good	moderate	v.slow	25
NOTE: The % is the approximate percent of the entire dairy operation by soil series.					

The dairy corrals at the Dairy G are a mixture of Dinuba and Oakdale sandy loams and have been modified by the construction of the dairy. The fields are a combination of both the Dinuba and Oakdale sandy loams. The pond is most likely on the Dinuba sandy loam as modified by construction.

3.3.5 Dairy F

According to a staff interview with the Dairyman, ground water is approximately 25 feet. No tail water leaves the property. Flood irrigation is used and the sandy soils have a rapid infiltration rates.

The Eastern Stanislaus Area Soil Survey (1964) was used to determine the soil types and mapping symbols.

SOIL SYMBOLS	SOIL SERIES NAME	CHARACTERISTICS			%
		Drainage	Permeability	Runoff	
DwA	Dinuba Sandy Loam slightly saline-alkali	imperfect	slow	v.slow	77
DoA	Dinuba Fine Sandy Loam, deep	imperfect	moderate	v.slow	23

The corrals and the pond were built over Dinuba fine sandy loams and have been modified by the construction of the dairy. The fields are primarily Dinuba sandy loams.

3.3.6 Comparison of Dairy Soils

Soil characteristics in the soil survey have similarities and differences among dairies. Drainage among all the dairies is generally imperfect because of high water tables. Permeability is characterized as very rapid at Dairies C1 and C2. Permeabilities from the soil survey at the other dairies vary from moderate to slow. Runoff is considered to be very slow at all the dairies because of ready infiltration of water and flat slopes. Areas sloped during construction of the dairies and compacted from heavy equipment and cattle could alter drainage, permeability and runoff characteristics.

The corrals, ponds and fields at the dairies have the following soil textures as determined from the soil surveys:

DAIRY	CORRALS	PONDS	FIELDS
C1	Loamy Sand	Loamy Sand	Sand and Loamy Sand
C2	Loamy Sand	Loamy Sand	Sand and Loamy Sand
D	Sandy Loam and Fine Sandy Loam	Sandy Loam and Fine Sandy Loam	Sandy Loam and Fine Sandy Loam
G	Fine Sandy Loam	Sandy Loam	Sandy Loam
F	Fine Sandy Loam	Fine Sandy Loam	Fine Sandy Loam

The textures at the cooperating dairies vary from sands to fine sandy loams. Soils at Dairies C1 and C2 are sandier with higher permeabilities than the other three dairies. Nitrates and salts are more likely to leach to ground water in sandy porous soils than the finer heavier textured soils. Hence, the fine sandy loams at the corrals at Dairy D and the corrals, ponds and fields at Dairy D and the corrals and ponds at Dairy F are less likely to transport as much nitrate and salt as Dairies C1 and C2. However, all of the dairies have highly permeable soils that could allow movement of soluble salts and nitrates into the ground water.

3.4 GROUND WATER HYDROLOGY

Ground water hydrology for the Modesto-Merced area has been described briefly by Page and Balding (1973) for the San Joaquin Valley. Figure 3-2 displays the geologic formations in the dairy study area relative to ground water hydrology. The confined and unconfined aquifers are the primary sources of water supply. The confined aquifer occurs *below* the base of the E-Clay layer in the unconsolidated older alluvium and continental deposits. It most likely extends to the top of the Mehrten Formation, but in terms of use the base is considered to be defined as extending downward to where the fresh water ends and saline water begins as shown in Figure 3-2. Page and Balding (1973) define fresh water as water having a specific conductance of less than 3,000 micromhos per centimeter. Ground water movement in the confined aquifer is mostly to the west and southwest toward the valley trough. The hydraulic head in the confined aquifer is lower than in the unconfined aquifer so the movement of water is downward from the unconfined into the confined zone.

The unconfined aquifer occurs above the E-Clay in the unconsolidated older alluvium, younger alluvium and flood-basin deposits. Where no E-Clay layer exists, the base is the top of the Mehrten Formation. The upper boundary extends from about 5 to 25 feet below the ground surface in the dairy study area. The direction of the flow of the unconfined aquifer in the mostly toward the west with some flow toward the southwest in certain areas, as estimated from a ground water contour map ~~from the~~ California Department of Water Resources (DWR, 1993).

Irrigation districts are a source of local ground water information. The Turlock Irrigation District (TID) has shallow monitoring wells to 15 feet below the surface at approximately one mile intervals to measure the depth to the water table (TID 1993). Well depths are checked and recorded once a month usually around the first of each month. They have about 250 wells and are typically at each section corner.

TID also has drainage wells which were drilled an average of 30 years ago to an average of 100 to 150 feet deep. These wells are used to lower the water table when it becomes closer than 6 feet to the surface. TID has generated data on depth to ground water. This data was used to predict depth and ground water flow direction prior to the drilling of the monitoring wells.

The Modesto Irrigation District (MID) has about 26 shallow monitoring wells at various locations (MID 1993). They are monitored only occasionally on an as-needed basis. These wells are eight to nine feet deep.

Water in the confined aquifer in the area of Dairies D and G flows toward the west and for Dairy F the confined aquifer flows toward the west by northwest according to Page and Balding (1973). A regional map shows the flow near Dairies C1 and C2 in the unconfined aquifer to the west toward the San Joaquin River (DWR, 1993). Shallow ground water levels

from Turlock Irrigation District (1992) data indicated flow at Dairies C1 and C2 flows toward the southwest. Ground water information for Dairies D, F and G in Modesto Irrigation District (1993) was much less extensive. Prior to the drilling of the dairy monitoring wells, the ground water flow direction was estimated to be toward the west and northwest.

3.4.1 Well Characteristics

Well driller's reports were obtained (Yamagata, 1993) for wells in the vicinity of the dairies, including some pumping wells. Thirty-one well drillers reports were obtained for the area around Dairies C1 and C2. The wells were drilled from 1949 to 1992; however, most of the reports were for wells drilled since 1970. Water depths ranged from 8 to 35 feet below the surface and were first encountered at an average of 16 feet. Wells were screened to allow water entry at certain depths. Well screen depths ranged from 10 to 340 feet below the surface. The majority of the screens ranged from 55 to 130 feet deep. The average depth to the middle of the screen was 100 feet. Well logs indicated that most of the production wells were in the unconfined aquifer above the E-Clay layer. Figures A-1 through A-4 in Appendix A show the locations of pumping wells near the study area dairies.

Sixteen well driller's reports were obtained for wells near Dairy D. The wells were drilled from 1931 to 1992 but the majority were drilled since 1970. Water was reportedly between 8 to 15 feet below the surface and was first encountered at an average of 10 feet. The well screens varied from the surface to 280 feet. About one-third of the wells were screened at less than 80 feet, one third at 80 to 120 feet and one-third deeper than 120 feet. The average depth to the middle of the screen was 108 feet. Nearly all the wells were in the unconfined aquifer did not show an E-Clay layer.

Thirteen well driller's reports were obtained for the wells around Dairy F. The wells were drilled from 1938 to 1987. Only three of the wells were drilled prior to 1970. Water was encountered from 12 to 30 feet below the surface, at an average of 18 feet. The well screens varied from 48 to 360 feet below the surface. The majority of the wells were screened from 70 to 120 feet. The average middle-of-the-screen depth was 106 feet. These wells were in the unconfined aquifer above the E-Clay layer.

3.5 WATER QUALITY

Water quality involves both surface water and ground water since neither is independent of the other. Surface water as it infiltrates affects shallow ground water. Shallow ground water percolates to deeper unconfined and confined aquifers. As water infiltrates and percolates, it carries with it dissolved salts, minerals and nitrates. Figure 3-1 illustrates these processes. Ground water becomes surface water when it is pumped to the surface or when discharged to streams, springs and rivers.

3.5.1 Surface Water Quality

Surface water from major rivers and irrigation canals is generally of good quality. Page and Balding (1973) reported average specific conductance for the Stanislaus, Tuolumne and Merced Rivers. Averages ranged from 44 to 444 mhos/cm for 1965-1969. Water Year (WY) 1993 data shows similar ranges (Mullen et al., 1994). Nitrate and nitrite as nitrogen ranged from 0.24 to 1.4 mg/l for the Merced River near Stevenson, from 0.19 to 1.4 mg/l for the Tuolumne River at Modesto, and from 0.15 to 0.85 mg/l at the Stanislaus River at Ripon in WY 1993.

Stream water quality was reported by Shelton and Miller (1988 and 1991) during the drought years from March 1985 to September 1988. Monthly averages for specific conductance ranged from 68 to 842 μs/cm (microsiemans per centimeter) for the Merced River near Stevenson. Nitrate plus nitrite as nitrogen ranged from less than 0.10 to 2.0 mg/l. Monthly averages for specific conductance ranged from 40 to 357 μs/cm and nitrate plus nitrite ranged from 0.16 to 3.2 mg/l of nitrogen in the Toulumne River at Modesto. Monthly averages for specific conductance ranged from 61 to 184 μs/cm, and nitrate plus nitrite ranged from less than 0.10 to 1.4 mg/l of nitrogen in the Stanislaus River at Ripon.

Modesto and Turlock Irrigation Districts divert water for irrigation from the Tuolumne River upstream of Modesto at La Grange Dam. Ketscher (1989) reported electrical conductivity (EC) for MID's main canal water in 1988 to be 20 μs/cm and nitrate at less than 1.0 mg/l above Modesto at Albers Road. EC's at MID Lateral No. 6 at the Stanislaus River ranged from 73 to 360 μs/cm (Westcot and Belden, 1989). Dairies D, G and F obtain irrigation water from MID. Dairies C1 and C2 obtain irrigation water from TID. TID irrigation canal water sampled in 1986 at three locations showed nitrate-N at 1.7 mg/l or less. TDS and EC results from two locations were less than 100 mg/l and 110 μs/cm (Lowry 1987). The Stevenson Lateral Canal discharge to the Merced River had EC's ranging from 340 to 1200 μs/cm (Westcot and Belden, 1989). The upper Stevenson Lateral Canal runs adjacent to Dairy C1.

In summary, surface waters are generally of the best quality upstream of Modesto. The quality generally is lower downstream. Surface water quality in irrigation canals is generally much better than ground water.

3.5.2 Ground Water Quality

Page and Balding (1973) characterize the quality of the unconfined and confined aquifer in the Modesto-Merced Area. Dissolved solids in the confined aquifer ranged from 36 to 3,170 mg/l and in the confined water body from 135 to 3,600 mg/l. They also mapped nitrate concentrations above and below 20 mg/l from 1959-1970 in the unconfined and confined aquifers. A portion of the map with the cooperating dairies showed on it has been reproduced as Figure 3-3. Dairy F was near the 10 to 20 mg/l nitrate (NO_3) range while Dairy D was outside the mapped area. Dairy G was near both a 10 to 20 mg/l and a greater than 20 mg/l nitrate zone. Wells in the unconfined aquifer near Dairies C1 and C2 produced 10 to 20 mg/l of nitrate as mapped in Figure 3-3.

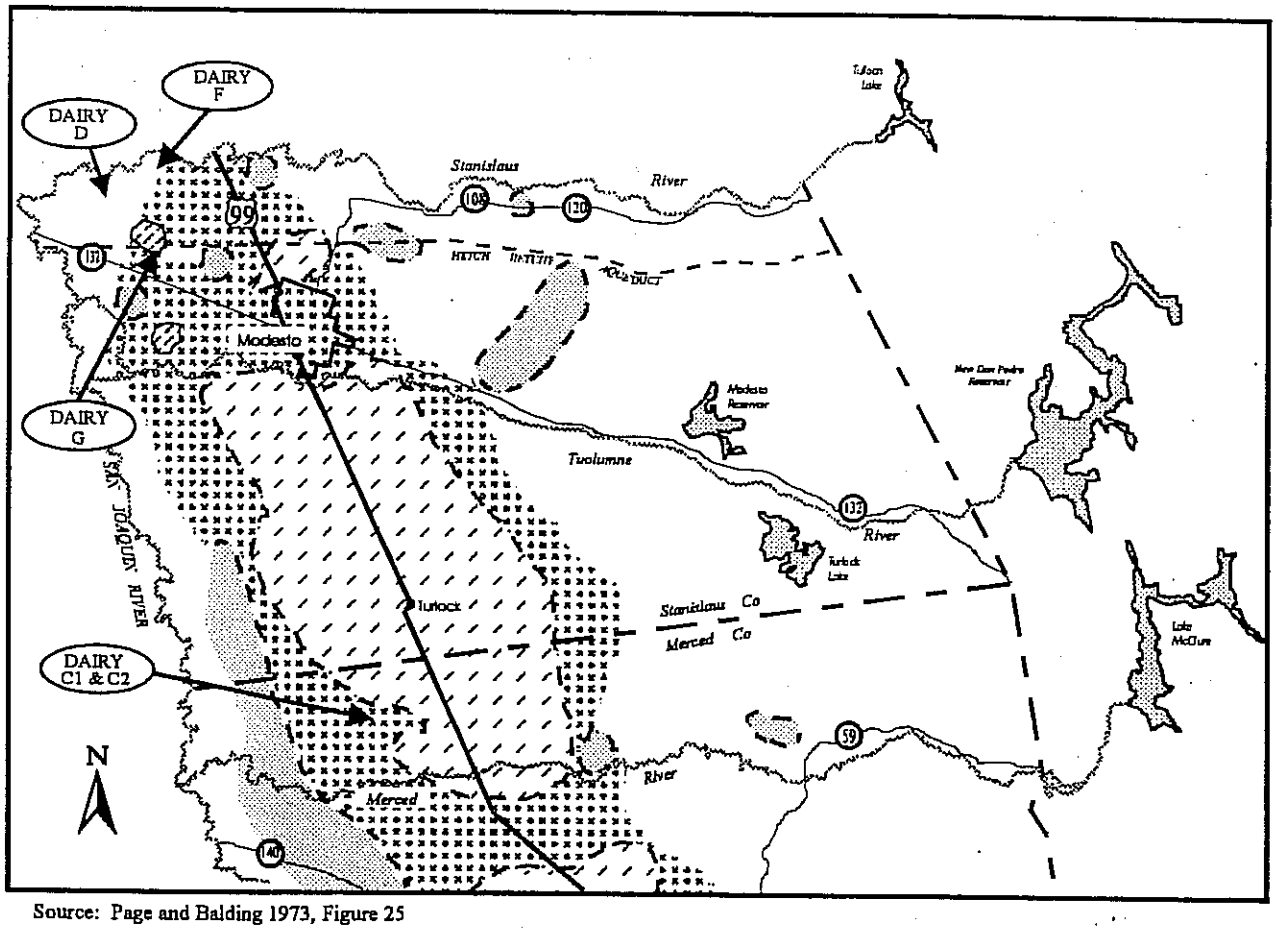
Lowry did a minerals and nitrate study for the Hilmar Area (1987). The study highlighted five existing wells in the unconfined aquifer in areas which were considered not affected by possible nitrate sources. Nitrate concentrations for these background wells averaged 0.23 mg/l, ranging from <0.01 to 0.80 mg/l NO_3-N. EC averaged 513 μs/cm and ranged from 350 to 890 μs/cm. Three wells in the confined aquifer also served as background. The average nitrate concentration for these 3 wells was 1.5 mg/l and ranged from 0.6 to 3.2 mg/l NO_3-N. Electrical conductivity (EC) averaged 347 μs/cm and ranged from 190 to 580 μs/cm.

Figure 3-4 shows the well locations and nitrate concentrations for the Hilmar study from sampling in June 1986. Forty-one of the 69 wells sampled showed nitrate concentrations greater than the 10 mg/l NO_3-N drinking water standard. Thirty-five of these forty-one wells sampled in October 1986 again showed nitrate concentrations above the drinking water standard.

Salinity and minerals were also sampled in the Hilmar area study (Lowry 1987). Agricultural water quality goals are 450 mg/l for TDS and 700 μs/cm of EC (Ayers and Westcot, 1989). However, different crops are sensitive to varying levels of salinity ranging from ECs of 700 to 6,500 μs/cm. Of the 69 wells sampled in June 1986, 17 had an EC of 750 μs/cm or greater. The maximum EC level in the unconfined aquifer was 1,200 μs/cm while the confined aquifer was 1,000 μs/cm.

The Hilmar Area study also looked at levels of other nutrients and minerals in well water. Table 3-3 provides nitrogen, phosphorus and salinity results from selected ground water samples in operating wells. In June 1986, the total Kjeldahl nitrogen (TKN) ranged from less than 0.06 to 0.84 mg/l and averaged 0.41 mg/l. No ammonia nitrogen was detected in these samples. Organic nitrogen compounds such as urea, amino acids and proteins were assumed to compose the TKN results because ammonia was missing. Total phosphate, orthophosphate, potassium and various mineral data can also be found in the report.

Figure 3-3 Nitrate Concentrations in the Unconfined Water Body, 1959 - 1970.



Source: Page and Balding 1973, Figure 25

0 5 10 Miles

SCALE

EXPLANATION

Nitrate in mg/l			
	<10		Aqueduct
	10-20		County Road
	>20		County Boundary
			River
			Highway

Filename: NCONCF.CDR
Date: 8/2/95

Table 3-3 Nitrogen, Phosphorus and Salinity Concentrations for Selected Samples in the Hilmar Area

WELL NUMBER	SAMPLE DATE	Well Depth*	TKN mg/l as N	Ortho-phosphates mg/l	Total NO_3-N mg/l	NH_3-N mg/l	K mg/l	Total Phosphates mg/l as P	TDS mg/l	EC umhos/cm	Land Use at Well Site
6S 10E 04N2	860617	30	0.78	0.05	17	<0.02	3.2	0.15	660	960	Dairy
	861015		0.3	0.06	36		2.4	0.09		1000	
6S 10E 05R	861015	155		0.05	7.7		4.7	0.08		1200	Dairy
6S 10E 08F	860617	110	0.67	0.03	9.0	<0.02	3.0	0.26	520	740	Dairy
6S 10E 08H2	861015	105	0.62		1.8					1200	Corn
6S 10E 10N	861015	80		0.03	23		5.6	0.06		1200	Dairy
6S 10E 15B2	860618	95	0.34	0.07	14	<0.02	1.8	0.11	370	490	Dairy
	861015		0.2	0.03	14		2.8	0.15		500	
6S 10E 16E1	860619	68	0.73	0.17	24	<0.02	1.5	0.23	490	700	Dairy
	861015		0.7	0.19	21		2.1	0.21		580	
6S 10E 16P1	860618	129	0.17	0.09	<0.01	<0.02	3.0	0.19	540	870	Dairy**
	861015		0.1	0.08	<1		3.2	0.13		840	
6S 10E 16P2	860617	95	0.11	0.16	0.02	<0.02	2.6	0.19	400	620	Dairy**
	861015		0.6	0.14	<1		3.0	0.16		520	
6S 10E 17J	860619	200	0.84	0.90	24	<0.02	2.7	0.90	430	720	Alfalfa
	861015		1.0	0.87	22		3.4	0.90		600	
6S 10E 21N1	860617	80	0.39	0.05	12	<0.02	1.8	0.21	390	560	Corn,Oats
	861015			0.04	9		2.0	0.13		530	
6S 10E 21N2	860618	102	0.50	0.07	15	<0.02	1.7	0.13	390	520	Pasture
	861015			0.05	15		1.9	0.11		500	
6S 10E 26G	860618	50	<0.06	0.18	0.05	<0.02	2.3	0.18	250	370	Grain
6S 10E 26L	860626	93	<0.06		2.1	<0.02			270	480	Almonds

Source: Hilmar Ground Water Study, Lowry (1987) Tables 8, 13 and 18.

NOTES:

* Well Depth is to be at the bottom of the perforation interval or the bottom of the casing if the perforation interval is not known. Blank spaces indicate that no analyses were performed.

**Wells were at or near Dairies C1 and C2

TKN = Total Kjeldahl Nitrogen

NO_3-N = Nitrate as Nitrogen

NH_3-N = Ammonia as Nitrogen

K = Potassium

TDS = Total Dissolved Solids

EC = Electrical Conductivity

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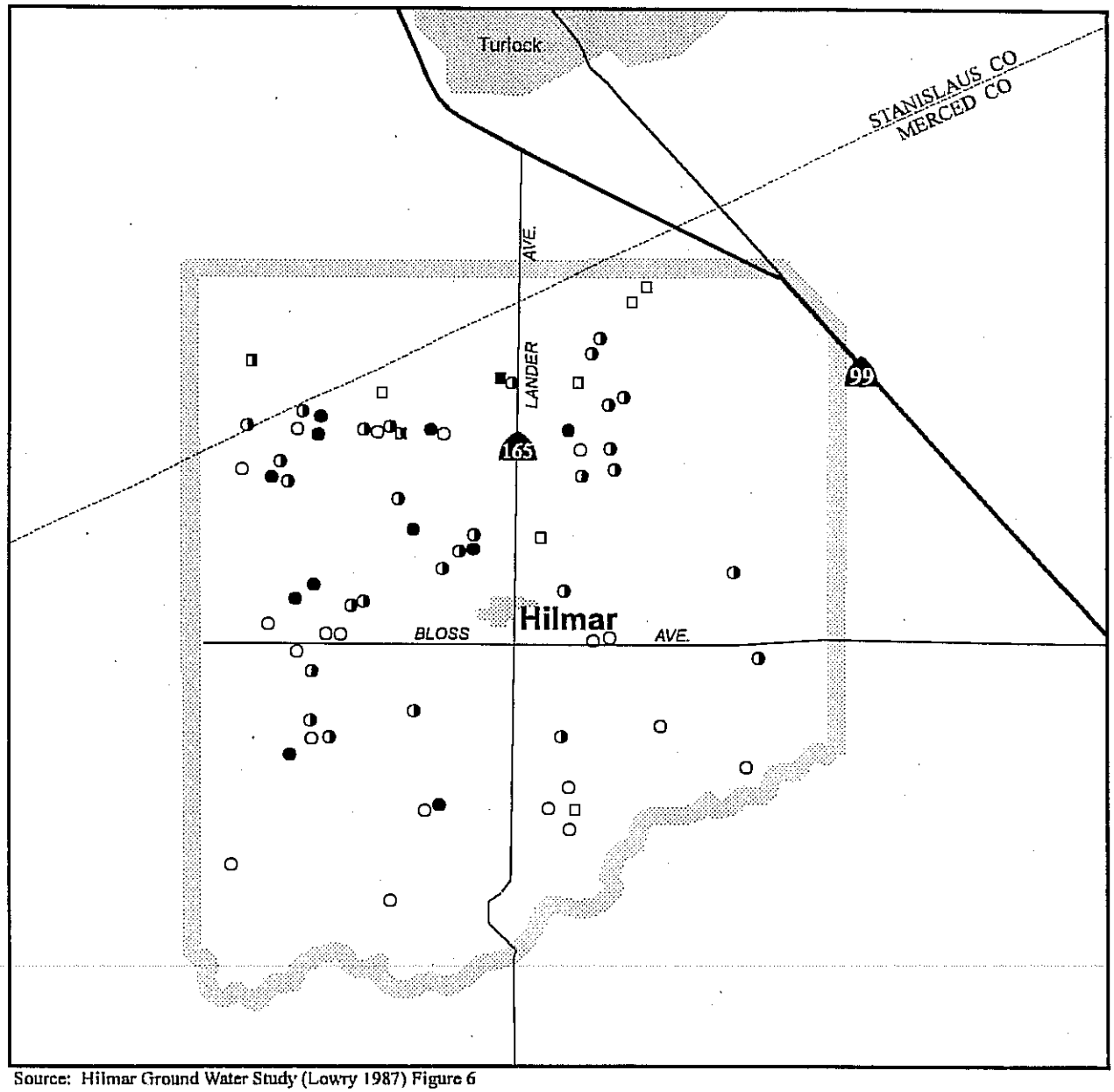
Figure 3-4 Hilmar Area Ground Water Nitrate Concentrations, June 1986



Source: Hilmar Ground Water Study (Lowry 1987) Figure 6

NOTES:

Circles indicate wells completed in the unconfined aquifer.
Squares indicate well completed in the confined aquifer.
Nitrate concentrations are as indicated below:

- ◻ ○ < 10 mg/l NO3-N
- ◨ ◑ 10-19 mg/l NO3-N
- ■ ● ≥ 20 mg/l NO3-N
- Hilmar Area Study Boundary

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Date: 8/2/95

Table 3-4 displays nitrogen and salinity relationships with depth for the unconfined aquifer in the Hilmar Study (Lowry 1987). Nitrogen concentrations decreased with depth in the unconfined aquifer. However, salinity concentrations increased with depth. Of the 49 wells with screening in the unconfined aquifer, 34 wells in June and 28 in October had concentrations of 10 mg/l NO_3-N or greater. Only two of the 10 wells with screens in the confined aquifer had nitrate concentrations above the drinking water standard in June and October.

The U.S. Geological Survey has been monitoring deeper ground water in domestic and observation wells in vineyards and almonds at sites in the San Joaquin Valley (Burow 1994). The Survey has been testing for nitrate, total dissolved solids and electrical conductivities. Overall nitrates ranged from less than 1 to 55 mg/l, TDS ranged from 90 to 1,400 mg/l and EC ranged from 85 to 1,950 μmhos/cm. At least four of these wells are near the cooperating dairies in the study area. These wells are screened from 96 to 211 feet below the ground surface. The depth to the water table is between 18 to 100 feet. Nitrates as nitrogen ranged from 7 to 37 mg/l, TDS ranged from 280 to 660 mg/l and EC ranged from 400 to 950 μmhos/cm. Seven wells are located between the Stanislaus and Merced Rivers which border the cooperating dairies to the north and south. Nitrates as N ranged from 5 to 37 mg/l, TDS ranged from 280 to 660 mg/l and EC ranged from 400 to 950 μmhos/cm.

Modesto Irrigation District analyzed 41 wells in their district (MID 1994). Total dissolved solids analyses were performed on over half of these wells in the 1950's or earlier. TDS has steadily increased since that time period. Four of these wells were located within half a mile of Dairies D, F and G. The wells monitored shallow ground water. The August 1994 water levels ranged from 15.9 to 24.0 feet below the ground surface. TDS in 1994, ranged from 355 to 897 mg/l. Nitrate levels ranged from 33 to 53 mg/l.

Turlock Irrigation District monitors shallow wells in their district. Thirteen wells are within approximately one mile of Dairies C1 and C2. These wells were analyzed for electrical conductivity in 1990 through 1993, the results ranged from 510 to 1,000 μmhos/cm and averaged about 700 μmhos/cm.

Certain dairies under the Regional Board's regulatory program are monitored for ground water quality (CVRWQCB, 1994). Monitoring is required or done voluntarily because of concerns above high ground water tables, pond leakage, elevated nitrate and salt levels in neighboring domestic wells, highly permeable sandy soils and lack of sufficient area of cropland for waste disposal. Eleven dairies have installed ground water monitoring wells under the program. At these dairies, 41 monitoring/observation wells and two tile drains were sampled since 1986. In four dairies in Kings, Tulare and Fresno counties, nitrates ranged from 0.1 to 396 mg/l. Total dissolved solids ranged from 600 to 4,100 mg/l. Well water depths ranged from dry, which indicates water below the well screen, to 48.6 feet below the ground surface.

Table 3-4 Nitrogen and Salinity Versus Depth in the Hilmar Area

Filename:NSALTDEP.XLS Date:08/04/95

Well Depth* (ft)	Number of Wells	Mean NO_3-N (mg/l)	Range of NO_3-N (mg/l)	Average EC (µs/cm)	Range of EC (µs/cm)
0-50	6	17	0.05 to 31	617	370 to 960
51-100	27	13	< 0.01 to 35	657	350 to 1200
101-150	12	11	< 1 to 21	696	310 to 1100
151-200	4	11	0.06 to 24	918	720 to 1200

SOURCE: Lowry (1987), Table 11

NOTES:

* Well depth is considered to be the bottom of the casing if the perforaton interval is unknown.

Wells are in the unconfined aquifer.

In Stanislaus and Merced counties, four dairies have installed 14 monitoring wells under the Regional Board's dairy regulatory program. These wells were sampled ~~on 18 occasions~~ from August 1992 to November 1994. Water depths measured at 6 to 30 feet below ground surface. Nitrate as nitrate levels ranged from less than 0.01 to 890 mg/l. Ammonia as nitrogen ranged from less than 0.1 to 0.16 mg/l. Total Kjeldahl nitrogen varied from less than 1.0 mg/l to 7.8 mg/l. TDS ranged from 192 to 4,942 mg/l. Overall, the limited ground water data in the Regional Board's dairy regulatory program files for the San Joaquin Valley indicated that nitrate as nitrate ranged from less than 0.01 to over 1,020 mg/l. Ammonia and TKN were insignificant in comparison.

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4.0 MONITORING WELLS AND SHALLOW GROUND WATER FLOW

4.1 MONITORING WELL INSTALLATION

Monitoring wells were installed near dairy ponds, corrals and fields.. The sites of these wells were based on the expected direction of ground water flow and information on dairy operations and use. Well locations were modified based on access to the site, safety and feasibility of drilling. Other locations were considered but excluded because they ran a high risk of being destroyed by heavy equipment, would be in the way of cattle movement or were situated in areas of planned construction.

Monitoring wells were installed to determine the effects on shallow ground water quality from the following features:

(1) dairy wastewater ponds,
(2) surrounding fields in which waste was applied and
(3) dairy corrals.

Table C-1 summarizes the location of each monitoring well relative to these features. At least one well, upgradient of each dairy operation, was to serve as a control site.

A total of 44 shallow monitoring wells at five dairies in Merced and Stanislaus Counties were drilled by Layne Environmental Services (also known as Layne-Western) in May and June 1993. A field geologist URS Consultants supplied on-site supervision for 38 wells, and completed well borings and well construction logs for the installations (URS 1993b). The last six wells were constructed without a field geologist. Therefore, logs were not produced for these wells. Well completion reports were filed by Layne-Western with Merced and Stanislaus Counties and the California Department of Water Resources, San Joaquin District.

Monitoring wells were numbered by dairy in order of drilling priority. Drilling priority within a dairy was usually the corral and pond areas first followed by the fields. Wells are located on the maps on Figures A-1 through A-4 in Appendix A. The order of drilling was:

(1) Dairies C1 and C2,
(2) Dairy D,
(3) Dairy G and
(4) Dairy F.

4.1.1 Well Depths and Core Samples

The wells were designed and constructed to obtain samples from the shallowest ground water. Depths of the wells ranged from 22 to almost 31 feet below the ground surface. The shallowest wells were at Dairies C1 and C2 at 22 and 23 feet deep. The deepest wells were from 29 to 32 feet deep at Dairy F. Wells at the Dairy G were 26 to 30 feet deep. The wells at the Dairy D were 22 to 23 feet deep. Generally, the wells were screened 5 feet above the water table and 10 feet below it. Screen lengths were in five foot segments.

features

Lithologic descriptions were recorded in the boring logs (URS 1993b). These descriptions included information on surface ~~description~~, grain size, texture, mineralogy, plasticity, color, relative moisture content and soil group by the Unified Soil Classification System. Also included on the boring logs were ambient air temperature and a well completion diagram. Additional information on the drilling process includes blow counts and ease of drilling. Soil core samples were collected above the water table with a California-Modified split-spoon sampler. No soil samples were taken below the water table. Instead, water was sampled below the water table following completion and stabilization of the well.

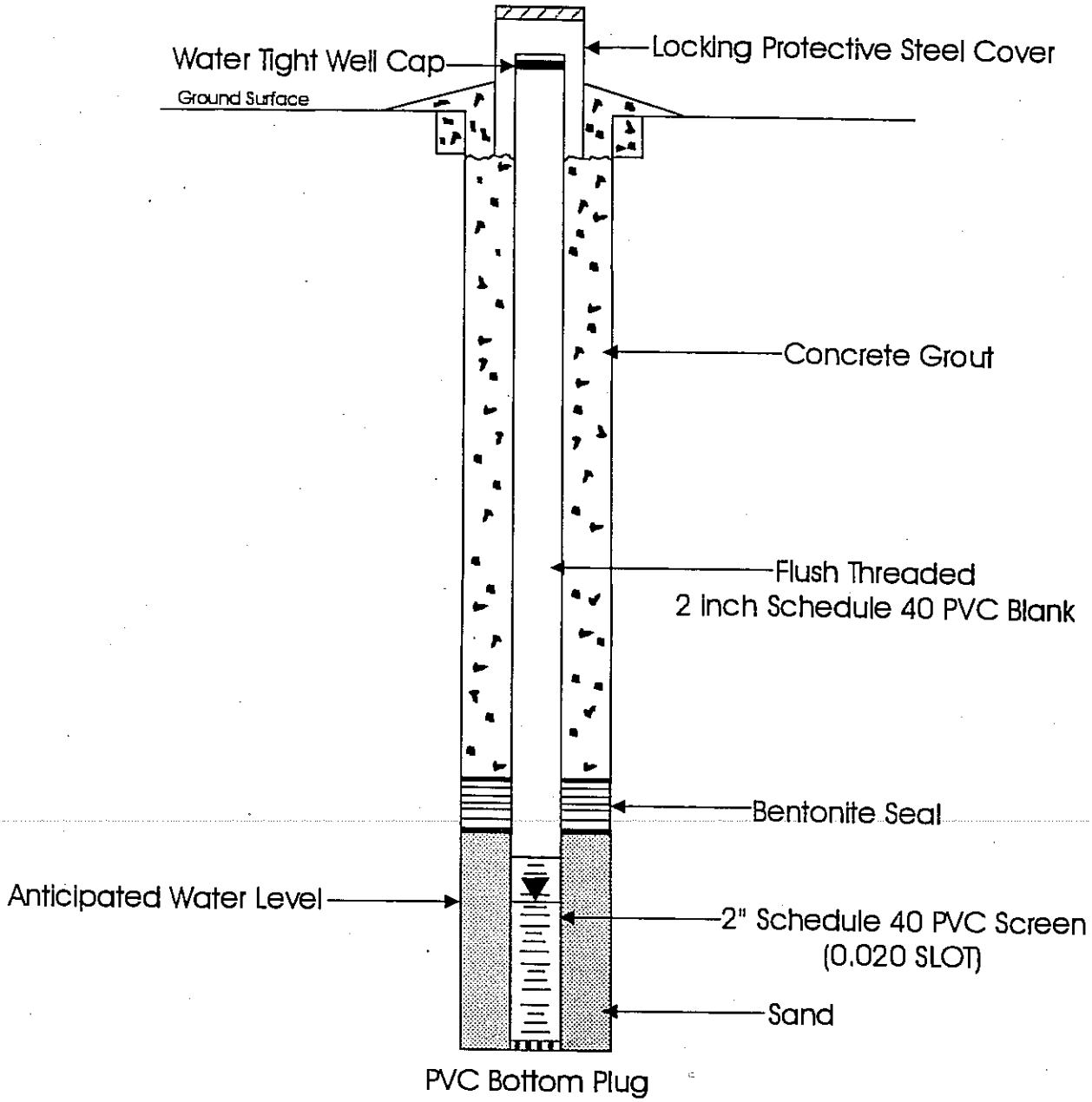
The wells were easily drilled because boring was in alluvial material with little or no hard pan (cemented) layers, boulders or cobbles. Split-spoon soil core samples were taken every five feet until the water table was reached. The split-spoon sampler was driven ahead of the auger to allow collection of undisturbed samples. The soil samples were kept at 4°C for up to five days then frozen.

4.1.2 Monitoring Well Construction

Well construction logs were completed for 38 monitoring wells. The wells were designed according to the typical well completion diagram in Figure 4-1. They were made of 2-inch Schedule 40 flush threaded plastic (PVC) pipe with generally 15 foot segments of 0.02 or 0.01 inch screen. Generally, the well screen was placed 10 feet into the saturated zone and 5 feet above it to account for seasonal variations in the shallow ground water levels. In cases where ground water was shallower than 10 feet, the screen extended less than 5 feet above the water table to allow room for the seal.

Wells were capped with threaded end plugs. The hole was drilled with an 8-inch outside diameter continuous flight hollow stem auger. No cement, solvents or joint compounds were used in well construction. The space between the well screen and the bore hole was typically packed with a #2 or #3 sand and sealed with bentonite pellets. The grout was a mixture of cement, bentonite powder and water. Surface completion consisted of either a Christie box constructed below grade (within a foot of the surface) or a locking steel casing riser (stovepipe) design at about 2.3 feet above the ground surface, both encased in concrete.

Figure 4-1 Typical Monitoring Well Completion Diagram



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Date:6/2/95

The first wells were drilled at Dairies C1 and C2. These wells were screened with a 0.020 inch slot size with #3 sand. After the initial wells were purged, they were considered too turbid by the field geologist. Subsequently, a 0.010 inch slotted screen with #2/12 sand was substituted for the larger screen and sand size. This design was more successful in reducing turbidity and was used for the remaining wells.

4.1.3 Texture Characteristics

The texture characteristics from the boring logs are summarized for each dairy in Table 4-1. Soil (or vadose zone) and saturated zone textures by monitoring well are contained in Table C-2 in Appendix C. Surface soil layers were made up of predominantly ~~of~~ sand, sandy silts and silty sands. Other textures included silty clays, silty clayer sands, sandy silts and clays. The texture of the shallow ground water layer varied from sands to clays.

The shallow vadose material typically undergoes a texture change at three to five feet. The surface soils were generally coarse grained sands or silts. Silty clays or clays at or near the surface were rare. Finer subsoils were generally reached within five to ten feet below the ground surface. However, there were some exceptions: twelve of the thirty-six subsoils were coarser than their surface soils. Generally, texture changes were found throughout the depth of the borings. Since the shallow ground water zone is saturated soil close to the surface, it is not surprising to see various textures. The textures are indicative of the subsurface alluvial lithology in ~~these alluvial geology~~. the study area.

4.2 ELEVATION AND DIRECTION OF FLOW

Table 4-2 displays the ground surface elevations, depth to shallow ground water and ground water elevations. Well heads were surveyed in June 1993 by Delamare-Fultz Engineering, so that water level elevations between monitoring wells could be compared. Well head elevations from the survey were used to estimate surface elevations. The ground surface elevations were based on U.S.G.S. topographic maps but refined from the land survey. Shallow ground water levels were measured from June 1993 through August 1994 and ranged from 2 to 23 feet below the ground surface. Shallow ground water elevations were determined by subtracting depth to shallow ground water from well head elevations as determined by the survey. Shallow ground water was measured from June 1993 through August 1994 using a depth sounder. Measurements were taken at the time of sampling and on other occasions. Elevations ranged from 30 to 84 feet above sea level. Figures C-1 through C-4 in Appendix C contain the elevations for the top of the shallow ground water zone.

Table 4-1 Boring Log Texture Characteristics by Layer

Filename:BORLOG.XLS Date: 10/31/95

DAIRY	SURFACE SOIL LAYER	SHALLOW GROUND WATER LAYER
C1	Sand	Silty Clay, Clayey Sand, Sand* Interbedded Sands & Clays
C2	Silty Clay, Sand*	Sand*, Clayey Sand, Silty Clay
D	Silty Clay, Silt, Silty Sand*, Sandy Silt*	Sandy Clay, Silty Sand, Sand, Silty Clayey Sand, Sandy Silt*, Silty Clay
G	Silty Sand* Silty Clayey Sand Sandy Silt	Silty Sand*, Clayey Sand Silty Sand, Sand Clay, Sandy Clay Sandy Silt
F	Silty Sand, Silty Clay, Clay, Sandy Silt	Sand, Clayey Sand, Clay, Silty Sand, Interbedded Sands & Clays

NOTE:

* Dominant texture type.

Table 4-2 Surface Elevation, Ground Water Elevation and Depth to Ground Water (June 1993 through August 1994)

filename: gwelev.xls 10/31/95

Dairy	Surface Elevation (ft. above sea level)	Depth to Ground Water (ft. below surface)	Ground Water Elevation (ft. above sea level)
C1	84 to 86	4 to 10	74 to 81
C2	82 to 86	2 to 11	72 to 84
D	42 to 45	7 to 14	30 to 37
G	49 to 55	11 to 20	35 to 41
F	50 to 57	13 to 23	33 to 39

The direction of shallow ground water flow at the five dairies was determined by triangulation using water elevations. Figures 4-2 through 4-5 display lines of equal ground water elevations and the dominant flow direction for each dairy. The water elevation lines were based on measurements taken in March 1994. This month was the period when irrigation and canal storage had the least influence on well water levels and flow direction. Some adjustments were made to the lines based on measurements made during other sampling periods.

Water elevations and flow direction for Dairies C1 and C2 are shown in Figure 4-2. Shallow ground water flow was to the southwest toward the Merced River. At Dairy C1 in March 1994, water flows from an elevation of 79.5 feet in the northeast corner to 74.9 feet in the southwest corner of the dairy property. A similar occurrence was noted at Dairy C2 where flow was to the southwest from an elevation of 80.3 feet to 75.3 feet. (above sea level)

Figure 4-3 shows the water elevations and flow direction for Dairy D. Shallow ground water flow was to the west by southwest toward the San Joaquin River. In March 1994, water flowed from an elevation of nearly 34 feet in the northeast corner to 31.5 feet in the southwest corner of the dairy property. (above sea level)

Water elevations and flow direction for Dairy G are shown in Figure 4-4. Flow was west by southwest toward the Tuolumne River. In March 1994, ground water elevations dropped from 39.5 feet in the eastern fields to 37 feet in the western side of the dairy. (above sea level)

Figure 4-5 displays water elevations and flow direction for Dairy F. Shallow ground water flow for Dairy F was northwest toward the Stanislaus River. In March 1994, water level elevations ranged from 36 feet in the southeast side of the Dairy to 34.5 feet in the northwest field. Contrary to the other dairies, which have flows mostly to the southwest, the normal flow for this site is toward the northwest except when affected by irrigation and other well pumping. (above sea level)

Water surface elevations by sampling period were tabulated and mapped and are contained in Appendix C. Depending on irrigation and canal storage and other factors, the direction of the shallow ground water flow can vary. Pumping of nearby wells, application of water to fields or other factors can influence water levels in the shallow monitoring wells. For example, in June 1993 the far southeast well (GMW-6) at Dairy G had a water surface elevation that was lower than the wells to the west. This well appeared to be in a cone of depression, probably caused by the pumping of a nearby production well. During the next sampling period the water elevation level in that well was higher and the cone of depression was not apparent. As another example, flow at Dairy F in March 1994 was toward the Stanislaus River to the northwest. However, during the first two sampling periods in 1993 flows appeared to be toward the north or west. These earlier flow directions were most likely because of the influence of crop irrigation and canal water level fluxations. No irrigation water was in the canal during the March 1994 monitoring period.

Figure 4-2 Lines of Equal Shallow Ground Water Elevations at Dairies C1 and C2

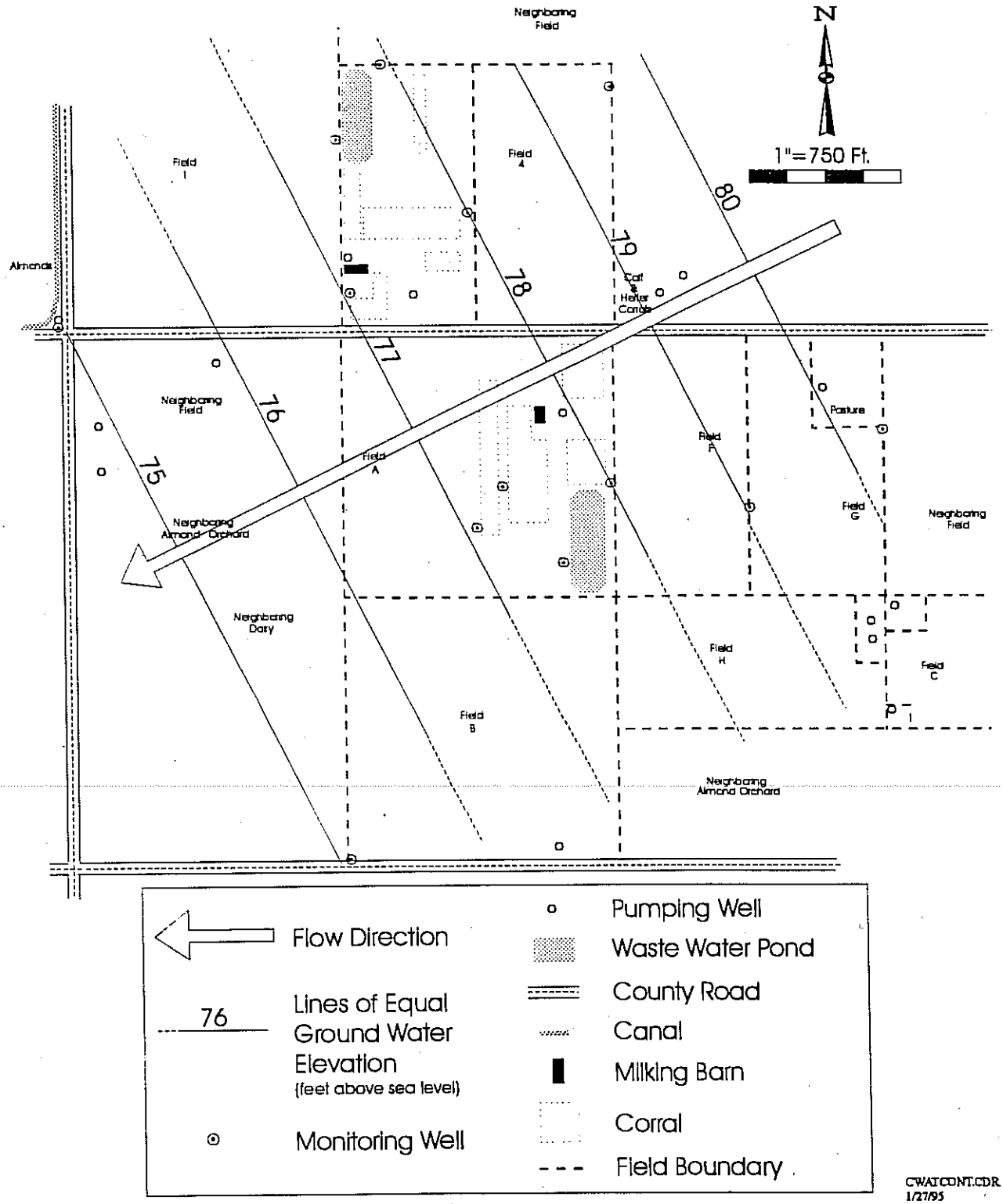

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Figure 4-3 Lines of Equal Shallow Ground Water Elevation at Dairy D

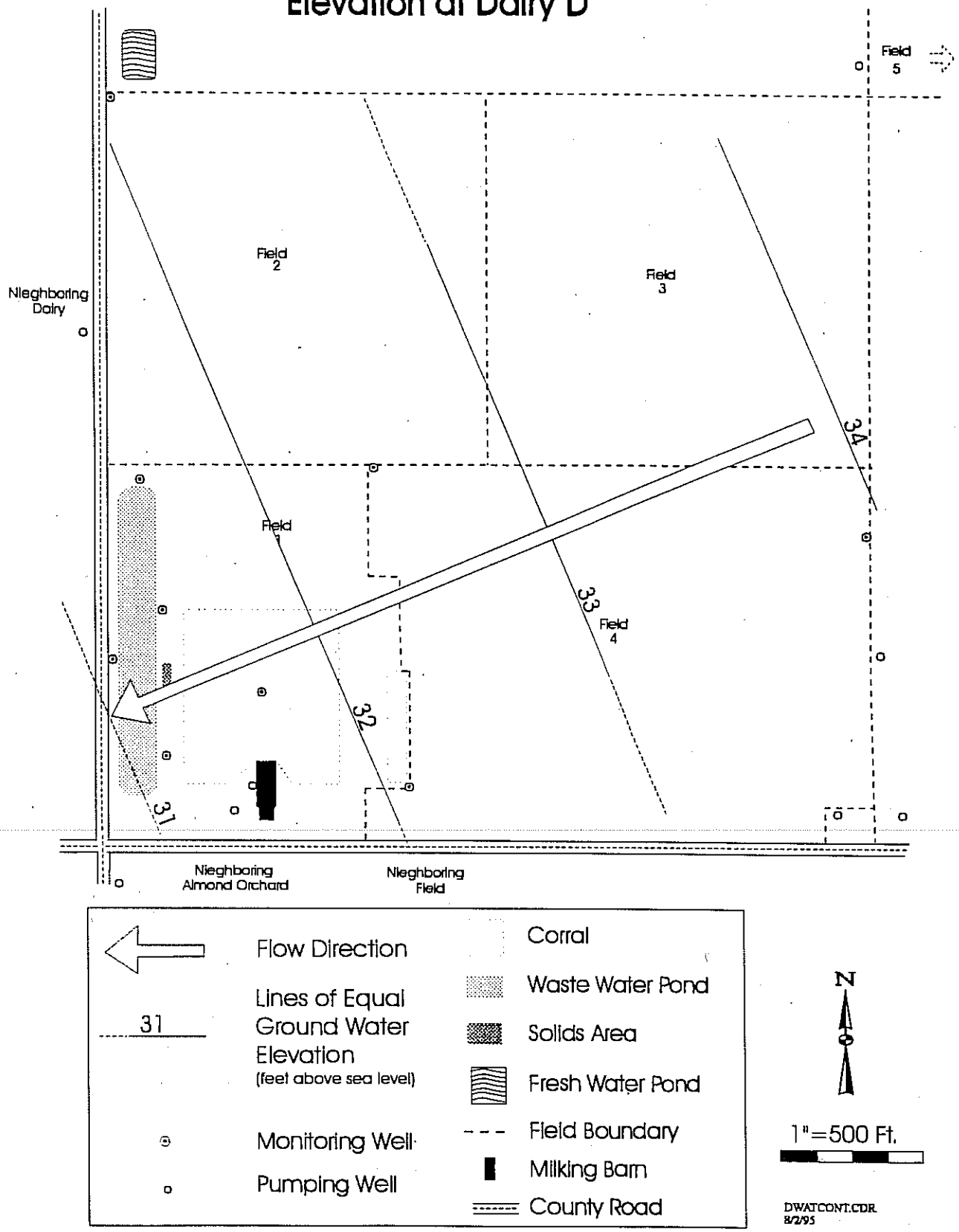
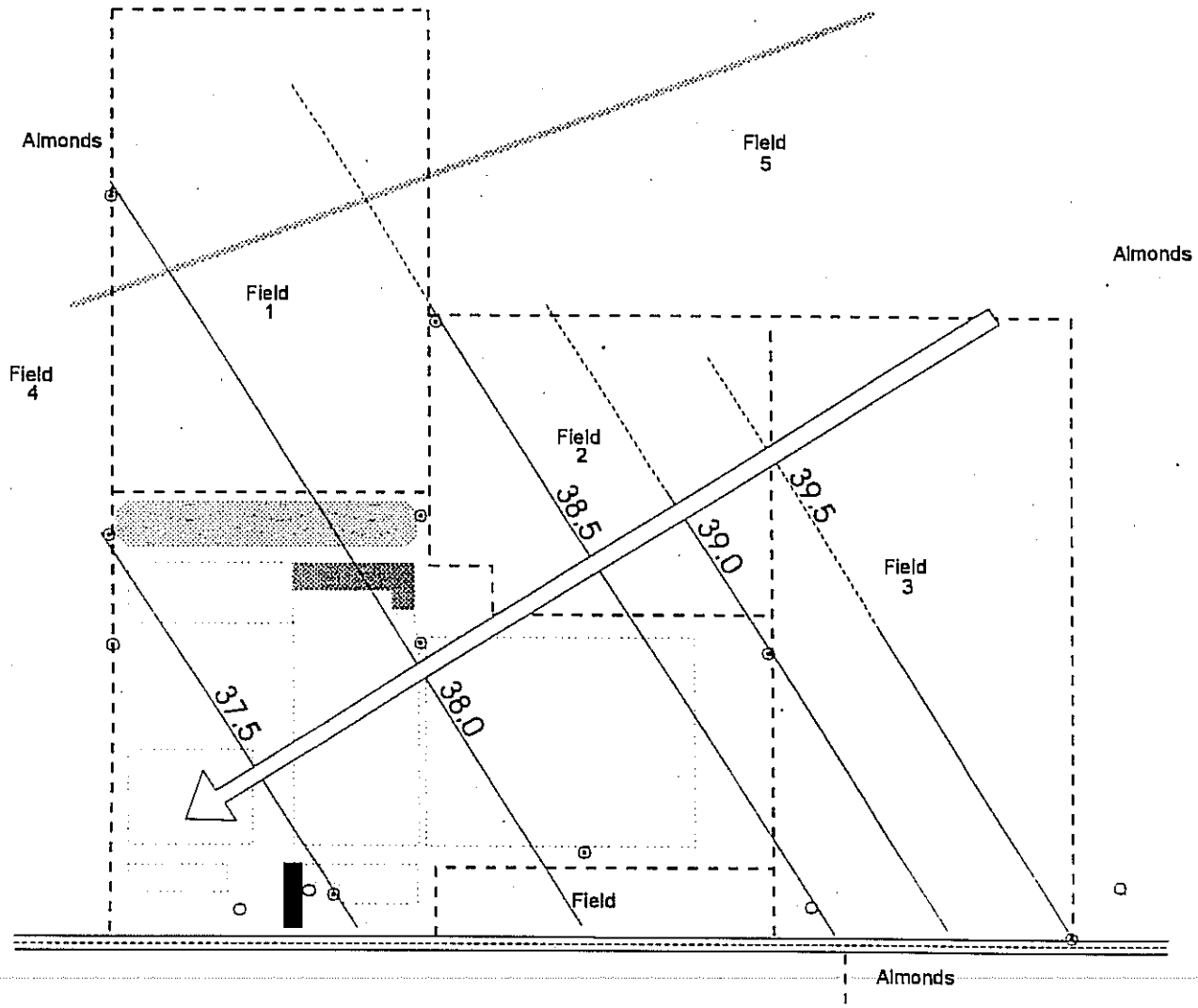


Figure 4-4 Lines of Equal Shallow Ground Water Elevations at Dairy G



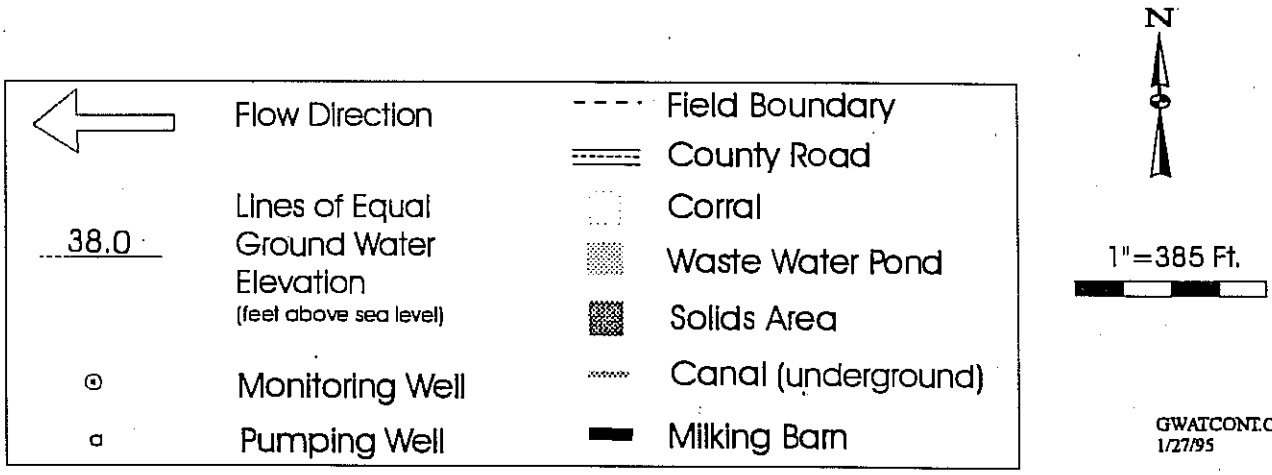


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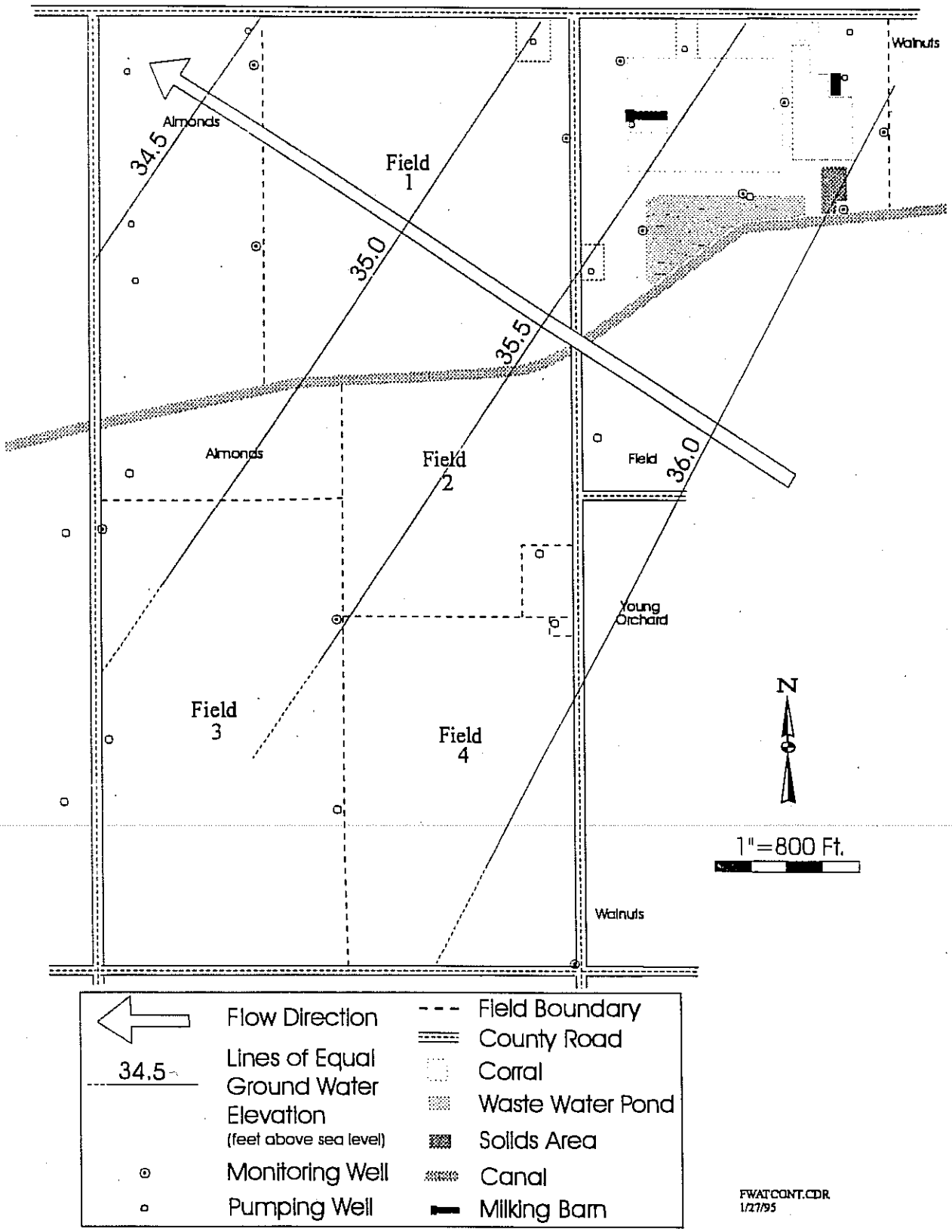
Figure 4-5 Lines of Equal Shallow Ground Water Elevation at Dairy F



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1/27/95

4.3 MOVEMENT OF SHALLOW GROUND WATER

Figure 3-1 in Chapter 3 illustrates typical water movement in the shallow ground water zone. Movement of water and solutes (such as nitrates) into the shallow ground water under dairies is usually from lateral flow or from the surface. Once in the shallow ground water zone, chemicals in solution can move in three directions: (1) upward through plant uptake or capillary action toward the surface, (2) downward as deep percolation, or (3) laterally within the shallow ground water zone of saturation. The discussion in this section is on lateral or horizontal flow. Since the geology of the dairies is alluvial with various horizontal layers including some slowly permeable clays, understanding this lateral water movement is critical to understanding solute movement. Hydrologic characteristics of the saturated zone are given in Tables C-2 and C-3 in Appendix C. These characteristics are used to describe the movement of shallow ground water and soluble constituents.

Table 4-3 displays the ranges of average linear ground water velocities (V) under each of the dairies. The high and low ranges in velocities vary from 5 to almost 1000 feet per year, which is equivalent to one-forth to two feet per day. According to the computed velocities shown in Table 4-3, the greatest velocities are under Dairy C2. Shallow ground water is expected to move approximately 720 to 770 feet per year. The slowest shallow ground water movement appears to be at Dairy F. Ground water moves at approximately 70 to 90 feet per year. Table 4-3 also contains velocity ~~pretections~~ for the corral areas. These calculations were based on monitoring well characteristics in or near the corral as tabulated in Table C-3. Corral area velocities are similar to the overall velocities at the dairies, which includes the entire dairy operations -- corrals, ponds and fields. Further discussion of ground water movement is in Appendix C.

The average linear velocity calculations do not take into account dispersion and other factors. Dispersion is the phenomenon resulting from ground water moving through different soil pore spaces at different rates and through various flow paths lengths (Fetter, 1994). Because these average linear velocities do not take into account the dispersion factor, they cannot be used to predict the entire movement of a chemical in solution. They can be used to estimate one aspect of solute flow, advective transport. Other factors to consider when determining solute transport includes the downward movement of solutes, diffusion, adsorption, plant and microbial uptake of nutrients and changes in the direction of the shallow ground water flow due to irrigation and well pumping. These average linear velocities should only be used as relative estimates of the rate of lateral chemical movement in the shallow ground water zone. A tracer study and a series of adjacent monitoring wells at various depths could provide more information on ground water and solute movement.

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Table 5-8 Selected Soil Chemical Data (Spring 1993)

Filename: SOILSOUR.XLS 10/30/95

DAIRY NAME	SAMPLE LOCATION	DATE	DEPTH feet	NH_3-N mg/kg	NO_3-N mg/kg	EC µs/cm
C1	C1MW-1	05/14/93	0.5	6.9	70	2330
	C1MW-1	05/14/93	5.25	<5.0	41	3000
	C1MW-2	05/25/93	0.5	5.3	17	689
	C1MW-2	05/25/93	5.5	5.7	8.6	304
	C1MW-5	05/26/93	0.5	<5.0	25	749
	C1MW-5	05/26/93	0.5	0.61*		
	C1MW-5	05/26/93	6.5	<5.0	12	943
	C1MW-5	05/26/93	6.5	<0.5*		
C2	C2MW-1	06/01/93	0.5	11	240	11400
	C2MW-1	06/01/93	6.0	<5.0	30	2490
	C2MW-1	06/01/93	11.0	<5.0	130	5760
	C2MW-2	05/27/93	0.5	9.8	22	1910
	C2MW-2	05/27/93	0.5	1.1*		
	C2MW-2	05/27/93	6.0	<5.0	47	1880
	C2MW-2	05/27/93	6.0	<0.5*		
D	DMW-1	06/03/93	1.0	<5.0	72	2810
	DMW-1	06/03/93	5.5	<5.0	18	1900
	DMW-2	06/03/93	1.0	7.7	<1.1	463
	DMW-2	06/03/93	5.0	13.0	<1.1	576
SUMMARY						
NUMBER OF SAMPLES				20	15	15
AVERAGE				4.0	49	2480
MAXIMUM				13	240	11400
MINIMUM				<5.0	<1.1	304

NOTES:

NH_3-N analysis was done by EPA Method 350.2/350.3 potentiometric, distillation procedure with ion selection electrode except where an asterisk appears.

*NH_3-N analysis was done by EPA Method 350.3 Distilled Water (DI) Extract with potentiometric, ion selection electrode except where an asterisk appears. This was not used in the averages.

NO_3-N analysis was done by EPA Method 300.0 ion chromatograhy.

EC analysis was done by CSTP Method 5.0 on DI Extract.

Soil units are in mg/kg of air dried soil.

If NH_3-N was <5.0, then 2.5 is used for statistical calculations.

If NO_3-N was <1.1, then 0.55 is used for statistical calculations.

APPENDIX B

FIELD AND POND CHARCTERISTICS

AppendB/narrat.wpd
8/24/95

Appendix B Field and Pond Characteristics

Table B-1 contains the field characteristics by dairy including field name, size, amount of fertilizer, waste water and dry manure waste applied, crop yields and crop nitrogen needs for optimum crop growth.

Table B-2 contains physical characteristics of dairy ponds including shape, length, width, depth capacity and surface area.

TABLE B-1 Field Characteristics by Dairy in 1993

filename: FIELDBch.xls 9/1/95

DAIRY FIELD	SIZE (acres)	FERTILIZER (lbs/acre)	FERTILIZER (lbs)	WASTE WATER	DRY WASTE	CROP YIELD (tons/acre)	ESTIMATED CROP N NEEDS lbs/acre	ESTIMATED CROP N NEEDS (lbs)
Dairy C1								
Field 1	60	204	12240	Yes	No	Silage Corn (32)	250	15000
						Silage Wheat (3)	120	7200
								22200
Dairy C2								
Field A	20	239	4780	Yes	No	Silage Corn (31)	250	5000
						Silage Wheat (3)	120	2400
Field B	39	287	11193	Yes	No	Silage Corn (31)	250	9750
						Silage Wheat (3)	120	4680
Field C	9	222	1998	Yes	Yes	Silage Corn (29)	250	2250
						Silage Wheat (3)	120	1080
Field F	20	306	6120	Yes	No	Silage Corn (33)	250	5000
						Silage Wheat (3)	120	2400
Field G	16	302	4832	Yes	Yes	Silage Corn (35)	250	4000
						Silage Wheat (3)	120	1920
Field H	17	305	5185	Yes	No	Silage Corn (32)	250	4250
						Silage Wheat (3)	120	2040
Field 4	17	292	4964	Yes	Yes	Silage Corn (30)	250	4250
						Silage Wheat (3)	120	2040
Subtotal	138		39072					51060

Note: Estimated Crop N Needs were from Table 4-1 in the Western Fertilizer Handbook (1995) and Roland D. Meyer (1995), UC Davis LAWR Department.

TABLE B-1 Field Characteristics by Dairy in 1993 (con't.)

DAIRY FIELD	SIZE (acres)	FERTILIZER (lbs/acre)	FERTILIZER (lbs)	WASTE WATER	DRY WASTE	CROP YIELD (ton/acre)	ESTIMATED CROP N NEEDS lbs/acre	ESTIMATED CROP N NEEDS (lbs)
Dairy D								
Field 1	8	112	896	No	No	Alfalfa (5)	300	2400
Field 2	40	0	0	No	Yes	Alfalfa (5)	300	12000
Field 3	40	112	4480	Yes	No	Silage Corn (23)	250	10000
						Silage Oats (5)	120	4800
Field 4	50	112	5600	Yes	No	Silage Corn (23)	250	12500
						Silage Oats (5)	120	6000
Field 5	15	112	1680	Yes	No	Silage Corn (23)	250	3750
						Silage Oats (5)	120	1800
Subtotal	153		12656					53250
Dairy G								
Field 1	12	100	1200	Yes	No	Silage Corn (25)	250	3000
						Winter Forage (15) (Oats, Barley & Wheat)	120	1440
Field 2	10	100	1000	Yes	No	Silage Corn (25)	250	2500
						Winter Forage (15)	120	1200
Field 3	20	100	2000	Yes	No	Silage Corn (25)	250	5000
						Winter Forage (15)	120	2400

TABLE B-1 Field Characteristics by Dairy in 1993 (con't.)

DAIRY FIELD	SIZE (acres)	FERTILIZER (lbs/acre)	FERTILIZER (lbs)	WASTE WATER	DRY WASTE	CROP YIELD (ton/acre)	ESTIMATED CROP N NEEDS lbs/acre	ESTIMATED CROP N NEEDS (lbs)
Dairy G (con't.)								
Field 4	55	100	5500	Yes	No	Silage Corn (25)	250	13750
						Winter Forage (15)	120	6600
Field 5	15	100	1500	Yes	No	Silage Corn (25)	250	3750
						Winter Forage (15)	120	1800
Subtotal	112		11200					41440
Dairy F								
Field 1	80	0	0	Yes	No	Silage Corn (23)	250	20000
						Silage Oats (12)	120	9600
Field 2	40	0	0	Yes	No	Grapes (8)	70	2800
Field 3	80	0	0	Yes	No	Grapes (8)	70	5600
Field 4	60	0	0	Yes	No	Grapes (8)	70	4200
Subtotal	260		0				~~580~~	42200
TOTALS								
21 FIELDS	723	ACRES	75168					210150

B-4

TABLE B-2 Physical Characteristics of Dairy Ponds in 1994

filename: PONDCHB2.xls 9/1/95

DAIRY NAME	SHAPE	LENGTH (feet)	WIDTH (feet)	DEPTH (feet)	CAPACITY (acre-feet)	SURFACE AREA (acres)
DAIRY C1	Rectangular	395	80	13	9	0.7
DAIRY C2	(a) East Half Rectangular	490	78	14	11	0.9
	(b) West Half Rectangular	490	93	14	13	1.0
				Dairy C2 Pond Total	24	1.9
DAIRY D	Rectangular	1125	135	15	39	3.0
DAIRY G	Rectangular	530	100	12	13	1.2
DAIRY F	(a) Old Pond Trapezoidal	285	60 and 90	16	8	0.5
	(b) New Pond Trapezoidal	600 and 625	450 and 60	16	47	3.5
				Dairy F Pond Total	55	4.0
				TOTAL FOR ALL DAIRIES	140	10.8

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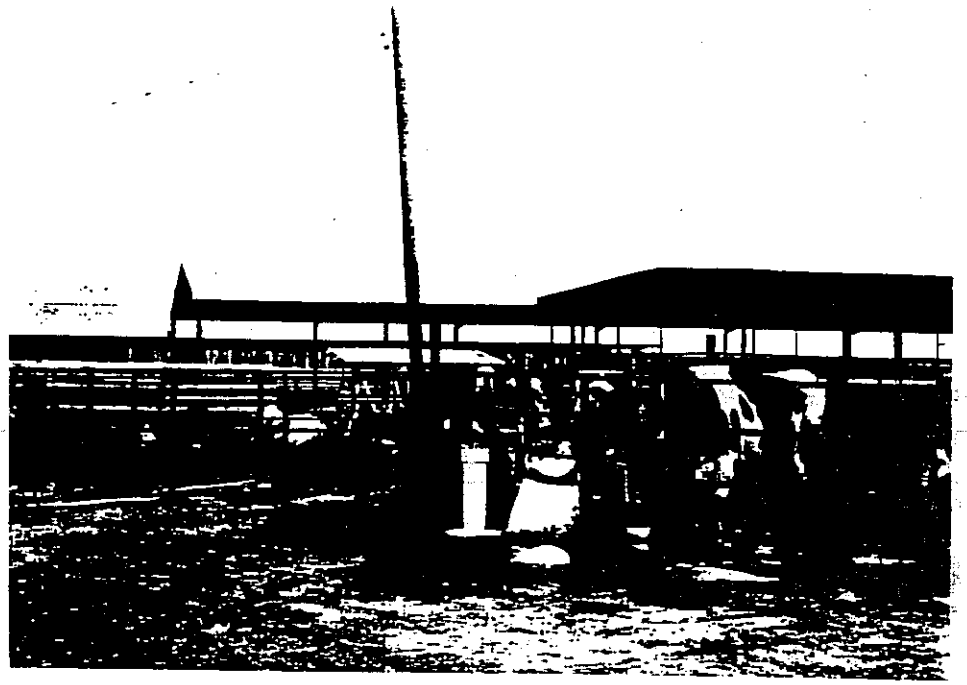
APPENDIX C

WELL CHARACTERISTICS AND GROUND WATER PARAMETERS



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APPENDIX C WELL CHARACTERISTICS AND GROUND WATER PARAMETERS

Table C-1 summarizes the reasons for locating each monitoring well. The wells were located near corrals, ponds and fields based on expected ground water flow direction. Turlock Irrigation District data were used to predict the direction of ground water flow at Dairies C1 and C2. As shown in Figure 4-2 of the report, the direction of shallow ground water movement was toward the southwest, the same as predicted. The other dairies (D, G and F) are located in Modesto Irrigation District. The sparse data available from MID indicated flows were generally toward the west and northwest. As displayed in Figures 4-3 through 4-5, direction of flow was toward the southwest at Dairies G and D and toward the northwest at Dairy F.

Figures C-1 through C-4 contain the elevations for the top of the shallow ground water zone. Hydrologic characteristics of the saturated zone are given in Tables C-2 and C-3. Textures for the saturated zone were taken from monitoring well logs. These textures are presented in Tables C-2 and C-3 for each monitoring well. Estimates of effective porosity were based on well log textures. Effective porosity is the volume of void spaces through which saturated flow occurs. Specific yield values were used to determine effective porosities by texture classes listed in Table C-4. Specific yield is a better estimate of effective porosity than soil porosity since it is directly related to the movement of water though a soil. Specific yield describes water that can be drained. It is measured as the ratio of the volume of water drained from a soil by gravity compared to the total soil volume. Soil porosity refers to only the ratio of voids but does not describe water movement through the soil. The effective porosities in Table C-4 were developed for the texture classes at the dairies.

Table 4-3 in the body of the report displays the ranges of average linear velocities (V) for each dairy. These velocities were based on the hydrologic characteristics contained in Table C-3 for the shallow ground water zone around each monitoring well as determined from slug tests. Velocities in Table 4-3 are averages taken from all the wells for each dairy. These averages are much better estimates of the flow of shallow ground water movement under each dairy than any single well value. Calculation of arithmetic and geometric means were two different statistical approaches used to determine average velocities. Arithmetic means are commonly used to compute averages. Geometric means tend to dampen extreme values.

The average linear velocities for the saturated zone surrounding the monitoring well were estimated in Table C-3 based on the following equation:

$$V = K I / n_e$$

where

V is the average linear velocity in feet/day,

K is the hydraulic conductivity in feet/day,

I is the hydraulic gradient in feet/feet as a fraction, and

n_e is the effective porosity as a dimension less fraction.

For more discussion of the above equation, see Equation 5-24 on page 145 in *Applied Hydrogeology* by Fetter, 1994.

The hydraulic gradients (I) in Table C-3 that were used to calculate linear velocities were determined from the ground water elevation maps in Figures 4-2 though 4-5. Gradients were determined for the direction of flow from the furthest upgradient to furthest downgradient location.

The hydraulic conductivities (K) were determined from slug tests performed at each of the monitoring wells in July 1994. Either a seven or ten foot long slug, depending on what would fit into the well. was lowered into each monitoring well. The slug was made of PVC material with either a 1.3 or 1.7 inch outside diameter. Most tests were performed with the seven foot long, 1.7 inch diameter slug. Water levels during the slug tests were measured using a digital transducer and recorded using a data logger. The transducer was calibrated for various measured depths of the water column.

Three methods were used to determine hydraulic conductivities:

(1) Bouwer and Rice Fully Penetrating Case,
(2) Bouwer and Rice Partially Penetrating Case and
(3) Hvorslev Method.

A number of references were consulted in evaluating these methods and the results (Woodling, 1994; Fetter. 1994; Freeze and Cherry, 1979; Driscoll, 1986; Bouwer, 1989; Bouwer and Rice, 1976: and Hvorslev, 1951). The hydraulic conductivities from the three methods were computed and the methods which showed the best agreement were chosen for each monitoring well. Averages were computed and entered into Table C-3 as average hydraulic conductivities.

Table C-3 contains the computed average linear velocities by monitoring well and the values for the parameters that were used to compute them. The average linear velocities estimate the speed that shallow ground water moves laterally. Hydraulic conductivities using slug tests measure the rate that the material near the monitoring wells transmits water. An average hydraulic conductivity for all the wells at a dairy is more representative of the ground water flow situation than conductivity for individual wells.

Table C-1 Monitoring Well Installation Summary

wp filename: \appendc\table1c.wpd 9/6/95

Dairy	Well Identification	Location and Description
C1	C1MW-1	Downgradient of Corral
C1	C1MW-2	Downgradient of Pond
C1	C1MW-3	Upgradient of Corral and Downgradient of Field
C1	C1MW-4	Upgradient of Pond and Downgradient of Field
C1	C1MW-5	Upgradient of Field (Initial Background)
C1	C1MW-6	Downgradient of Field and Dairy Site
C2	C2MW-1	Upgradient of Pond
C2	C2MW-2	Downgradient of Pond
C2	C2MW-3	Middle of Corral
C2	C2MW-4	Downgradient of Corral
C2	C2MW-5	Upgradient of Field (Initial Background)
C2	C2MW-6	Middle of Field
C2	C2MW-7	Downgradient of Field and Dairy Operations
D	DMW-1	Downgradient of Pond
D	DMW-2	Downgradient of Field and Pond
D	DMW-3	Downgradient of Field and Corral
D	DMW-4	Upgradient of Pond and Downgradient of Corral
D	DMW-5	Middle of Corral
D	DMW-6	Upgradient of Corrals
D	DMW-7	Downgradient of Field
D	DMW-8	Downgradient of Field
D	DMW-9	Upgradient of Field (Initial Background)

Table C-1 Monitoring Well Installation Summary (continued)

Dairy	Well Identification	Location and Description
G	GMW-1	Downgradient of Corral
G	GMW-2	Middle of Corrals
G	GMW-3	Downgradient of Pond
G	GMW-4	Downgradient of Corral
G	GMW-5	Upgradient of Corral and Downgradient of Field
G	GMW-6	Upgradient of Field (Initial Background)
G	GMW-7	Downgradient of Corral
G	GMW-8	Downgradient of Field and Upgradient of Pond
G	GMW-9	Downgradient of Field
G	GMW-10	Middle of Fields
F	FMW-1	Downgradient of Corral
F	FMW-2	Downgradient of Pond
F	FMW-3	Downgradient of Pond
F	FMW-4	Upgradient of Field and Downgradient of Corral
F	FMW-5	Upgradient of Site (Initial Background)
F	FMW-6	Upgradient of Pond
F	FMW-7	Upgradient of Field and Downgradient of Corral
F	FMW-8	Downgradient of Field
F	FMW-9	Middle of Field (Vineyard)
F	FMW-10	Upgradient of Field (Vineyard)
F	FMW-11	Downgradient of Field
F	FMW-12	Downgradient of Field (Vineyard)

Table C-2 Monitoring Texture Classes and Effective Porosities by Location

filename: appendc\textclas.xls 8/25/95

DAIRY	WELL No.	Soil Texture*	Soil Effective Porosity** %	Saturated Zone Texture*	Location***
C1	1	wl: sand (clay lens) ss: sand	20	clayey sand	corral
C1	2	wl: sand ss: loamy sand	26	sand	pond
C1	3	wl: sand, clayey sand ss: loamy sand	18	clayey sand, coarse sand	corral
C1	4	wl: sand ss: loamy sand	26	sand	pond
C1	5	wl: sand (clay lens) ss loamy sand	20	sand (clay lens interbedded)	field
C1	6	wl: sand (silty sand) ss: sand	23	clay (clayey sand)	field
C2	1	wl: silty sand ss: sand	20	sand	pond
C2	2	wl: sand (clayey sand) ss: sand	20	sand	pond
C2	3	wl: sand (clayey sand) ss: sand	20	sand (silty sand)	corral
C2	4	wl: sand (clayey sand) ss: sand	20	sand (silty sand)	corral
C2	5	wl: sand ss: loamy sand	26	silty sand	field
C2	6	wl: sand ss: loamy sand	26	clayey sand	field
C2	7	wl: silty sand ss: loamy sand	20	sand	field

NOTES:

* Soil or vadose zone textures are from either:

wl: well logs from drilling monitoring wells logs above the water table: secondary texture in parenthesis, or

ss: soil survey maps to the subsurface depth surveyed.

Saturated zone textures are from monitoring well logs.

**Soil effective porosities are estimated based on specific yields by texture classes (see Table C-4).

***Locations are those corral, field, and pond use nearest to monitoring wells.

Table C-2 Monitoring Texture Classes and Effective Porosities by Location (continued)

DAIRY	WELL No.	Dominant Soil Texture*	Soil Effective Porosity** %	Dominant Saturated Zone Texture*	Location***
D	1	wl: sandy silt,silty sand ss:fine sandy loam	10	silty sand	pond
D	2	wl: sandy clay (silty sand) ss: fine sandy loam	12	silty sand	pond
D	3	wl: sandy clay, silty sand ss: fine sandy loam	14	clayey sand, silty sand	field
D	4	wl: silty sand, clay ss: sandy loam	10	silty sand	pond
D	5	wl: sandy silt ss: fine sandy loam	5	sand (silty sand)	corral
D	6	wl: sandy silt ss: sandy loam	5	sand, silty clayey sand	field
D	7	wl: sandy clay (silty sand) ss: sandy loam	8	sandy silt	field
D	8	wl: sandy silt ss: fine sandy loam	5	sandy silt, silty sand	field
D	9	wl: sandy clay (silty sand) ss: sandy loam	12	silty sand	field

NOTES:

* Soil or vadose zone textures are from either:

wl: well logs from drilling monitoring wells logs above the water table; secondary texture in parenthesis, or

ss: soil survey maps to the subsurface depth surveyed.

Saturated zone textures are from monitoring well logs.

**Soil effective porosities are estimated based on specific yields by texture classes (see Table C-4).

***Locations are those corral, field, and pond use nearest to monitoring wells.

Table C-2 Monitoring Texture Classes and Effective Porosities by Location (continued)

DAIRY	WELL No.	Dominant Soil Texture*	Soil Effective Porosity** %	Dominant Saturated Zone Texture*	Location***
G	1	wl: silty sand/sand ss: sandy loam	23	silty sand	pond
G	2	wl: sand/clay ss: sandy loam	10	silty sand (clayey sand)	corral
G	3	wl: sandy clay (clay) ss: sandy loam	6	silty sand (sand)	pond
G	4	wl: silty sand (clay) ss: sandy loam	12	sandy clay (clay)	corral
G	5	wl:silty sand/ sandy silt/clay ss: sandy loam	8	silty sand (clayey silt)	field
G	6	wl:silty sand /sand&silt/sand ss: sandy loam	20	sand (sandy silt, silty clay)	field
G	7	wl:sandy silt/clayey silt/sand ss: sandy loam	12	sand	corral
G	8	l:silty sand/clayey sand/sand/cl ss: sandy loam	14	silty sand	pond
G	9	wl:sandy silt/silty sand/sand ss: sandy loam	16	sand	field
G	10	wl:silty sand/sandy silt (clay) ss: sandy loam	12	sand (sandy silt)	field

NOTES:

* Soil or vadose zone textures are from either:

wl: well logs from drilling monitoring wells logs above the water table; secondary texture in parenthesis, or
ss: soil survey maps to the subsurface depth surveyed.

Saturated zone textures are from monitoring well logs.

**Soil effective porosities are estimated based on specific yields by texture classes (see Table C-4).

***Locations are those corral, field, and pond use nearest to monitoring wells.

Table C-2 Monitoring Texture Classes and Effective Porosities by Location (continued)

DAIRY	WELL No.	Dominant Soil Texture*	Soil Effective Porosity** %	Dominant Saturated Zone Texture*	Location***
F	1	wl: silty sand/clay (sand) ss: fine sandy loam	18	sand	corral
F	2	wl: silty clay/clay (sand) ss: fine sandy loam	5	clayey sand (sandy clay)	pond
F	3	wl:clay (silty sand) ss: fine sandy loam	6	silty sand	pond
F	4	wl:sandy silt/ silty sand/ clay ss: fine sandy loam	8	sand	corral
F	5	wl:silty sand (sand) ss: fine sandy loam	22	silty sand	field
F	6	wl:silty sand (sand) ss: fine sandy loam	22	sand (interbedded clays)	field
F	7	ss: fine sandy loam			corral
F	8	ss fine sandy loam			field
F	9	ss: fine sandy loam			field
F	10	ss: fine sandy loam			field
F	11	ss: fine sandy loam			field
F	12	ss: fine sandy loam			field

NOTES:

* Soil or vadose zone textures are from either:

wl: well logs from drilling monitoring wells logs above the water table: secondary texture in parenthesis, or

ss: soil survey maps to the subsurface depth surveyed.

Saturated zone textures are from monitoring well logs.

**Soil effective porosities are estimated based on specific yields by texture classes (see Table C-4).

***Locations are those corral, field, and pond use nearest to monitoring wells.

Table C-3 Ground Water Movement Parameters and Velocities

filename: gwmovel.xls 8/11/95

DAIRY	WELL No.	Average Hydraulic Conductivity (K) cm/s	Average Hydraulic Conductivity (K) ft/day	Hydraulic Gradient (i) ft/ft	Dominant Saturated Zone Texture*	Effective Porosity (n_e)** dimensionless	Average Linear Velocity (V) ft/day	Average Linear Velocity (V) ft/yr
C1	1	0.021	59.0	0.00148	clayey sand	0.15	0.580	206.5
C1	2	0.050	141.5	0.00148	sand	0.26	0.803	285.8
C1	3	0.097	275.2	0.00148	clayey sand, coarse sand	0.22	1.845	656.8
C1	4	0.053	149.0	0.00148	sand	0.26	0.845	300.9
C1	5	0.034	97.4	0.00148	sand (clay lens interbedded)	0.20	0.718	255.6
C1	6	0.041	115.9	0.00148	clay (clayey sand)	0.20	0.855	304.3
High (max)		0.097	275.2	0.00159		0.26	1.845	656.8
Low (min)		0.034	59.0	0.00136		0.15	0.580	206.5
Arithmetic Mean		0.049	139.7	0.00148		0.22	0.941	335.0
Geometric Mean		0.044	125.3	0.00147		0.21	0.874	311.1
Corral Area (monitoring well numbers 1,2,3,4)		0.049	139.7	0.00144		0.22	0.904	321.8

NOTES: $V = K\,i\,/\,n_e$

* Textures from well boring logs. Secondary texture in parenthsis.

** Effective porosity was based on specific yields for saturated zone textures.

Table C-3 Ground Water Movement Parameters and Velocities (continued)

DAIRY	WELL No.	Average Hydraulic Conductivity (K) cm/s	Average Hydraulic Conductivity (K) ft/day	Hydraulic Gradient (i) ft/ft	Dominant Saturated Zone Texture*	Effective Porosity (n_e)** dimensionless	Average Linear Velocity (V) ft/day	Average Linear Velocity (V) ft/yr
C2	1	0.130	368.6	0.00148	sand	0.26	2.091	744.3
C2	2	0.086	244.6	0.00148	sand	0.26	1.388	494.0
C2	3	0.178	505.0	0.00148	sand (silty sand)	0.30	2.483	883.9
C2	4	0.129	365.3	0.00148	sand (silty sand)	0.24	2.245	799.2
C2	5	0.103	292.9	0.00148	silty sand	0.20	2.160	768.9
C2	6	0.097	274.4	0.00148	clayey sand	0.15	2.698	960.5
C2	7	0.141	399.0	0.00148	sand	0.26	2.263	805.7
High (max)		0.178	505.0	0.00159		0.30	2.698	960.5
Low (min)		0.086	244.6	0.00136		0.15	1.388	494.0
Arithmetic Mean		0.124	349.9	0.00148		0.24	2.043	727.2
Geometric Mean		0.120	340.7	0.00147		0.23	2.151	765.9
Corral Area (monitoring well numbers 1,2,3,4)		0.131	370.9	0.00147		0.27	2.057	732.4

NOTES: $V = K i / n_e$

* Textures from well boring logs. Secondary texture in parenthsis.

** Effective porosity was based on specific yields for saturated zone textures.

C-10

Table C-3 Ground Water Movement Parameters and Velocities (continued)

DAIRY	WELL No.	Average Hydraulic Conductivity (K) cm/s	Average Hydraulic Conductivity (K) ft/day	Hydraulic Gradient (i) ft/ft	Dominant Saturated Zone Texture*	Effective Porosity (n_e)** dimensionless	Average Linear Velocity (V) ft/day	Average Linear Velocity (V) ft/yr
D	1	0.062	175.8	0.00110	silty sand	0.20	0.967	344.2
D	2	0.056	185.4	0.00110	silty sand	0.20	1.020	363.0
D	3	0.099	281.7	0.00110	clayey sand, silty sand	0.20	1.549	551.5
D	4	0.042	117.7	0.00110	silty sand	0.20	0.647	230.4
D	5	0.063	179.9	0.00110	sand (silty sand)	0.23	0.860	306.3
D	6	0.151	427.8	0.00110	sand, silty clayey sand	0.20	2.353	837.6
D	7	0.050	141.6	0.00110	sandy silt	0.20	0.779	277.2
D	8	0.002	5.9	0.00110	sandy silt, silty sand	0.50	0.013	4.6
D	9	0.160	455.0	0.00110	silty sand	0.20	2.503	891.0
High (max)		0.160	455.0	0.00130		0.50	2.503	891.0
Low (min)		0.002	5.9	0.00080		0.20	0.013	4.6
Arithmetic Mean		0.076	219.0	0.00110		0.24	1.188	422.9
Geometric Mean		0.051	146.8	0.00110		0.22	0.718	255.6
Corral Area (monitoring well numbers 3,4,5,6)		0.089	251.7	0.00100		0.21	1.213	431.9

NOTES: $V = K i / n_e$

* Textures from well boring logs. Secondary texture in parenthsis.

** Effective porosity was based on specific yields for saturated zone textures.

Table C-3 Ground Water Movement Parameters and Velocities (continued)

DAIRY	WELL No.	Average Hydraulic Conductivity (K) cm/s	Average Hydraulic Conductivity (K) ft/day	Hydraulic Gradient (i) ft/ft	Dominant Saturated Zone Texture*	Effective Porosity (n_e)** dimensionless	Average Linear Velocity (V) ft/day	Average Linear Velocity (V) ft/yr
G	1	0.051	144.0	0.00150	silty sand	0.20	1.080	384.5
G	2	0.092	261.6	0.00150	silty sand (clayey sand)	0.18	2.180	776.1
G	3	0.100	284.8	0.00150	silty sand (sand)	0.22	1.942	691.3
G	4	0.066	186.9	0.00150	sandy clay (clay)	0.10	2.803	997.8
G	5	0.025	71.5	0.00150	silty sand (clayey silt)	0.16	0.670	238.6
G	6	0.089	252.1	0.00150	sand (sandy silt, silty clay)	0.22	1.719	612.0
G	7	0.014	41.1	0.00150	sand	0.26	0.237	84.3
G	8	0.074	208.8	0.00150	silty sand	0.20	1.566	557.5
G	9	0.027	76.4	0.00150	sand	0.26	0.441	157.0
G	10	0.043	122.8	0.00150	sand (sandy silt)	0.23	0.801	285.0
High (max)		0.100	284.8	0.02360		0.26	2.803	997.8
Low (min)		0.014	41.1	0.00116		0.10	0.237	84.3
Arithmetic Mean		0.058	165.0	0.00150		0.20	1.344	478.4
Geometric Mean		0.049	140.1	0.00150		0.20	1.068	380.3
Corral Area (monitoring well numbers 1,2,4,5,7)		0.050	141.0	0.00088		0.18	0.689	245.4

NOTES: $V = K\,i\,/\,n_e$

* Textures from well boring logs. Secondary texture in parenthsis.

** Effective porosity was based on specific yields for saturated zone textures.

Table C-3 Ground Water Movement Parameters and Velocities (continued)

DAIRY	WELL No.	Average Hydraulic Conductivity (K) cm/s	Average Hydraulic Conductivity (K) ft/day	Hydraulic Gradient (i) ft/ft	Dominant Saturated Zone Texture*	Effective Porosity (n_e)** dimensionless	Average Linear Velocity (V) ft/day	Average Linear Velocity (V) ft/yr
F	1	0.042	118.4	0.00044	sand	0.26	0.200	71.3
F	2	0.034	97.1	0.00044	clayey sand (sandy clay)	0.10	0.427	152.1
F	3	0.077	217.4	0.00044	silty sand	0.20	0.478	170.3
F	4	0.055	157.2	0.00044	sand	0.15	0.461	164.2
F	5	0.019	55.2	0.00044	silty sand	0.20	0.121	43.2
F	6	0.031	86.6	0.00044	sand (interbedded clays)	0.26	0.147	52.2
F	7	0.030	83.7	0.00044	unknown	0.20	0.184	65.5
F	8	0.044	36.5	0.00044	unknown	0.10	0.161	57.2
F	9	0.048	135.9	0.00044	unknown	0.20	0.299	106.4
F	10	0.022	62.3	0.00044	unknown	0.25	0.110	39.0
F	11	0.026	72.6	0.00044	unknown	0.20	0.160	56.9
F	12	0.017	48.8	0.00044	unknown	0.20	0.107	38.2
High (max)		0.077	217.4	0.00060		0.26	0.478	170.3
Low (min)		0.017	36.5	0.00038		0.10	0.107	38.2
Arithmetic Mean		0.037	97.6	0.00044		0.19	0.238	84.7
Geometric Mean		0.034	86.3	0.00044		0.19	0.205	73.1
Corral Area (monitoring well numbers 1,3,4,5,6)		0.045	127.0	0.00040		0.21	0.237	84.5

NOTES: $V = K i / n_e$

* Textures from well boring logs. Secondary texture in parenthsis.

** Effective porosity was based on specific yields for saturated zone textures.

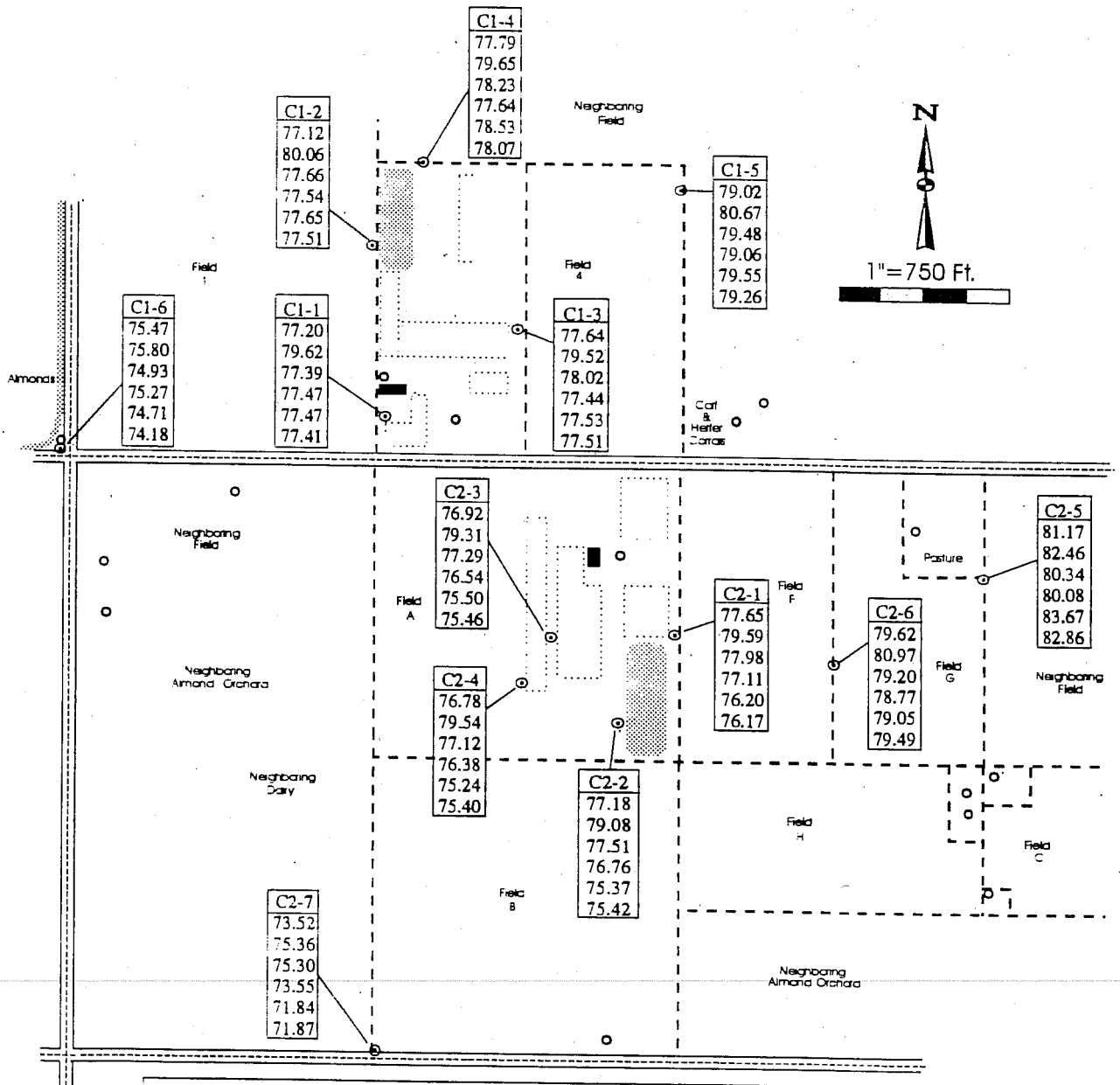
Table C-4 Estimates of Effective Porosities by Texture Classes

filename: porosit.xls 8/25/95

Texture Class	Effective Porosity (n_e)
Coarse Sand	30
Sand	26
Fine Sand	20
Loamy Sand	20
Silty Sand	20
Silty Clay Sand	17
Clayey Sand	15
Sandy Loam	15
Fine Sandy Loam	10
Silty Clay Loam	10
Clayey Silt	8
Sandy Clay	8
Sandy Silt	5
Silt	4
Silty Clay	2
Clay	1

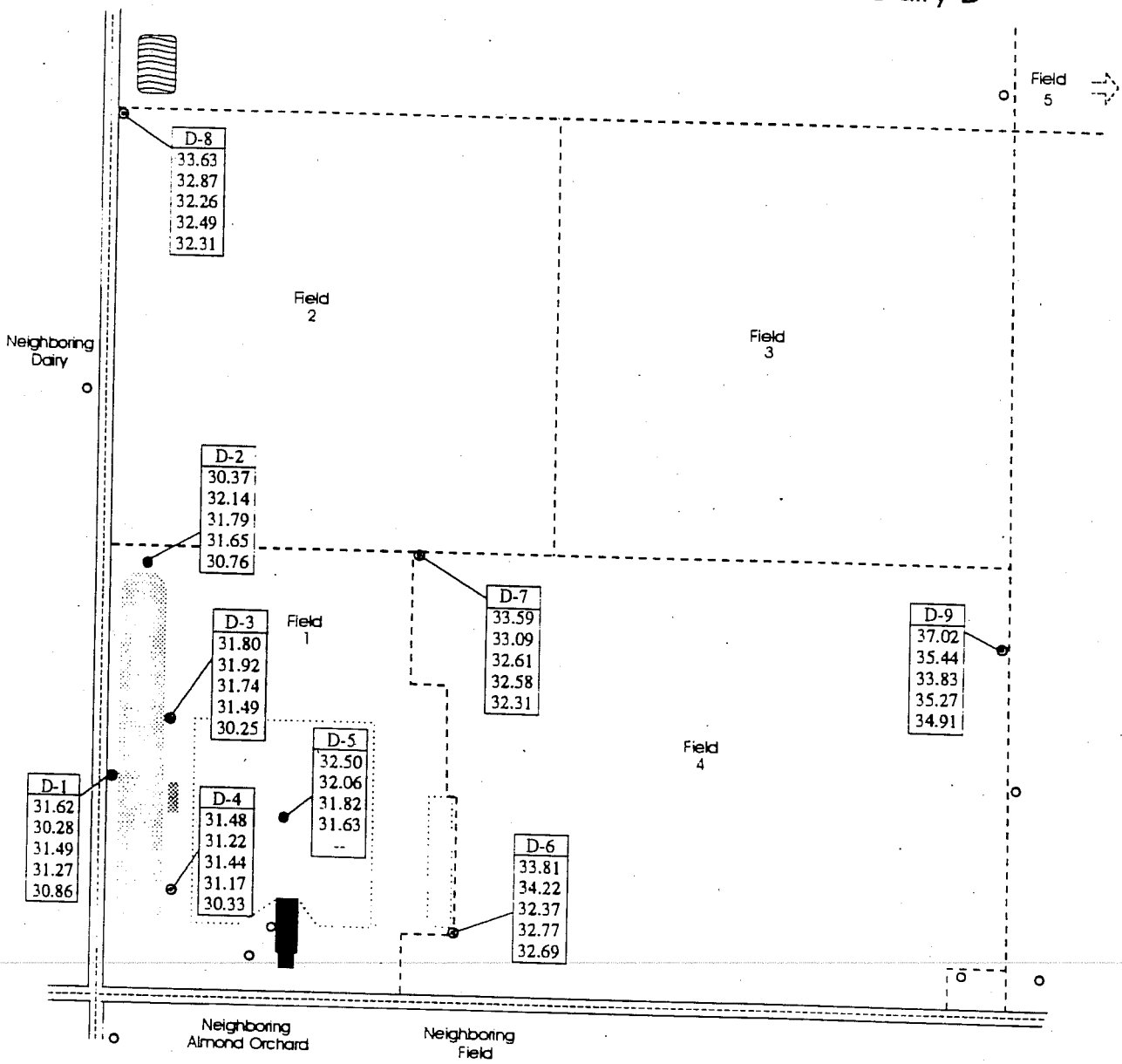
NOTE: Values are based on specific yields in Todd, 1959; Fetter, 1994; Driscoll, 1986.

Figure C-1
Elevation of Shallow Ground Water Surfaces at Dairies C1 and C2



ALLELVC.CDR
08/30/95

Figure C-2
Elevation of Shallow Ground Water Surfaces at Dairy D



D-6	
June	93
Sept.	93
March	94
June	94
July	94

Monitoring Well Number

Elevation of Water Surface (feet above sea level)

Monitoring Well

Pumping Well

Corral

Waste Water Pond

Solids Area

Fresh Water Pond

Field Boundary

Milking Barn

County Road

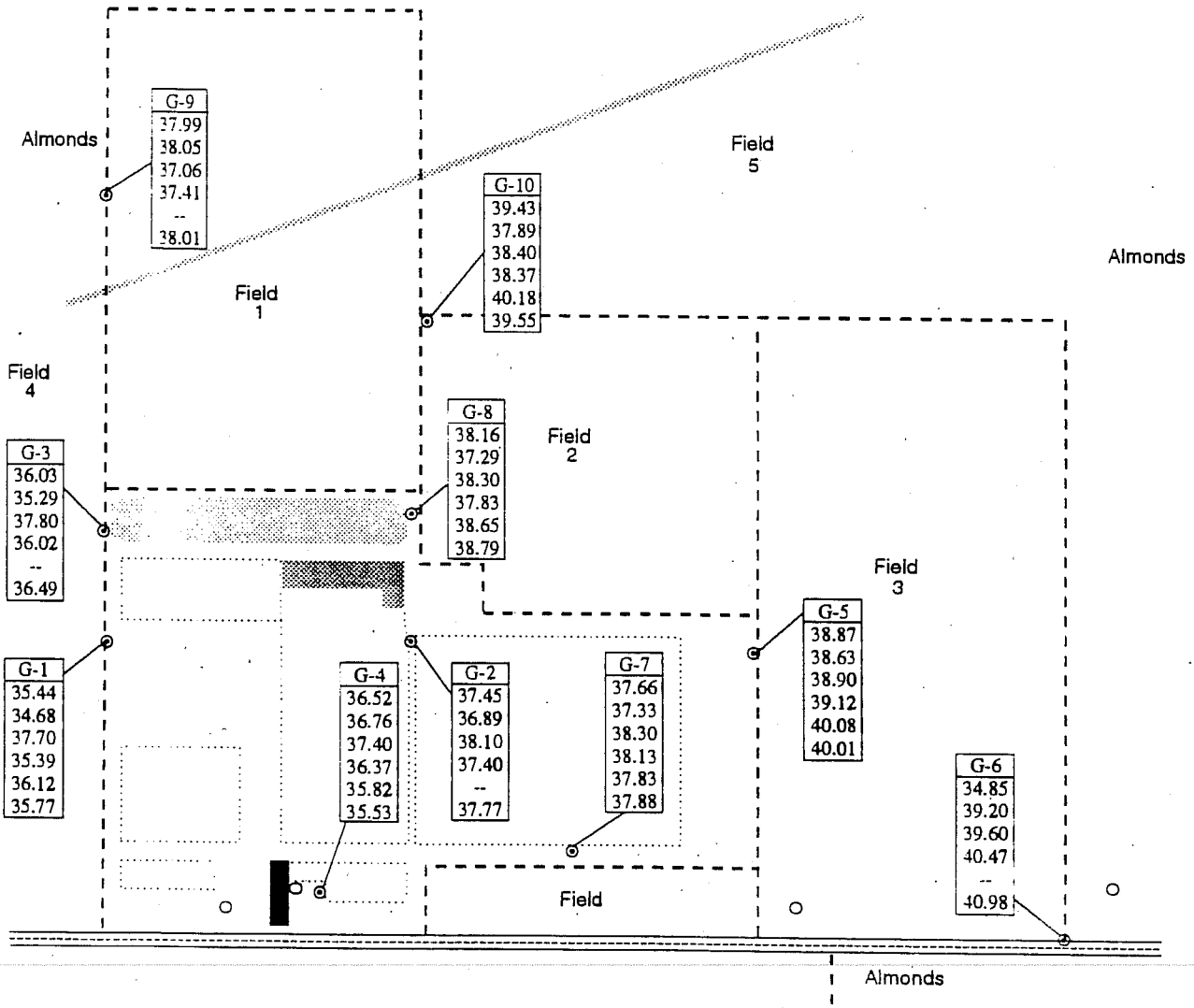
N

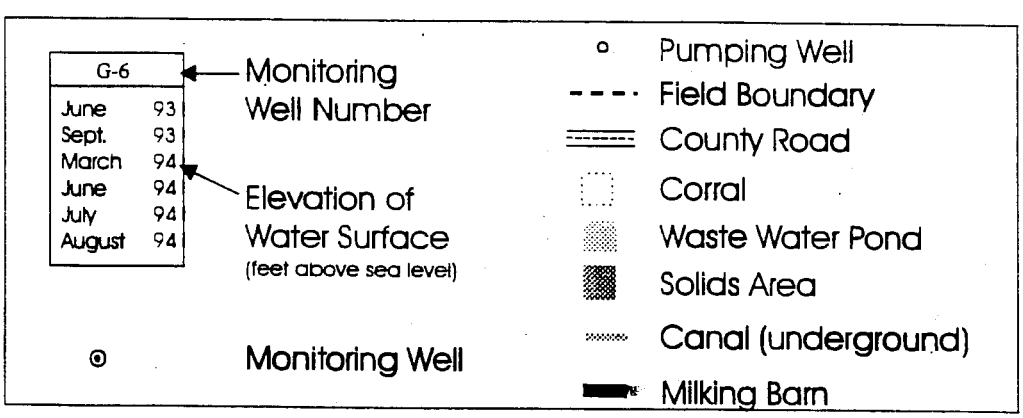
1"=500 Ft.

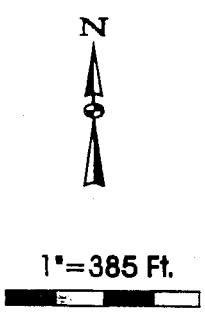
ALLELVD.CDR
08/30/95

Figure C-3

Elevation of Shallow Ground Water Surfaces at Dairy G







ALLELVG.CDR
08/30/95

Figure C-4

Elevation of Shallow Ground Water Surfaces at Dairy F

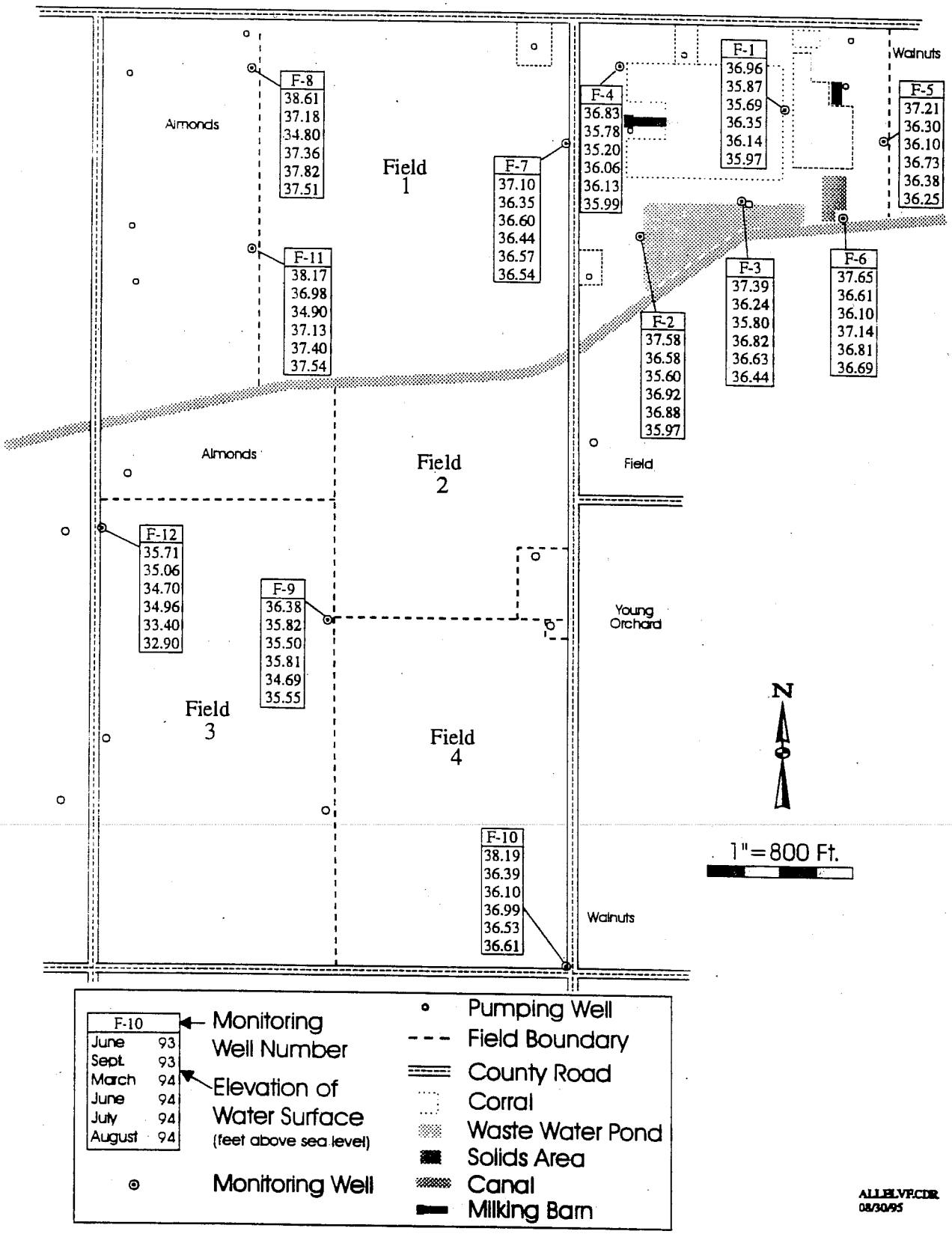


TABLE E-2 (con't.)
Total Dissolved Solids(TDS) and Electrical Conductivity(EC) by Monitoring Well

DAIRY G CONTINUED

DAIRY NAME	WELL NUMBER	DATE	TIME	TDS mg/l	EC µs/cm	RATIO TDS/EC
Summer 94	GMW-1	08/02/94	1330		1913	
	GMW-2	08/02/94	1110		1450	
	GMW-3	08/02/94	1345		1430	
	GMW-4	08/02/94	956		2570	
	GMW-5	08/02/94	1047		1842	
	GMW-6	08/02/94	1259		940	
	GMW-7	08/02/94	1025		1025	
	GMW-8	08/02/94	1207		1590	
	GMW-9	08/02/94	1419		1379	
	GMW-10	08/02/94	1225		1044	
SUMMARY OF DAIRY G						
NUMBER OF SAMPLES				40	50	40
AVERAGE				1060	1648	0.637
MAXIMUM				2200	3270	0.904
MINIMUM				580	940	0.507
STANDARD DEVIATION				329	499	0.098

Filename:MWSALT.XLS
Date:8/30/95

TABLE E-2 (con't.)
Total Dissolved Solids(TDS) and Electrical Conductivity(EC) by Monitoring Well

DAIRY NAME	WELL NUMBER	DATE	TIME	TDS mg/l	EC µs/cm	RATIO TDS/EC
DAIRY F						
Spring 93	FMW-1	06/23/93	1220	2200	2800	0.786
	FMW-2	06/23/93	1330	1200	1670	0.719
	FMW-3	06/23/93	1020	1600	2360	0.678
	FMW-4	06/23/93	1125	1300	1710	0.760
	FMW-5	06/23/93	1420	1200	1710	0.702
	FMW-6	06/23/93	1530	630	715	0.881
	FMW-7	06/28/93	1800	2000	3000	0.667
	FMW-8	06/28/93	1310	870	1260	0.690
	FMW-9	06/28/93	1530	620	890	0.697
	FMW-10	06/28/93	1615	1100	1690	0.651
	FMW-11	06/28/93	1910	1600	2190	0.731
	FMW-12	06/28/93	1655	310	835	0.371
Fall 93	FMW-1	10/15/93	1345	1800	3140	0.573
	FMW-2	10/19/93	1345	840	1470	0.571
	FMW-3	10/15/93	1420	1400	2540	0.551
	FMW-4	10/15/93	1320	1100	1830	0.601
	FMW-5	10/19/93	1505	920	1490	0.617
	FMW-6	10/15/93	1500	290	550	0.527
	FMW-7	10/15/93	1245	1700	3050	0.557
	FMW-8	10/15/93	1050	650	1140	0.570
	FMW-9	10/14/93	1640	790	1290	0.612
	FMW-10	10/14/93	1815	770	1360	0.566
	FMW-11	10/15/93	1205	1400	2380	0.588
	FMW-12	10/15/93	930	588	911	0.645
Winter 94	FMW-1	03/04/94	1030	1900	2680	0.709
	FMW-2	03/04/94	1125	1100	1650	0.667
	FMW-3	03/04/94	1215	840	1370	0.613
	FMW-4	03/04/94	1315	1200	1590	0.755
	FMW-5	03/04/94	1405	980	1390	0.705
	FMW-6	03/04/94	1445	290	449	0.646
	FMW-7	03/04/94	1445	1800	2660	0.677
	FMW-8	03/04/94	1545	790	1190	0.664
	FMW-9	03/04/94	1645	810	1225	0.661
	FMW-10	03/04/94	1715	780	1175	0.664
	FMW-11	03/04/94	1630	1600	2410	0.664
	FMW-12	03/04/94	1550	440	695	0.633

TABLE E-2 (con't.)
Total Dissolved Solids(TDS) and Electrical Conductivity(EC) by Monitoring Well

DAIRY F CONTINUED

DAIRY NAME	WELL NUMBER	DATE	TIME	TDS mg/l	EC µs/cm	RATIO TDS/EC
Spring 94	FMW-1	06/06/94	1115	2000	2990	0.669
	FMW-2	06/06/94	1160	1200	2170	0.553
	FMW-3	06/06/94	1230	1600	2820	0.567
	FMW-4	06/06/94	1305	1200	1900	0.632
	FMW-5	06/06/94	1345	890	1440	0.618
	FMW-6	06/06/94	1425	270	485	0.557
	FMW-7	06/07/94	1245	1600	2800	0.571
	FMW-8	06/07/94	1215	640	1160	0.552
	FMW-9	06/07/94	945	340	530	0.642
	FMW-10	06/07/94	1025	720	1241	0.580
	FMW-11	06/07/94	1150	1500	2670	0.562
	FMW-12	06/07/94	1100	430	765	0.562
Summer 94	FMW-1	07/25/94	1127		2880	
	FMW-2	07/25/94	1650		1881	
	FMW-3	07/25/94	855		2040	
	FMW-4	07/25/94	1315		1799	
	FMW-5	07/25/94	1048		1245	
	FMW-6	07/25/94	943		505	
	FMW-7	07/25/94	1420		2420	
	FMW-8	07/25/94	1620		1026	
	FMW-9	07/25/94	1325		670	
	FMW-10	07/25/94	1150		1086	
	FMW-11	07/25/94	1510		2240	
	FMW-12	07/25/94	1430		667	
SUMMARY OF DAIRY F						
NUMBER OF SAMPLES				48	60	48
AVERAGE				1079	1665	0.634
MAXIMUM				2200	3140	0.881
MINIMUM				270	449	0.371
STANDARD DEVIATION				518	784	0.082

SUMMARY FOR ALL MONITORING WELLS			
NUMBER OF SAMPLES	176	216	176
AVERAGE	1217	1858	0.646
MAXIMUM	4100	6120	0.989
MINIMUM	270	449	0.371
STANDARD DEVIATION	617	932	0.096

Filename:MWSALT.XLS
Date:8/30/95

Table E-3 Nitrogen and Salt Loads and Associated Characteristics Under Corral and Pond Areas

Dairy	Monitoring Well Numbers	Saturated Zone Depth ft.	Width ft.	Length ft.	Volume $ft.^3$	Weight lbs.	Average NO_3-N Concentration ppm	Average TDS Concentration ppm	Load NO_3-N lbs.	Load TDS lbs.
C1	1,2,3,4	13.1	1300	1200	2.04E+07	1.28E+09	104	1870	1.33E+05	2.38E+06
C2	1,2,3,4	12.6	1300	1200	1.97E+07	1.23E+09	60	1600	7.36E+04	1.96E+06
D	1,2,3,4,5,6	11.0	1400	1500	2.31E+07	1.44E+09	53	1440	7.64E+04	2.08E+06
G	1,2,3,4,5,7,8	13.9	1300	1300	2.35E+07	1.47E+09	50	1130	7.33E+04	1.66E+06
F	1,2,3,4,5,6	10.3	1600	1900	3.13E+07	1.95E+09	36	1160	7.03E+04	2.27E+06

NOTES:

Saturated zone heights are from March 1994 water levels.

Average nitrate and TDS concentrations are averages for all monitoring data from June 1993 through August 1994.

Saturated zone volume is the average saturated zone height times the width and length of the area.

It includes the corrals, ponds, and the area between them and the monitoring wells.

Saturated zone weight = 62.4 pounds/ft3 times saturated volume in ft3.

The pounds of nitrates and salts is the weight of the saturated zone of water times the concentration in parts per million (ppm).

The units ppm is parts per million and is equivalent to mg/l.

E denotes exponential format. For example, 1.28 E+09 is 1.28x109 or 1,280,000,000.

Filename: NO3SLOAD.XLS 8/30/95

Table E-4 Delta N-15 and Related Water Quality in Selected Wells

Filename: N15DATA.XLS 08/30/95

DAIRY NAME	MONITORING WELL NO.	WELL LOCATION	DATE SAMPLED	TIME SAMPLED	TOTAL N (mg/l)	DELTA N-15	EC µs/cm
C1	C1MW-1	CORRAL	05/31/94	1530	208.2	19.6	5760
	C1MW-6	FIELD	05/31/94	1645	26.2	12.9	710
C2	C2MW-1	POND	05/31/94	1355	78.6	13.4	2640
	C2MW-5	FIELD	05/31/94	1035	43.8	12.8	700
	C2MW-7	FIELD	05/31/94	1210	8.8	21.4	2760
D	DWM-7	FIELD	06/01/94	1455	88.0	19.5	2720
	DWM-8	FIELD	06/01/94	1610	26.0	26.8	2030
	DWM-9	FIELD	06/01/94	1530	12.5	17.0	706
G	GMW-4	CORRAL	06/02/94	1015	67.6	18.9	2580
	GMW-6	FIELD	06/02/94	1030	26.9	9.0	1040
	GMW-9	FIELD	06/02/94	1205	89.3	18.4	1760
	GMW-10	FIELD	06/02/94	1130	20.4	9.7	1040
F	FMW-1	CORRAL	06/06/94	1115	103.6	19.7	2990
	FMW-5	FIELD	06/06/94	1345	26.9	13.7	1440
	FMW-11	FIELD	06/06/94	1150	75.7	18.3	2670
	FMW-12	FIELD	06/06/94	1100	4.3	16.5	765
AVERAGES							
	Average of Wells Near Corrals				126.5	19.4	3777
	Average of Wells In Fields				37.4	16.3	1528

NOTES:

Total N and Delta N-15 values are results of analysis performed by University of Illinois at Urbana-Champaign.
Electrical Conductivity (EC) values are from CVRWQCB staff laboratory analysis.

TABLE E-5 Minerals by Monitoring Well (Spring 1993)

filename: mwminer.xls 8/14/95

DAIRY WELL	DATE	TIME	pH	T-ALK	HCO_3 ALK	CO_3 ALK	B	Cl	SO_4	Ca	Hard-Ness	Mg	Fe	K	Na	Si
				mg/L												
DAIRY C1																
C1MW-1	6/10/93	1215	7.4	850	850	<5.0	<0.3	950	450	210	940	101	0.59	4.94	1010	30
C1MW-2	6/10/93	1330	7.0	210	210	<5.0	<0.3	100	110	200	740	58.5	0.66	7.1	76.8	30.2
C1MW-3	6/9/93	1205	6.9	400	400	<5.0	0.66	550	180	300	1100	85.3	1.02	9.4	240	36
C1MW-4	6/10/93	1025	7.4	150	150	<5.0	<0.3	56	64	97	390	35.9	1.37	4.18	38.4	31.2
C1MW-5	6/9/93	1325	7.3	310	310	<5.0	<0.3	140	110	93	430	48.1	1.64	91	137	35
C1MW-6	6/10/93	1120	7.4	150	150	<5.0	<0.3	15	38	70	260	20.7	1.08	2.68	36.5	33.7
DAIRY C2																
C2MW-1	6/10/93	930	6.8	180	180	<5.0	0.43	580	180	210	830	74.3	1.1	64	227	38
C2MW-2	6/9/93	1500	6.8	490	490	<5.0	<0.3	360	38	120	450	36.5	5.68	76	184	32
C2MW-3	6/9/93	1620	7.0	280	280	<5.0	<0.3	440	160	220	750	48.8	3.19	39	169	52
C2MW-4	6/9/93	1710	6.6	140	140	<5.0	<0.3	530	110	160	590	46.3	5.06	52	214	50
C2MW-5	6/10/93	745	6.5	44	44	<5.0	<0.3	28	27	39	200	24.9	2.13	2.08	23.8	40.4
C2MW-6	6/10/93	845	6.8	140	140	<5.0	<0.3	270	94	130	420	23.2	1.69	2.7	178	35.7
C2MW-7	6/9/93	1825	7.0	690	690	<5.0	<0.3	470	110	260	1000	85.2	2.77	7.52	227	47.9
DAIRY D																
DMW-1	6/21/93	1320	6.9	1300	1300	<5.0	0.37	2	51	110	1300	249	8.8	7.8	190	52
DMW-2	6/21/93	2030	7.2	700	700	<5.0	0.56	130	160	95	830	144	14	11.9	320	48
DMW-3	6/21/93	1835	7.2	730	730	<5.0	0.81	<2	200	51	1100	236	4.7	5.9	305	30
DMW-4	6/21/93	1935	7.2	540	540	<5.0	0.31	73	120	19	530	117	26	9.3	222	100
DMW-5	6/21/93	1515	7.1	610	610	<5.0	0.43	110	140	150	630	74.2	13	13.8	232	52
DMW-6	6/21/93	1100	7.3	560	560	<5.0	0.32	46	53	95	550	70	5.8	6.00	128	39
DMW-7	6/21/93	1705	7.4	510	510	<5.0	0.35	120	120	76	1200	245	12	19.1	149	59
DMW-8	6/22/93	820	7.3	330	330	<5.0	<0.3	37	35	64	330	41.4	5.2	8.00	103	28
DMW-9	6/22/93	925	7.1	310	310	<5.0	<0.3	30	34	88	350	31.6	78	9.4	38	168

NOTE: HCO_3 ALK = Bicarbonate Alkalinity, CO3 ALK = Carbonate Alkalinity, T-ALK= Total Alkalinity

E-27

TABLE E-5 Minerals by Monitoring Well (Spring 1993) (continued)

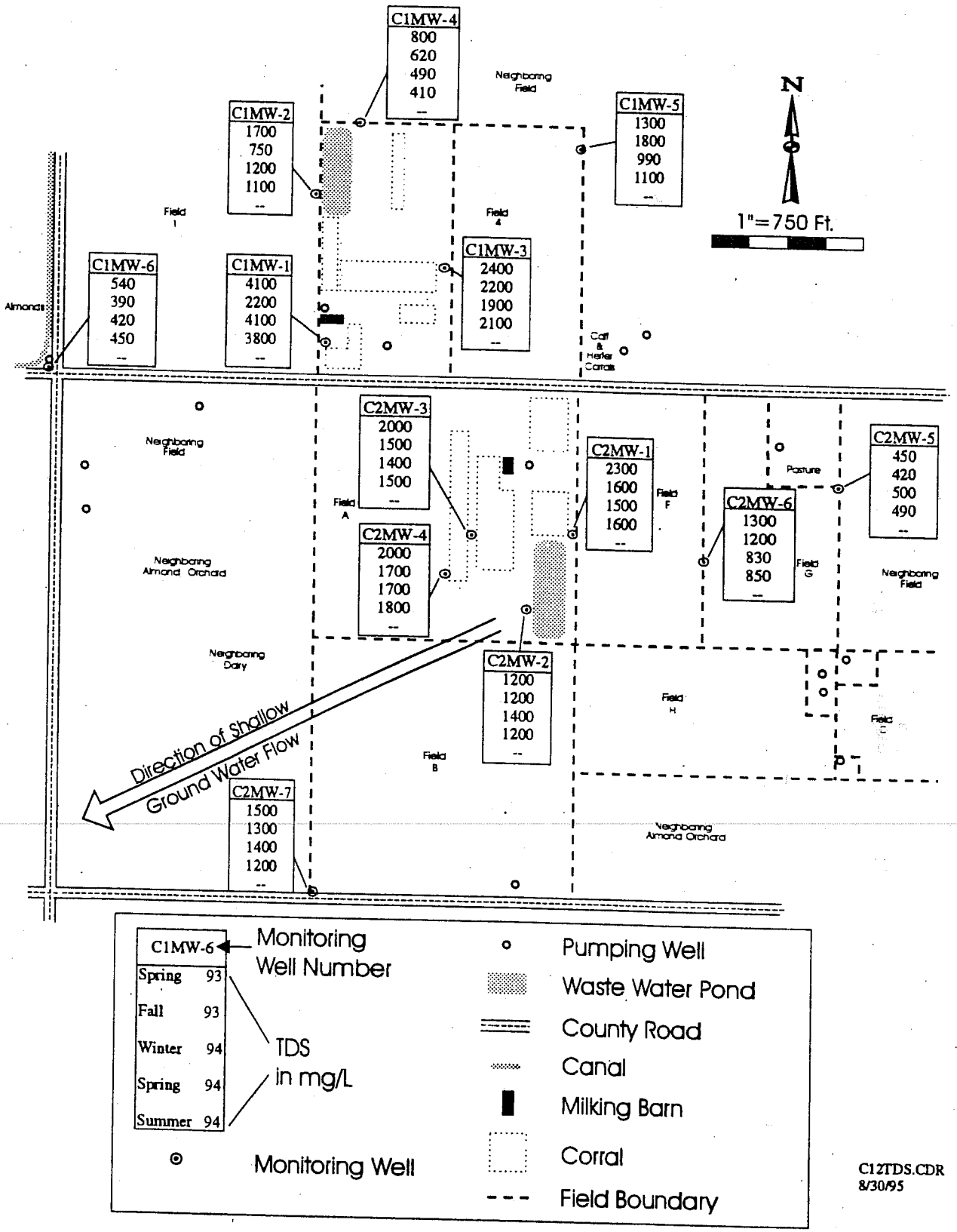
DAIRY	WELL	DATE	TIME	pH	T-ALK	HCO_3 ALK	CO_3 ALK	B	Cl	SO_4	Ca	Hard-Ness	Mg	Fe	K	Na	Si
					mg/L												
DAIRY G																	
	GMW-1	6/22/93	1210	6.9	860	860	<5.0	0.36	110	34	73	1000	223	25	12.4	133	130
	GMW-2	6/22/93	1345	7.2	580	580	<5.0	<0.3	87	48	71	670	120	29	10.3	112	140
	GMW-3	6/22/93	1555	7.0	740	740	<5.0	<0.3	94	59	180	850	97.3	12.0	41.0	87	61
	GMW-4	6/22/93	1055	7.0	490	490	<5.0	<0.3	210	110	67	1200	251	8.0	15.6	96	42
	GMW-5	6/22/93	1725	7.3	590	590	<5.0	<0.3	90	53	56	660	126	7.7	5.8	40	44
	GMW-6	6/22/93	1825	7.3	310	310	<5.0	<0.3	35	170	130	630	74.2	3.0	9.2	142	23
	GMW-7	6/22/93	2025	7.3	420	420	<5.0	<.03	5	37	85	480	65.1	5.6	9.3	76	33
	GMW-8	6/22/93	1935	7.3	530	530	<5.0	<0.3	70	37	67	680	125	11.1	8.00	84	57
	GMW-9	6/23/93	750	7.0	460	460	<5.0	0.32	140	52	170	750	7.1	6.1	7.5	79	42
	GMW-10	6/23/93	850	7.5	400	400	<5.0	<0.3	30	35	62	380	54.7	2.9	6.7	89	24
DAIRY F																	
	FMW-1	6/23/93	1220	7.0	680	680	<5.0	0.44	140	190	210	1200	164	1.4	12.5	148	26
	FMW-2	6/23/93	1330	7.3	690	690	<5.0	0.28	65	65	48	740	151	7.3	8.3	112	41
	FMW-3	6/23/93	1020	7.0	1100	1100	<5.0	0.32	100	27	160	1100	170	6.3	13.3	180	48
	FMW-4	6/23/93	1125	7.1	470	470	<5.0	0.39	75	94	120	640	82.7	3.7	9.6	132	36
	FMW-5	6/23/93	1430	6.8	530	530	<5.0	0.38	65	160	110	590	76.6	5.1	10.9	163	43
	FMW-6	6/23/93	1530	8.0	320	320	<5.0	<0.3	40	15	58	290	35.3	12.3	9.4	57	49
	FMW-7	6/28/93	1800	7.2	1100	1100	<5.0	0.54	180	150	150	740	88.8	39	14.3	502	220
	FMW-8	6/28/93	1310	7.4	360	360	<5.0	<0.3	80	51	110	480	49.9	5.2	10.7	82	56
	FMW-9	6/28/93	1530	7.3	300	300	<5.0	0.3	25	78	89	320	23.8	20.8	8.3	58	140
	FMW-10	6/28/93	1615	7.6	460	460	<5.0	0.47	150	190	120	450	36.5	15.3	15.4	274	100
	FMW-11	6/28/93	1910	7.5	840	840	<5.0	0.46	80	77	110	580	74.2	11.9	11.6	328	100
	FMW-12	6/28/93	1655	7.4	370	370	<5.0	<0.3	25	24	120	420	29.2	82	13.2	30	650
NUMBER OF SAMPLES				44	44	44	0	0	0	44	44	44	44	44	44	44	44
AVERAGE (Arithmetic Mean)				7.2	505	505	<5.0	0.28	158	99	119	677	91.4	11.7	16.3	169	72
MAXIMUM				8	1300	1300	<5.0	0.81	950	450	300	1300	251	82	91	1010	650
MINIMUM				6.5	44	44	<5.0	<0.3	<2	15	19	200	7.1	0.59	2.08	23.8	23
STANDARD DEVIATION				0.28	274	274	<5.0	0.16	196	78	62	291	67.2	17.2	19.4	162	99
AVERAGE meq/L						8.28			4.4	2.1	5.9		7.52	0.42	0.42	7.37	1.9

Table E-6 Total and Fecal Coliform Bacteria in Monitoring Wells and Dairy Pond Water

Filename:COLIBACT.XLS 08/30/95

DAIRY	WELL NO.	DATE	TOTAL COLIFORM BACTERIA MPN/100ml	FECAL COLIFORM BACTERIA MPN/100ml
C1	C1MW-1	6/10/93	24000+	<2
	C1MW-1	9/28/93	500	2.0
	C1MW-2	6/10/93	240	2.0
	C1MW-3	9/28/93	8	<2
C2	C2MW-2	9/28/93	<2	<2
D	DMW-1	6/21/93	24000+	
	DMW-2	10/5/93	2.0	<2
	DMW-3	10/5/93	170	<2
	DMW-4	10/5/93	<2	<2
	DMW-1	10/5/93	500	<2
	DMW-5	6/21/93	1400	
G	GMW-1	6/22/93	260	
	GMW-2	6/22/93	2.0	
	GMW-3	6/22/93	500	
F	FMW-1	6/23/93	900	
	FMW-2	6/23/93	80	
POND COLIFORM				
DAIRY C2 POND		5/13/93	170,000	
DAIRY C2 POND		5/13/93	500,000	
DAIRY D POND		5/13/93	240,000+	
DAIRY F POND		5/13/93	240,000+	
DAIRY G POND		5/13/93	240,000+	

Figure E-1
Total Dissolved Solids at Dairies C1 and C2 Monitoring Wells



C12TDS.CDR
8/30/95

Figure E-2
Total Dissolved Solids at Dairy D Monitoring Wells

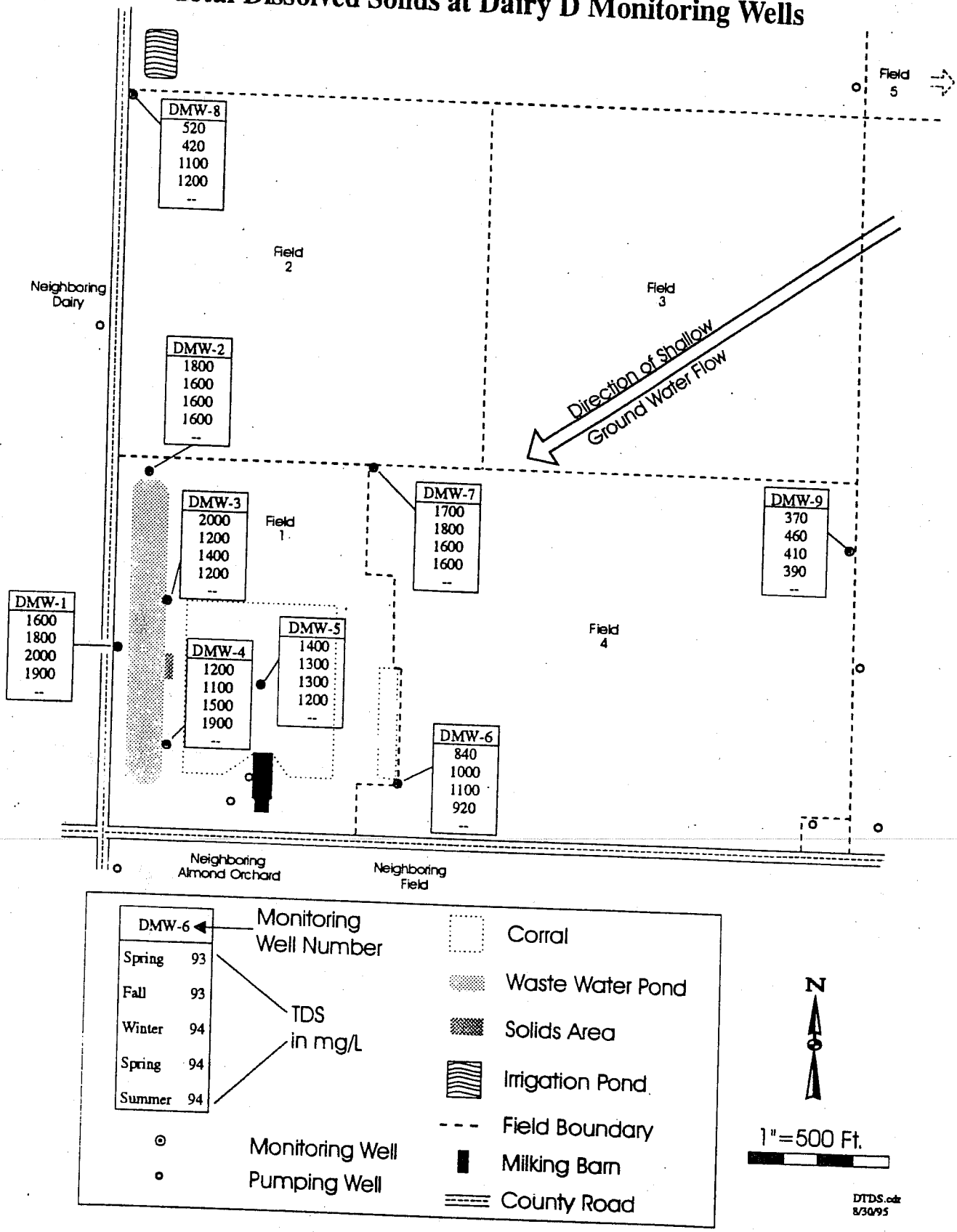
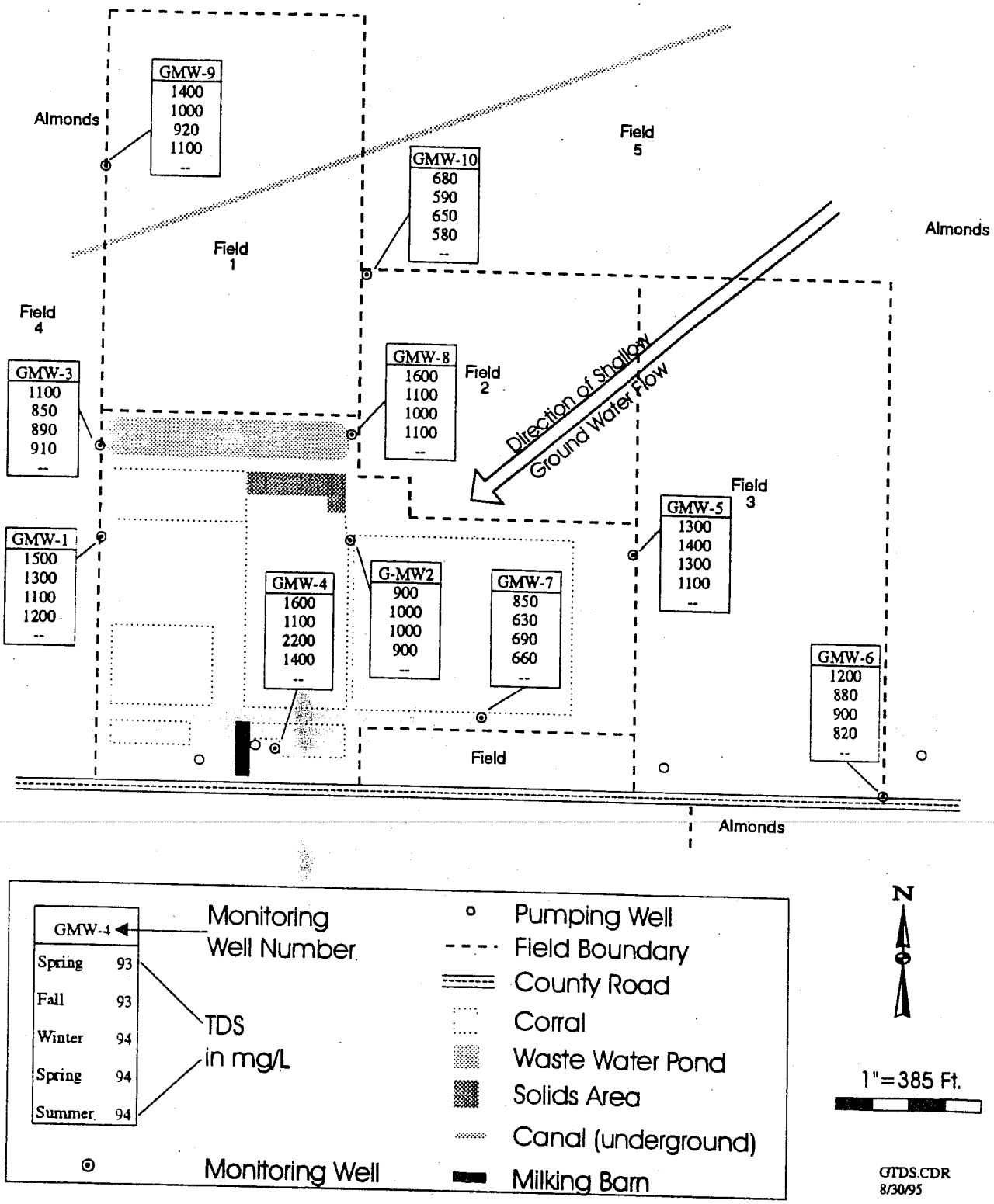


Figure E-3
Total Dissolved Solids at Dairy G Monitoring Wells



APPENDIX F

DEEPER WATER QUALITY

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9/6/95

Appendix F <u>Ground Water Quality</u>

Table F-1 contains nitrogen, phosphorus and salinity concentrations by dairy, sample location code, date and time of sampling and the ratio of TDS to EC for the milking barns wells.

Table F-2 contains mineral concentrations by dairy, sample location code, date and time of sampling for the milking barn wells.

Table F-1 Nitrogen, Phosphorus and Salinity in Milking Barn Wells

Filename:NPMILKB.XLS 11/2/95

DAIRY NAME	SAMPLE OCATION CODE	DATE	TIM	TOTAL P	NH_3-N	NO_3-N +NO_2-N	TKN	NO_2-N	NO_3-N	TOTAL N	TDS	EC	RATIO TDS/EC
				mg/L								µs/cm	
C1	C1DW-1	6/29/93	0850	<0.1	<1.0	0.47	<1.0	<0.1	0.47	0.47	550	944	0.583
C2	C2DW-1	6/29/93	0830	0.1	<1.0	0.68	<1.0	<0.1	0.68	0.68	450	737	0.611
D	DDW-1	6/29/93	1125	<0.1	<1.0	10	<1.0	<0.1	10	11	610	1160	0.526
G	GDW-1	6/29/93	1040	<0.1	<1.0	17	<1.0	<0.1	17	18	530	800	0.663
F	FDW-1	6/28/93	1730	<0.1	<1.0	31	<1.0	<0.1	31	31	750	956	0.785
SUMMARY OF DAIRIES													
NUMBER OF SAMPLES				5	5	5	5	5	5	5	5	5	5
AVERAGE				<0.1	<1.0	12	<1.0	<0.1	12	12	578	919	0.633
MAXIMUM				0.1	<1.0	31	<1.0	<0.1	31	31	750	1160	0.785
MINIMUM				<0.1	<1.0	0.47	<1.0	<0.1	0.47	0.47	450	737	0.526

NOTES:

If NH_3-N is <1.0, then 0.0 is used for the statistical calculations.

If NO_2-N, NO_3-N or TOTAL P is <0.1 or not analyzed, then 0.0 is used for the statistical calculations.

If TKN is <1.0, then 0.0 is used for the statistical calculations.

TOTAL-N is calculated as TKN plus NO_3-N.

NO_3-N is (NO_3-N plus NO_2-N) minus NO_2-N.

F.2

APPENDIX G

POND and POND IRRIGATION WATER QUALITY

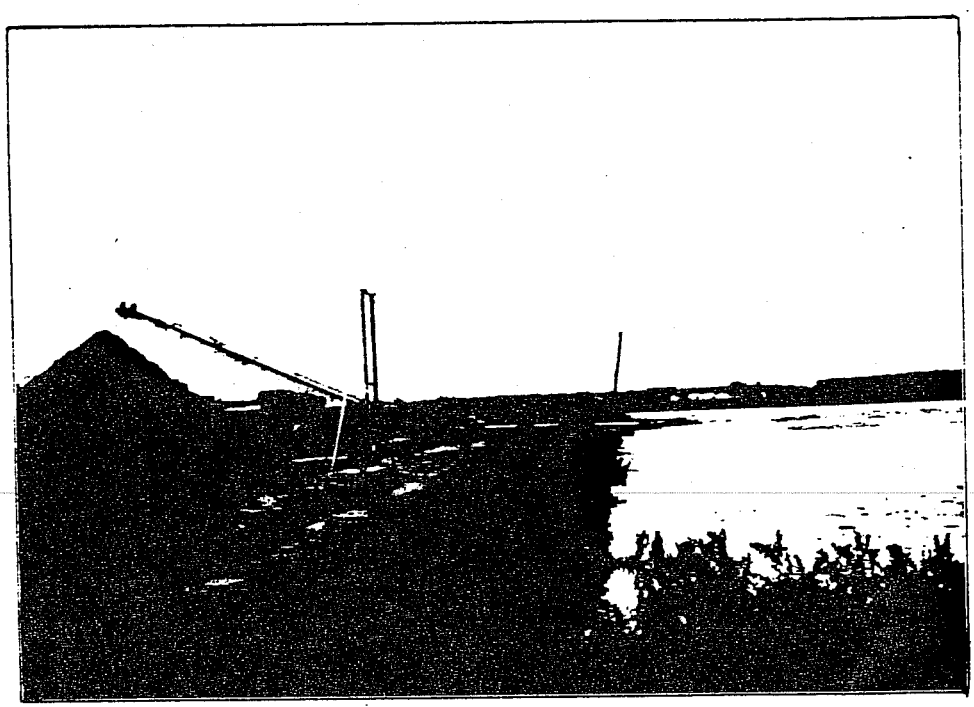


Table G-1 Nitrogen in Dairy Waste Water Ponds

Filename:PNDNUT.XLS 9/1/95

DAIRY NAME	DATE	SAMPLE LOCATION CODE	TIME	NH_3-N	NO_3-N + NO_2-N	TKN	NO_2-N	NO_3-N	TOTAL N
				mg/l					
C1	09/28/93	C1P1	1730	140		180		0.11	180
	03/09/94	C1P1	1000					0.19	
C2	05/13/93	C2P1	1430	140	0.35	230		0.35	230
	06/29/93	C2P1	900	290	0.29	420	<0.1	0.29	420
	09/28/93	C2P1	1845	290		650		0.26	650
	05/31/94	C2P2	1350	78		460		0.31	460
	05/31/94	C2P1	1440	60		300		0.38	300
D	09/02/92	DP1	1130	170	0.75	310		0.75	311
	11/17/92	DP1	1115	190	<0.05	190		<0.05	
	05/13/93	DP1	1230	250	0.35	880		0.35	880
	06/29/93	DP1	1115	260	0.21	350	<0.1	0.21	350
	10/05/93	DP1	1135	240		670		0.10	670
	04/29/94	DP2	1420	280		490		0.17	490
	05/02/94	DP2	930	260		360		0.12	360
	06/18/94	DP2	900	260		340		0.18	340
G	11/17/92	GP3	1010	250	<0.05	250		<0.05	
	05/13/93	GP3	1230	290	0.81	450		0.81	451
	06/29/93	GP2	1040	330	0.15	490	<0.1	0.15	490
	10/05/93	GP1	1000	350		1000		0.03	1000
	03/02/94	GP3	1150	510		1600		0.2	1600
	03/02/94	GP3	1315	490		1700		0.51	1701
	04/26/94	GP3	2000	380		660		0.065	660
F	11/17/92	FP1	1145	150	<0.05	170		<0.05	170
	05/13/93	FP1	1130	280	0.61	360		0.61	361
	06/29/93	FP1	1715	270	0.29	340	<0.1	0.29	340
	10/05/93	FP3	1100	200		680		0.08	680
	03/07/94	FP2	1300		0.33				
	04/15/94	FP2	1700	310		400			400
	04/17/94	FP2	2000	29		50			50
	04/22/94	FP1	1230	270		420			420
	07/06/94	FP2	1700	280		460			460
	07/20/94	FP2	1000	120		410		0.18	410
SUMMARY FOR ALL DAIRIES									
NUMBER OF SAMPLES				30	15	30	4	27	28
AVERAGE				247	0.32	509	<0.1	0.18	530
MAXIMUM				510	0.81	1700	<0.1	0.75	1701
MINIMUM				29	<0.05	50	<0.1	<0.05	50
STANDARD DEVIATION				110	0.25	372		0.20	377

NOTE:

If NO_3 + NO_2 or NO_3 is <0.05, then 0.0 is used for statistical calculations.

Table F-2 Minerals in Milking Barn Wells

Filename:MILKBmin.XLS 8/14/95

DAIRY NAME	DATE	TIME	pH	T-ALK	HCO_3 ALK	CO_3 ALK	B	Cl	SO_4	Ca	HARDNESS	Mg	Fe	K	Na	Si
				mg/l												
C1	06/29/93	850	7.7	180	180	<5.0	<0.3	170	50	42	160	13.4	<0.04	3.3	144	17
C2	06/29/93	830	7.5	150	150	<5.0	<0.3	75	97	54	190	13.4	<0.04	3.2	84	15
D	06/29/93	1125	7.5	370	370	<5.0	<0.3	75	56	85	390	43.2	<0.04	5.4	66	18
G	06/29/93	1040	7.4	300	300	<5.0	<0.3	25	23	79	320	29.8	<0.04	3.2	52	19
F	06/28/93	1730	7.6	420	420	<5.0	<0.3	20	71	100	430	43.8	0.04	7.4	101	20
SUMMARY OF DAIRIES																
NUMBER OF SAMPLES			5	5	5	0	0	5	5	5	5	5	0	5	5	5
AVERAGE			7.5	284	284	<5.0	<0.3	73	59	72	298	28.7	<0.04	4.5	89	18
MAXIMUM			7.7	420	420	<5.0	<0.3	170	97	100	430	43.8	0.04	7.4	144	20
MINIMUM			7.4	150	150	<5.0	<0.3	20	23	42	160	13.4	<0.04	3.2	52	15

NOTES:

T-ALK = Total Alkalinity

HCO_3 ALK = Bicarbonate Alkalinity

CO_3 ALK = Carbonate Alkalinity

F-3

Table G-2 Total Dissolved Solids, Electrical Conductivity and pH in Dairy Waste Water Ponds

Filename:PNDSLT.XLS 9/01/95

DAIRY NAME	DATE	TIME	FIELD TEMP °F	FIELD pH	LAB TDS mg/l	LAB EC µs/cm	RATIO TDS TO LAB EC	FIELD EC µs/cm	RATIO TDS TO FIELD EC
C1	09/28/93	1730			1900	3840	0.495		
	03/09/94	1000			1900	3780	0.503		
C2	05/13/93	1435	69	6.9	3100	4630	0.670	3940	0.787
	06/29/93	900		7.2	3900	6370	0.612	6530	0.597
	09/28/93	1845			3200	6190	0.517		
	05/31/94	1350	80	7.4	2800	6150	0.455	6220	0.450
	05/31/94	1440	80		2600	5050	0.515	5110	0.509
D	09/02/92	1130	74			3300		3300	
	11/17/92	1115	56	7.0	2700	3950	0.684	3950	0.684
	05/13/93	1230	74	6.9	2700	4420	0.611	3900	0.692
	06/29/93	1115		7.3	2700	4520	0.597	3075	0.878
	10/05/93	1135		7.0	2500	4830	0.518	4600	0.543
	04/29/94	1420	72		2200	5250	0.419	4930	0.446
	05/02/94	930			2200	4820	0.456		
	06/18/94	900			1800	5290	0.340		
G	11/17/92	1010	56	7.0	3800	6200	0.613	6200	0.613
	05/13/93	1230	67	7.2	4400	5550	0.793	5070	0.868
	06/29/93	1040		6.4	4600	6740	0.682	6260	0.735
	10/05/93	1000			4100	7440	0.551	7200	0.569
	03/02/94	1150			4000				
	03/02/94	1315			5000				
	04/26/94	2000			2900	6720	0.432		
F	11/17/92	1145	56	7.0	2200	2800	0.786	2800	0.786
	05/13/93	1130	68	6.5	3700	4950	0.747	4500	0.822
	06/29/93	1715	68	6.5	3300	4800	0.688	4500	0.733
	10/05/93	1100			2800	5060	0.553	4600	0.609
	03/07/94	1300	64	7.4	3200	5730	0.558	5130	0.624
	04/15/94	1700			2700	5200	0.519		
	04/17/94	2000			400	780	0.513		
	04/22/94	1230	72	7.1	2700	5700	0.474	5500	0.491
	07/06/94	1700			2900				
	07/20/94	1000			2700	5950	0.454		
SUMMARY FOR ALL DAIRIES									
NUMBER OF SAMPLES			14	15	31	29	28	20	19
AVERAGE			68	7.0	2955	5035	0.563	4866	0.655
MAXIMUM			80	7.4	5000	7440	0.793	7200	0.878
MINIMUM			56	6.4	400	780	0.340	2800	0.446
STANDARD DEVIATION			8	0.3	938	1345	0.114	1199	0.136

Table G-3 Minerals in Dairy Waste Water Ponds

Filename:PDMNERLS.XLS 09/01/95

DAIRY	DATE	TIME	pH	PO_4-P	T-ALK	HCO_3 ALK	CO_3 ALK	B	Cl	SO_4	Ca	Hard-ness	Mg	Fe	K	Na	Si
				mg/l													
C2	5/13/93	1435	7.2	88	1800	1800	<5	0.67	380	61	190	870	96.1	0.66	476	239	32
	6/29/93	900	7.6	95	2900	2900	<5	0.84	430	1300	176	1000	144	1.6	684	310	38
D	9/2/92	1130		46													
	11/17/92	1100		59											365		
	5/13/93	1210	7.6	240	1900	1900	<5	1.1	230	96	190	810	81.5	0.94	375	134	50
	6/29/93	1115	7.6	56	2200	2200	<5	0.68	200	720	210	810	69.4	3.7	446	158	46
G	11/17/92	1010		69											624		
	5/13/93	1230	7.6	81	2600	2600	<5	0.9	250	23	170	940	125	2.1	587	191	54
	6/29/93	1040	7.7	120	3600	3600	<5	0.88	350	950	238	1300	171	4.5	902	256	57
F	5/13/93	1130	7.5	71	2500	2500	<5	0.81	180	29	170	1000	140	1.8	426	153	52
	6/29/93	1715	7.7	70	2400	2400	<5	0.64	180	640	190	1100	152	2.5	487	154	43
SUMMARY FOR ALL DAIRIES																	
NUMBER OF SAMPLES			8	11	8	8	8	8	8	8	8	8	8	8	10	8	8
AVERAGE			7.6	90	2488	2488	<5	0.82	275	477	192	979	122	2.2	537	199	47
MAXIMUM			7.7	240	3600	3600	<5	1.1	430	1300	238	1300	171	4.5	902	310	57
MINIMUM			7.2	46	1800	1800	<5	0.64	180	23	170	810	69.4	0.66	365	134	32
STANDARD DEVIATION			0.2	54	577	577		0.15	98	495	23	164	36	1.3	166	62	8

NOTES:
T-ALK = Total Alkalinity
HCO_3 ALK = Bicarbonate Alkalinity
CO_3 ALK = Carbonate Alkalinity, If CO_3 is <5, then 2.5 is used for statistical calculations.

Table G-4 Nitrogen in Dairy Pond Irrigation Water

Filename:PDIRGNUT.XLS 09/01/95

DAIRY NAME	DATE	TIME	NH_3-N	TKN	NO_3-N	TOTAL N
			mg/L			
C1	03/09/94	915			0.17	
	03/09/94	1000			0.15	
	03/09/94	1100			0.20	
	04/11/94	1345	260	3800		3800
	04/11/94	1415	250	3600		3600
	04/11/94	1500	260	3600		3600
	07/15/94	1200	94	140	4.10	144
	07/15/94	1300	95	130	5.00	135
C2	05/31/94	1430	66	490	0.36	490
	05/31/94	1545	60	400	0.41	400
	05/31/94	1700	55	330	0.42	330
	09/13/94	1300	23	46	0.31	46
	09/13/94	1500	18	31	0.30	31
	09/13/94	1700	13	28	0.31	28
D	10/08/93	1240	25	41	<0.02	41
	03/11/94	1530	380	480	0.12	480
	03/12/94	1200	340	480	0.13	480
	05/02/94	1010	260	360	0.05	360
	06/18/94	1030	280	590	0.14	590
	06/18/94	1400	260	440	0.15	440
	06/18/94	2015	270	380	0.12	380

Table G-4 Nitrogen in Dairy Pond Irrigation Water (continued)

DAIRY NAME	DATE	TIME	NH_3-N	TKN	NO_3-N	TOTAL N
			mg/L			
G	10/14/93	915		290		290
	04/26/94	2000	380	660	0.07	660
	04/26/94	2100	340	500	0.12	500
	04/27/94	30				
	04/27/94	900	420	920	0.04	920
	04/27/94	1500	440	1600	0.15	1600
	06/20/94	900	340	1000	0.37	1000
	06/20/94	1430	300	450	0.32	450
	06/20/94	2345	310	450	0.20	450
	06/21/94	730	460	2400	0.22	2400
F	03/04/94	1510	160	350	0.13	350
	03/05/94	1700			0.18	
	03/06/94	1700			0.22	
	03/07/94	1315			0.25	
	04/16/94	2000	310	490		490
	07/07/94	800	280	490		
	07/08/94	800	280	450		
	07/20/94	1800	120	450	0.20	
	07/20/94	1000	120	410	0.18	
	07/21/94	600	130	420	0.19	
	07/21/94	1630	130	430		
SUMMARY FOR ALL DAIRIES						
NUMBER OF SAMPLES			34	35	33	29
AVERAGE			221	775	0.46	844
MAXIMUM			460	3800	5.00	3800
MINIMUM			13	28	<0.02	28
STANDARD DEVIATION			134	1001	1.07	1089

NOTE: If NO_3-N is <0.02, then 0.0 is used for statistical calculations.

Table G-5 Total Dissolved Solids, Electrical Conductivity and pH in Dairy Pond Irrigation Water

Filename:PDIRGSLT.XLS 08/30/95

DAIRY NAME	DATE	TIME	pH	TDS mg/l	EC µs/cm	RATIO TDS/EC
C1	03/09/94	915		2300	4900	0.469
	03/09/94	1000		2300	4920	0.467
	03/09/94	1100		2400	4860	0.494
	04/11/94	1345		2900	5320	0.545
	04/11/94	1415		2700	5260	0.513
	04/11/94	1500		2700	5220	0.517
	07/15/94	1200	7.0	1000	2330	0.429
	07/15/94	1300	7.2	1000	2310	0.433
C2	05/31/94	1430		2800	5480	0.511
	05/31/94	1545		2500	5160	0.484
	05/31/94	1700		2200	4970	0.443
	09/13/94	1300		970	1830	0.530
	09/13/94	1500		880	1620	0.543
	09/13/94	1700		820	1600	0.513
D	10/08/93	1240		470	878	0.535
	03/11/94	1530		2600	5630	0.462
	03/12/94	1200		2900	5660	0.512
	05/02/94	1010	7.3	2200	4900	0.449
	06/18/94	1030	7.2	1100	5230	0.210
	06/18/94	1400	7.3	1500	5240	0.286
	06/18/94	2015	7.3	1900	5210	0.365

Table G-5 Total Dissolved Solids, Electrical Conductivity and pH in Dairy Pond Irrigation Water (continued)

DAIRY NAME	DATE	TIME	pH	TDS mg/l	EC µs/cm	RATIO TDS/EC
G	10/14/93	915		1800	3470	0.519
	04/26/94	2000		2900	6720	0.432
	04/26/94	2100	7.5	3300	6760	0.488
	04/27/94	30	7.3	2900	5870	0.494
	04/27/94	900				
	04/27/94	1500	7.3	4100	6170	0.665
	06/20/94	900	7.4	4500	6400	0.703
	06/20/94	1430		3900	6840	0.570
	06/20/94	2345		3900	6730	0.579
	06/21/94	730		4200	5720	0.734
F	03/04/94	1510	7.43	3000	5600	0.536
	03/05/94	1700		3000	5560	0.540
	03/06/94	1700		2900	5620	0.516
	03/07/94	1315	7.45	3000	5240	0.573
	04/16/94	2000	7.3	2400		
	07/07/94	800		2700		
	07/08/94	800		2800		
	07/20/94	1800	8.0	3100	6200	0.500
	07/20/94	1000	7.9	2700	5950	0.454
	07/21/94	600	7.9	2800	6270	0.447
	07/21/94	1630	7.8	2700	6320	0.427
SUMMARY FOR ALL DAIRIES						
NUMBER OF SAMPLES			17	41	38	38
AVERAGE			7.4	2506	4999	0.497
MAXIMUM			8.0	4500	6840	0.734
MINIMUM			7.0	470	878	0.210
STANDARD DEVIATION			0.3	960	1578	0.095

Figure G-1 Stiff Diagram of Minerals in Pond Water

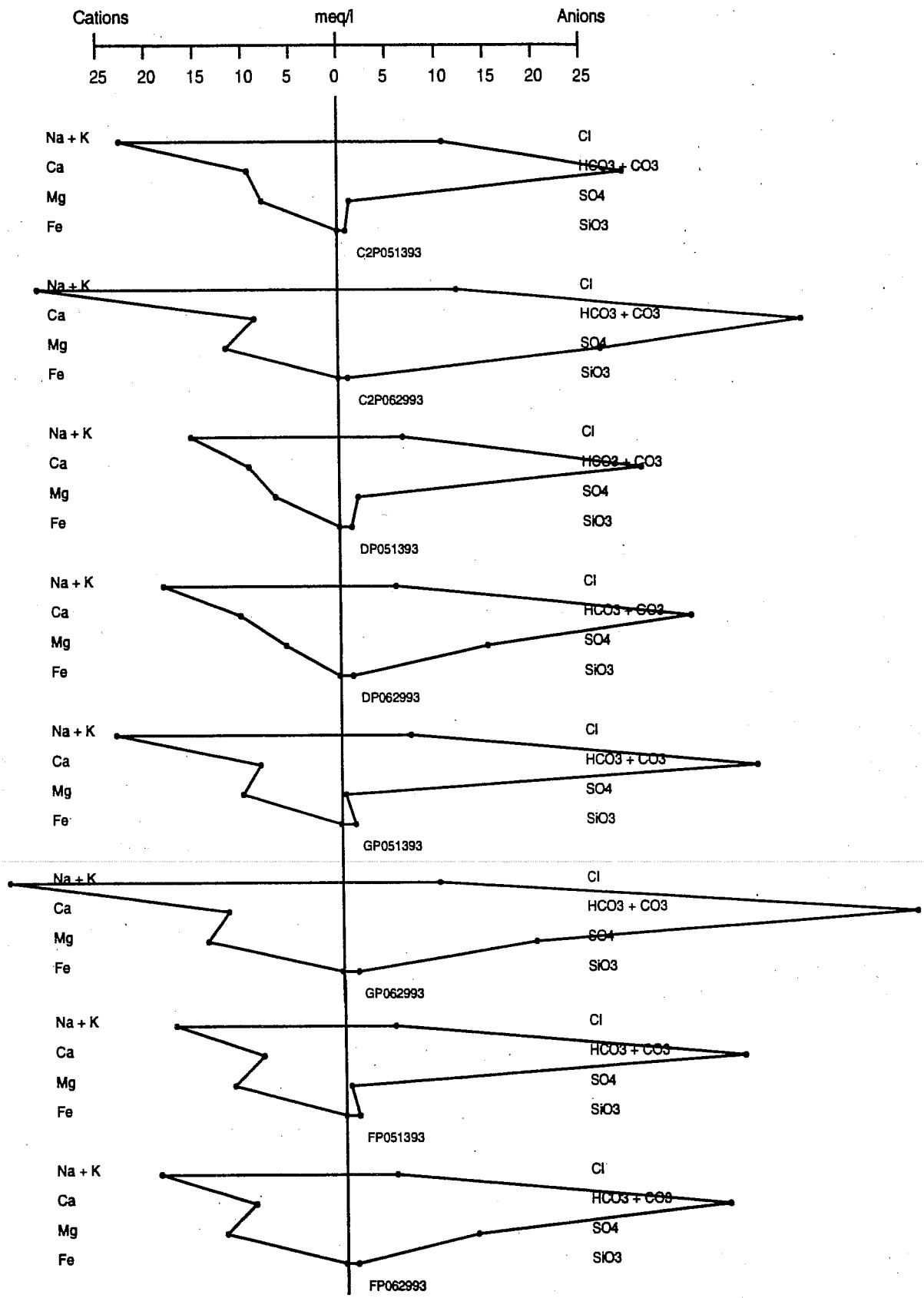
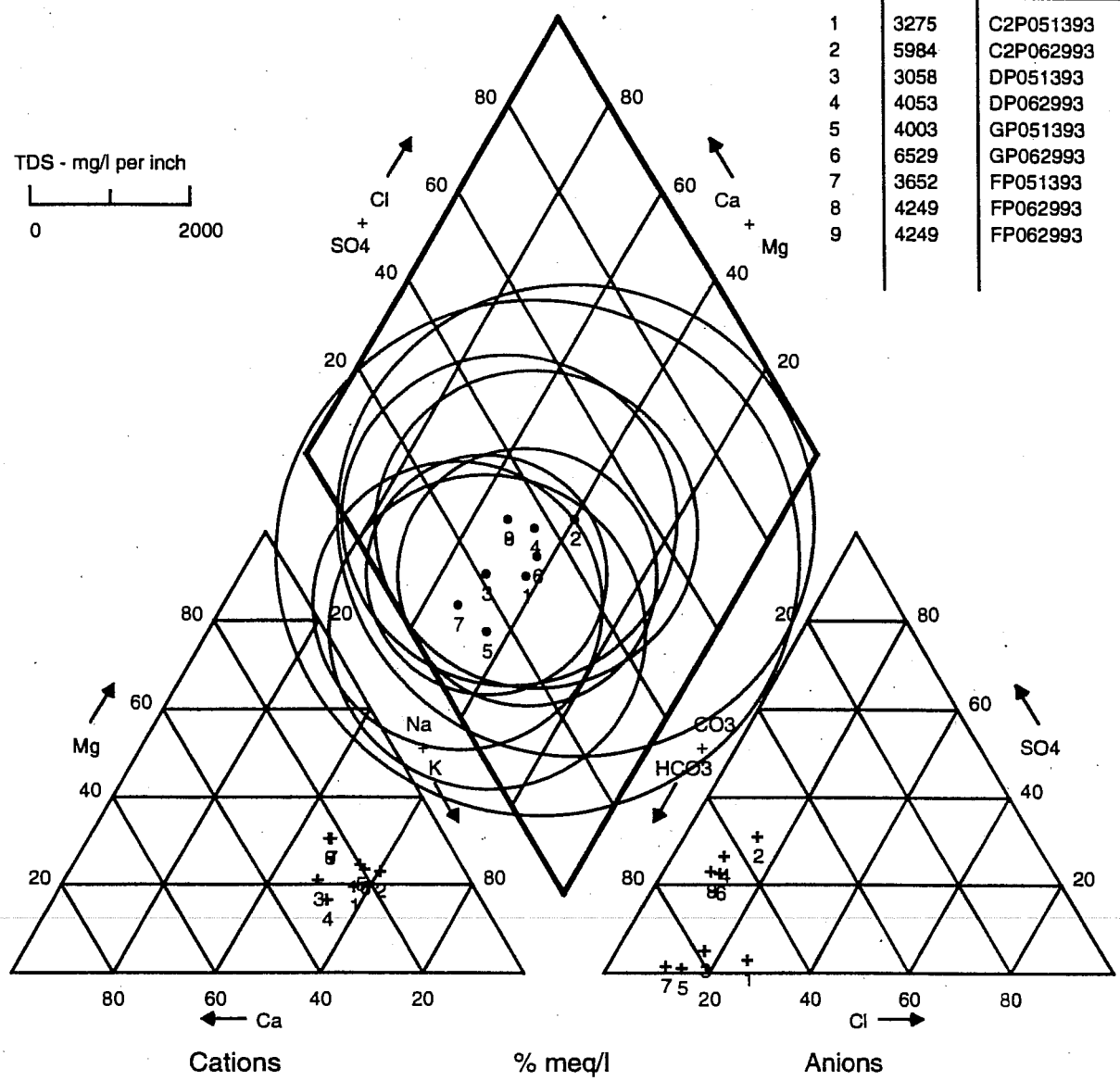


Figure G-2 Piper Diagram for Minerals in Pond Water



No.	Calculated TDS	Well Name
1	3275	C2P051393
2	5984	C2P062993
3	3058	DP051393
4	4053	DP062993
5	4003	GP051393
6	6529	GP062993
7	3652	FP051393
8	4249	FP062993
9	4249	FP062993

Figure G-3 Ammonia versus Electrical Conductivity for Dairy Ponds

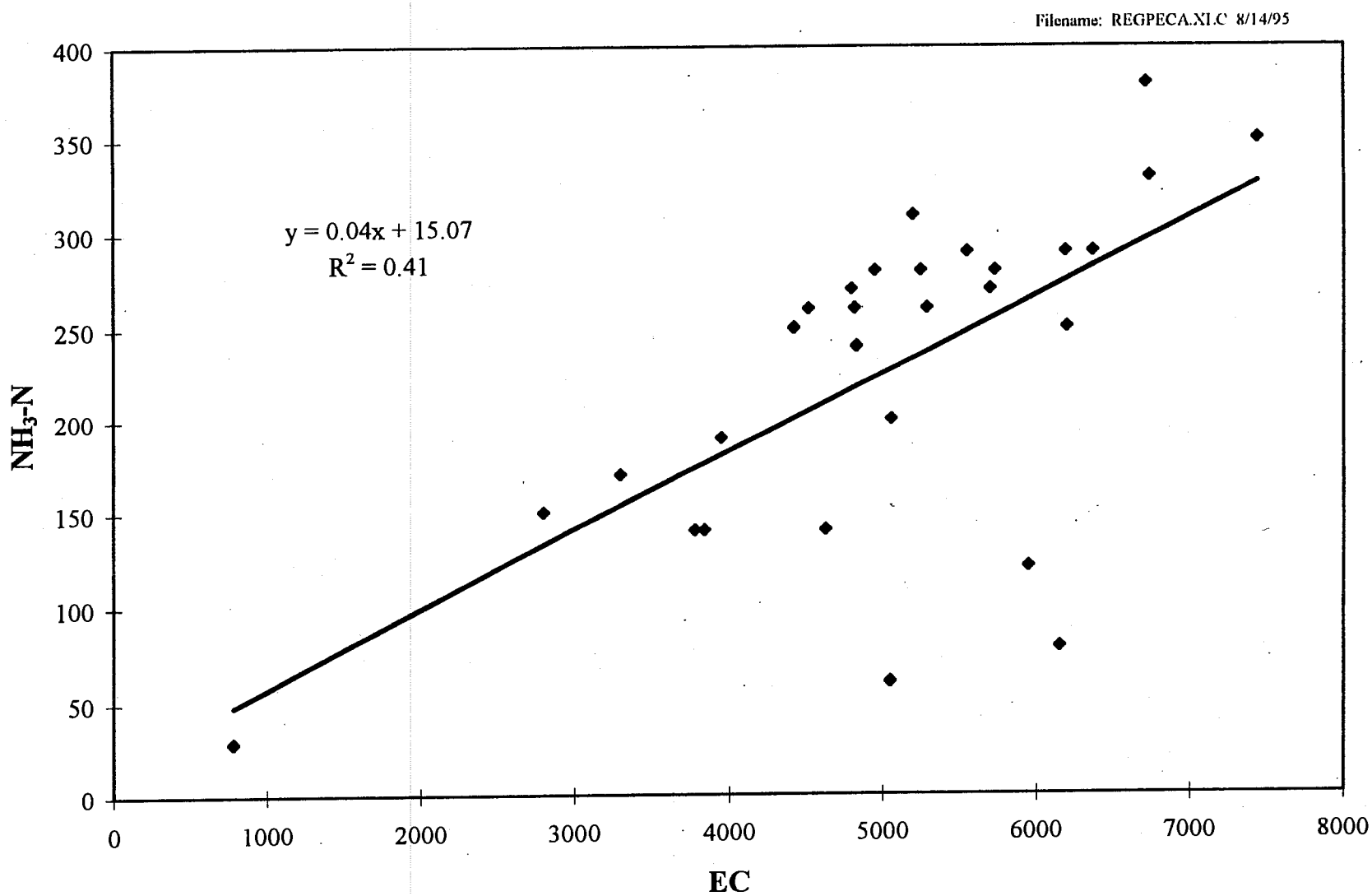


Figure G-4 Ammonia Versus Total Dissolved Solids for Dairy Ponds

Filename:REGPTDSA.XLC 8/14/95

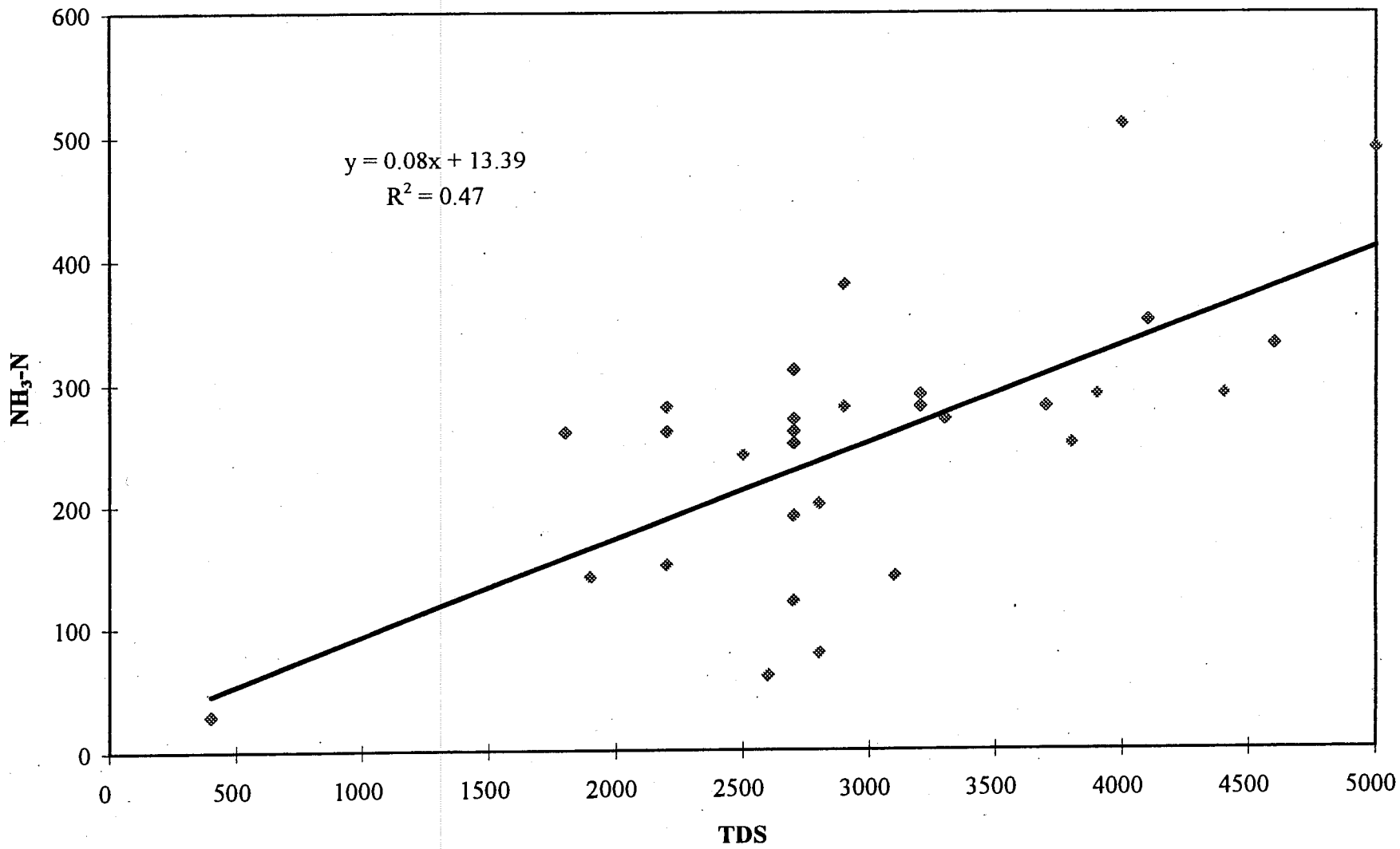
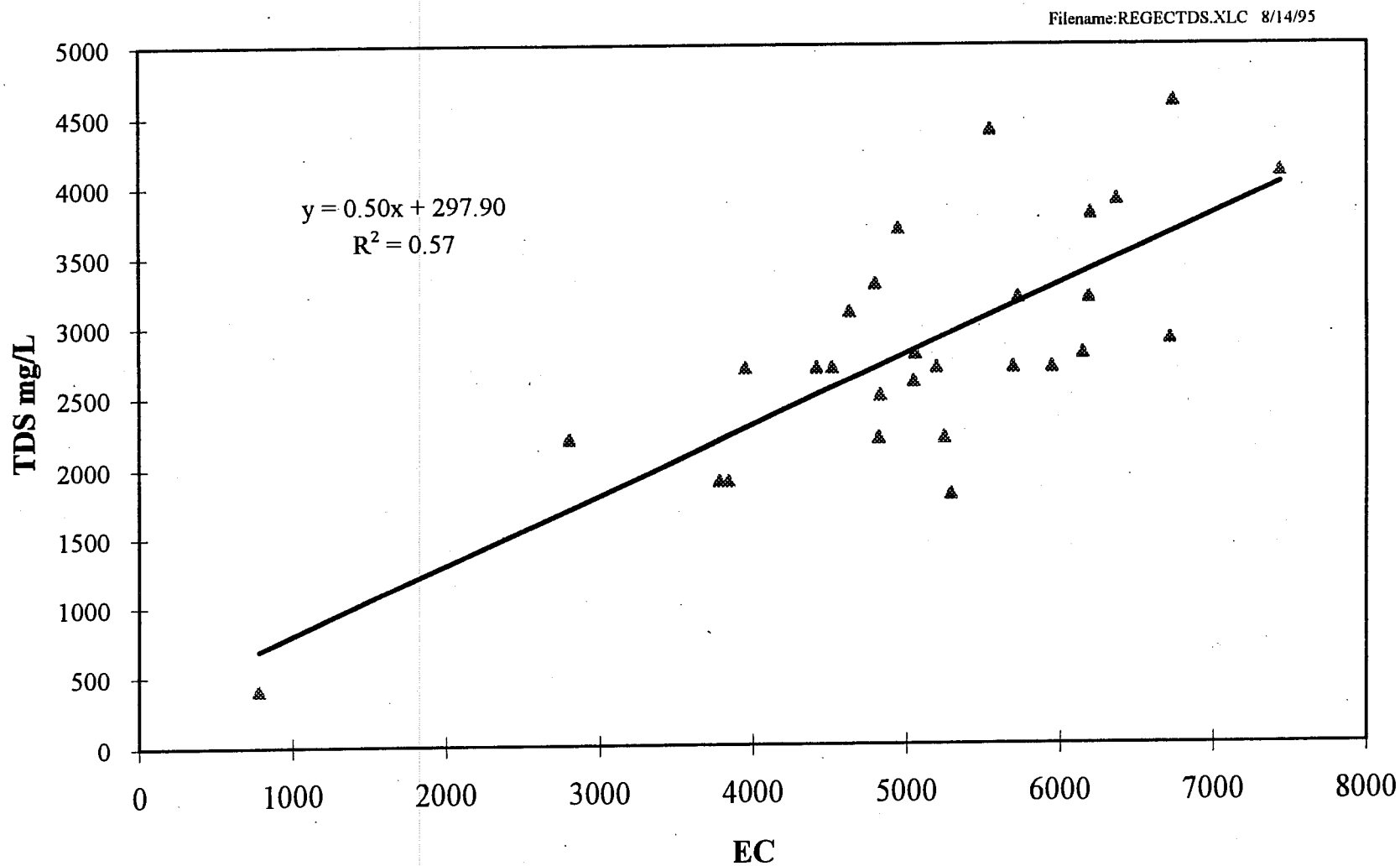


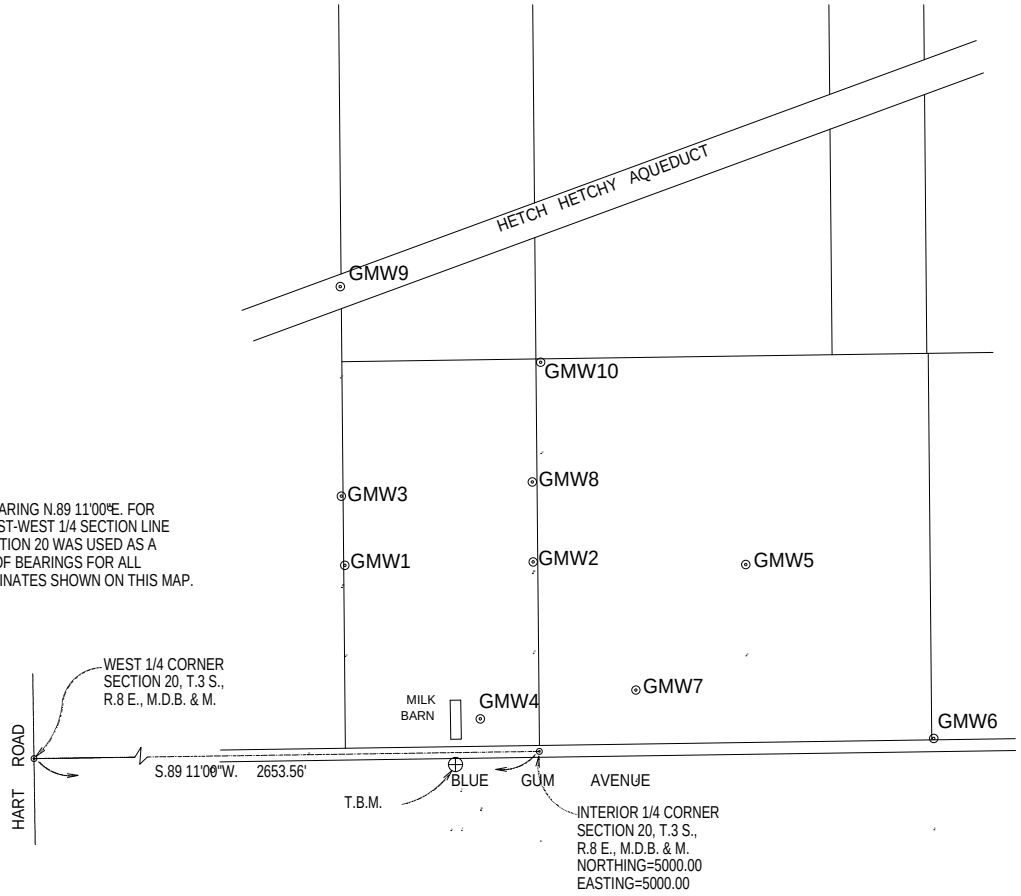
Figure G-5 Total Dissolved Solids Versus Electrical Conductivity for Dairy Ponds



G-12

GEN

MONITORING WELL LOCATIONS
FOR
GENASCI DAIRY



THE BEARING N.89 11'00"E. FOR THE EAST-WEST 1/4 SECTION LINE OF SECTION 20 WAS USED AS A BASIS OF BEARINGS FOR ALL COORDINATES SHOWN ON THIS MAP.

BENCH MARK:
BRASS PLATE ON M.I.D. LATERAL NO. 3 AT DROP 39, SOUTH OF BLUE GUM AVENUE.
ELEVATION: 58.07 M.I.D. DATUM

TEMPORARY BENCH MARK:
SPIKE IN NORTH FACE OF POWER POLE SOUTH SIDE OF BLUE GUM AVENUE OPPOSITE THE GENASCI MILK BARN.
ELEVATION: 54.61 M.I.D. DATUM

WELL	NORTHING	EASTING	ELEVATION
GMW1	5625.782	4345.737	51.68
GMW2	5637.040	4979.117	51.73
GMW3	5858.317	4333.833	52.94
GMW4	5109.355	4801.225	55.31
GMW5	5628.324	5694.099	55.74
GMW6	5043.590	6326.268	56.98
GMW7	5206.249	5324.617	56.86
GMW8	5905.965	4976.202	54.28
GMW9	6562.871	4330.231	54.26
GMW10	6308.677	5004.026	55.85

N

SCALE 1"=500'

MAP PREPARED BY:
DELAMARE - FULTZ
ENGINEERING AND SURVEYING
3421 TULLY ROAD, SUITE "J"
MODESTO, CALIFORNIA 95350
TELEPHONE: (209) 529-7450

Exploratory Boring Log

BORING NO.: GMW-1

Project: RWQCB Dairy Project
Site No.: Genasci Dairy Farm
Location: Blue Gum Rd., Modesto, CA
Drilled By: Layne Western/Steve McCoy
Elevation:

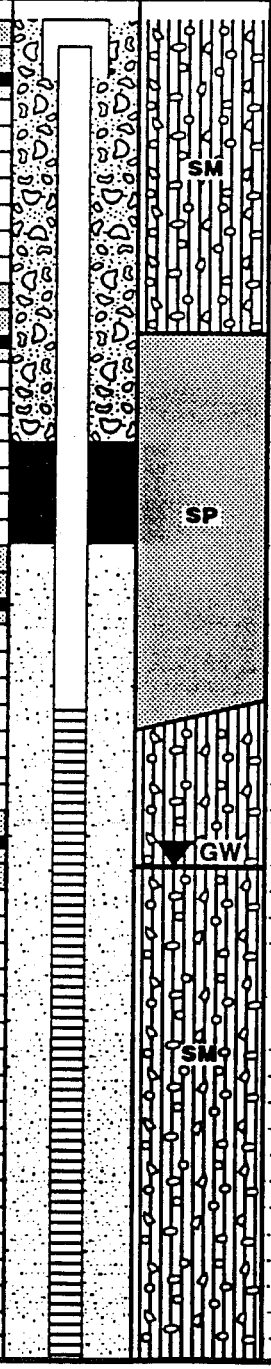
Job No.: 65584.02
Date: 6-15-93 Start: 1515 Finish: 1545
Logged By: M. Sands
Sampling Method: CA Mod. SS
Amb. Temp. (°F): ~85°F

METHOD OF DRILLING: [X] Hollow Stem Auger Other: [ ] Directional Well

Size of Bit: 8" Type of Bit: HS Hammer: wt. 140 lb. Drop 30 in.
Total Depth: 28.0 Depth of Groundwater/Time/Date: 16.0/1535/6-15-93

Surface Description: Dirt, just off concrete, next to field.

Sample Number	Blow Count/6"	Depth	Description
GMW-1 1.0		0–3	SILTY SAND (SM). ~65% very fine sand, 30% silt, 5% organics, brown, moist, loose.
GMW-1 6.0	4 5 5	5–10	SILTY SAND (SM), 55% very fine sand, 45% silt, very micaceous, light brown, moist, loose. SAND (SP), 10% medium grain, 70% fine grain, 20% silt, little mica, brown, moist, loose.
GMW-1 11.0	7 9 13	10–15	SAND (SP), 50% medium grain, 40% fine grain, 10% silt, micaceous, subangular, pale brown, moist, loose.
GMW-1 15.5	8 8 10	15–25	Groundwater encountered at 16.0' bgs during drilling. SILTY SAND (SM), 60% fine sand, 40% silt, very micaceous, olive-brown, wet, loose. Few medium grains, color becomes greyish-brown, saturated. Easy drilling. Minor clay in cuttings.



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Exploratory Boring Log

BORING NO.: GMW-1

Project: RWQCB Dairy Project

Job No.: 65584.02

Date: 6-15-93

Sample Number	Blow Count/6"	Depth	Well Completion Diagram	Soil Group Symbol (USCS)	Surface Description: Description:
		26		SM	
		27			
		28			Total depth - 28.0 feet bgs. Boring converted to Monitoring Well on 6-15-93.
		29			
		30			
		31			
		32			
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Exploratory Boring Log

BORING NO.: GMW-2

Project: RWQCB Dairy Project
Site No.: GMW 2
Location: Genasci Dairy Farm., Modesto, CA
Drilled By: Layne Western/S. McCoy
Elevation:

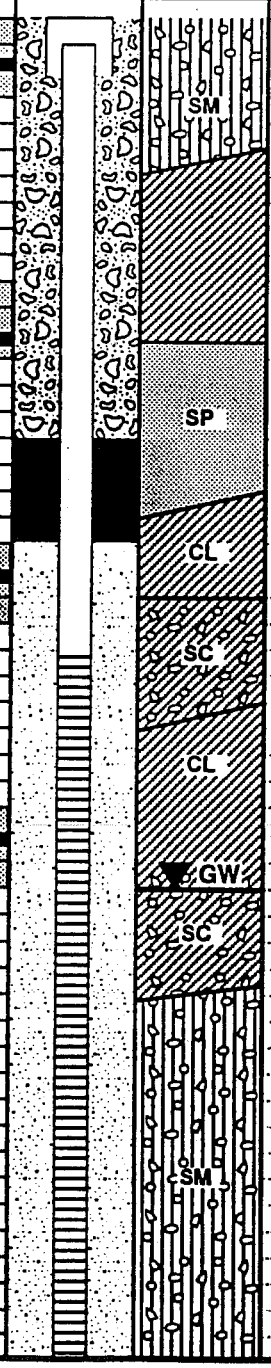
Job No.: 65584.02
Date: 6-15-93 Start: 0750 Finish: 0845
Logged By: M. Sands
Sampling Method: CA Mod. SS
Amb. Temp. (°F): ~75°F

METHOD OF DRILLING: [X] Hollow Stem Auger Other: [ ] Directional Well

Size of Bit: 8" Type of Bit: HS Hammer: wt. lb. Drop in.
Total Depth: 27.0 Depth of Groundwater/Time/Date: 16.5/0820/6-15-93

Surface Description: Dirt w/ gravel, next to cement road, in between corrals.

Sample Number	Blow Count/6"	Depth	Soil Group Symbol (USCS)	Description
GMW-2 1.0	7 7 9	0–5	SM	SILTY CLAYEY SAND (SM), 5% medium grain sand, 60% very fine sand, 35% fines, dark greyish brown, slightly moist, loose.
GMW-2 6.0	16 23 27	5–10	CL	CLAY (CL), ~10% very fine sand, plastic, greyish-brown w/ orange mottling, very stiff, slightly moist.
		7–10	SP	SAND (SP), fine grained, very micaceous, reddish brown w/ orange mottling, slightly moist, moderately dense.
GMW-2 10.5	6 12 15	10–12	CL	CLAY (CL), plastic, <5% very fine sand, greyish brown, slightly moist, stiff.
		12–14	SC	CLAYEY SAND (SC), 60% very fine sand, 40% fines, greyish brown, dense.
		14–16	CL	CLAY (CL), plastic, ~5% sand, greyish brown, slightly moist, stiff.
GMW-2 15.5	7 11 15	16	GW	Groundwater encountered at 16.5' bgs during drilling.
		16–19	SC	CLAYEY SAND (SC), very fine grain sand, slightly plastic, very micaceous, greyish brown, wet-saturated, dense.
		19–25	SM	SILTY SAND (SM), 25% medium grain, 35% very fine grain, 30% silt, greyish brown, saturated from cuttings.



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Exploratory Boring Log

BORING NO.: GMW-2

Project: RWQCB Dairy Project

Job No.: 65584.02

Date: 6-15-93

Sample Number	Blow Count/6"	Depth	Well Completion Diagram	Soil Group Symbol (USCS)	Surface Description:
		26		SM	Description:
		27			Total Depth - 27.0' bgs.
					Boring converted to monitoring well GMW-2 on 6-15-93.
		28			
		29			
		30			
		31			
		32			
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Exploratory Boring Log

BORING NO.: GMW-3

Project: RWQCB Dairy Project
Site No.: Genasci Dairy
Location: Blue Gum Road, Modesto, CA
Drilled By: Layne Western/S. McCoy
Elevation:

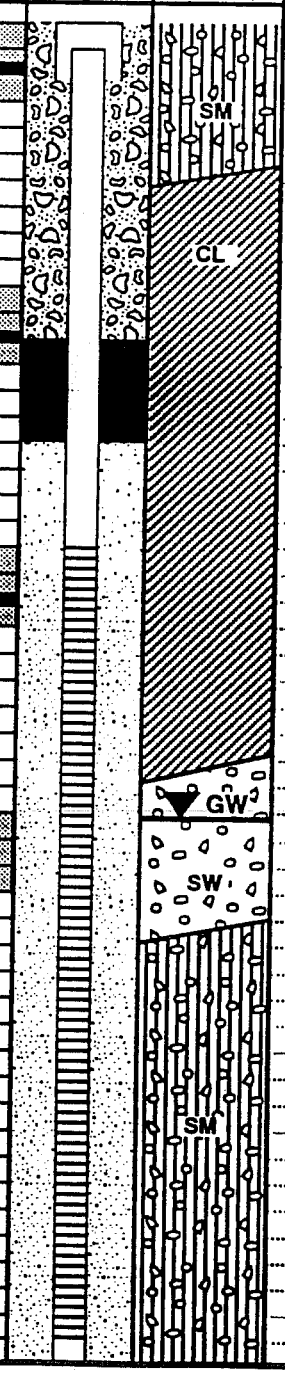
Job No.: 65584.02
Date: 6-16-93 Start: 0750 Finish: 0830
Logged By: M. Sands
Sampling Method: CA Mod. SS
Amb. Temp. (°F): ~70°F

METHOD OF DRILLING: [X] Hollow Stem Auger Other: [ ] Directional Well

Size of Bit: 8" Type of Bit: HS Hammer: wt. 140 lb. Drop 30 in.
Total Depth: 26.0 Depth of Groundwater/Time/Date: 15.0/0815/6-16-93

Surface Description: Dirt - west side of fence west side of pond, in field.

Sample Number	Blow Count/6"	Depth	Well Completion Diagram	Soil Group Symbol (USCS)	Description
GMW-3 1.0	2 3 5	0–6		SM	SILTY SAND (SM), <5% medium grain sand, 60% very fine sand, 35% silt, brown, slightly moist, loose.
GMW-3 6.0	15 29 34	6–15		CL	SANDY CLAY (CL), 30% very fine sand, 70% fines, micaceous, pale brown w/ orange mottlings & white marbling, slightly plastic, slightly moist, dense.
GMW-3 11.0	5 7 10	15–16		CL	CLAY (CL), minor very fine grain sand lenses, plastic, micaceous, pale brown, moist, stiff.
NS		15–16		GW	Groundwater encountered at 15.0' bgs during drilling.
		16–18		SW	SAND (SW), 30% Crs, 30% medium, 30% fine grain, 10% fines, micaceous, light brown, saturated, medium dense.
		18–25		SM	SILTY SAND (SM), 30% medium, 30% fine grain, 30% silt, brown, saturated.



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Exploratory Boring Log

BORING NO.: GMW-3

Project: RWQCB Dairy Project

Job No.: 65584.02

Date: 6-16-93

Sample Number	Blow Count/6"	Depth	Well Completion Diagram	Soil Group Symbol (USCS)
		26		
		27		
		28		
		29		
		30		
		31		
		32		
		33		
		34		
		35		
		36		
		37		
		38		
		39		
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		43		
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		48		
		49		
		50		

Surface Description:

Description:

Total Depth - 26.0' bgs.

Boring converted to monitoring well GMW-3 on 6-16-93.

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Exploratory Boring Log

BORING NO.: GMW-4

Project: RWQCB Dairy Project
Site No.: Genasci Dairy Farm
Location: Blue Gum Road, Modesto
Drilled By: Layne Western, S. McCoy
Elevation:

Job No.: 65584.02
Date: 6-15-93 Start: 1120 Finish: 1210
Logged By: M. Sands
Sampling Method: CA Mod. SS
Amb. Temp. (°F): ~75°F

METHOD OF DRILLING: [X] Hollow Stem Auger Other: [ ] Directional Well

Size of Bit: 8" Type of Bit: HS Hammer: wt. 140 lb. Drop 30 in.
Total Depth: 29.0 Depth of Groundwater/Time/Date: 18.0/1200/6-15-93

Surface Description: Dirt w/ grass.

Sample Number	Blow Count/6"	Depth	Well Completion Diagram	Soil Group Symbol (USCS)	Description:
GMW-4 1.5		0–5		SM	SILTY SAND (SM), very fine grain, ~40% silt, brown, slightly moist, dense.
GMW-4 6.0	4 5 5	5–9		SM	SILTY SAND (SM), ~70% very fine grain sand, very micaceous, brown, slightly moist, loose.
GMW-4 11.0	30 32 39	9–15		CL	CLAY (CL), ~30% very fine grain sand, greyish brown, slightly moist, hard.
GMW-4 16.0	9 21 30	15–18		CL	CLAY (CL) w/ small lenses of fine grain well sorted sand, plastic, micaceous, greyish brown, moist-wet, stiff-very stiff.
		18	GW		Groundwater encountered at 18.0' bgs during drilling.
		18–20		CL	SANDY CLAY (CL), greyish brown, saturated.
		20–25		SC	increasing sand content

Depth scale: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25

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Exploratory Boring Log

BORING NO.: GMW-4

Project: RWQCB Dairy Project

Job No.: 65584.02

Date: 6-15-93

Sample Number	Blow Count/6"	Depth	Well Completion Diagram	Soil Group Symbol (USCS)	Surface Description:
		26		SC	Description:
		27			
		28			Hard drilling (CL?)
		29			Total Depth - 29.0' bgs.
		30			Boring converted to monitoring well GMW-4 on 6-15-93.
		31			
		32			
		33			
		34			
		35			
		36			
		37			
		38			
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Exploratory Boring Log

BORING NO.: GMW-5

Project: RWQCB Dairy Project
Site No.: Genasci Dairy Farm
Location: Blue Gum Rd., Modesto, CA
Drilled By: Layne Western, Steve McCoy
Elevation:

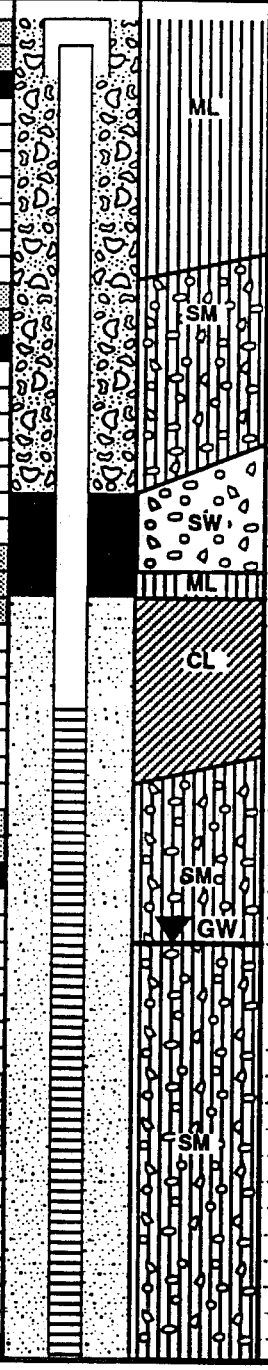
Job No.: 65584.02
Date: 6-10-93 Start: 1220 Finish: 1540
Logged By: P.A. Crispell
Sampling Method: CA Mod. SS
Amb. Temp. (°F): 80's

METHOD OF DRILLING: [X] Hollow Stem Auger Other: [ ] Directional Well

Size of Bit: 8.5 Type of Bit: Hammer: wt. 140 lb. Drop 30 in.
Total Depth: 30' Depth of Groundwater/Time/Date: 17.5/–/6-10-93

Surface Description: Grass covered hill at edge of field.

Sample Number	Blow Count/6"	Depth	Soil Group Symbol (USCS)	Description
GMW-5 1.0	6, 6, 7	0–1	ML	SANDY SILT (ML), non plastic (0,15,75,10) brown, dry to moist, firm.
GMW-5 6.0	17, 11, 19	5–6	SM	SILTY SAND (SM), moderatly graded, (0,50,40,10) micaceous grains, subangular to rounded, brown, moist, medium dense.
	10, 10, 16	9–11	SW	SAND (SW), well graded, (0,85,10,5) course to very fine, qtz plag, fspars, subangular to rounded, red brown, moist, medium dense.
		11	ML	SILTY CLAY (ML), mod plastic, grey-brown, moist, stiff.
		12–14	CL	
GMW-5 16.0	11, 11, 14	15–16	SMd	SILTY SAND (SM), mod graded, (0,75,20,5) med to very fine, Qtz, fspars, subangular to rounded, brown w/ rust stains, med dense, wet to saturated.
		17	GW	Groundwater encountered at 17.5' bgs during drilling.
	15, 21, 13	20–21	SM	SILTY SAND (SM), poorly graded, (0,90,10,0) fine to very fine sand, mica chips, rounded, brown, med dense, saturated.
	15	25		



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Exploratory Boring Log

BORING NO.: GMW-5

Project: RWQCB

Job No.: 4165584.02

Date: 6-10-93

Surface Description: Grass covered hill at edge of field.

Sample Number	Blow Count/6"	Depth	Well Completion Diagram	Soil Group Symbol (USCS)	Description:
	50/5	26		ML	CLAYEY SILT W/ SAND (ML/CL), mod graded (0,10,60,30) very fine sands, mica flakes, brown, hard, moist.
		27		CL	
		28			Total Depth - 28.0' feet bgs Boring converted to monitoring well on 6-10-93.
		29			
		30			
		31			
		32			
		33			
		34			
		35			
		36			
		37			
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		49			
		50			

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Exploratory Boring Log

BORING NO.: GMW-6

Project: RWQCB Dairy Project
Site No.: Genasci Dairy Farm
Location: Blue Gum Rd., Modesto, CA
Drilled By: Layne Western
Elevation:

Job No.: 65584.02
Date: 6-10-93 Start: 8:00 Finish: 10:00
Logged By: P.A. Crispell
Sampling Method: Ca Mod. SS
Amb. Temp. (°F): 70's to 80's

METHOD OF DRILLING: [X] Hollow Stem Auger Other: [ ] Directional Well

Size of Bit: 8.5" Type of Bit: Hammer: wt. 140 lb. Drop 30 in.
Total Depth: 30' Depth of Groundwater/Time/Date: 19.0/--/6-10-93

Surface Description: Edge (SE) corner of field, open, soil.

Sample Number	Blow Count/6"	Depth	Well Completion Diagram	Soil Group Symbol (USCS)	Description:
GMW-6 1.0	3 4 6	0 1 2 3 4 5		ML	SANDY SILT (ML), mod graded (0,30,60,10) fine to very fine, non plastic, brown, dry.
GMW-6 6.0	6 7 8	6 7 8 9		SM	SILTY SAND (SM), mod graded (0,60,30,10) med to very fine, sub angular to rounded, brown, moist, loose.
	6 9 10	10 11 12 13 14		SW	SAND (SW), well graded (0,90,5,5) qtz, mica, fspar, plagioclase, subangular to round, brown and white, loose, moist.
	10 15 22	15 16 17 18		SW	increasing coarseness with depth.
		19		GW1	Groundwater encountered at 19.0' bgs during drilling.
No Sample		20 21 22 23 24		SW	
	10	25		ML	SANDY SILT (ML), non plastic, (0,25,65,10) sand med to very

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Exploratory Boring Log

BORING NO.: GMW-6

Project: RWQCB Dairy Project

Job No.: 65584.02

Date: 6-10-93

Surface Description: SE Corner of field, open soils.

Sample Number	Blow Count/6"	Depth	Well Completion Diagram	Soil Group Symbol (USCS)	Description
	19	26		ML	fine, qtz, fspar, plag, subangular to rounded, brown, wet, very stiff.
	25	27		CL	SILTY CLAY (CL), (0,5,40,55), mod. plastic, brown, moist, very stiff.
		28			"hard drilling"
		29			
		30			Total Depth - 30.0' feet bgs
		31			Boring converted to monitoring well on 6-10-93.
		32			
		33			
		34			
		35			
		36			
		37			
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Exploratory Boring Log

BORING NO.: GMW-7

Project: RWQCB Dairy Project
Site No.: Genasci Dairy Farm
Location: Blue Gum Rd., Modesto, CA
Drilled By: Layne Western
Elevation:

Job No.: 65584.02
Date: 6-9-93 Start: 1020 Finish: 1430
Logged By: P.A. Crispell
Sampling Method: CA Mod. SS
Amb. Temp. (°F): 80's

METHOD OF DRILLING: [X] Hollow Stem Auger Other: [ ] Directional Well

Size of Bit: 8.5 Type of Bit: Hammer: wt. 140 lb. Drop 30 in.
Total Depth: 30' Depth of Groundwater/Time/Date: 18.5'/--/6-9-93

Surface Description: South side of corrals in grass strip between road and corrals.

Sample Number	Blow Count/6"	Depth	Well Completion Diagram	Soil Group Symbol (USCS)	Description
GMW-7 1.0	18 22 13	0–4		ML	SANDY SILT (ML), (0,30,60,10) non plastic, brown, dry to moist, very stiff.
GMW-7 6.0	3 4 7	5–9		ML	CLAYEY SILT (CL/ML),(0,15,60,25) mod plastic, tan brown, firm, moist.
No Sample	10 14 14	10–14		SW	SAND (SW),well graded (0,90,5,5) mica, qtz, fspars, metamorphic grains, subangular to rounded, tan brown, moist, med dense.
GMW-7 16.0	11 16 21	15–17		SW	
		18		GW	Groundwater encountered at 18.5' bgs during drilling.
		19–25		SW	increasing coarseness with depth.
	4				

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Exploratory Boring Log

BORING NO.: GMW-7

Project: RWQCB Dairy Project

Job No.: 65584.02

Date: 6-9-93

Surface Description: grass covered soil

Sample Number	Blow Count/6"	Depth	Well Completion Diagram	Soil Group Symbol (USCS)	Description:
No Sample	5 6	26		SW	SAND (SW), well graded, (5,85,5,<5) very coarse to fine, qtz, fspar, plagioclase, mica, subangular to round, light tan and black, saturated, loose.
		27			
		28			
		29			
		30			Total Depth - 30' feet bgs Boring converted to monitoring well on 6-9-93.
		31			
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		34			
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Exploratory Boring Log

BORING NO.: GMW-8

Project: RWQCB Dairy Project
Site No.: GMW 8
Location: Genasci Dairy
Drilled By: Layne Western/S. McCoy
Elevation:

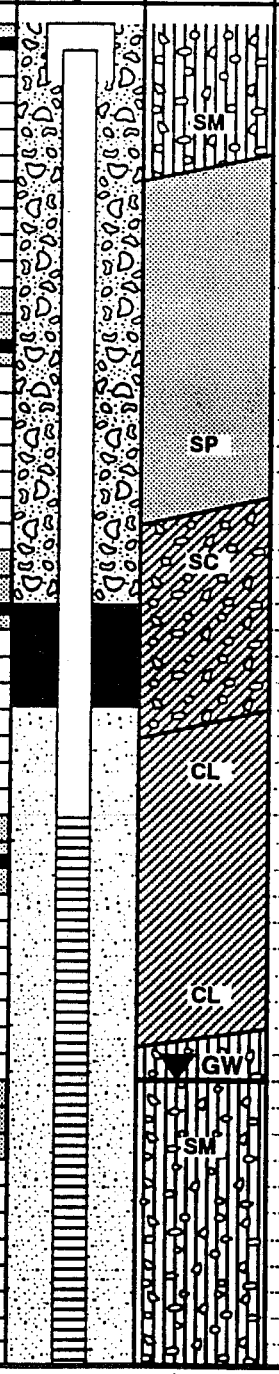
Job No.: 65584.02
Date: 6-14-93 Start: 1120 Finish: 1200
Logged By: M. Sands
Sampling Method: CA Mod. SS
Amb. Temp. (°F): ~90°F

METHOD OF DRILLING: [X] Hollow Stem Auger Other: [ ] Directional Well

Size of Bit: 8" Type of Bit: HS Hammer: wt. 140 lb. Drop 30 in.
Total Depth: 30.5' Depth of Groundwater/Time/Date: 20.0'/1200/6-14-93

Surface Description: Dirt W. side of pond between pond and road.

Sample Number	Blow Count/6"	Depth	Soil Group Symbol (USCS)	Description
GMW-8 0.5	2 3 3	0–5	SM	SILTY SAND (SM), very fine grain, micaceous, brown, slightly moist, loose
GMW-8 6.0	9 15 13	5–10	SP	SAND (SP), fine grained, very micaceous, clay noduals, light brown w/ orange mottling, moist, med dense.
GMW-8 11.0	9 14 21	10–14	SC	CLAYEY SAND (SC), very fine grain w/ lenses of fine to med grain sand, very micaceous, slightly plastic, olive-brown with minor orange mottling, moist, dense.
GMW-8 16.0	9 10 15	14–20	CL	CLAY (CL), w/ lenses of CLAYEY SAND (SC), fine-very fine grain, micaceous, olive-brown with orange mottling, moist-wet, stiff.
		16		decreasing sand content
		20	GW	Groundwater encountered at 20.0' bgs during drilling.
No Sample		20–25	SM	SILTY SAND (SM), very fine grain, very micaceous, 40% silt, olive brown, saturated, moderately dense.



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Exploratory Boring Log

BORING NO.: GMW-8

Project: RWQCB Dairy Project

Job No.: 65584.02

Date: 6-14-93

Sample Number	Blow Count/6"	Depth	Well Completion Diagram	Soil Group Symbol (USCS)	Surface Description:
		26		SM	Description:
		27			
		28			
		29			
		30			Total Depth - 30.0' bgs.
		31			Boring converted to monitoring well GMW-8 on 6-14-93.
		32			
		33			
		34			
		35			
		36			
		37			
		38			
		39			
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		49			
		50			

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Exploratory Boring Log

BORING NO.: GMW-9

Project: RWQCB Dairy Project
Site No.: Genasci Dairy Farm
Location: Blue Gum Rd., Modesto, CA
Drilled By: Layne Western
Elevation:

Job No.: 65584.02
Date: 6-11-93 Start: 7:45 Finish: 10:15
Logged By: P.A. Crispell
Sampling Method: CA Mod. SS
Amb. Temp. (°F): 80's

METHOD OF DRILLING: [X] Hollow Stem Auger Other: [ ] Directional Well

Size of Bit: 8.5 Type of Bit: Hammer: wt. 140 lb. Drop 30 in.
Total Depth: 27' Depth of Groundwater/Time/Date: 15.0'/--/6-11-93

Surface Description: Sandy silty loam, edge of northern field, tilled.

Sample Number	Blow Count/6"	Depth	Well Completion Diagram	Soil Group Symbol (USCS)	Description:
GMW-9 1.0	1 2 3	0–4		ML	SANDY SILT (ML), non plastic, (0,35,55,10) sand-fine to very fine, brown, soft, dry to moist.
GMW-9 6.0	6 8 10	5–9		SM	SILTY SAND (SM), moderately graded (0,75,20,5) medium to very fine, qtz, mica, plag, subangular to rounded, brown, moist, loose.
No Sample	5 6 9	10–13		SW	SAND (SW), moderately sorted (0,90,55) med to very fine, qtz, plag, mica, subangular to rounded, tan brown, moist, loose.
		14		ML	SANDY SILT (ML), mod plastic, grey brown, wet, stiff.
		15		GW	Groundwater encountered at 15.0' bgs during drilling.
No Sample	15 27 19	16–19		SW	SAND (SW), well graded, (0,85,10,5) course to very fine, qtz, fspars, mica, plag, subangular to rounded, tan brown, saturated, medium dense.
No Sample	5 15 17	20–24		SW	
No Sample	6	25		SW	

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Exploratory Boring Log

BORING NO.: GMW-9

Project: RWQCB Dairy Project

Job No.: 65584.02

Date: 6-11-93

Surface Description: silty soil

Sample Number	Blow Count/6"	Depth	Well Completion Diagram	Soil Group Symbol (USCS)	Description:
	9 10	26		SW	
		27			Total Depth - 27.0' feet bgs Boring converted to monitoring well GMW-9 on 6-11-93.
		28			
		29			
		30			
		31			
		32			
		33			
		34			
		35			
		36			
		37			
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Exploratory Boring Log

BORING NO.: GMW-10

Project: RWQCB Dairy Project
Site No.: Genasci Dairy Farm
Location: Blue Gum Rd., Modesto, CA
Drilled By: Layne Western
Elevation:

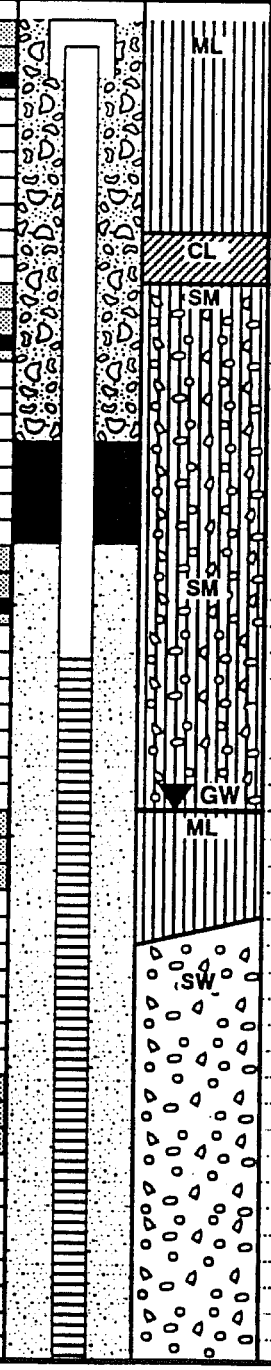
Job No.: 65584.02
Date: 6-11-93 Start: 1055 Finish: 1215
Logged By: P.A. Crispell
Sampling Method: CA Mod. SS
Amb. Temp. (°F): 80's

METHOD OF DRILLING: [X] Hollow Stem Auger Other: [ ] Directional Well

Size of Bit: 8.5" Type of Bit: Hammer: wt. 140 lb. Drop 30 in.
Total Depth: 28' Depth of Groundwater/Time/Date: 15.0/--/6-11-93

Surface Description: Silty soil, edge of field.

Sample Number	Blow Count/6"	Depth	Soil Group Symbol (USCS)	Description
GMW-10 1.0	2 3 7	0–4	ML	SANDY SILT (ML), non plastic, brown, dry to moist, soft.
		4–5	CL	SILTY CLAY (CL), moderately plastic, brown, moist.
GMW-10 6.0	2 4 4	5–15	SM	SILTY SAND (SM), mod graded, (0,85,10,5) fine to very fine, plag, qtz, mica, subanglular to rounded, tan brown, moist, loose.
GMW-10 11.0	7 17 11	10–15	SM	
		15	GW	Groundwater encountered at 15.0' bgs during drilling.
No Sample	14 18 19	15–18	ML	SANDY SILT (ML), non plastic, very fine sand 10%, silt 85%, clay 5%, brown, saturated, very stiff.
No Sample	15 25 21	18–25	SW	SAND (SW), poorly graded (0,95,5) fine to very fine, qtz, fspars, plagroclase, mica, subangular to rounded, light tan brown, saturated, medium dense.
		24		"heavy sands" no sample



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Exploratory Boring Log

BORING NO.: GMW-10

Project: RWQCB Dairy Project

Job No.: 65584.02

Date: 6-11-93

Sample Number	Blow Count/6"	Depth	Well Completion Diagram	Soil Group Symbol (USCS)	Surface Description: silty soil, edge of field.
		26		SW	Description:
		27			Total Depth - 27.0' feet bgs
		28			Boring converted to monitoring well GMW-10 on 6-11-93.
		29			
		30			
		31			
		32			
		33			
		34			
		35			
		36			
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TRO

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GROUNDWATER MONITORING WORKPLAN
J. Troost Dairy, L.P.
Near Chowchilla, Madera County, CA

Prepared by:
URS CORPORATION

July 6, 2005

URS Job No. 18715077

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APPENDICES

Appendix A Groundwater Elevation Data
Appendix B Soil Data
Appendix C Well Drillers Logs
Appendix D Construction Details MW-1
Appendix E Groundwater Monitoring Well Installation Details
Appendix F Groundwater Monitoring Procedures

GROUNDWATER MONITORING WORKPLAN
Troost Dairy
Near Chowchilla, Madera County, CA

1.0 INTRODUCTION

In a January 31, 2005 letter, the California Regional Water Quality Control Board (CRWQCB) requested that J. Troost Dairy (Client) submit a plan to assess the quality of first encountered groundwater underneath their facility and associated cropland and to determine the quality of groundwater used on the facility. The subject facility is a dairy farm (confined animal facility), located in the northwestern portion of Madera County, California. This Workplan describes the site setting, rationale and monitoring approach, proposed sampling methodology, plan for reporting, and schedule to implement these activities.

2.0 SITE SETTING

This section summarizes the location and description of the dairy farm, and the geologic and hydrogeologic conditions in its vicinity.

2.1 LOCATION AND DESCRIPTION

The facility encompasses approximately 65 acres out of a total combined dairy and cropland area of 822 acres. The facility is located about 5 miles west of the City of Chowchilla, in the northwestern portion of Madera County (Figure 1). It is south of Avenue 25, and west of Road 9, and in the northeast quarter of Section 36, Township 9 South, Range 14 East, Mount Diablo Base and Meridian (Figure 2). The dairy is located at an elevation of about 180 feet above mean sea level (amsl), the general topography in the area is relatively flat, and the ground surface slopes about 5 to 10 feet per mile to the west (United States Geological Service (USGS), 1969).

ok

The dairy is milking approximately 1850 cows. Solids are separated from the liquid dairy waste as it flows across a screen. The liquid fraction is stored in two ponds that operate in series. A nutrient management plan for the facility is currently being prepared for the dairy. The location of the facility and associated cropland are indicated on Figure 2.

2.2 GEOLOGIC CONDITIONS

The site is located in the central portion of the San Joaquin Valley, a broad valley that is dominated by coalescing alluvial fans and flood plains. The San Joaquin Valley is a prominent fault-bounded, northwest-trending topographic structural trough in central California. The valley is bordered on the east by the Sierra Nevada and on the west by the Coast Range. The structural floor of the valley is asymmetrical, sloping westward to its greatest depth near the western margin of the valley. The valley fill consists of a sequence of marine and overlying continental sediments, Jurassic to Holocene in age, that reaches a thickness of as much as 28,000 feet on the southwest side of the valley (Page, 1986).

The surficial geology of the site consists of older alluvium of Quaternary age, that is part of the geomorphic feature known as the Alluvial Fan of the Chowchilla River (Mitten, et al., 1970). The Chowchilla River originates in the Sierra Nevada. The surficial deposits are underlain by lacustrine and marsh deposits, known as E-Clay (also known as the Blue Clay or Corcoran Clay). The E-Clay is considered to be a virtually impermeable aquiclude, restricting the vertical movement of groundwater. Beneath the E-Clay is additional older alluvium of Quaternary age, which extends to a depth of about 600 feet bgs, and which is underlain by unconsolidated continental deposits of Tertiary and Quaternary age.

According to the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS), the original surficial soils the facility and associated croplands are mostly part of the Grangeville, Traver, Tujunga, and Wunjey series (United States Department of Agriculture, 1951). These soils are characterized as follows:

- Grangeville fine sandy loam over Traver soils – This soil is extensive on the alluvial fan of the Chowchilla River and its distributaries. The Grangeville fine sandy loam material is 15 to 48 inches thick, and it overlies an older, strongly alkaline Traver soil that contains excess salts and alkali. Internal drainage is moderately rapid to the underlying Traver soils, then moderately slow.

- Traver loam, strongly saline-alkali – This light-colored soil occurs extensively in the basin part of the area. Most of the salts and alkali are concentrated in the upper part of the profile, and more than 70 percent of the soil is saline-alkali to the surface. The amount of clay in the subsoil is somewhat variable but there is usually slightly more than in the subsoil. It may be faintly mottled with brown and brownish yellow. Internal drainage is moderately slow. Water-holding capacity is moderate.

- Tujunga loamy sand, coarse-textured, derived from granitic sediments. In the Madera Area, these soils do not contain coarse fragments, except for gravel in the subsoil and substratum. The soils are free of excess salts and alkali. The moisture-holding capacity and natural fertility are low. The root zone is very deep.

- Wunjey very fine sandy loam, slightly saline-alkali – These soils differ from the Grangeville soils in being pale brown in color and calcareous throughout.

See Appendix B for a copy of the NRCS soil survey map for the site area.

2.3 HYDROLOGIC CONDITIONS

The San Joaquin Valley is separated into two hydrologic sub-basins by an indistinct divide that interrupts the lengthwise slope of the Valley. The San Joaquin sub-basin is located to the north and the Tulare subbasin is located to the south; Madera County is located within the San Joaquin sub-basin. The San Joaquin sub-basin drains into the Pacific Ocean, and the Tulare sub-basin has an outlet only when rare flood flows carry its water into the San Joaquin sub-basin.

In addition to the hydrologic sub-basins described above, the U.S. Environmental Protection Agency's (EPA) Unified Watershed Assessment (UWA) Clean Water Action Plan places the western parts of Madera County within the Middle San Joaquin-Lower Chowchilla watershed ([USGS Cataloging Unit No. 1804001). Groundwater at the site lies within the Madera Groundwater Subbasin. Major aquifers include the near surface unconfined aquifer, and a deeper confined aquifer, separated by the E-clay (see above). The top of the E-clay is estimated to occur at a depth between 130 and 255 feet below ground surface (bgs) (Mitten, et al., 1970).

General movement of groundwater within the San Joaquin Valley is from the valley flanks to the axis of the valley trough and then northward toward the Sacramento-San Joaquin Delta area (Page, 1986). However, local conditions can produce groundwater movement, on a local scale, that differs significantly from this general pattern. Excerpts of DWR maps depicting lines of equal groundwater elevation or equal groundwater depth for the unconfined aquifer, as downloaded from DWR's Internet web-site, are provided in Appendix A. The groundwater flow direction is perpendicular to the lines of equal elevation. As deduced from the Department of Water Resources (DWR) maps, the groundwater flow direction beneath the dairy and its cropland, though generally southwesterly, may vary significantly due to variations in groundwater table depressions near Red Top (southwest of the dairy) and near Chowchilla (northeast of the dairy).

The DWR maps for spring 2001 and 2002 indicate groundwater depths in the dairy area is on the order of 100 feet bgs. Sounding of an existing on-site monitoring well in June 2005 indicated a groundwater depth of approximately 80 feet bgs. No local groundwater quality data are available at this time.

Surface water bodies in the area include westward flowing irrigation ditches, operated by Chowchilla Irrigation District. One of their ditches runs along the south side of the dairy's cropland.

3.0 WATER WELL SURVEY

A water well survey was conducted to identify existing water supply wells within 1000 feet of the facility boundaries. Eight on-site and nine off-site supply wells were identified within this area by visual survey from the site and public roads, and by requesting available information from DWR. The well locations are presented on Figure 3. Well drillers' logs or electric logs for the on-site supply wells are presented in Appendix C. Well SW-1 is the main supply of drinking and process water on the dairy. It also supplies drinking water for the on-site houses. This well will be incorporated in the groundwater monitoring program.

4.0 PROPOSED MONITORING APPROACH

This section presents the proposed groundwater monitoring approach for the facility and associated cropland. One objective of the groundwater monitoring program is to establish a network of groundwater monitoring and supply wells to allow assessment of groundwater occurrence, movement, and quality within the upper portion of the aquifer upgradient and

downgradient of the facility and associated cropland. A second objective is to assess the quality of groundwater used on the facility.

4.1 GENERAL WELL SITING CONSIDERATIONS

The predominant groundwater flow direction in the vicinity of the facility is an important consideration in siting of monitoring points. However, as indicated above, the flow direction may vary with time, sometimes on a seasonal basis. Before monitoring points are established, it is necessary to make assumptions about the anticipated flow direction based on available data. Later, the monitoring points themselves will be used to test the assumptions. A minimum of three monitoring points not aligned linearly is necessary to obtain even an approximate indication of the groundwater flow direction.

As shown in Appendix A, the regional contours of groundwater levels in the area are not straight lines and are not even particularly smooth. Contours do indicate a generally southwesterly movement of groundwater. Monitoring points will be sited based on an initial assumption of a southwesterly movement of groundwater.

It is desirable to locate one or more "background" monitoring points hydraulically upgradient of the facility and associated cropland to provide a comparison with downgradient measurements.

4.2 WELL DEPTH CONSIDERATIONS

Review of available groundwater level data reveals considerable variations in groundwater elevation over the past decade, varying from approximately 75 to 100 feet amsl, which corresponds to a depth of approximately 80 to 105 feet bgs. To maximize the utility of the monitoring wells, a screened interval extending about 5 to 15 feet above and 20 to 30 feet below the Fall water table is proposed. (Fall is typically the season with the deepest depth to the groundwater table.)

4.3 SPECIFIC MONITORING APPROACH

An estimated total of four to five groundwater monitoring wells are proposed, installed in two or more phases. Proposed well locations are presented on Figure 4. The initial phase of well installation will consist of two wells near the facility's perimeter. Those wells, in combination with an existing monitoring well, will serve to provide insight in the groundwater flow direction underneath the site. The rationale for the initial well locations is discussed below:

- An existing monitoring well, identified as MW-1 on Figure 4, is located in the northeast corner of field T-2, along the fence line of the residence. This well location is separated from the field by a narrow dirt road. Based on the typical regional groundwater flow direction, it is reasonable to expect that, with that location, MW-1 can serve as a background well.

- A well, identified as MW-2 on Figure 4, will be located southwest of the wastewater ponds, between fields T-6 and T-7. This well will monitor groundwater conditions downgradient of those ponds.

assuming GW flow

- A well identified as MW-3 on Figure 4, will be located along the southern half of the western edge of the facility, and will serve to monitor groundwater conditions downgradient of the corrals.

Soil core sampling and lithologic logging by a field engineer/geologist during drilling of the well borings will provide data on the geologic stratigraphy at the well locations. Each new well will have a nominal screen length of about 35 feet that will span from about 5 to 15 feet above the water table to about 20 to 30 feet below the water table, assuming that the water table is encountered within a relatively permeable formation. This screen length will accommodate a relatively wide range of groundwater level fluctuations without causing unreasonable sample dilution. The length of screened casing placed above the water table will depend upon the depth at which the water table is encountered. If the water table is encountered above a depth of 80 feet bgs, only 5 feet of screened casing will be placed above the water table. If the water table is encountered at a depth of 80 to 90 feet bgs, 10 feet of screened casing will be placed above the water table. Otherwise, 15 feet of screened casing will be placed above the water table.

If the water table is encountered within a relatively impermeable formation, then drilling will continue downward until a relatively permeable formation is encountered, and a well having a nominal screen length of about 20 feet, spanning from the top of the permeable formation to about 20 feet below the top, will be installed.

The existing monitoring well MW-1 is screened between 60 and 90 feet bgs. Details on the construction of this well are appended to this workplan (see Appendix D).

The three initial monitoring wells will be monitored for about two years to provide data on groundwater elevation, flow direction, quality, and temporal variations thereof. Based on this data, additional monitoring well locations will be selected for installation in one or more follow-up phases. As detailed in Section 8.0, a workplan addendum will be submitted to the RWQCB for review and approval before installing additional wells..

5.0 BORING AND WELL INSTALLATION PROCEDURES

The monitoring well boreholes will be advanced using the hollow-stem auger drilling technique. The well casing and annular materials will be installed inside the augers prior to removal of the augers from the borehole. Soil sampling will be conducted during drilling to aid the field engineer/geologist in preparing lithologic logs of each borehole. Proposed monitoring well construction details are presented on Figure 5. Details of boring and well installation procedures are presented in Appendix E.

The monitoring well installation program will be overseen by a California-registered civil engineer or geologist. The wells will be constructed following DWR and local well construction standards by a drilling contractor that holds a California C-57 license. A monitoring well installation permit will be obtained from the Madera County Environmental Health Department prior to constructing the wells. A registered land surveyor will be retained to perform a level survey to determine the reference point (north side top of casing) elevations of the monitoring well casings (including MW-1) relative to a common datum.

6.0 GROUNDWATER MONITORING

After the initial phase of groundwater monitoring well installation, eight quarterly monitoring events will be conducted to evaluate groundwater conditions over the course of two calendar years. Monitoring activities at each well will include measurement of the depth to groundwater, purging of stagnant water from the well, groundwater sampling, measurement of field parameters, and submittal of the samples to a laboratory for analysis. The groundwater monitoring procedures that will be used are presented in Appendix F. Based upon the data obtained from the initial eight monitoring events, additional monitoring well locations will be selected for installation in one or two follow-up phases. If temporal variations are relatively small, and if no constituent concentrations are threatening to exceed groundwater quality goals, a proposal will be made at some time to reduce the monitoring frequency to less than quarterly.

7.0 ANALYTICAL TESTING

Groundwater samples collected from the monitoring wells will be analyzed for inorganic compounds potentially present in typical dairy wastewater, as detailed below:

Cations/Nutrients (Ammonium, Calcium, Magnesium, Potassium, and Sodium)
Anions/Nutrients (Chloride, Nitrate, Nitrite, and Sulfate)
Total Kjeldahl Nitrogen (TKN)
Total Dissolved Solids (TDS)
Alkalinity (Bicarbonate, Carbonate, Hydroxide)
Electrical Conductivity
pH

Analyses will be performed by a laboratory accredited under the California Department of Health Services' Environmental Laboratory Accreditation Program. In addition, field measurements of groundwater temperature, pH, and electrical conductivity will be made during groundwater monitoring activities, as described in Appendix F.

8.0 REPORTING

A groundwater investigation report will be prepared following the initial monitoring well installation and monitoring event. The report will include a description of well installation and monitoring procedures, a description of geologic materials encountered, a well location map, a potentiometric surface contour map, tabulated groundwater elevations and analytical results, boring logs, well completion details, and laboratory reports. Data transmittals will be prepared following each subsequent monitoring event, and will include a description of monitoring procedures, a potentiometric surface contour map, tabulated analytical results, and laboratory reports.

If Client elects to proceed with one or more follow-up phases of monitoring well installation, a workplan addendum will be prepared to identify the proposed location(s). Following installation, a report will be prepared to document installation of subsequent well(s).

9.0 SCHEDULE

The following approximate schedule is proposed for implementation of this workplan:

Start	Receive RWQCB approval of workplan
Month 1	Procure a licensed drilling contractor and perform other preparatory activities
Month 2	Install and develop three initial groundwater monitoring wells (depending on subcontractor availability)
Month 3	Initial monitoring of wells (no sooner than two weeks after completion of well installation and development)
Month 4	Receive and evaluate initial analytical results
Month 5	Finish groundwater investigation report

Thereafter, seven more groundwater monitoring events will be performed on a quarterly basis. Data transmittals will be submitted to the RWQCB within about two months after each event.

10.0 LIMITATIONS

This workplan has been prepared for the exclusive use of the Client, and in accordance with generally accepted environmental engineering practices in Madera County, California at this time. No other warranties either express or implied are made as to the professional advice provided under the terms of URS' agreement with Client. The passage of time, natural processes, and/or human intervention on the Site and/or nearby properties, as well as changes in regulations, can cause changed conditions that may invalidate the findings or conclusions presented in this document. The results or findings of the work proposed herein may not conclusively resolve issues regarding potential environmental impacts at the Site, or the suitability of the Site for future activities.

11.0 REFERENCES

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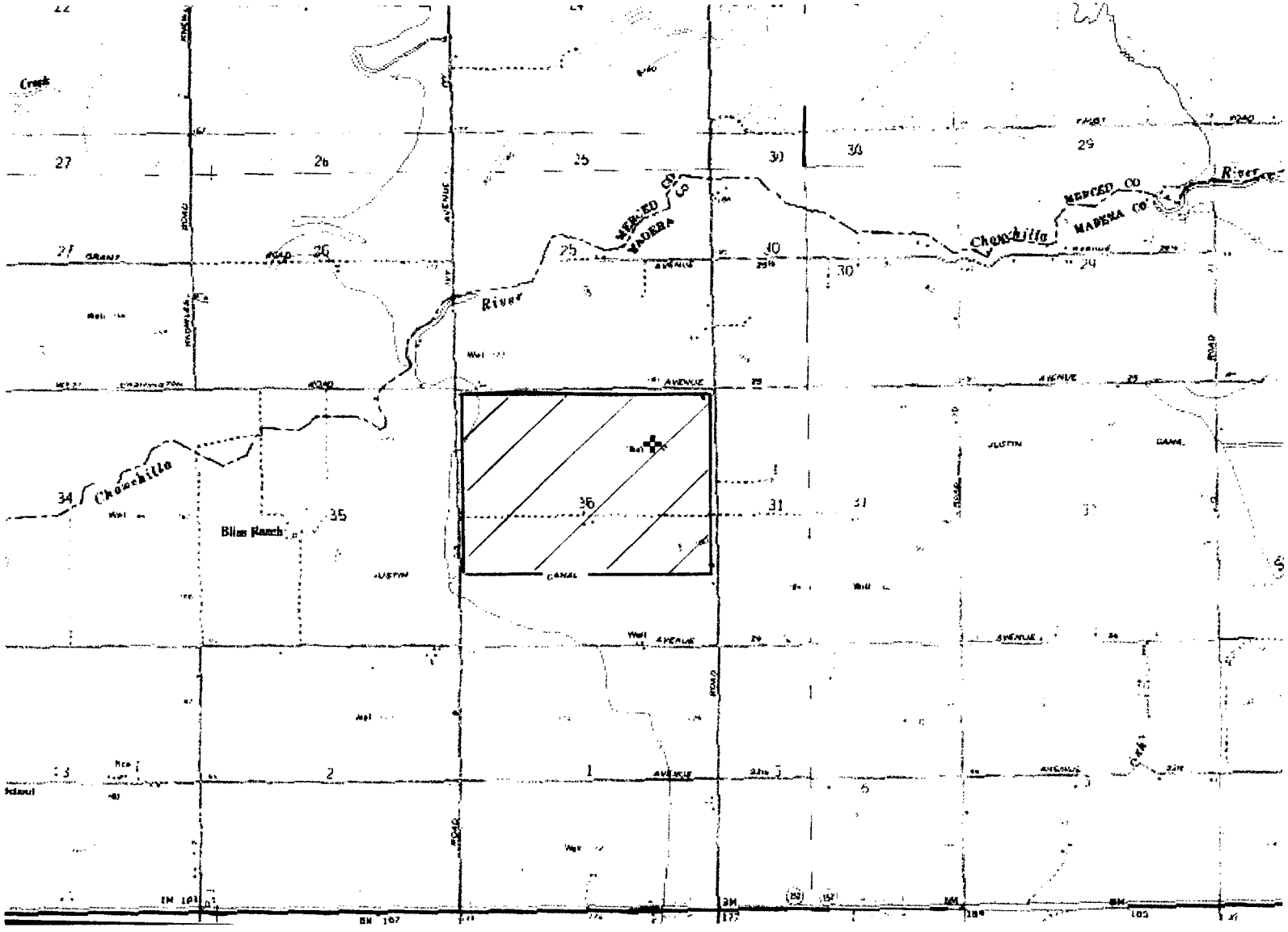

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Troost Dairy

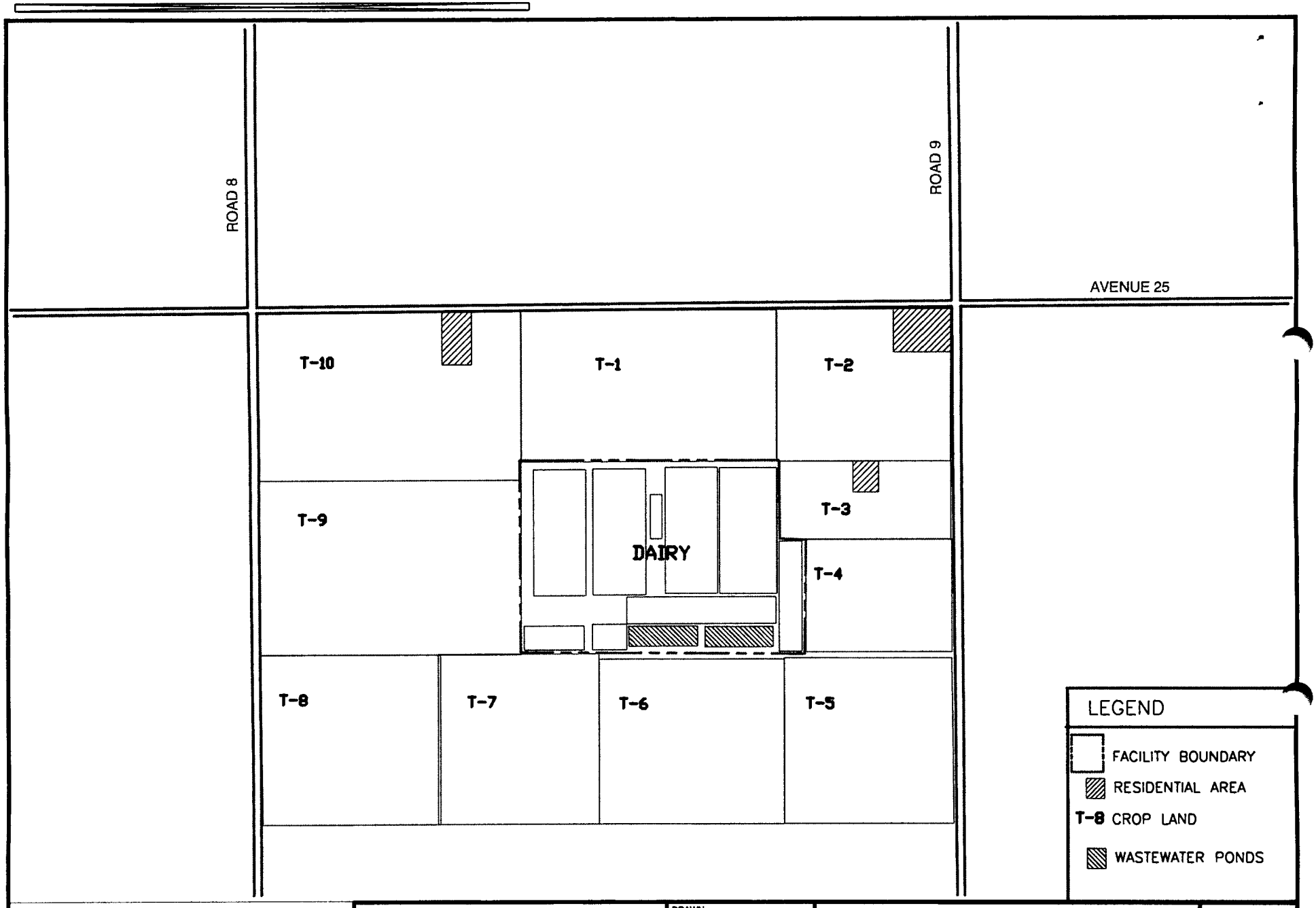
0 0.25 0.5
(MILES)

URS
30 River Park Place West,
Suite 180
Fresno, California 93720
Tel. (559) 256-1444

DRAWN	BLS
APPR	CVK
DATE	12-01-04
JOB NO.	18715077

VICINITY MAP
TROOST DAIRY
NEAR CHOWCHILLA, MADERA COUNTY, CA

FIGURE NO. 1



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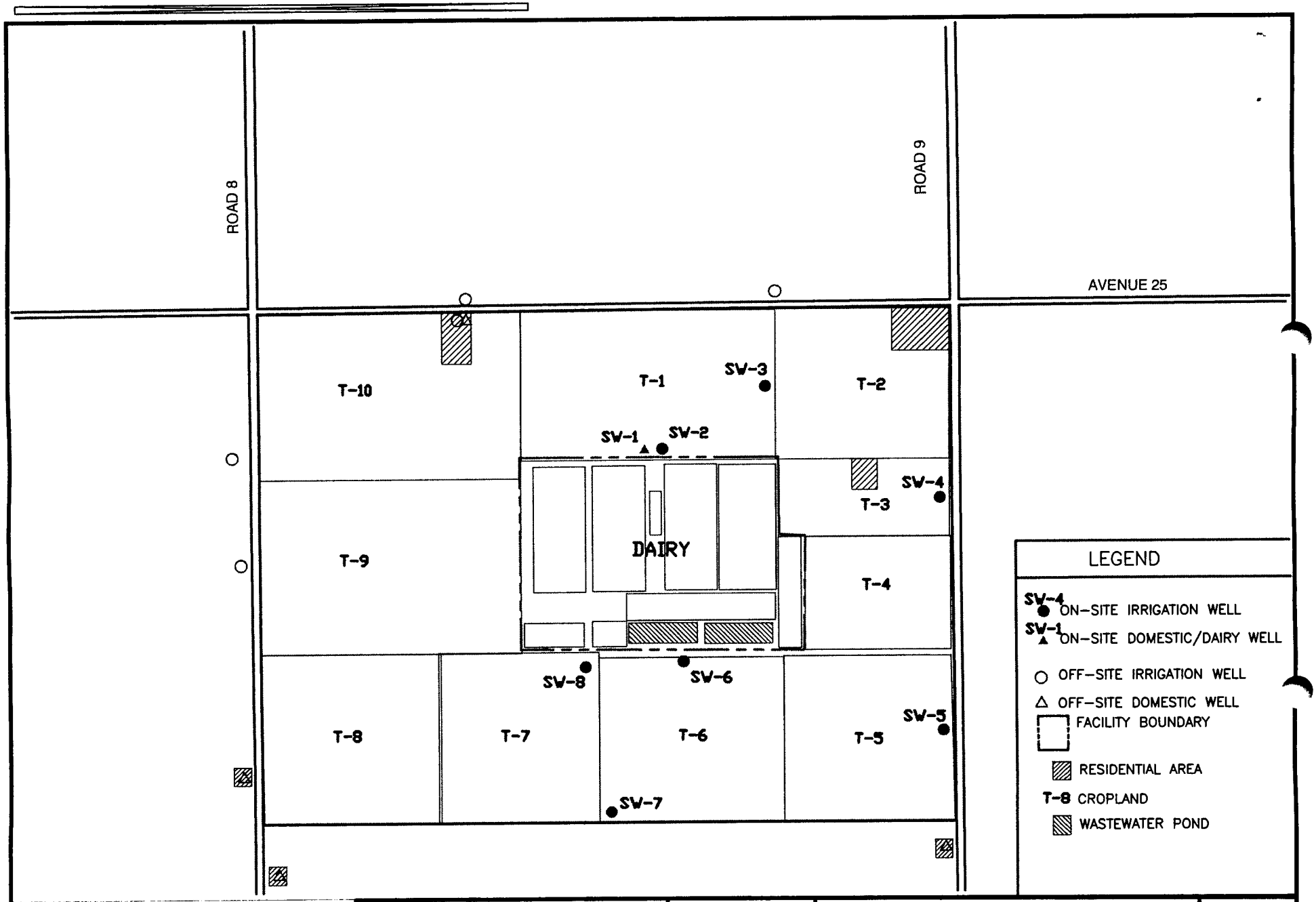
0 500 1000
(FEET)

URS
30 River Park Place West,
Suite 180
Fresno, California 93720
Tel. (559) 256-1444

DRAWN	BLS
APPR	CVK
DATE	06-14-2005
JOB NO.	18715077

FACILITY AND ASSOCIATED CROP LAND
TROOST DAIRY
NEAR CHOWCHILLA, MADERA COUNTY, CA

FIGURE NO. 2



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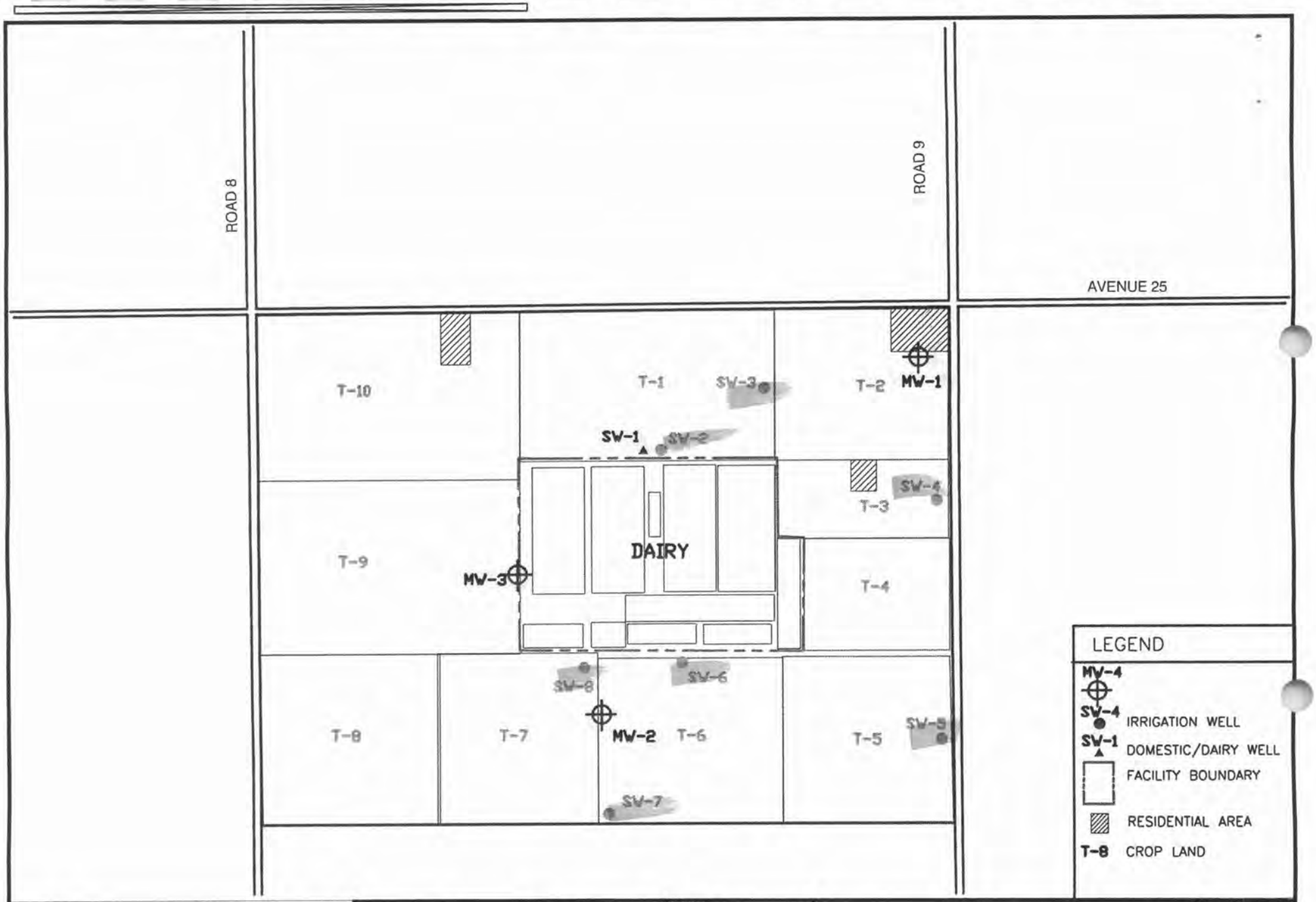
Suite 180
Fresno, California 93720
Tel. (559) 256-1444

DRAWN	CvK
APPR	RTB
DATE	06-15-2005
JOB NO.	18715077

SUPPLY WELL SURVEY
TROOST DAIRY
NEAR CHOWCHILLA, MADERA COUNTY, CA

FIGURE NO. 3



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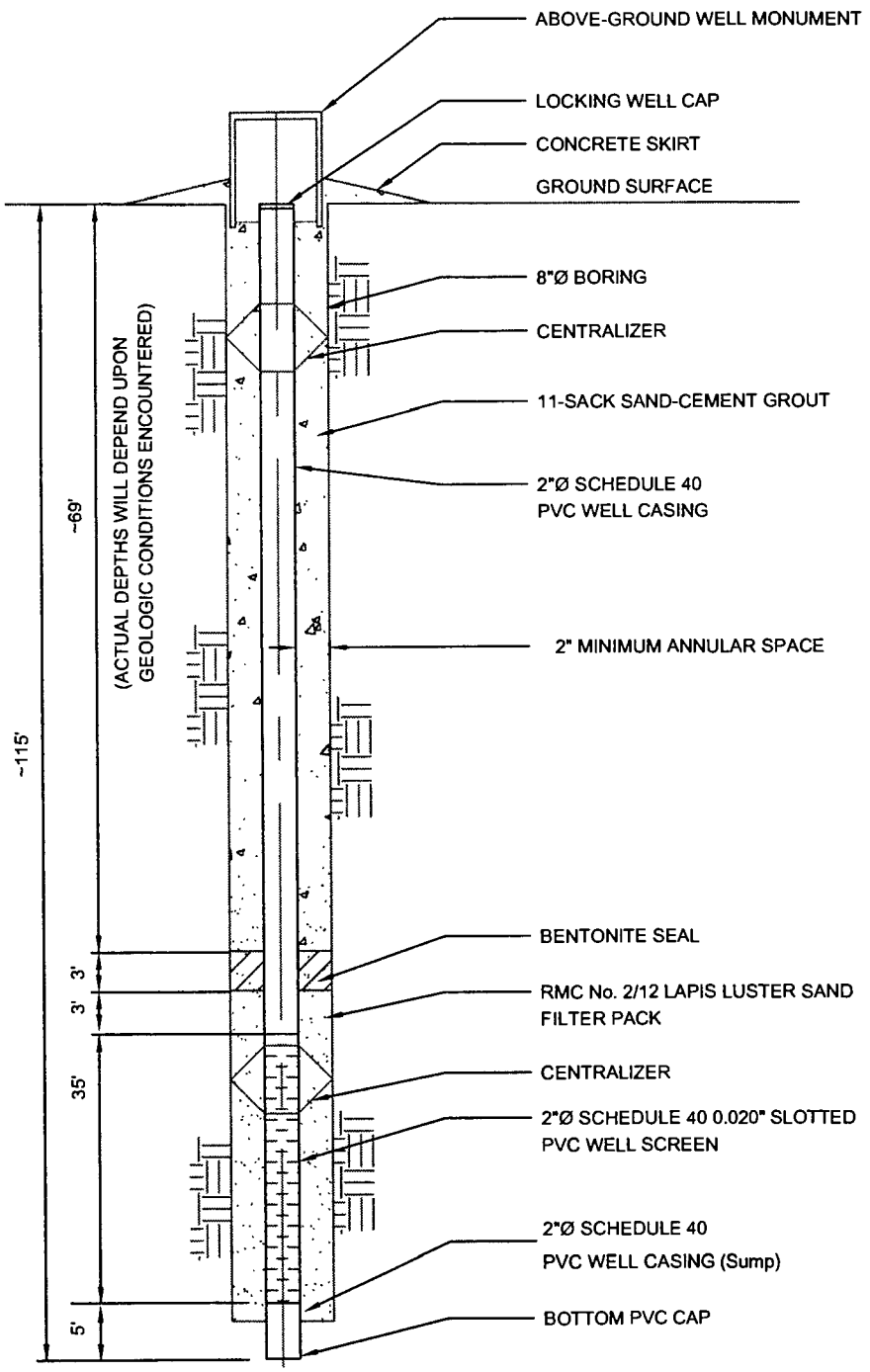
0 500 1000
(FEET)

URS
30 River Park Place West,
Suite 180
Fresno, California 93720
Tel. (559) 256-1444

DRAWN	CvK
APPR	RTB
DATE	06-14-2005
JOB NO.	18715077

MONITORING WELL LOCATION MAP
TROOST DAIRY
NEAR CHOWCHILLA, MADERA COUNTY, CA

FIGURE NO. 4



Note:
Refer to accompanying workplan for further descriptions of monitoring well construction and installation procedures

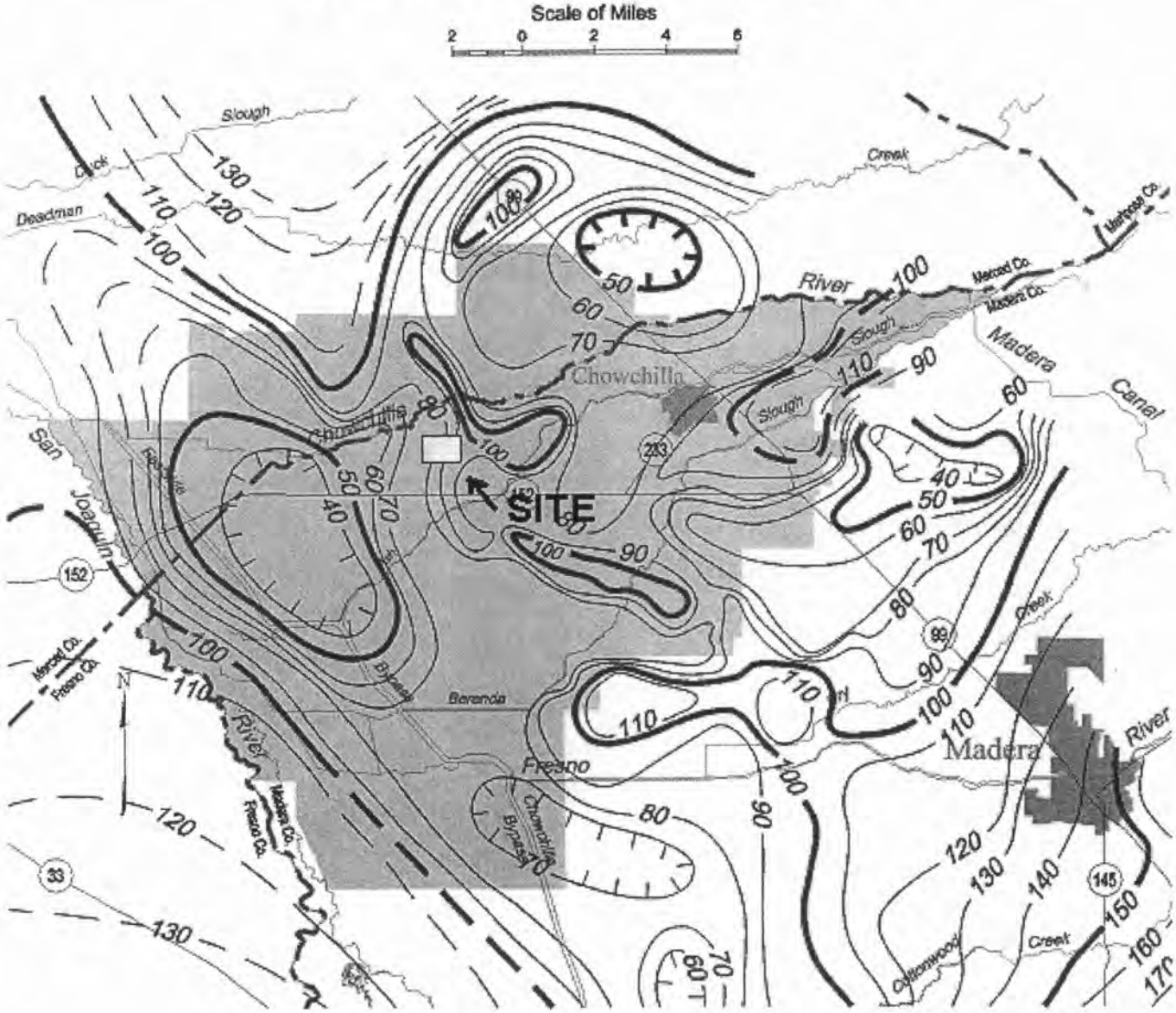
URS 30 River Park Place West, Suite 180 Fresno, California 93720 Tel. (559) 256-1444	DRAWN BLS APPR CvK DATE 6/14/05 JOB NO. 18715077	TYPICAL CONSTRUCTION DETAIL PROPOSED MONITORING WELLS TROOST DAIRY NEAR CHOWCHILLA, MADERA COUNTY, CA	FIGURE NO. 5

APPENDIX A

Groundwater Elevation Data

Chowchilla Groundwater Basin

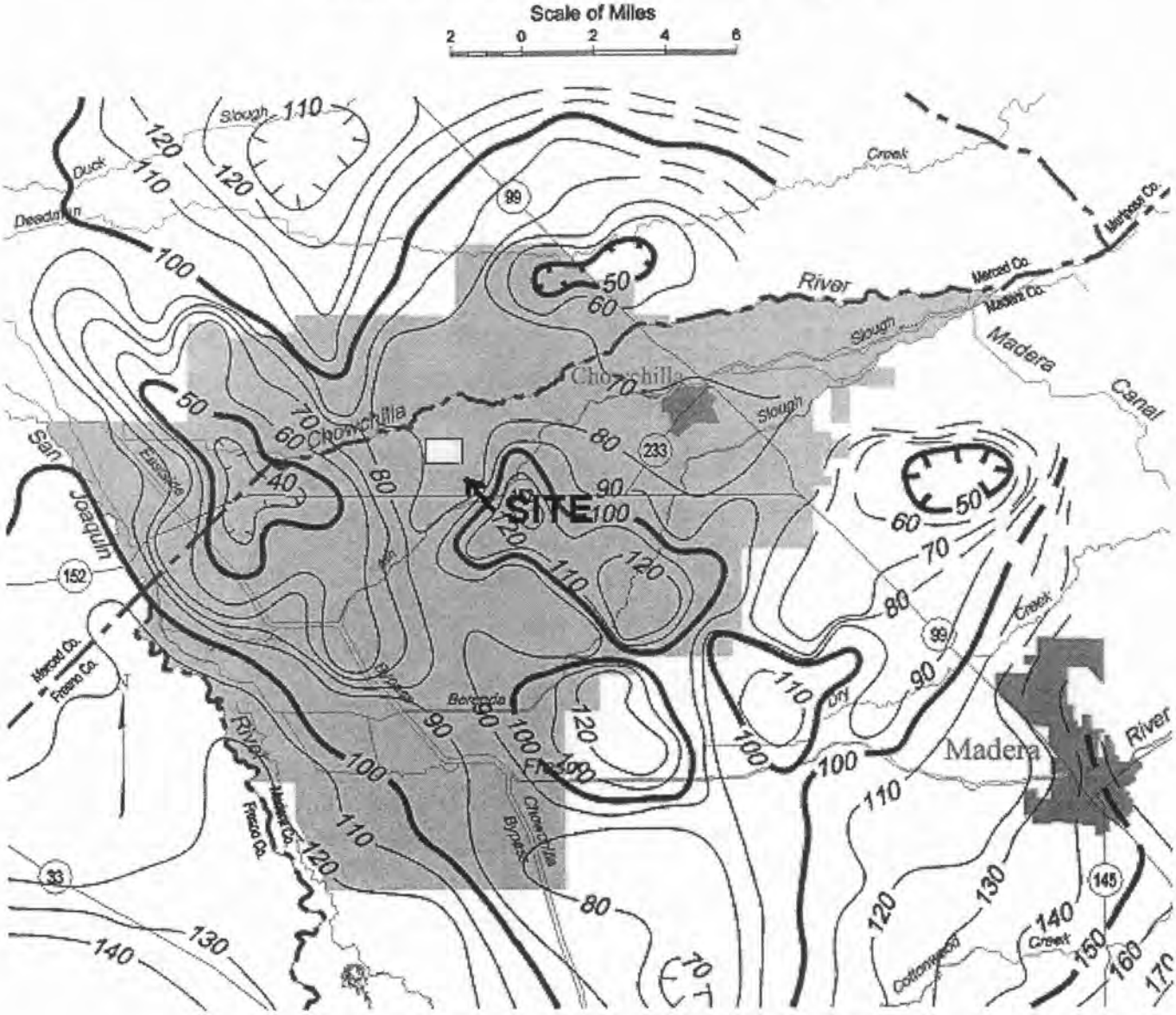
Spring 2002, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer



Contours are dashed where inferred. Contour interval is 10 feet.

Chowchilla Groundwater Basin

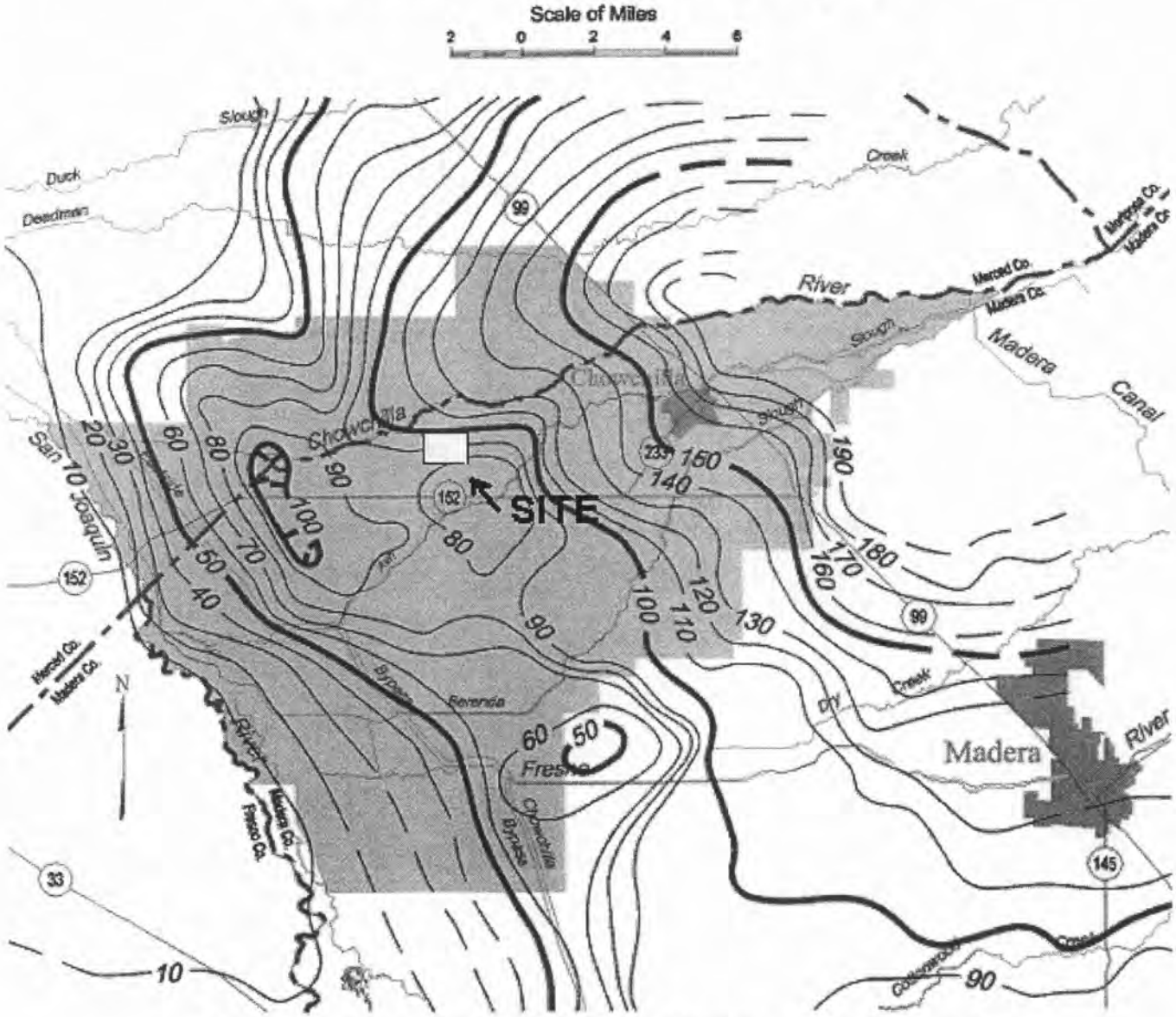
Spring 2001, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer



Contours are dashed where inferred. Contour interval is 10 feet.

Chowchilla Groundwater Basin

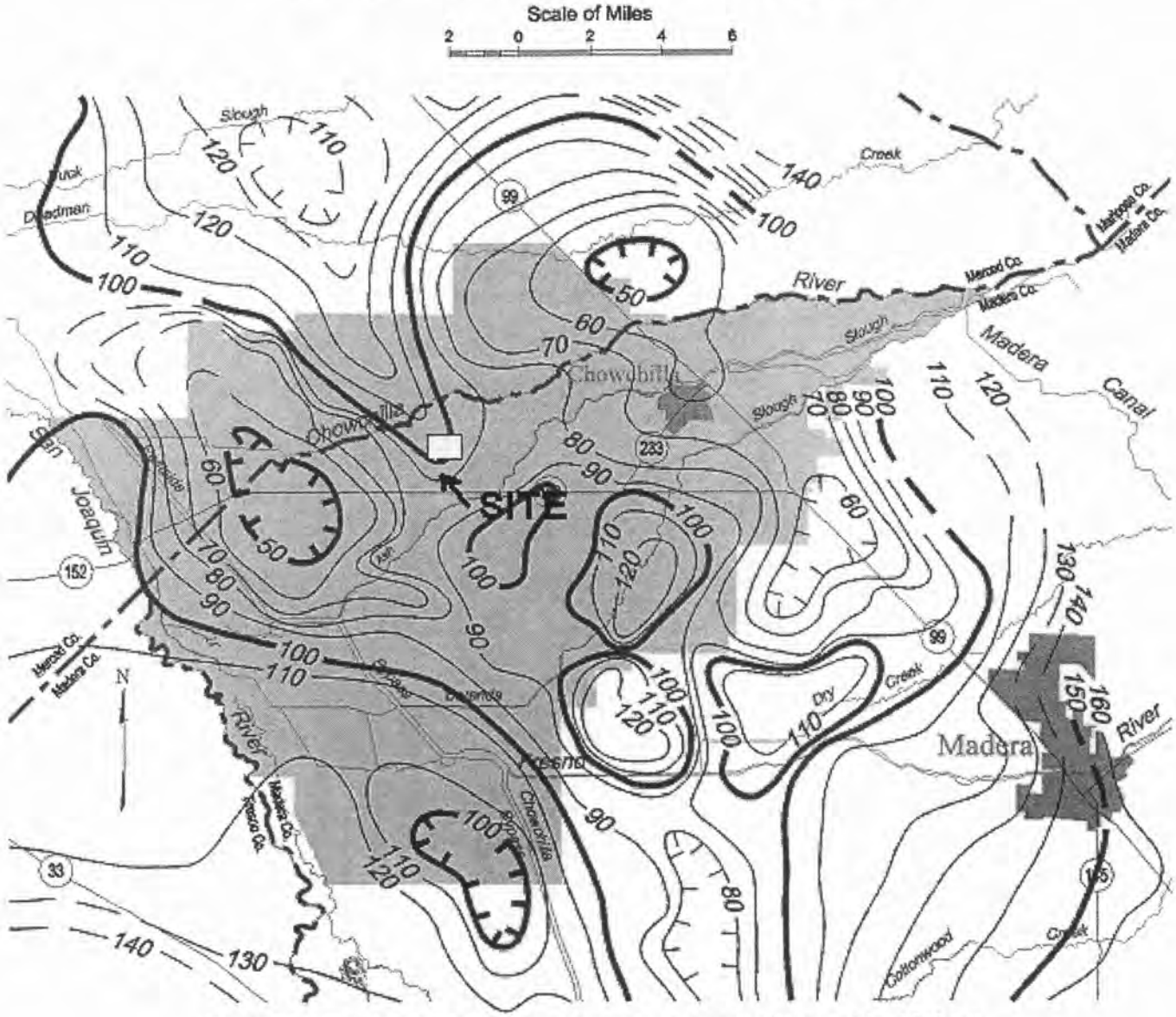
Spring 2000, Lines of Equal Depth to Water in Wells, Unconfined Aquifer



Contours are dashed where inferred. Contour interval is 10 feet.

Chowchilla Groundwater Basin

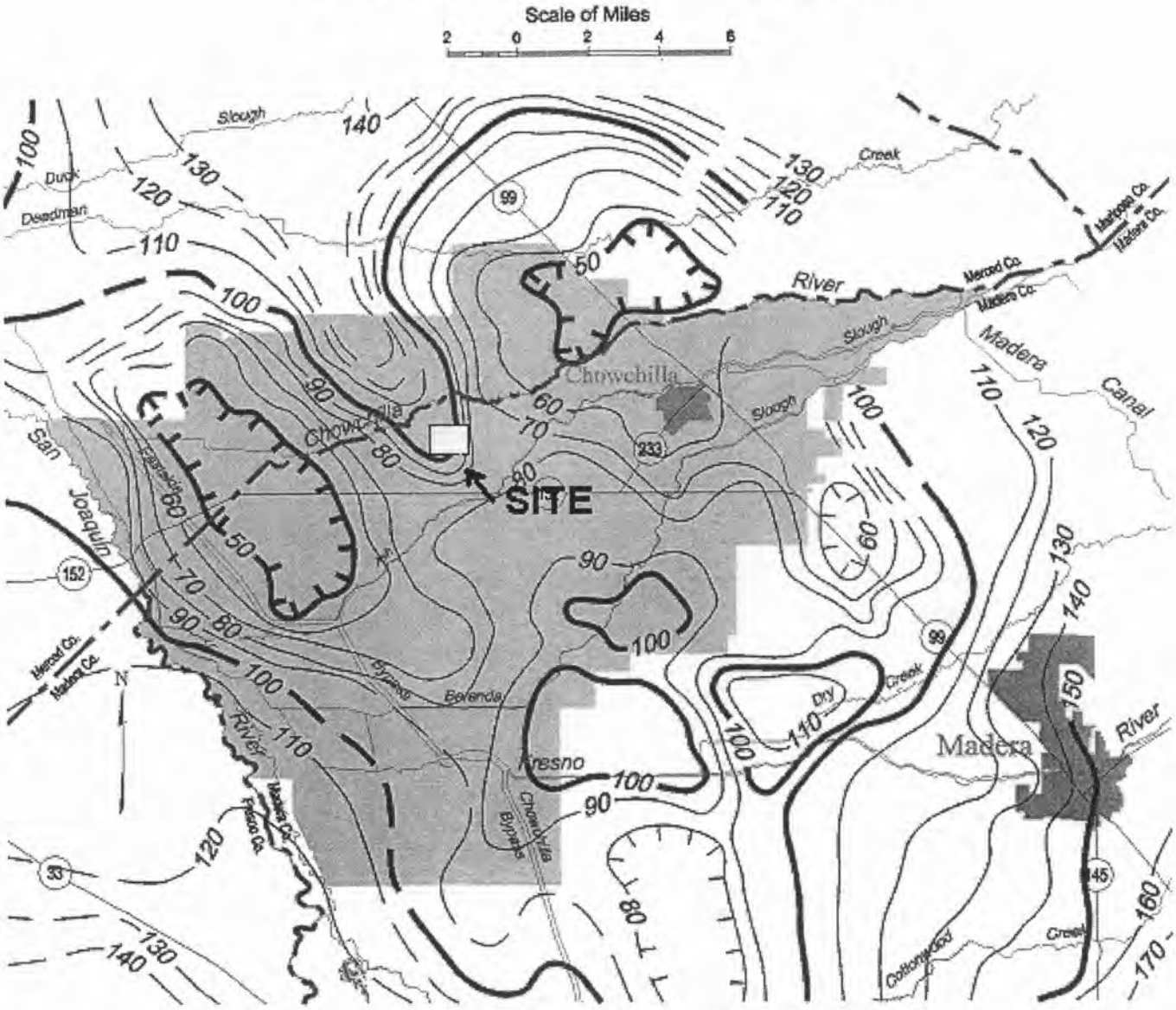
Spring 1999, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer



Contours are dashed where inferred. Contour interval is 10 feet.

Chowchilla Groundwater Basin

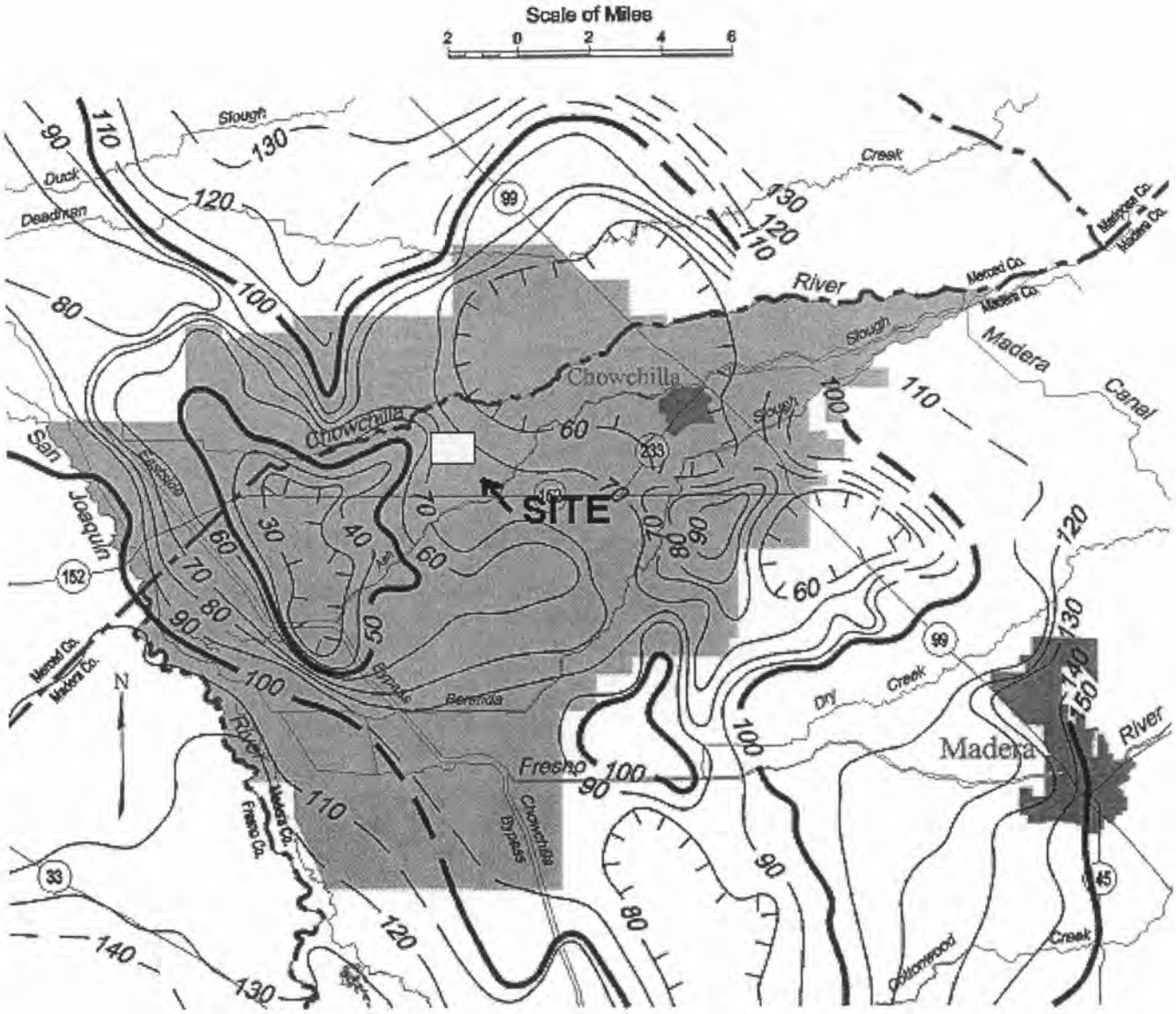
Spring 1998, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer



Contours are dashed where inferred. Contour interval is 10 feet.

Chowchilla Groundwater Basin

Spring 1997, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer

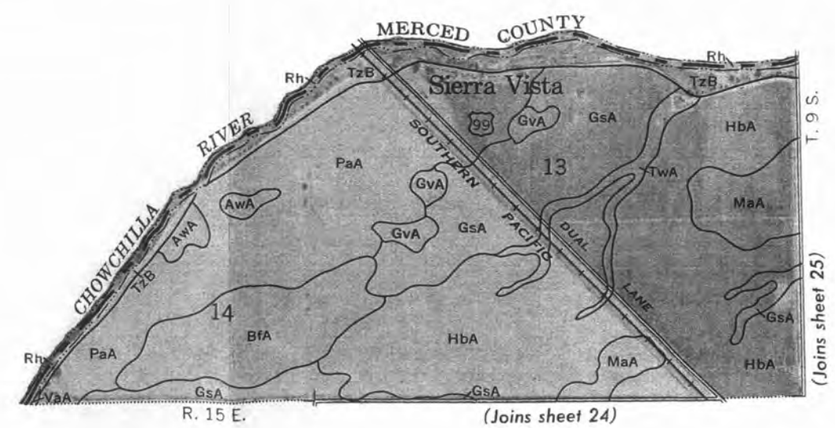


Contours are dashed where inferred. Contour interval is 10 feet.

APPENDIX B

Soil Data

Appendix B:
Soil Survey Madera Area
USDA, 1951



0 ½ 1 Mile Scale 1:20 000 0 5000 Feet

APPENDIX C

Well Drillers Logs

SW-1

ORIGINAL
File with DWR

Page 1 of 2

STATE OF CALIFORNIA WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. 768788

DWR USE ONLY — DO NOT FILL IN: 0 9S/19E-36 (18)
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. #1-2002
Date Work Began 7/24/02, Ended 8/2/02
Local Permit Agency MADERA COUNTY
Permit No. 270286 Permit Date 6/14/02

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)
DRILLING METHOD REVERSE FLUID

DEPTH FROM SURFACE Ft. to Ft.	DESCRIPTION Describe material, grain, size, color, etc.
0 – 12	CLAY
12 – 20	SAND
20 – 110	SANDY CLAY
110 – 118	CLAY
118 – 125	SAND
125 – 135	CLAY TAN
135 – 150	CLAY BLUE MEDIUM TEXTURE
150 – 158	CLAY TAN SANDY TEXTURE
158 – 165	SAND
165 – 172	CLAY SANDY TEXTURE
172 – 176	SAND W/CLAY STRINGERS
176 – 194	CLAY BROWN SANDY TEXTURE
194 – 199	SAND
199 – 203	CLAY BROWN SANDY TEXTURE
203 – 207	SAND
207 – 216	GRAVEL
216 – 243	CLAY BROWN MEDIUM TEXTURE
243 – 247	SAND
247 – 252	SAND W/ CLAY STRINGERS
252 – 290	CLAY BROWN SANDY TEXTURE
290 – 294	SAND W/ STRINGERS CLAY
294 – 312	CLAY BROWN
312 – 315	SAND W/ CLAY
315 – 352	BROWN CLAY
352 – 357	COARSE SAND
357 – 382	BROWN CLAY
382 – 397	MEDIUM SAND W/STRINGERS CLAY
397 – 416	BLUE CLAY
416 – 419	MEDIUM SAND
419 – 441	BLUE CLAY SANDY

TOTAL DEPTH OF BORING 840 (Feet)
TOTAL DEPTH OF COMPLETED WELL 800 (Feet)

WELL OWNER

Name JOHN TROOST DAIRY
Mailing Address 24888 RD 9
CHOWCHILLA CA 93610
CITY STATE ZIP

WELL LOCATION

Address AVE 24 AND RD 9
City CHOWCHILLA CA
County MADERA
APN Book 025 Page 100 Parcel 021
Township — Range — Section —
Latitude — DEG. MIN. SEC. — DEG. MIN. SEC.

LOCATION SKETCH

NORTH
WEST EAST
SOUTH

Hwy 152 Rd 9 Ave 24 Hwy 1/2 mile

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
— Deepen
— Other (Specify)
— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
✓ Domestic — Public
— Irrigation — Industrial
MONITORING —
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) ✓ DAIRY

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER — (Ft.) BELOW SURFACE 1
DEPTH OF STATIC WATER LEVEL — (Ft.) & DATE MEASURED
ESTIMATED YIELD * — (GPM) & TEST TYPE
TEST LENGTH — (Hrs.) TOTAL DRAWDOWN — (Ft.)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft. to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0 – 110	44"			✓		STEEL	34"	3/8"	
0 – 320	28"	✓				STEEL	16"	5/16"	
320 – 800	28"		✓			STEEL	16"	5/16'	.060

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft. to Ft.	TYPE: CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0 – 110	✓			6 SACK
0 – 840			✓	1/4 X 1/8"

ATTACHMENTS (✓)
— Geologic Log
✓ Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME MYERS BROS. WELL DRILLING, INC.
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
8650 E. LACEY BLVD. HANFORD CA 93230-4844
ADDRESS CITY STATE ZIP
Signed [signature] 08/06/02
WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED
548214
C-57 LICENSE NUMBER

DWR 188 REV. 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

ORIGINAL
File with DWR

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. 768788

DWR USE ONLY — DO NOT FILL IN
0951/146-316
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. #1-2002
Date Work Began 7/24/02, Ended 8/2/02
Local Permit Agency MADERA COUNTY
Permit No. 270266 Permit Date 6/14/02

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE ___ (SPECIFY)
DRILLING METHOD REVERSE FLUID

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION Describe material, grain, size, color, etc.
441	458	CLAY BLUE SOFT
458	461	SAND
461	546	CLAY BLUE SOFT/SANDY
546	549	SAND
549	573	CLAY BLUE/SANDY
573	579	SAND
579	598	CLAY BLUE/HARD
598	600	GRAVEL
600	605	CLAY SANDY
605	610	CLAY W/SANDY STRINGERS
610	619	CLAY / HARD
619	623	SAND
623	654	CLAY
654	657	SAND
657	668	BLUE CLAY
668	671	MEDIUM SAND
671	687	BLUE CLAY
687	693	SAND W/BLUE CLAY
693	715	BLUE CLAY
715	720	SAND GRAVEL
720	728	BLUE CLAY
728	732	MEDIUM SAND
732	750	BLUE CLAY
750	752	SAND
752	769	BLUE CLAY
769	771	MEDIUM SAND
771	840	BLUE CLAY

TOTAL DEPTH OF BORING 840 (Feet)
TOTAL DEPTH OF COMPLETED WELL 800 (Feet)

WELL OWNER
Name JOHN TROOST DAIRY
Mailing Address 24868 RD 9
CHOWCHILLA (CITY) CA (STATE) 93610 (ZIP)

WELL LOCATION
Address AVE. 24 AND RD 9
City CHOWCHILLA CA
County MADERA
APN Book 025 Page 100 Parcel 021
Township ___ Range ___ Section ___
Latitude ___ DEG. MIN. SEC.

LOCATION SKETCH
NORTH
WEST EAST
SOUTH
Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)
✓ NEW WELL
MODIFICATION/REPAIR
— Deepen
— Other (Specify)
— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
✓ Domestic — Public
— Irrigation — Industrial
MONITORING —
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) ✓ DAIRY

WATER LEVEL & YIELD OF COMPLETED WELL
DEPTH TO FIRST WATER ___ (Ft.) BELOW SURFACE 1
DEPTH OF STATIC WATER LEVEL ___ (Ft.) & DATE MEASURED ___
ESTIMATED YIELD * ___ (GPM) & TEST TYPE ___
TEST LENGTH ___ (Hrs.) TOTAL DRAWDOWN ___ (Ft.)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	110	44"			✓		STEEL	34"	3/8"	
0	320	28"	✓				STEEL	16"	5/16"	
320	800	28"		✓			STEEL	16"	5/16"	.080

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BEN-TONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	110				6 SACK
0	840			✓	1/4 X 1/8"

ATTACHMENTS (✓)
— Geologic Log
✓ Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other ___
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT
I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME MYERS BROS. WELL DRILLING, INC.
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
ADDRESS 8850 E. LACEY BLVD. HANFORD (CITY) CA (STATE) 93230-4844 (ZIP)
Signed [signature] WELL DRILLER/AUTHORIZED REPRESENTATIVE
08/05/02 DATE SIGNED
548214 C-57 LICENSE NUMBER

DWR 188 REV. 11-97
IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

SW-2

ORIGINAL
File with DWR

Page 1 of 2

Owner's Well No.

Date Work Began 4/12/94 Ended 6/6/94

Local Permit Agency Madera County

Permit No. 54898 Permit Date 4/11/94

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. 458054

DWR USE ONLY — DO NOT FILL IN

STATE WELL NO./STATION NO.

LATITUDE LONGITUDE

APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) X VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)

DEPTH TO FIRST WATER ___ (Ft.) BELOW SURFACE

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0	2	Topsoil
2	48	Sandy brown clay
48	57	Brown sand & gravel
57	94	Soft brown clay
94	101	Brown shale
101	170	Tough brown clay
170	201	Very sandy brown clay
201	205	Brown sand & gravel
205	221	Very tough brown clay
221	224	Medium brown sand
224	303	Very tough brown clay
303	308	Coarse brown sand & gravel
308	389	Tough brown clay
389	401	Layers brown sand & clay
401	444	Tough blue clay
444	468	Sandy brown clay
468	476	Brown sand & gravel
476	494	Very tough blue clay
494	497	Blue sand & gravel
497	608	Tough blue clay
608	610	Fine blue sand
610	651	Tough blue clay
651	657	Blue shale
657	754	Very tough blue clay
754	758	Medium blue sand
758	780	Sticky blue clay
780	784	Medium blue sand
784	796	Sandy blue clay
796	804	Blue sand & gravel
804	816	Sandy blue clay

TOTAL DEPTH OF BORING 972 (Feet)

TOTAL DEPTH OF COMPLETED WELL ___ (Feet)

WELL OWNER

Name Troost Dairy

Mailing Address 24868 Rd. 9

Chowchilla, CA 93610

CITY STATE ZIP

WELL LOCATION

Address 24868 Rd. 9

City Chowchilla, Ca 93610

County Madera

APN Book ___ Page ___ Parcel 025-100-021

Township 9S Range 14E Section 36

Latitude DEG. MIN. SEC. NORTH Longitude DEG. MIN. SEC. WEST

LOCATION SKETCH

NORTH

WEST EAST

Rd 9

SOUTH

Illustrate or Describe Distance of Well from Landmarks such as Roads, Buildings, Fences, Rivers, etc. PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

X NEW WELL

MODIFICATION/REPAIR

___ Deepen

___ Other (Specify)

___ DESTROY (Describe Procedure and Materials Under "GEOLOGIC LOG")

PLANNED USE(S) (✓)

___ MONITORING

WATER SUPPLY

___ Domestic

___ Public

___ Irrigation

X Industrial

___ "TEST WELL"

___ CATHODIC PROTECTION

___ OTHER (Specify)

DRILLING METHOD Cable tool FLUID

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH OF STATIC WATER LEVEL ___ (Ft.) & DATE MEASURED

ESTIMATED YIELD* ___ (GPM) & TEST TYPE

TEST LENGTH ___ (Hrs.) TOTAL DRAWDOWN ___ (Ft.)

* *May not be representative of a well's long-term yield.*

CASING(S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	GRAVEL PACK	FILL PIPE	MATERIAL/GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	60	18	X		X		Steel	18	10	
0	844	14	X				Steel	14	8	
844	972	12					Open hole			

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE: CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)

ATTACHMENTS (✓)

___ Geologic Log

___ Well Construction Diagram

___ Geophysical Log(s)

___ Soil/Water Chemical Analyses

___ Other

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME C. E. Cates Well Drilling
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

ADDRESS P. O. Box 427 CITY Chowchilla STATE CA ZIP 93610

Signed [signature] DATE SIGNED 6-7-94 C-57 LICENSE NUMBER 324643
WELL DRILLER/AUTHORIZED REPRESENTATIVE

DWR 188 REV. 7-80

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

ORIGINAL
File with DWR

Page 2 of 2

Owner's Well No. _____

Date Work Began _____ Ended _____

Local Permit Agency _____

Permit No. _____ Permit Date _____

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. 458055

DWR USE ONLY — DO NOT FILL IN

STATE WELL NO./STATION NO.

LATITUDE LONGITUDE

TRS/TRE/OTHER

GEOLOGIC LOG

ORIENTATION (✓) ___ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)

DEPTH TO FIRST WATER ___ ___ (Ft.) BELOW SURFACE

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
816	822	Blue sand & gravel
822	844	Dark blue clay
844	920	Dark blue shale /with black sand layers
920	943	Black sand & rocks
943	972	Black shale/with layers black sand & gravel

Below casing

TOTAL DEPTH OF BORING 972 (Feet)

TOTAL DEPTH OF COMPLETED WELL _____ (Feet)

WELL OWNER

Name TRUST

Mailing Address _____

CITY STATE ZIP

WELL LOCATION

Address _____

City _____

County _____

APN Book _____ Page _____ Parcel _____

or Township _____ Range _____ Section _____

Latitude DEG. MIN. SEC. NORTH Longitude DEG. MIN. SEC. WEST

LOCATION SKETCH

NORTH

WEST EAST

SOUTH

Illustrate or Describe Distance of Well from Landmarks such as Roads, Buildings, Fences, Rivers, etc.
PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

___ NEW WELL

MODIFICATION/REPAIR

___ Deepen

___ Other (Specify)

___ DESTROY (Describe Procedure and Material Under "GEOLOGIC LOG")

PLANNED USE(S) (✓)

___ MONITORING

WATER SUPPLY

___ Domestic

___ Public

___ Irrigation

___ Industrial

___ "TEST WELL"

___ CATHODIC PROTECTION

___ OTHER (Specify)

DRILLING METHOD _____ FLUID _____

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH OF STATIC WATER LEVEL _____ (Ft.) & DATE MEASURED _____

ESTIMATED YIELD* _____ (GPM) & TEST TYPE _____

TEST LENGTH _____ (Hrs.) TOTAL DRAWDOWN _____ (Ft.)

* May not be representative of a well's long-term yield.

CASING(S)

DEPTH FROM SURFACE Ft. to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL/ GRADE	INTERNAL DIAMETER (Inches)	GAUGE OF WALL THICKNESS	SLOT SIZE IF ANY (Inches)

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft. to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)

ATTACHMENTS (✓)

___ Geologic Log

___ Well Construction Diagram

___ Geophysical Log(s)

___ Soil/Water Chemical Analysis

___ Other _____

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME C. E. Cates Well Drilling
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

ADDRESS P. O. Box 427 CITY Chowchilla, CA STATE 93610 ZIP

Signed [signature] DATE SIGNED 6-7-94

WELL DRILLER/AUTHORIZED REPRESENTATIVE

324643
C-57 LICENSE NUMBER

DWR 188 REV. 7-90

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

SW-3

GEO-HYDRO-DATA

ELECTRIC WELL LOG

COMPANY M. MEDERS
WELL TEST HOLE NO. 1
FIELD CHOWCHILLA
COUNTY MADERA STATE CALIF.

COMPANY M. MEDERS

WELL TEST HOLE NO. 1

FIELD CHOWCHILLA

COUNTY MADERA STATE CALIFORNIA

LOCATION

Sec. _____ Twp. _____ Rge. _____

TYPE LOG

SP
PR
6' LATERAL

Permanent Datum GROUND LEVEL Elev. _____

Log Measured From GROUND LEVEL 0 Ft. Above Perm. Datum

Drilling Measured From GROUND LEVEL

Elev.: K. B. _____
D. F. _____
G. L. _____

Date	JAN. 21, 1978		
Run No.	ONE		
Depth — Driller	683 ft.	ft.	ft.
Depth — GHD	682 ft.	ft.	ft.
Btm. Log Inter.	682 ft.	ft.	ft.
Top Log Inter.	14 ft.	ft.	ft.
Casing — Driller	in. @ ft.	in. @ ft.	in. @ ft.
Casing — GHD	ft.	ft.	ft.
Bit Size	12 ¼ in. to 683 ft.	in. to ft.	in. to ft.
Bit Size	in. to ft.	in. to ft.	in. to ft.
Bit Size	in. to ft.	in. to ft.	in. to ft.
Type Fluid in Hole	CLAY-GEL		
Source of Sample	DITCH-VERY POOR SAMPLE		
PPM TDS	300		
Fluid Level	88 ft.	ft.	ft.
Dens. / Visc.			
pH / Fluid Loss	ml	ml	ml
Rm @ Meas. Temp.	@ °F	@ °F	@ °F
Rmf @ Meas. Temp.	@ °F	@ °F	@ °F
Rmc @ Meas. Temp.	@ °F	@ °F	@ °F
Time Since Circ.	15 hr.	hr.	hr.
Logging Speed	25 ft./min.	ft./min.	ft./min.
Tool Type and No.	COMB. 1		
Unit No.	1		
Location	STOCKTON, CALIF.		
Invoice No.	980		
Recorded By	D. SHANHOLTZER	(ASSOCIATE GEOLOGIST)	
Witnessed By	J. DIBLER		
other	M. MEDERS		

2500 So. Chester Ave. Bakersfield, Calif. 93304 (805) 832-4101

DATA LOG

CALIFORNIA

TYPE LOG
SP
PR
6' LATERAL

Elev.: K.B. ____
D.F. ____
G.L. ____

GEOLOGIST)

(805) 832-4101

Fold Here

REMARKS: HIGH POWER LINES IN AREA

DRILL METHOD: STD. ROTARY

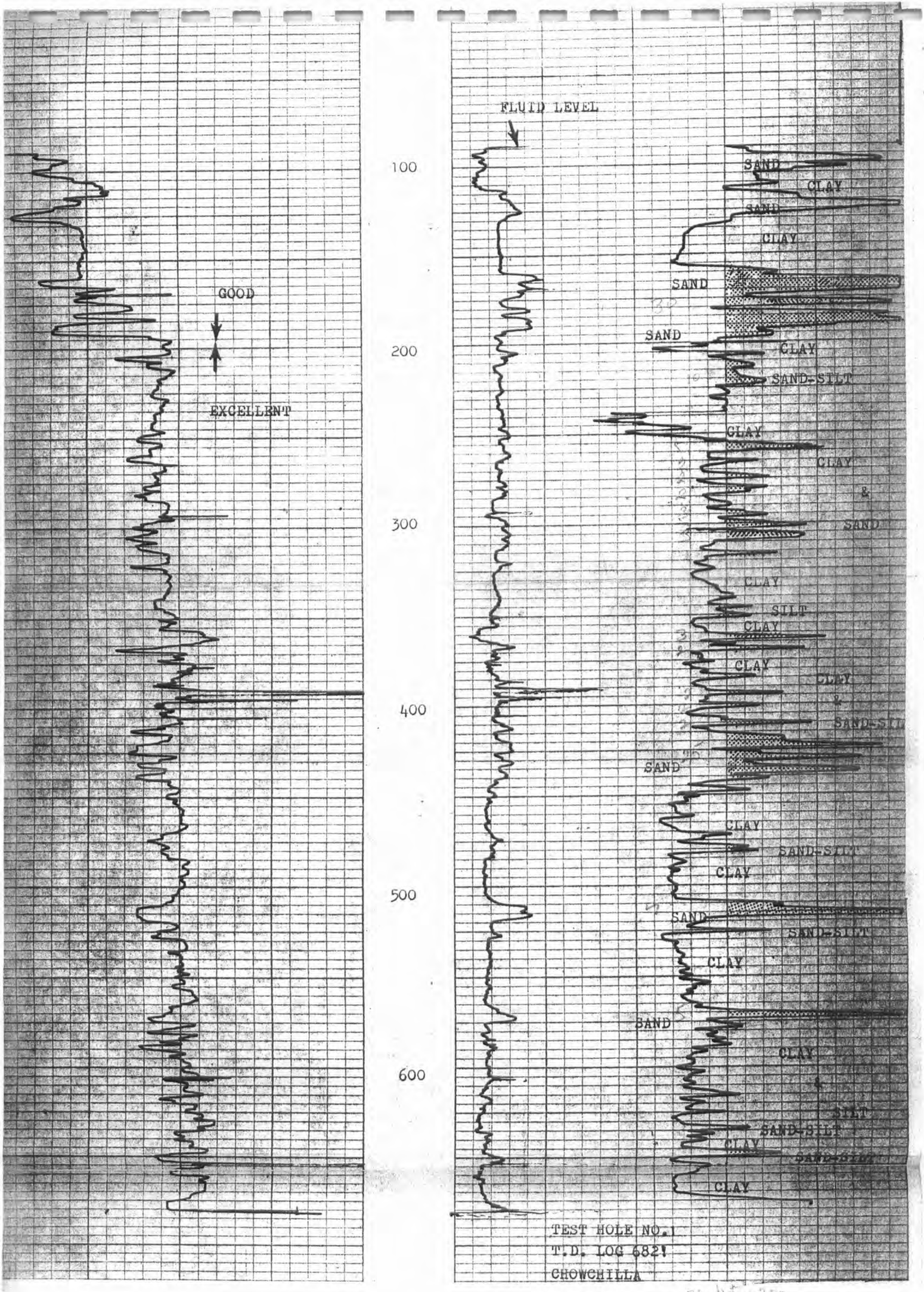
DRILLED BY: ANDERSON PUMP CO., CHOWCHILLA, CALIF.

SCALE CHANGES			
Type Log	Depth	Scale Up Hole	Scale Down Hole

All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretations, and we shall not be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpreations are also subject to Clause 6 of our General Terms and Conditions as set out in our current Price Schedule.

WATER QUALITY	YIELD	FORMATION
ppm TDS EXCELLENT LESS THAN 400 GOOD 400 to 600	SHADING INDICATES AREAS OF PROBABLE YIELD. THE INDICATED YIELD IS USUALLY RELATIVE, BEING GREATER AS SHADING AREA INCREASES.	DESCRIPTION IS GENERAL, NOT GEOLOGIC. SAND INCLUDES GRAVELS. BASED ON ELECTRICAL PROPERTIES INDICATED BY THE LOG. ADDITIONAL DATA IS ALSO CONSIDERED IF AVAILABLE.

	SPON. POTENTIAL — 2 MV +		DEPTH	POINT RESISTIVITY 5 OHM		6' LATERAL 0 10 20 OHM		


FLUID LEVEL
GOOD
EXCELLENT
100
200
300
400
500
600
SAND
CLAY
SAND
CLAY
SAND
SAND
CLAY
SAND-SILT
CLAY
CLAY
&
SAND
CLAY
SILT
CLAY
CLAY
CLAY
&
SAND-SILT
SAND
CLAY
SAND-SILT
CLAY
SAND
SAND-SILT
CLAY
SAND
CLAY
&
SILT
SAND-SILT
CLAY
SAND-SILT
CLAY
TEST HOLE NO. 1
T.D. LOG 682!
CHOWCHILLA

74 below 200

SW-4

W-4

Old - 14-inch 160 feet deep - Deepened 2/63 (see drillers-Report)

12-inch #10 gauge casing landed 403, used 404',
cased to bottom, cemented.
Depth 403'

Sandy Clay	160-176	
Pack Sand	176-180	- 4
Red Clay	180-192	
Pack Sand	192-202	— 10
Cube Clay	202-228	—
Red Clay	228-264	
Red Sandy Clay	264-292	
Red Clay	292-300	
Sand (Coarse)	300-306	— 6
Red Clay	306-330	
Red Sandy Clay(Soft)	330-334	
Red Clay	334-350	
Red Sandy Clay(Soft	350-352	
Red Clay	352-360	
Red Sandy Clay	360-368	
Sandy Clay	368-388	
Sand	388-393	- 5
Cube Clay	393-403	

PERFORATIONS:

130-212	82'
290-316	26
325-362	37
378-398	20
	165 feet of perforations.

WELL South of House Hwy 9-
NAME Pikie Gaumnitz DATE 2-4-63
Address
Pump
H. P.
Motor
Gal. Per Min. 1400 at 88 1050 at 85
Water Level Standing 780 at 83.5
Water Level Below Ground 5 Ft. To 76 Ft.
Head Above Ground
Total Lift Water To Water 100 GPM per ft.
Meter H. P.
Yeild Gal. Per Ft. Draw Down
Overall Efficiency Development test: 2/63

DD

WELL LOG -- Carl Gaumnitz 4/29/47 - Original Well

¼ mile North of Harold Rogers

14" 12 gage casing landed at 108'

Quick sand	60 - 64'
Sand	64 - 67'
Sandy Clay	67 - 88'
Quick Sand & Dirty sand	88 - 106'
Shale	106 - 118'
Dirty Sand	118 - 120'
Sandy Clay	120 - 135'
Cube Clay	135 - 162'
Sand	162 - 170'

12/27/62 - well blowing - $40.00
1/63 - 1513.37 casing cost
2/1/63 - well development $300.00

SW-5

~~#7~~

Log of well

Dirty Sand	42 - 44
Sandy Clay	44 - 54
Sand	54 - 56
Sandy Clay	56 - 67
Dirty Sand	67 - 70
Sandy Clay	70 - 91
Hard	91 -95
Pack Sand	95 - 96
Sandy Clay	98 - 105
Dry Quick Sand	105 - 106
Sandy Clay	106 - 108
Shale	108 -118
Blue Pack Sand	118 - 121
Shale	121 - 123
Sandy Clay	123 - 125
Blue Sand	125 - 127
Sandy Clay	127 - 134
Clay	134 - 144
Blue Cube Clay	144 - 157
Cube Clay	157 - 166

Sand at bottom 166 ft.
Landed casing 94 ft. used 96 ft.

N.E Well - Bk 36 - ([redacted]) 4206

Fairmead, Calif., November 6, 1940

Mr. Carl Gaumitz

Chowchilla, California

To **G. H. RITCHEY & SON** Dr.
WELL DRILLERS

ALL WORK GUARANTEED

October 31, 1940				
166 ft. 14 inch well	double 14" 14 ga - 18' Starter			$174 00
(over)	bal Single 14" - 14 ga			

1-6

QUADRUPLICATE
RETAIN THIS COPY

5

WATER WELL DRILLERS REPORT
(Sections 7076, 7077, 7078, Water Code)

STATE OF CALIFORNIA

Do Not Fill In
№ 49944
State Well No.
Other Well No.

(1) OWNER:
Name Michael Gourrity
Address 24868 Road 9
Chowchilla, California

(2) LOCATION OF WELL:
County Madera Owner's number, if any—
R. F. D. & Street No. or Route No. between Avenue 24 and Avenue 25 on Road 9, 2000 feet west of Road 9

(3) TYPE OF WORK (*check*):
New well ☒ Deepening ☐ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 11.

(4) PROPOSED USE (*check*):
Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☒ Test Well ☐ Other ☐

(5) EQUIPMENT:
Rotary ☐
Cable ☒
Dug Well ☐

(6) CASING INSTALLED:
SINGLE ☒ DOUBLE ☐

From	ft. to	ft.	Diam.	Gage or Wall
0	450	24	8	

If gravel packed

Diameter of Bore	from ft.	to ft.

Type and size of shoe or well ring 10x3/4 Perforated
Describe joint Butt Weld
Size of gravel:

(7) PERFORATIONS:
Type of perforator used Mills
Size of perforations 2/0 in., length, by 22 in.

From	ft. to	ft.	Perf. per row	Rows per ft.
125	240		22	
263	284		22	
293	312		22	
355	450		22	

(8) CONSTRUCTION:
Was a surface sanitary seal provided? ☐ Yes ☒ No To what depth ft.
Were any strata sealed against pollution? ☐ Yes ☒ No If yes, note depth of strata

From	ft. to	ft.

Method of Sealing Cased To Bottom, Cemented

(9) WATER LEVELS:
Depth at which water was first found 75' ft.
Standing level before perforating Same ft.
Standing level after perforating Same ft.

(10) WELL TESTS:
Was a pump test made? ☐ Yes ☐ No If yes, by whom? Anderson Pump Co.
Yield: 1057 gal./min. with 24 ft. draw down after 2 hrs.
Temperature of water Was a chemical analysis made? ☐ Yes ☐ No
Was electric log made of well? ☐ Yes ☐ No N 789 / 1 DD

(11) WELL LOG:
Total depth 456 ft. Depth of completed well 454 ft.
Formation: *Describe by color, character, size of material, and structure.*

ft. to	ft.	
1	4	Clay
4	20	Sand
20	24	Sandy Clay
24	30	Sand
30	60	Sandy Clay
60	82	Sand
82	110	Sandy Clay
110	130	Fine Blue Sand & Hard Clay
130	150	Cube Clay
150	168	Blue Cube Clay
168-172	172	Mix Cube Clay
172	176	Sand
176	192	Cube Clay
192	200	Red Sandy Clay
200	204	Sand
204	272	Red Sandy Clay
272	276	Sandy Sandy Clay
276	293	Sandy Clay
293	296	Pack Sand
296	300	Sandy Clay
300	302	Pack Sand
302	365	Sandy Clay
365	388	Sand
388	396	Sandy Clay
396	402	Pack Sand
402	403	Sandy Clay
403	407	Sand
407	414	Sandy Clay
414	417	Sand
417	420	Sandy Clay
420	436	Green Cube Clay
436	446	Sand
446	454	Sandy Clay
454	456	Green Cube Clay

Work started 2/27 62, 19 Completed 3-20- 62, 19

WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Mitchell Brothers Well Drilling
(Person, firm or corporation) (Typed or printed)
Address 300 Riverside
Chowchilla, California

[SIGNED] Well Driller
License No. 16888 Dated 3-27-62, 19

55655 3-54 80M QUIN ⓟ SPO DWR FORM NO. 246 (REV. 3-54)

[SW-7]

Well #2
Depth of Well 233 ft
Casing 152

1-27 ft Surface Dirt
27-36 " Hard Pan
First water 64 ft.
36-84 Dobie

84-116 Soft Clay
116-144 Dobie
144-187 Clay casing at 152 ft.

187-224 Shale
224-233 Blue Clay
233- Sand

on the canal - at low lift Pump
lot 20 Sec 36 - 9-14
Micky #15

(Plt. chart notes 1948-1949)

#15 Sec. 31-9-14. Micky Canal - Blanton says 233 - Casing 152' Pump and Wells - 191' Sand Stratas 191' Perforated 148' to 120' by Muril.

SW-8

SW-8

Log of Well

Dirty Sand ----------	49 - 57
Sandy Clay ----------	57 - 83
Sand ----------	83 - 90
Sandy Clay ----------	90 - 92
Dirty Sand----------	92 - 94
Sandy Clay ----------	94 - 95
Shale ----------	95 - 101
Sandy Clay -----------	101 - 107
Quick Sand ---------	107 - 113
Shale ----------	113 - 127
Sandy Clay ---------	127 - 129
Sand ----------	129 - 133

Sand at bottom
filled to 132 ft.
Landed casing 113½ used 114 ft.
Water Level 39 ft.

West Well - Beh 86 - College 80
(798 ?)

Fairmead, Calif., November 6, 1940

Mr. Carl Gaumitz

Chowchilla, California

To **G. H. RITCHEY & SON** Dr.
WELL DRILLERS

ALL WORK GUARANTEED

August 28, 1940 Well north of Tony Rhe			
132 ft. 14 inch well Sing 14" - 14 ga		$132	00
(over)			

APPENDIX D

Construction Details MW-1

Associated Soils Analysis
1141 Batavia Court • Tulare, California 93274
(209) 688-1011 • FAX (209) 688-1195

JOB NO.: 199-91
DATE: 4/18/95
BY: G. Sullivan

BORING NUMBER MW2

DEPTH	% REC.	BLOW COUNTS	PI METER READING	SOIL GROUP		SOIL DESCRIPTION
0				ML	0-3'	Sandy silt: Moderate yellowish brown; moist; medium dense; slightly to moderately plastic silt with sand. No petroleum odor.
				ML	3'-6'	Clayey silt: Moderate yellowish brown; moist; medium dense; moderately cohesive silt and clay. No petroleum odor.
5'				ML	6'-13'	Sandy silt: Moderate yellowish brown; moist; medium dense; slightly to moderately plastic silt with sand. No petroleum odor.
10'						
				SW	13'-20'	Sand: Light yellowish brown; moist; loose to medium dense; very fine to coarse; well graded subangular sand. No petroleum odor.
15'		4 6 8	1			
20'				ML	20'-30'	Silt: Light yellowish brown; moist; medium dense; moderately cohesive; moderately plastic silt with clay binder. No petroleum odor.
25'		3 4 10	1			
30'						

LOCATION: See Monitoring Well Location Map
EQUIPMENT: Ingersoll Rand A2000 drill rig with 8.50 inch O.D. and 4.25 inch I.D. hollow-stem auger and 2.00 inch split spoon sampler.
NOTES: Drilled 95 feet south-southwest of MW1

Associated Soils Analysis
1141 Batavia Court • Tulare, California 93274
(209) 688-1011 • FAX (209) 688-1195

JOB NO.: 199-91
DATE: 4/18/95
BY: G. Sullivan

BORING NUMBER MW2

DEPTH	% REC.	BLOW COUNTS	PI METER READING	SOIL GROUP	SOIL DESCRIPTION
30'				ML	30'-40' Silt: Light yellowish brown; moist; medium dense; slightly cohesive; slightly plastic silt. No petroleum odor.
35'		4 6 9	1		
40'				ML	40'-45' Sandy silt: Light yellowish brown; moist; medium dense; slightly plastic silt with very fine to medium sand. No petroleum odor.
45'		4 5 7	2	ML	45'-50' Silt: Light yellowish brown; moist; medium dense; slighty cohesive; slightly plastic silt. No petroleum odor.
50'				ML	50'-70' Sandy silt: Light yellowish brown; moist; medium dense; slightly cohesive; slightly plastic silt with sand. No petroleum odor.
55'		5 12 18	1		
60'					

LOCATION: See Monitoring Well Location Map
EQUIPMENT: Ingersoll Rand A2000 drill rig with 8.50 inch O.D. and 4.25 inch I.D. hollow-stem auger and 2.00 inch split spoon sampler.
NOTES: Drilled 95 feet south-southwest of MW1

Associated Soils Analysis
1141 Batavia Court • Tulare, California 93274
(209) 688-1011 • FAX (209) 688-1195

JOB NO.: 199-91
DATE: 4/18/95
BY: G. Sullivan

BORING NUMBER MW2

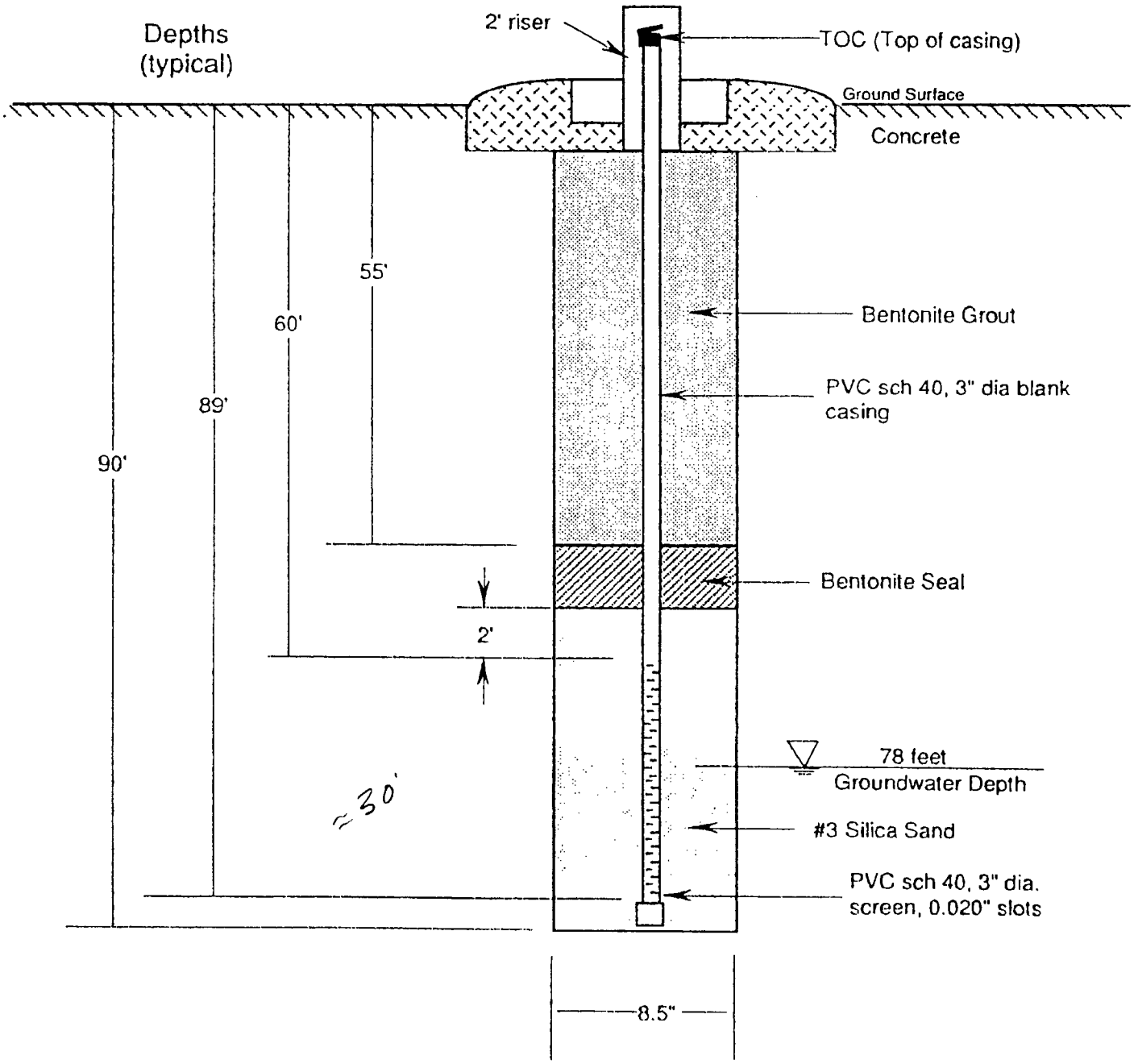
DEPTH	% REC.	BLOW COUNTS	PI METER READING	SOIL GROUP	SOIL DESCRIPTION
60'					
65'		4 9 12	1		
70'				ML	70'-75' Silt: Light yellowish brown; moist; medium dense; slightly cohesive; slightly plastic silt. No petroleum odor.
75'		5 7 9	2	ML	75'-90' Sandy silt: Light yellowish brown; moist; medium dense; slightly cohesive; slightly plastic silt with very fine to fine sand. No petroleum odor. Ground water encountered at approximately 78 feet below surface grade.
80'					
85'					
90'					Boring terminated at 90 feet below surface grade. Converted into a 3-inch diameter ground water monitoring well.

LOCATION: See Monitoring Well Location Map
EQUIPMENT: Ingersoll Rand A2000 drill rig with 8.50 inch O.D. and 4.25 inch I.D. hollow-stem auger and 2.00 inch split spoon sampler.
NOTES: Drilled 95 feet south-southwest of MW1

WELL DETAIL

BORING / WELL NO. MW2
TOP OF CASING ELEV. N/A
GROUND SURFACE ELEV. N/A
DATUM N/A
INSTALLATION DATE 4/18/95

LOCATION See Monitoring Well Location Map
WELL PERMIT NO. Madera County



APPENDIX E

Groundwater Monitoring Well Installation Procedures

APPENDIX E
GROUNDWATER MONITORING WELL INSTALLATION PROCEDURES

Borehole Drilling and Monitoring Well Installation

Monitoring wells will be constructed by a C-57 licensed drilling contractor using conventional hollow-stem auger drilling techniques. During drilling, core samples will be collected from selected depths, evaluated, and retained for preparation of lithologic logs and possible laboratory testing. Well casing and annular materials will be installed inside the augers prior to removal of the augers from the borehole.

Monitoring well casing materials will consist of 2-inch diameter polyvinyl chloride (PVC) casing and screen, generally in 10-foot lengths with threaded connections and a threaded bottom cap. Based on anticipated geologic deposits, the planned slot size for the screened casing is 0.020-inch and the planned filter pack material to be placed in the annular space around the screened interval is No. 3 sand, although the slot size and/or filter pack material may be adjusted depending on actual geologic materials encountered.

The annular space of each well will be filled with No. 3 sand filter pack from the bottom of the borehole up to about 3 feet above the top of the well screen. The volume of filter pack actually emplaced will be compared to the theoretical volume to verify that collapse of the borehole or "bridging" of the filter pack has not occurred. Approximately 3 feet of bentonite chips or pellets will be placed above the filter pack. Several gallons of fresh water will be poured onto the bentonite after it is placed into the borehole, and the bentonite will be allowed to hydrate before further annular materials are placed. The annular space above the bentonite seal will then be grounted to the ground surface with a six-sack sand-cement slurry.

Surface completion for the monitoring wells will consist of either a 12-inch diameter steel vault mounted approximately flush with the surrounding ground surface or a 10-inch diameter steel monument cover with locking lid extending approximately 3 feet above the ground surface. The vault or monument cover will be pushed about ½ foot into a freshly placed, concrete well pad at the ground surface.

Well Development

Following monitoring well installation, the wells will be developed by bailing, swabbing, pumping, or a combination thereof to remove sediments from inside the well casing and to develop the filter pack prior to sampling.

Well Surveying

A level survey will be conducted to determine the reference point (north side of top of casing) elevation of each well casing relative to a common datum.

APPENDIX F

Groundwater Monitoring Procedures

APPENDIX F
GROUNDWATER MONITORING PROCEDURES

Prior to purging or collecting a groundwater sample from each monitoring well, the depth to groundwater and the total depth of the well will be measured and recorded. Then, a minimum of three casing volumes of groundwater will be purged from the well using a submersible pump. Purging will continue until the field-measured temperature, pH, and electrical conductivity (EC) of the purged groundwater are substantially stable. Following purging, the groundwater sample will be collected directly from the discharge tubing connected to the pump. If a monitoring well is de-watered while purging, the well will be allowed to recharge until a minimum of either 80-percent recovery has occurred or 1 hour has elapsed, and then the well will be sampled using a single-use, disposable bailer.

Groundwater samples will be collected into laboratory-supplied containers and placed into a chilled, insulated container for delivery to the analytical laboratory. Labels will be placed on the samples identifying the well name, job number, sampler's initials, and date/time of sample collection. Each groundwater sample will be recorded on a chain-of-custody form identifying the sample name, job number, sampler's name, date/time of sample collection, analyses ordered, and responsible couriers and laboratory personnel, along with the dates/times that the samples were in each person's custody.

Field analysis meters will be calibrated with unexpired calibration solutions at least once per day. All purging and sampling equipment that could come into contact with purged groundwater will be washed with laboratory grade detergent and rinsed with fresh water prior to the placement of the pump in each well. Purged groundwater generated during sampling will be discharged onto the ground surface near each well.

California Planning and Engineering Corporation

2025 East Noble Avenue, Visalia California, 93292, (209) 625-5233

AARON L. CANVASSER
RCE 21182

REPORT OF HYDROMETER ANALYSIS

The data provided on this form is simply the results from testing soil. A Soils Report must be prepared and approved by the State of California Regional Water Quality Control Board (WQCB) prior to the use of the tested material in a Dairy Waste Water Discharge Pond. For more information on this process, please contact CPE at 209-625-5233, or Larry Glandon with the (WQCB) at 209-445-5116

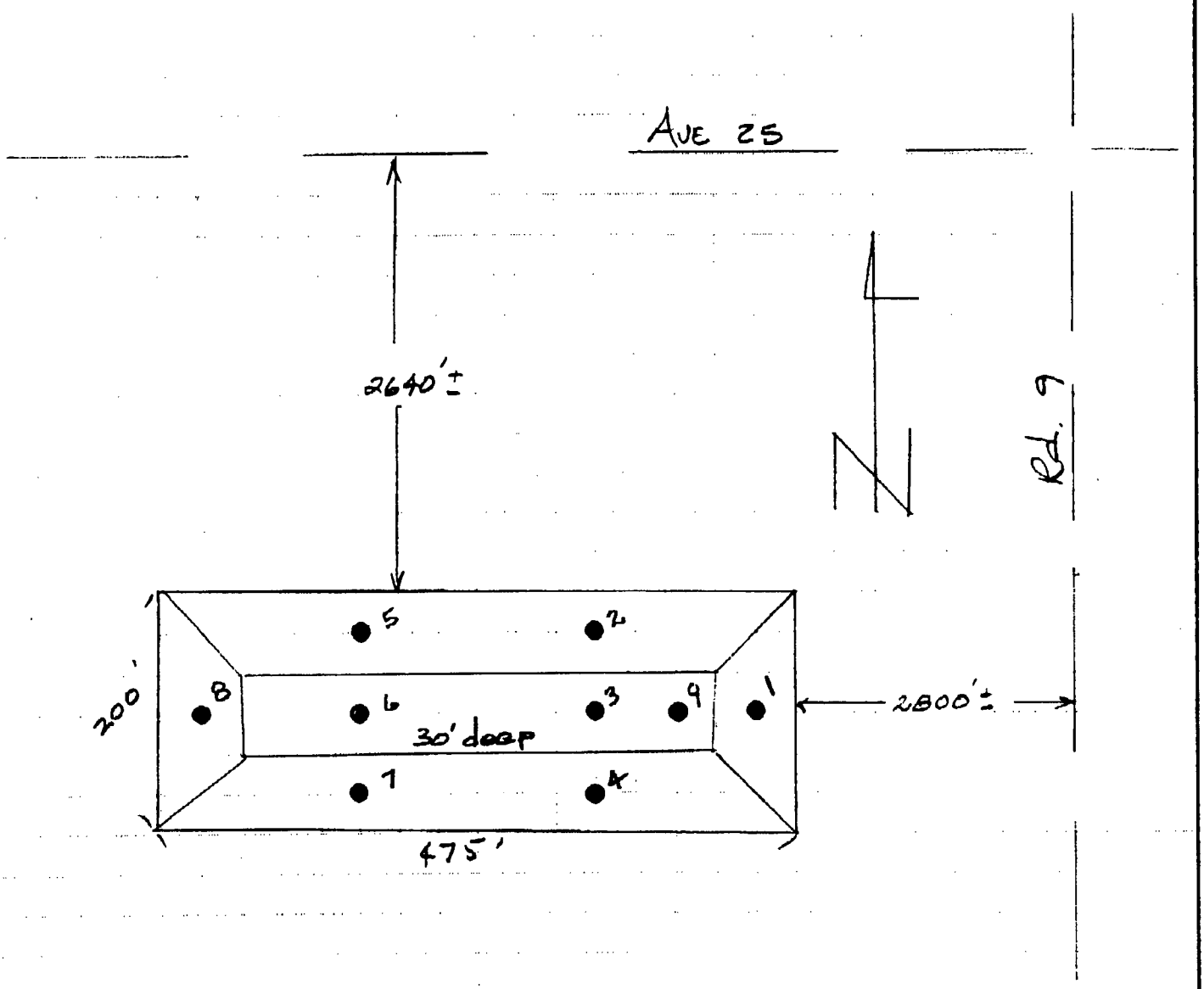
Client Name: Troost Dairy Project Name/ Job #: / 99725

Sampled: 11 / 17 / 99 by: J.T.R. Tested: 11 / 19 / 99 by: J.T.R. Job Expense#: 2109

		HYDROMETER READING @		% SAND	% SILT	% CLAY
#	DESCRIPTION / SUMP #	40-sec's	2-hrs.			
1	E. BANK / SUMP #1	33.4	10.9	35%	44%	21%
2	N.E. BANK / SUMP #1	30.4	5.9	39%	49%	12%
3	E. BOTTOM / SUMP #1	28.4	9.9	46%	35%	19%
4	S.E. BANK / SUMP #1	27.4	9.9	43%	36%	21%
5	N.W. BANK / SUMP #1	34.4	10.9	23%	52%	25%
6	W. BOTTOM / SUMP #1	31.4	11.9	36%	40%	24%
7	S.W. BANK / SUMP #1	29.4	9.9	44%	37%	19%
8	W. BANK / SUMP #1	27.4	8.9	42%	39%	19%
9	E. BOTTOM / SUMP #1	21.4	9.9	61%	21%	18%

California Planning & Engineering
Civil Engineers & Land Surveyors
2025 East Noble
VISALIA, CALIFORNIA 93292
(209) 625-5233

JOB TROOST DAIRY 99725
SHEET NO. _____ OF _____
GATHER CALCULATED BY J.R. DATE 11/17/99
Test CHECKED BY JR DATE 11/19/99
SCALE _____



Smith

URS

MONITORING WELL INSTALLATION REPORT

Troost Dairy
24868 Road 9
Near Chowchilla, Madera County, CA

Prepared by:
URS Corporation

March 27, 2006

URS Job No. 18715077

RECEIVED
APR 03 2006
RWQCB-CVR
FRESNO, CALIF.

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2.0 OBJECTIVE AND SCOPE **1**

3.0 BACKGROUND **1**

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- 5.2 Monitoring Well Construction 2
- 5.3 Well Development 3

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7.0 SUMMARY **3**

8.0 LIMITATIONS **4**

FIGURES

Figure 1 Vicinity Map
Figure 2 Monitoring Well Location Map

APPENDICES

Appendix A MCEHD Well Permits and DWR Well Driller's Completion Reports
Appendix B Boring Logs and Construction Diagrams

GROUNDWATER MONITORING WELL INSTALLATION REPORT
Troost Dairy
24868 Road 9
Near Chowchilla, Madera County, California

1.0 INTRODUCTION

URS Corporation (URS) has prepared this report regarding the installation of monitoring wells MW-2 and MW-3 at the Troost Dairy site (site), located at 24868 Road 9, near Chowchilla, Madera County, California (Figure 1). These activities were conducted in accordance with URS' July 6, 2005 Groundwater Monitoring Workplan, which was approved in an October 7, 2005, California Regional Water Quality Control Board (RWQCB) letter. This report was prepared for J Troost Dairy, L.P. (Client) in accordance with URS' November 11, 2005 work order, which was authorized by Client on November 16, 2005.

2.0 OBJECTIVE AND SCOPE

The objective of the well installation program is to assess the quality of first encountered groundwater beneath the site. In order to achieve this objective, ~~tow~~ 2 new monitoring wells were installed to complement an existing monitoring well.

3.0 BACKGROUND

In a January 31, 20~~05~~ 04 letter, RWQCB requested a plan to assess the quality of first encountered groundwater underneath Client's dairy facility and associated cropland, and to determine the quality of groundwater used at the facility. URS' workplan, prepared in response to this letter, proposed a groundwater monitoring network consisting of one existing monitoring well (MW-1, installed in April 1995 by others on Client's behalf) and two new monitoring wells (MW-2 and MW-3).

4.0 SETTING

The site consists of a 65-acre dairy facility with 822 acres of associated cropland where liquid dairy waste is applied. The site is lies south of Avenue 25, west of Road 9, about 5 miles west of Chowchilla. The site is located in the northeast quarter of Section 36, Township 9 South, Range 14 East, Mount Diablo Base and Meridian. The site elevation is approximately 180 feet above mean sea level (amsl). The general topography in the area is relatively flat, and the ground surface slopes about 5 to 10 feet per mile to the west (United States Geological Service, 1969). Figure 1 shows a site vicinity map and Figure 2 shows the site and portions of the adjacent properties.

The site is located in the central portion of the San Joaquin Valley, a broad valley that is dominated by coalescing alluvial fans and flood plains. The surficial geology of the site consists

of older alluvium of Quaternary age, that is part of the geomorphic feature known as the Alluvial Fan of the Chowchilla River (Mitten, et al., 1970).

Groundwater measurements conducted in September 2005 at well MW-1, indicated the water depth at the site to be approximately 80 feet below ground surface (bgs). As discussed in the workplan, the groundwater flow direction near the site may vary considerably due to two depressions in the groundwater table located to the northeast and southwest of the site.

5.0 WELL INSTALLATION METHODOLOGY

On December 5 through December 6, Technicon Engineering Services Inc., a Client-retained California C-57 licensed drilling contractor, installed two new monitoring wells MW-2 and MW-3 south and west of the dairy facility, respectively. A URS California-licensed civil engineer oversaw the installation of the new monitoring wells at the Site. A URS field engineer was present during drilling and well installation to observe and document field conditions, drilling and well installation. The field engineer prepared lithologic logs describing the subsurface materials encountered. The new monitoring well locations, along with the locations of monitoring well MW-1 are presented in Figure 2.

5.1 Drilling

The well borings were drilled using a Central Mine Equipment CME-55 drill rig with a nominal 8½–inch diameter hollow stem auger (HSA) rig. The borings for MW-2 and MW-3 were extended to depths of 118 and 120 feet bgs, respectively, with groundwater being first encountered at 95 and 85 feet bgs, respectively. Soil core samples were collected with a California-modified split-barrel sampler at selected intervals, typically every 5-feet until groundwater was encountered. The sampler was driven into the soil below the cutting head at the bottom of the HSA, with a 140-pound hammer free falling 30-inches onto an anvil attached to the connective rods and sampler. The number of blow counts required to drive the sampler into the soil formation over three 6-inch intervals was recorded. The lithologic logs for the borings were prepared by the URS field engineer using the Unified Soil Classification System (USCS) and generally accepted geologic interpretive descriptions, based on auger penetration, soil cuttings, and core samples.

5.2 Monitoring Well Construction

Each monitoring well consists of a 2-inch diameter flush-threaded schedule-40 polyvinyl chloride (PVC) casing, installed in a nominal 8-inch diameter boring. The as-built well-construction detail, boring log, and DWR Well Driller's Completion Report for each well are presented in Appendix A.

Based upon the hydrogeologic conditions encountered, total well depths were established at about 120 feet bgs (which was about 25 to 35 feet below the groundwater table),. The screened interval consists of about 30-feet of 2-inch diameter, 0.020-inch slotted PVC screen. A 5-foot long sump section constructed of 2-inch diameter solid PVC casing fitted with an end-cap was installed at the bottom of each well casing.

The annular materials for well construction were placed through the inside of the hollow augers, with a minimal practical separation of less than 3-feet between the bottom of the auger and the point of placement. The annular space of each well was filled with a filter pack consisting of RMC Pacific No. 2/12 Lapis Luster sand from the bottom of the boring up to about 6-feet above the top of the well screen. About 4-feet of bentonite chips or pellets were then placed above the filter pack, and hydrated with sufficient water. The annular spaces above the bentonite seals were then filled with 11-sack sand-cement slurry to within about 1-foot of the surface. Surface completion consisted of above-ground monuments set in concrete.

A California-registered land surveyor will be retained to survey the location and reference elevation (top of casing, north side) of the new monitoring wells relative to a common datum. This survey information will be presented in the subsequent groundwater monitoring report.

5.3 Well Development

The groundwater monitoring wells were developed to reduce suspended solids in the water produced. Prior to development, the water level in each well was sounded using a calibrated well sounding tape and recorded. Well development was accomplished by the surge-block and air eduction techniques to fluidize and force the solids out of the well.

6.0 LITHOLOGY

During the drilling of well MW-2, on December 6, 2005, interbedded sands, silty sands, and sandy silts were encountered in the boring throughout most of the depth to first encountered groundwater. Interbedded poorly graded sands and silty sands dominated the profile, with few seams of sandy silts. Groundwater was first encountered at 85 feet bgs. Below the water table, sandy clay was encountered at about 104 feet bgs and extending the maximum depth drilled.

During the drilling of well MW-3, on December 5, 2005, more fine-grained materials were encountered. Interbedded silty sands and sandy silts dominated the profile, with few seams of poorly-graded and well-graded sands. Groundwater was first encountered at 94 feet bgs. Below the water table, a layer of sandy silt transitioning into sandy clayey-silt was encountered at about 97 feet bgs, underlain by a cemented layer of silty sand encountered at about 117 feet bgs and extending to the maximum depth drilled.

Boring logs showing the encountered lithology are presented in Appendix B.

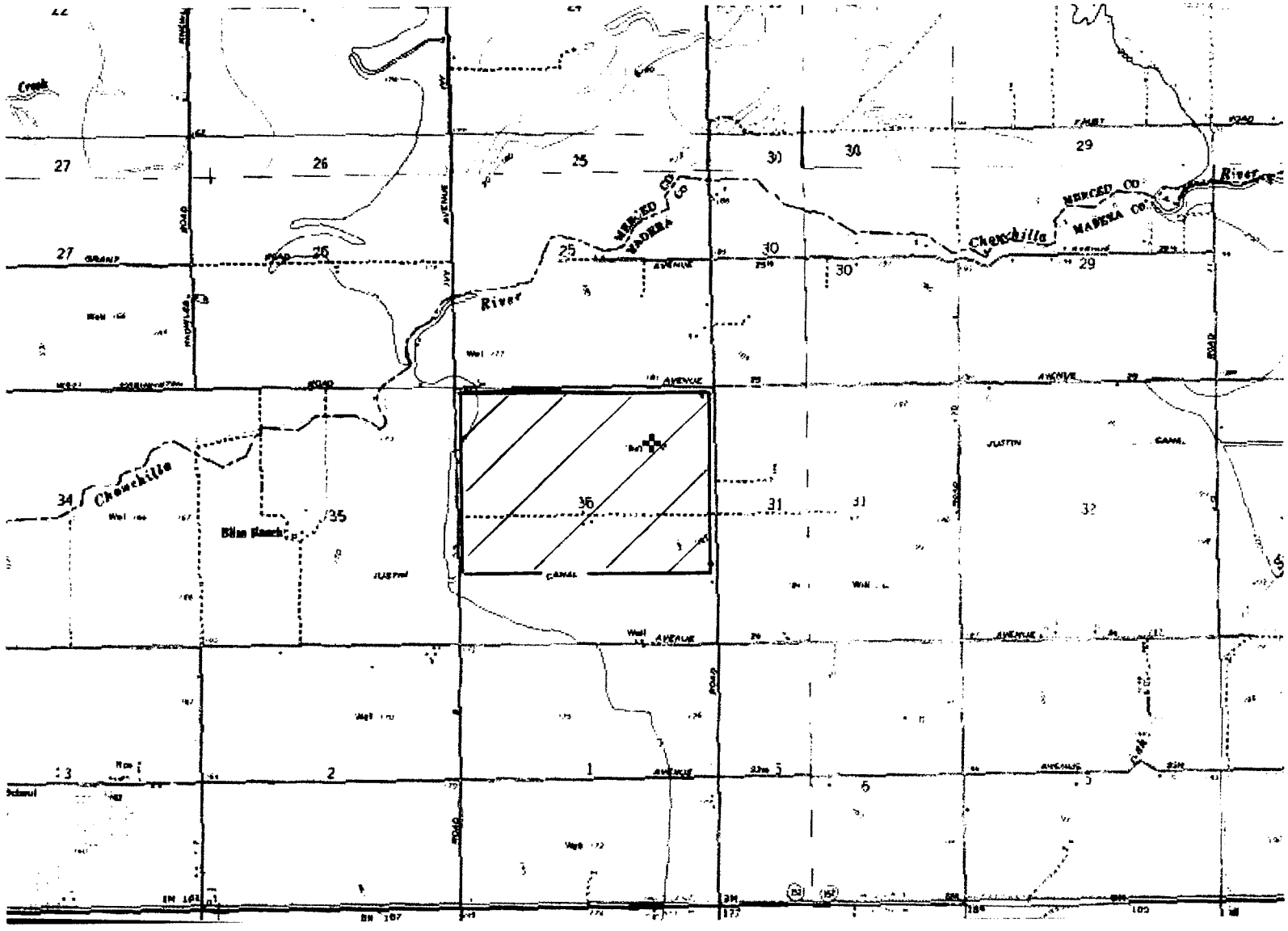
7.0 SUMMARY

The monitoring well installation methodologies were consistent with those described in the workplan. After this initial phase of groundwater monitoring well installation, eight quarterly monitoring events will be conducted to evaluate groundwater conditions over the course of two calendar years. Further details regarding the groundwater monitoring program were presented in the workplan.

8.0 LIMITATIONS

This report has been prepared for the exclusive use of the Client, and in accordance with generally accepted environmental engineering practices in Madera County, California at this time. No other warranties either express or implied are made as to the professional advice provided under the terms of URS' agreement with Client. URS provides no other express or implied warranty regarding its services. URS' services were performed solely for the objective stated herein.

FIGURES



N

Troost Dairy

0 0.25 0.5
(MILES)

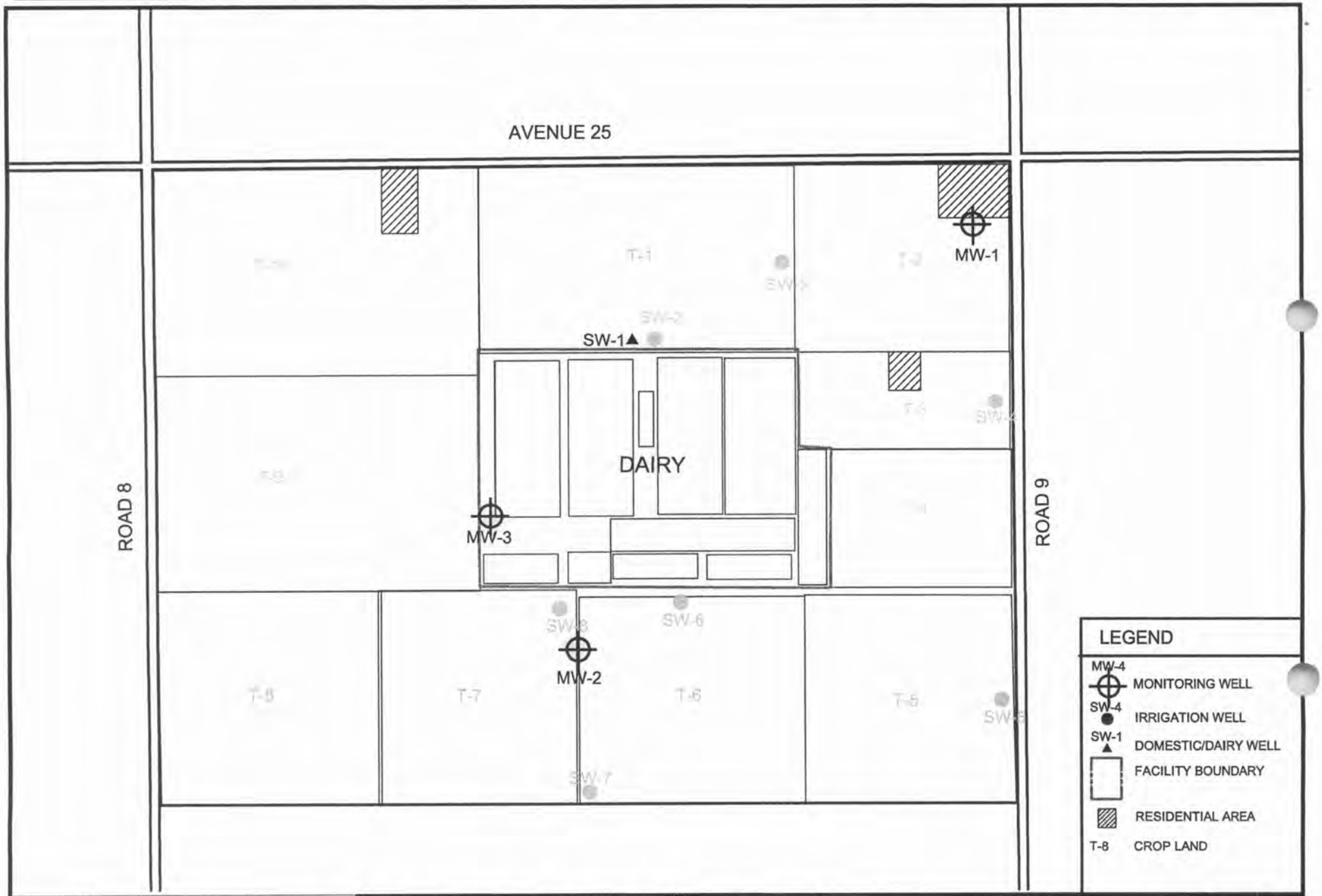
URS

30 River Park Place West,
Suite 180
Fresno, California 93720
Tel. (559) 256-1444

DRAWN	BLS
APPR	CVK
DATE	12-01-04
JOB NO.	18715077

VICINITY MAP
TROOST DAIRY
NEAR CHOWCHILLA, MADERA COUNTY, CA

FIGURE NO. 1



N

0 400 800
(FEET)

URS
30 River Park Place West,
Suite 180
Fresno, California 93720
Tel. (559) 256-1444

DRAWN	BLS
APPR	CvK
DATE	02/01/06
JOB NO.	18715077

MONITORING WELL LOCATION MAP
TROOST DAIRY
NEAR CHOWCHILLA, MADERA COUNTY, CA

FIGURE NO. 2

Appendix A

MCEHD Well Permits & DWR Well Drillers Completion Reports

RECEIVED
DEC 16 2005

TECHNICON
ENGINEERING SERVICES, INC.

FAX TRANSMITTAL

To: Casper Van Keppel Date: 12-16-05

Company: URS No. of Pages 8 (Including Cover Page)

FAX Number: (559) 256-1478

From: Ash Jones
Technicon Engineering Services, Inc.

Project: Troost Dairy

Subject: Permits & Concrete Tickets

Contents/Comments:

Call me if you have any questions
(559) 994-7486

4539 N. Brawley #108 • Fresno, California 93722-3950
Phone: (559) 276-9311 • FAX: (559) 276-9344
www.technicon.net • E-MAIL: info@technicon.net

PERMIT IS VALID ONLY WHEN SIGNED & PERMIT # ISSUED

RESOURCE MANAGEMENT AGENCY

Environmental Health Department
2037 Cleveland, Madera, CA 93637-3502
(559) 661-6333 FAX (559) 675-7919

INSPECTION #	PERMIT # 040515
FEE $150	FEE $150
DATE 12 8 05	DATE 12 8 05
CHECK# 034739	CHECK# 034739

WELL CONSTRUCTION APPLICATION

PROPERTY OWNER (S) JOHN TROOST (TROOST DAIRY PHONE 559-906-5335 4/4(52)

MAILING ADDRESS 24868 ROAD 9 CHOWCHILLA, CA PARCEL MAP#

JOB ADDRESS 24868 RD 9 CHOWCHILLA, CA 93610 APN# 025-100-024 LOT # T-9

CONTRACTOR'S NAME TECHNICON ENGINEERING PHONE 559-276-9311

LICENSE TYPE: C57 LICENSE # 767889

WATER WELL

Intended Use

- ___ Domestic
- ___ Shared
- ___ Agricultural
- ___ Industrial
- ___ Community
- X Monitoring/Soil Boring
- ___ Existing Well(s) y / n If yes # ___

Type of Work

- ___ New Well
- ___ Deepening
- ___ Repair
- ___ Destruction
- ___ Replacement Well

Applicant must:

- Submit a copy of the well log to Madera County Department of Environmental Health.
- Provide 24-hour notice for all seal placements. Community well seals are by appointment only.
- Unauthorized changes to the permit WILL RENDER IT VOID
- Maintain ALL County Setbacks
- This permit is valid only for the property owner for the subject parcel and is nontransferable.

Construction Information

Type of Well

Cable Tool ~~Rotary~~ Gravel Pack Hardrock Other ___

Casing Diameter 2" Casing Material PVC

Casting Gauge / Schedule 40

Annular Seal Material SAND SLURRY Seal Depth 80'

Comments SAND-SLURRY - 11.3 SACK

Sewage Disposal

- ☐ Sewer
- ☐ Onsite Disposal

U.S.H.U.D. FLOOD HAZARD ZONE "A" FORM

ATTACHED ☐ O.K. ☒

BY [signature] DATE 12/8/05

• SEE REVERSED SIDE FOR SYSTEM SETBACKS

☐ Setbacks variances requested and obtained.

Initial

PLOT PLAN -- For subject parcel and all affected adjacent lands, show street, nearest intersection, buildings, distances from buildings and property lines, easements, right of ways, all existing wells and applicable sewage system components as well as contamination sources.

Final Env Health
Yellow - Assessor
Pink Permit
Goldenrod Applicant

Permit Approved: [signature] Date 12-08-05

Inspection: ___ Date ___

PERMIT SHALL EXPIRE BY LIMITATION AND BECOME NULL AND VOID IF THE WORK IS NOT COMMENCED OR IF NO INSPECTIONS ARE CALLED FOR WITHIN 180 DAYS

PERMIT IS VALID ONLY WHEN SIGNED & PERMIT # ISSUED

RESOURCE MANAGEMENT AGENCY

Environmental Health Department
2037 Cleveland, Madera, CA 93637-3502
(559) 661-6333 FAX (559) 675-7919

INSPECTION #	PERMIT #
WI 0008155	
FEE $130 ~~$34739~~	FEE $150
DATE 12-8-05	DATE 12-8-05
CHECK# 034734	CHECK# 034739

WELL CONSTRUCTION APPLICATION

PROPERTY OWNER (S) John Troost (Troost Dairy) PHONE (559) 706-5335 44 05

MAILING ADDRESS 24868 Road 9 Chowchilla, CA 93610 PARCEL MAP#

JOB ADDRESS 24868 Road 9 Chowchilla, CA 93610 APN# 025.102-020-000 LOT # T-6

CONTRACTOR'S NAME Technical Engineering PHONE (559) 276-9311

LICENSE TYPE: C57 LICENSE # 767888

WATER WELL

Intended Use

- ___ Domestic
- ___ Shared
- ___ Agricultural
- ___ Industrial
- ___ Community
- X Monitoring/Soil Boring
- ___ Existing Well(s) y / n If yes # ___

Type of Work

- ___ New Well
- ___ Deepening
- ___ Repair
- ___ Destruction
- ___ Replacement Well

Applicant must:

- Submit a copy of the well log to Madera County Department of Environmental Health.
- Provide 24-hour notice for all seal placements. Community well seals are by appointment only
- Unauthorized changes to the permit WILL RENDER IT VOID
- Maintain ALL County Setbacks
- This permit is valid only for the property owner for the subject parcel and is nontransferable.

Construction Information

Type of Well

Cable Tool Rotary Gravel Pack Hardrock Other ___

Casing Diameter 2" Casing Material PVC

Casing Gauge / Schedule 40

Annular Seal Material Sand/Slurry/Bentonite Seal Depth 20'

Comments: ___

Sewage Disposal

- ☐ Sewer
- ☐ Onsite Disposal

U.S.H.U.D. FLOOD HAZARD ZONE "A" FORM

ATTACHED ☐ O.K. ☑

BY [signature] DATE 12-5-05

SEE REVERSED SIDE FOR SYSTEM SETBACKS

☐ Setbacks variances requested and obtained.

___ Initial

PLOT PLAN -- For subject parcel and all affected adjacent lands, show street, nearest intersection, buildings/distances from buildings and property lines, easements, right of ways, all existing wells and applicable sewage system components as well as contamination sources.

Wheatland

Permit Approved: [signature] Date 12-8-05

Inspection: ___ Date ___

PERMIT SHALL EXPIRE BY LIMITATION AND BECOME NULL AND VOID IF THE WORK IS NOT COMMENCED OR IF NO INSPECTIONS ARE CALLED FOR WITHIN 180 DAYS

Bay Health
Assessor
Permit
Applicant

TECHNICON
ENGINEERING SERVICES, INC.
4539 N. BRAWLEY STE. 108
FRESNO, CA 93722-3950
(559) 276-9311

Union Bank of California
3015 W. Shaw Ave
Fresno, CA 93711

1140
1210

034739

12-8-05

PAY TO THE ORDER OF Resourse Management EHD $300.00

Three Hundred Dollars and xx/100 DOLLARS

TES #15405-I.06

MEMO 1 Roost Dairy Project

Ken

"034739" 1:121000497: 1340021564"

CENTRAL VALLEY CONCRETE

MAILING ADDRESS
PO BOX 1071
MERCED, CA 95341-1071
(209) 723-6846
(209) 384-2305 (FAX)

MERCED
MAIN PLANT 3023 N. HWY 59 | SOUTH PLANT 1812 GRANTLEY | NORTH PLANT 3071 N. HWY 59
DONAIR PLANT 1200 LESTER RD | CHOWCHILLA PLANT 745 S. 5TH STREET | TURLOCK PLANT 1800 TAULSON RD

PLANT 71065
CHOWCHILLA PLT.

TIME	DATE	ACCOUNT		TRUCK	DRIVER	TICKET
14:35	12/15/05	1000		197	TAMMY	58617

NAME
CHNICON ENG.

Well By Alfalfa Field.

DELIVERY ADDRESS
TECHNICON ENG.
24868 RD 9 TROOST DAIRY
CHOWCHILLA
TECHNICON

IDER	SALES ORDER	TAX	CREDIT			SLUMP
		MAD	COD			6.0

QTY	PRODUCT	DESCRIPTION	ORDERED	DELIVERED	UNIT PRICE	AMOUNT
.50CU-YD	32257	S11	1.50	1.50	120.00	180.00
1.00	32555	FUEL CHARGE	1.00	1.00	10.00	10.00
.00	32412	SHORT LOAD	1.00	1.00	80.00	80.00

!!!!!!!!!!!!REMEMBER TO ASK ABOUT FIBERMESH!!!!!!!!!!!!
!!!!!ASK US ABOUT COLD WEATHER SPECIALS!!!!!!!!!!!!!!

3H	SCHEDULED TIME 14:00	WATER ADDED ON JOB 10 gal

PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	ARRIVE PLANT
40	3:00	3:05	3:10	:

SUB TOTAL	270.00
DISCOUNT	0.00
TAX	19.58
TOTAL	289.58
PREVIOUS TOTAL	0.00
GRAND TOTAL	289.58

LEY CONCRETE, INC
STER

SLUMP TEST ☐YES ☐NO | TEST CYLINDER ☐YES ☐NO | MIN LOAD CHG ☐YES ☐NO

( ) MIN STANDING TIME IN EXCESS OF ( ) MIN @ MIN

DE A. SR. DEPUTY
HM A.

WEIGHMASTER CERTIFICATE

O CERTIFY that the following described commodity was weighed, measured, d by a weighmaster, whose signature is on this certificate, who is a recognized accuracy, as prescribed by Chapter 7 (commencing with Section 12700) of the California Business and Professions Code, administered by the Divi- asurement Standards of the California Department of Food and Agriculture.

X

ED ARE NOT WARRANTED to be acceptable for any particular use, purpose or application, anted to be acceptible for use in any particular environment or in conjunction with any particular Buyer's selection of the quoted mix, unless otherwise acknowledged in writing by Central Valley ned to be without the advice, consultation, recommendation or suggestion of Central Valley assumes all risk related to the selection of the quoted product for any particular application

CUSTOMER

CAUTION. **Freshly mixed concrete may cause skin irritation or chemical burns.** Avoid direct contact where possible and wash exposed skin areas promptly with water

NOTICE. UNLOADING TIME ALLOWED - 4 MINUTES PER YARD.

- We do not guarantee finished results obtained from this load of concrete as many important factors affecting the ultimate quality of the completed job are out of our control.
- Not responsible for peeling or scaling on any exposed concrete
- If requested to leave road, we assume no responsibility for damage incurred by our truck. BY
- This company will only recognize tests done in accordance with ASTM standards

TERMS. Credit is extended with the understanding that all accounts will be paid by the 10th of the month following delivery. A finance charge of 1½% per month or 18% per annum, will be charged on outstanding balances. Buyer will pay reasonable costs of collection and attorney's fees

Dec 15 05 01:01p

Well By Barns

p.0/0

CENTRAL VALLEY CONCRETE

MAILING ADDRESS:
P.O. BOX 1071
MERCED, CA 95341-1071
(209) 723-8140
(209) 384-2395 (FAX)

MERCED

MAIN PLANT 3923 N. HWY 59 | SOUTH PLANT 1812 GRANTLEY | NORTH PLANT 3271 N. HWY 59
DENAIR PLANT 4200 LINTER RD. | CROWSHELLA PLANT 745 S. 5TH STREET | TURLOCK PLANT 1900 DIVISION RD.

PLANT 67309

PLANT	TIME	DATE	ACCOUNT	TRUCK	DRIVER	TICKET

CUSTOMER NAME

DELIVERY ADDRESS

PURCHASE ORDER	SALES ORDER	TAX	CREDIT

LOAD QTY	PRODUCT	DESCRIPTION	ORDERED	DELIVERED	UNIT PRICE	SLUMP	AMOUNT
2.0	CU-YD32257	S11					
		FUEL CHARGE					
		SHORT LOAD					

REMEMBER TO ASK ABOUT FIBERMESH
ASK US ABOUT COLD WEATHER SPECIALS

ORDERED BY	SCHEDULED TIME	WATER ADDED ON JOB
		gal

LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	ARRIVE PLANT

SUB TOTAL
DISCOUNT
TAX
TOTAL
PREVIOUS TOTAL

CENTRAL VALLEY CONCRETE, INC
WEIGHMASTER

SLUMP TEST ☐YES ☐NO | TEST CYLINDER ☐YES ☐NO | MIN LOAD CHG ☐YES ☐NO

( ) MIN STANDING TIME IN EXCESS OF ( ) MIN @ MIN

BY DEPUTY

GRAND TOTAL 311.03

WEIGHMASTER CERTIFICATE

THIS IS TO CERTIFY that the following described commodity was weighed, measured, or counted by a weighmaster, whose signature is on this certificate, who is a recognized authority of accuracy, as prescribed by Chapter 7 (commencing with Section 12700) of Division 5 of the California Business and Professions Code, administered by the Division of Measurement Standards of the California Department of Food and Agriculture.

SIGN HERE X

CAUTION: **Freshly mixed concrete may cause skin irritation or chemical burns.** Avoid direct contact where possible and wash exposed skin areas promptly with water

NOTICE: UNLOADING TIME ALLOWED - 6 MINUTES PER YARD.

- We do not guarantee finished results obtained from this load of concrete as many important factors affecting the ultimate quality of the completed job are out of our control
- Not responsible for peeling or scaling on any exposed concrete
- If requested to leave road, we assume no responsibility for damage incurred by our truck. BY
- This company will only recognize tests done in accordance with ASTM standards

TERMS: Credit is extended with the understanding that all accounts will be paid by the 10th of the month following delivery. A finance charge of 1½% per month or 18% per annum, will be charged on outstanding balances. Buyer will pay reasonable costs of collection and attorney's fees

ALL MIXES QUOTED ARE NOT WARRANTED to be acceptable for any particular use, purpose or application, nor are they warranted to be acceptable for use in any particular environment or in conjunction with any particular soil conditions. Buyer's selection of the quoted mix, unless otherwise acknowledged in writing by Central Valley Concrete, will be deemed to be without the advice, consultation, recommendation or suggestion of Central Valley Concrete and Buyer assumes all risk related to the selection of the quoted product for any particular application.

BATCH OFFICE

California Home

Thursday, Decemb

Welcome to California

License Detail
Contractor License # 767888

CALIFORNIA CONTRACTORS STATE LICEN

DISCLAIMER

A license status check provides information taken from the CSLB license data base. Before on this information, you should be aware of the following limitations:

- CSLB complaint disclosure is restricted by law (B&P 7124.6). If this entity is subject tc complaint disclosure, a link for complaint disclosure will appear below. Click on the lin button to obtain complaint and/or legal action information.
- Per B&P 7071.17, only construction related civil judgments reported to the CSLB are disclosed.
- Arbitrations are not listed unless the contractor fails to comply with the terms of the arbitration.
- Due to workload, there may be relevant information that has not yet been entered ont Board's license data base.

Extract Date: **12/08/2005**

* * * Business Information * * *

TECHNICON ENGINEERING SERVICES INC
4539 N BRAWLEY AVENUE #108
FRESNO, CA 93722
Business Phone Number: (559) 276-9311

Entity: **Corporation**
Issue Date: **08/26/1999** Expire Date: **08/31/2007**

* * * License Status * * *

This license is current and active. **All information below should be reviewed.**

* * * Classifications * * *

Class	Description
C57	WELL DRILLING (WATER)

* * * Bonding Information * * *

CONTRACTOR'S BOND: This license filed Contractor's Bond number **WCL1199558** in the of **$10,000** with the bonding company

DEC-16-2005 10:13 From:TECHNICON 5592769344 To:559 256 1478 P.7/8

INTERNATIONAL BUSINESS AND MERCANTILE REASSURANCE COMPANY.
Effective Date: **01/01/2004**

Contractor's Bonding History

BOND OF QUALIFYING INDIVIDUAL(1): The Responsible Managing Officer (RMO) DA GREY WILLIAMS certified that he/she owns 10 percent or more of the voting stock/equity corporation. A bond of qualifying individual is **not** required.
Effective Date: **08/26/1999**

*** * * Workers Compensation Information * * ***

This license has workers compensation insurance with the
STATE COMPENSATION INSURANCE FUND
Policy Number: **1597039** Effective Date: **09/01/2000** Expire Date: **09/01/2006**

Workers Compensation History

Personnel List

License Number Request **Contractor Name Request** **Personnel Name Request**

Salesperson Request **Salesperson Name Request**

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DEC-16-2005 10:13 From:TECHNICON 5592769344 To:559 256 1478 P.8/8

E037796

ORIGINAL
File with DWR

Page 1 of 2

Owner's Well No. MW-2

Date Work Began 12-5-05, Ended 12-6-05

Local Permit Agency Resource Management Agency (Madera County)

Permit No. 8155 Permit Date 12-5-05

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. XXXXXXX

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.: 09S14E36K002M
LATITUDE / LONGITUDE
APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)

DRILLING METHOD Hollow Stem Auger FLUID ___

DEPTH FROM SURFACE FL.	to FL.	DESCRIPTION *Describe material, grain size, color, etc.*
0'	15'	(SP-SM) Sand with Silt, Medium Dense, Fine Grained, Damp, Olive Brown.
15'	21'	(SP) Poorly Graded Sand, Medium Dense, Fine to Medium Grained Damp, Light Olive Brown
21'	30'	(SM) Silty Sand, Loose, Fine Grained, Damp, Olive Brown
30'	35'	(ML) Sandy Silt, Stiff, Fine Grained, Damp, Non-Plastic, Olive Brown.
35'	40'	(SM) Silty Sand, Loose, Fine Grained, Damp, Olive Brown
40'	49'	(SP) Poorly Graded Sand, Medium Dense, Fine to Medium Grained, Damp, Light Yellowish Brown.
49'	51'	(SW) Well Graded Sand, Medium Dense, Fine to Coarse Grained, Damp, Light Olive Brown.
51'	57'	(SP) Poorly Graded Sand, Medium Dense, Fine to Medium Grained, Damp, Yellowish Brown.
57'	64'	(ML) Sandy Silt, Fine Grained, Damp.
64'	75'	(SM) Silty Sand, Fine Grained
75'	83'	(SP) Poorly Graded Sand, Fine Grained
83'	118'	(SP-SM) Poorly Graded Sand with Silt, Medium Dense, Fine Grained, Wet, Olive Brown

TOTAL DEPTH OF BORING 118 (Feet)

TOTAL DEPTH OF COMPLETED WELL 118 (Feet)

WELL OWNER

Name John Troost

Mailing Address 24868 Road 9

Chowchilla CA 93610
CITY STATE ZIP

WELL LOCATION

Address Troost Dairy 24868 Road 9

City Chowchilla

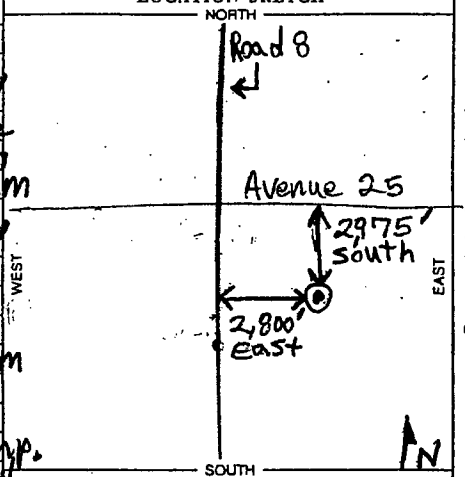
County Madera

APN Book 025 Page 100 Parcel 020

Township 9 South Range 14 East Section 36 North East

Latitude 37 06 28 NORTH (DEG. MIN. SEC.) Longitude 120 23 27 WEST (DEG. MIN. SEC.)

LOCATION SKETCH



Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

✓ NEW WELL

MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)

___ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)

WATER SUPPLY
___ Domestic ___ Public
___ Irrigation ___ Industrial

MONITORING ✓
TEST WELL ___
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 83' (Ft.) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL 83' (FL) & DATE MEASURED 12-6-05

ESTIMATED YIELD * N/A (GPM) & TEST TYPE N/A

TEST LENGTH N/A (Hrs.) TOTAL DRAWDOWN N/A (Ft.)

** May not be representative of a well's long-term yield.*

CASING (S)

DEPTH FROM SURFACE FL.	to FL.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0'	83'	8.5"	✓				Schedule 40	2.049	0.154	N/A
83'	113'	8.5"		✓			Schedule 40	2.049	0.154	0.020
113'	118'	8.5"	✓				Schedule 40	2.049	0.154	N/A

ANNULAR MATERIAL

DEPTH FROM SURFACE FL.	to FL.	TYPE: CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0'	72'	✓			
72'	76'		✓		
76'	113'				#2/12 Sand
113'	118'			✓	

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analyses
___ Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME Ashley Jones Technicon Engineering
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

4539 N. Brawley Fresno CA 93722
ADDRESS CITY STATE ZIP

Signed Ashley Jones
WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED C-57 LICENSE NUMBER 767888

DWR 188 REV. 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

State of California

The Resources Agency
Department of Water Resources

State Well No. 09S14E36K002M

DISTRICT San Joaquin

WELL DATA

Owner: John Troost
Address: 24868 Road 9
Tenant: Chowchilla, CA 93610
Address:

State Well No. 09S14E36K002M
Other No. MW-2

Type of Well: Hydrograph [ ] Key [ ] Index [ ] Semiannual [ ]
Location: County Madera Basin No.
U.S.G.S. Quad. Bliss Ranch Quad. No. 5-339C

NW 1/4 SE ¼ Section 36, Township. 09 South, Range. 14 East MDX SB H Base & Meridian

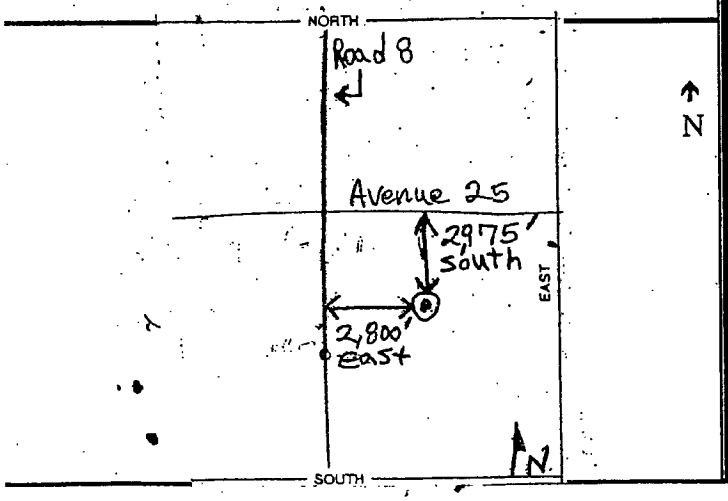
Description 2975' S/O Avenue 25 & 2800' E/O Road 8

Reference Point description

Which is ft. Above Below land surface. Ground Elevation 178' ft.
Reference Point Elev. ft. Determined from Quad
Well: Use Monitor Condition New Depth 118 ft.
Casing, size 2" in., perforations 83-113

Measurement By: DWR [ ] USGS [ ] USBR [ ] County [ ] Irr. Dist. [ ] Water Dist. [ ] Cons. Dist. [ ]
Chief Aquifer: Name Depth to Top Aq. Depth to Bot. Aq.
Type of Material Perm. Rating Thickness
Gravel Packed? Yes [ ] No [ ] Depth to Top Gr. Depth to Bot. Gr.
Supp. Aquifer Depth to Top Aq. Depth to Bot. Aq.
Driller Technicon Engineering
Date drilled 12/06/2005 Log, filed E037796 Open (1) Confidential (2)
Equipment: Pump, type Make
Serial No. Size of discharge pipe in.
Power, Kind Make
H.P. Motor Serial No.
Elec. Meter No. Transformer No.
Yield GPM Pumping level ft.

Water Analysis: Min. (1) San. (2) H.M.(3)
Water Levels Available: Yes (1) No
Period of Record: Begin End
Collecting Agency
Prod. Rec. (1) Pump Test (2) Yield (3)



REMARKS

37 06 17
120 23 25 NAD 27

Recorded by: CG
Date: 03/06

E037795

ORIGINAL
File with DWR
Page 2 of 2

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. XXXXXXX

DWR USE ONLY — DO NOT FILL IN
09S14E36F001M
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. MW-3
Date Work Began 12-6-05, Ended 12-7-05
Local Permit Agency Resource Management Agency (Madera County)
Permit No. 8156 Permit Date 12-05-05

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DRILLING METHOD Hollow Stem Auger FLUID ___

DEPTH FROM SURFACE FL.	to FL.	DESCRIPTION *Describe material, grain size, color, etc.*
0'	10'	(SM) Silty Sand, Loose, Fine to Medium Grained, Damp, Brown
10'	15'	(ML) Sandy Silt, Stiff, Fine to Medium Grained, Damp, Slightly Plastic, Light Brown.
15'	20'	(SP-SM) Poorly Graded Sand with Silt, Loose, Fine to Medium Grained, Damp, Light Brown
20'	26'	(ML) Sandy Silt, Stiff, Fine Grained, Olive Brown.
26'	30'	(SM) Silty Sand, Dense, Fine to Medium Grained, Yellowish Brown
30'	35'	(ML) Sandy Silt, Fine to Medium Grain.
35'	41'	(SW) Well Graded Sand, Fine To Coarse Grained,
41'	45'	(ML) Silt W/Sand, Very Stiff, Fine Grained.
45'	51'	(SM) Silty Sand, Medium Dense, Fine Grained.
51'	60'	(ML) Sandy Silt, Stiff Fine Grained, Moist, Slightly plastic, Olive Brown.
60'	65'	(SM) Silty Sand, Very Dense, Fine Grained, Damp, Redish Brown.
65'	70'	(ML) Sandy Silt, Very Stiff, Fine Grained, Damp, Brown.
70'	85'	(SM) Silty Sand, Medium Dense, Fine Grained, Moist, Brown.
85'	90'	(ML) Sandy Silt, Fine Grained, Brown
90'	96'	(SM) Silty Sand, Fine to Medium Grained, Brown
96'	100'	(ML) Sandy Silt, Wet, Gray
100'	105'	(CL-ML) Clayey Silt, Wet Gray
105'	120'	(SC-SM) Silty Clayey Sand, Wet, Brown

TOTAL DEPTH OF BORING 120 (Feet)
TOTAL DEPTH OF COMPLETED WELL 120 (Feet)

WELL OWNER
Name John Troost
Mailing Address 24868 Road 9
Chowchilla CA 93610
CITY STATE ZIP

WELL LOCATION
Address Troost Dairy 24868 Road 9
City Chowchilla
County Madera
APN Book 025 Page 100 Parcel 024
Township 9 South Range 14 East Section 36 North East
Latitude 37 06 33 NORTH (DEG. MIN. SEC.) Longitude 120 23 35 WEST (DEG. MIN. SEC.)

LOCATION SKETCH
NORTH
Road 8
Avenue 25
2,130' South
2,150' East
MW-3
WEST EAST
SOUTH
Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)
✓ NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
___ Domestic ___ Public
___ Irrigation ___ Industrial
MONITORING ✓
TEST WELL ___
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL
DEPTH TO FIRST WATER 94 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 94' (Ft.) & DATE MEASURED 12-7-05
ESTIMATED YIELD* N/A (GPM) & TEST TYPE N/A
TEST LENGTH N/A (Hrs.) TOTAL DRAWDOWN N/A (Ft.)
** May not be representative of a well's long-term yield.*

CASING (S)

DEPTH FROM SURFACE FL.	to FL.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0'	85'	8.5"	✓				Schedule 40	2.049	0.154	N/A
85'	115'	8.5"		✓			Schedule 40	2.049	0.154	0.020
115'	120'	8.5"	✓				Schedule 40	2.049	0.154	N/A

ANNULAR MATERIAL

DEPTH FROM SURFACE FL.	to FL.	TYPE: CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0'	76'	✓			
76'	79'		✓		
79'	115'				#2/12 Sand
115'	120'			✓	

ATTACHMENTS (✓)
___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analyses
___ Other ___
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT
I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME Ashley Jones Technicon Engineering
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
4539 N. Brawley Fresno CA 93722
ADDRESS CITY STATE ZIP
Signed Ashley Jones
WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED
767888
C-57 LICENSE NUMBER

DWR 188 REV. 11-97 IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

State of California
The Resources Agency
Department of Water Resources

State Well No. 09S14E36F001M

DISTRICT San Joaquin

WELL DATA

Owner: John Troost
Address: 24868 Road 9
Tenant: Chowchilla, CA 93610
Address:

State Well No. 09S14E36F001M
Other No. MW-3

Type of Well: Hydrograph [ ] Key [ ] Index [ ] Semiannual [ ]
Location: County Madera Basin ____ No. ____
U.S.G.S. Quad. Bliss Ranch Quad. No. 5-339C

SE 1/4 NW ¼ Section 36, Township. 09 South, Range. 14 East MDX SB H Base & Meridian

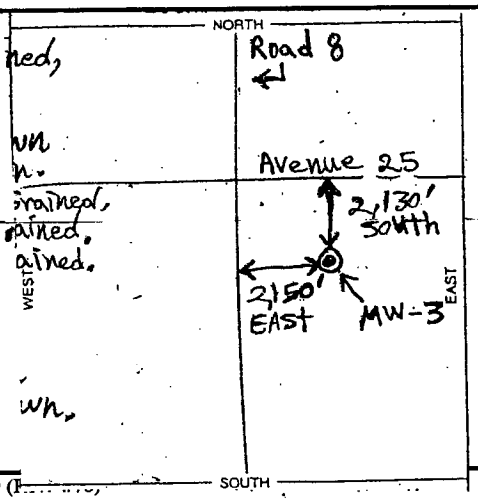
Description 2130' S/O Avenue 25 & 2150' E/O Road 8

Reference Point description

Which is ____ ft. Above Below land surface. Ground Elevation 178' ft.
Reference Point Elev. ____ ft. Determined from Quad
Well: Use Monitor Condition New Depth 120 ft.
Casing, size 2" in., perforations 85-115

Measurement By: DWR [ ] USGS [ ] USBR [ ] County [ ] Irr. Dist. [ ] Water Dist. [ ] Cons. Dist. [ ]
Chief Aquifer: Name ____ Depth to Top Aq. ____ Depth to Bot. Aq. ____
Type of Material ____ Perm. Rating ____ Thickness ____
Gravel Packed? Yes [ ] No [ ] Depth to Top Gr. ____ Depth to Bot. Gr. ____
Supp. Aquifer ____ Depth to Top Aq. ____ Depth to Bot. Aq. ____
Driller Technicon Engineering
Date drilled 12/07/2005 Log, filed E037795 Open (1) ____ Confidential (2) ____
Equipment: Pump, type ____ Make ____
Serial No. ____ Size of discharge pipe ____ in.
Power, Kind ____ Make ____
H.P. ____ Motor Serial No. ____
Elec. Meter No. ____ Transformer No. ____
Yield ____ GPM Pumping level ____ ft.

Water Analysis: Min. (1) ____ San. (2) ____ H.M.(3) ____
Water Levels Available: Yes (1) ____ No ____
Period of Record: Begin ____ End ____
Collecting Agency ____
Prod. Rec. (1) ____ Pump Test (2) ____ Yield (3) ____



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REMARKS

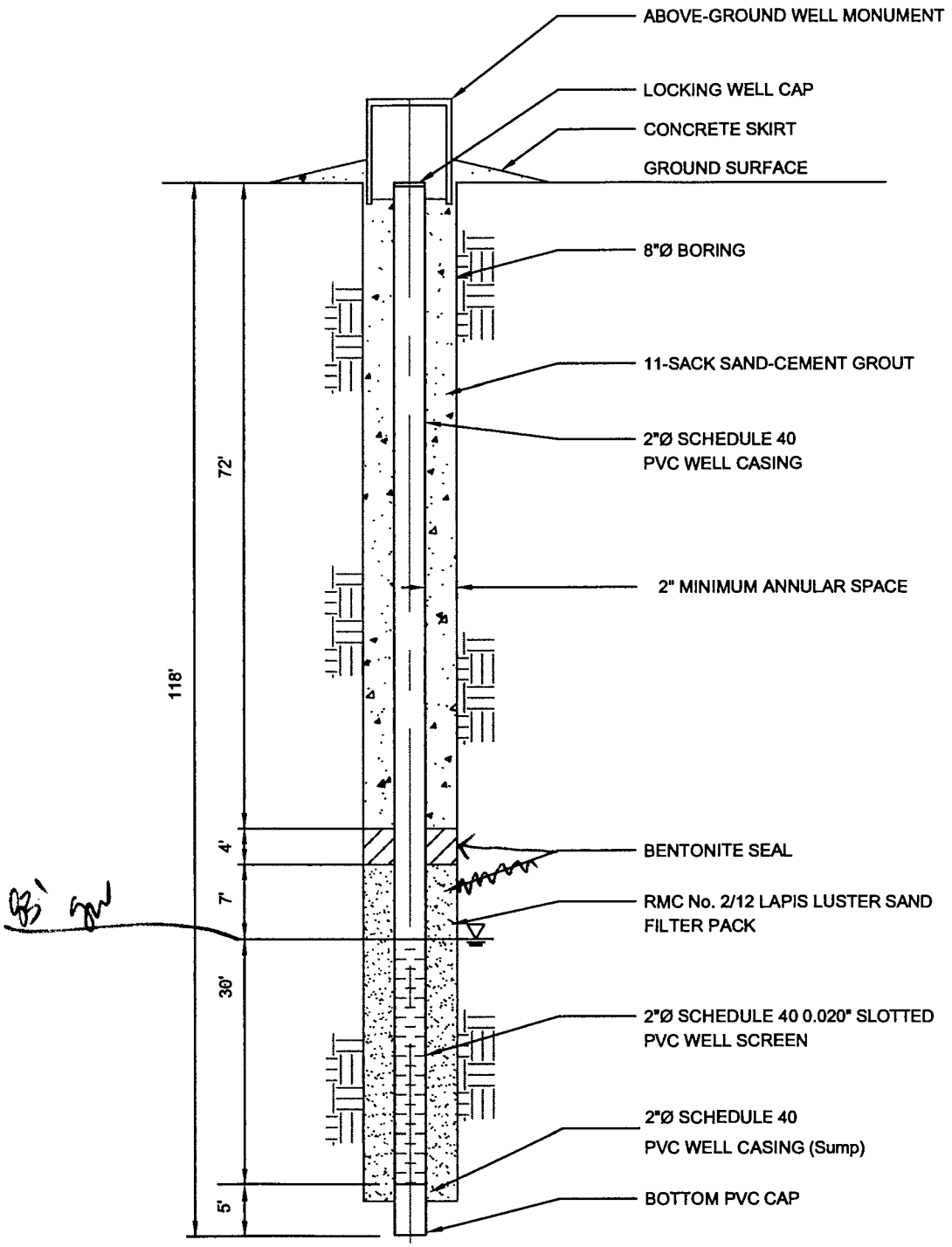
37 06 24
120 23 33 NAD 27

Recorded by: CG
Date: 03/06

DWR 429 (

APPENDIX B

Boring Logs & Construction Diagrams



Note:
Refer to accompanying Monitoring Well Installation Report for further descriptions of monitoring well constructionand installation procedures

URS 30 River Park Place West, Suite 180 Fresno, California 93720 Tel. (559) 256-1444	DRAWN BLS APPR CvK DATE 02/01/06 JOB NO. 18715077	WELL CONSTRUCTION DETAIL MONITORING WELL MW-2 TROOST DAIRY NEAR CHOWCHILLA, MADERA COUNTY, CA	FIGURE NO. B-1

Project: J. Troost Dairy
Project Location: 24868 Road 9, Madera County, California
Project Number: 18715077

Log of MW-2

Date(s) Drilled	12/06/05	Logged By	STS	Checked By	
Drilling Method	Hollow Stem Auger	Drill Bit Size/Type	8 1/2-inch Drag	Total Depth of Borehole	118.0 feet
Drill Rig Type	CME 55	Drilling Contractor	Technicon	Approximate Surface Elevation	~180
Groundwater Level(s)	83-feet bgs 12/06/05	Sampling Method(s)	SPT	Hammer Data	Downhole
Borehole Backfill		Location	2975 feet South and 2800 feet East of the Intersection of Road 8 and Avenue 25		

Depth, feet	SAMPLES Type	Blow Count per Interval (N-Value)	Graphic Log	MATERIAL DESCRIPTION	WELL SCHEMATIC and CONSTRUCTION DETAILS	REMARKS AND OTHER TESTS
0					Steel Above Ground Monument in Concrete Pad	
					11 sk Sand-Cement Grout	
5						
10	2	3 9 12		**SP-SM** Sand /w Silt: medium dense, fine grained, damp, olive brown		
15	4	5 7 12		**SP** Sand, Poorly-Graded: medium dense, fine to medium grained, damp, light olive brown	2"dia, Sch 40, PVC Casing	
20	7	4 5 9		increase in medium grained sand **SM** Sand, Silty: loose, fine grained, damp, olive brown		
25	2	2 3 5		increase in silt content	11 sk Sand-Cement Grout	
30						

Report: GEO_10_FRESNO_MW; File: TROOST DAIRY.GPJ; 2/2/2006 MW-2

URS

Project: J. Troost Dairy
Project Location: 24868 Road 9, Madera County, California
Project Number: 18715077

Log of MW-2

Depth, feet	SAMPLES Type	Blow Count per Interval (N-Value)	Graphic Log	MATERIAL DESCRIPTION	WELL SCHEMATIC and CONSTRUCTION DETAILS	REMARKS AND OTHER TESTS
30		2, 3, 7, 10		Silt, Sandy: stiff, fine grained, damp, non-plastic, olive brown		
35		2, 2, 3, 5		trace of clay, brown increase in sand	11 sk Sand-Cement Grout	
40		4, 8, 13, 21		**SP** Sand, Poorly-Graded: medium dense, fine to medium grained, damp, light yellowish brown increase in medium grained sand, yellowish brown		
45		7, 12, 15, 27			2"dia, Sch 40, PVC Casing	
				SW Sand, Well-Graded: medium dense, fine to coarse grained, damp, light olive brown		
50		9, 15, 12, 27		**SP** Sand, Poorly-Graded: medium dense, fine to medium grained, damp, yelowish brown		
55		5, 8, 10, 18				
				ML Silt, Sandy: stiff, fine grained, damp, non-plastic, dark yellowish brown		
60		2, 5, 9, 14			11 sk Sand-Cement Grout	
				SM Sand, Silty: loose, fine grained, damp, olive brown		
65						

Report: GEO_10_FRESNO_MW; File: TROOST DAIRY.GPJ; 2/2/2006 MW-2

URS

Project: J. Troost Dairy
Project Location: 24868 Road 9, Madera County, California
Project Number: 18715077

Log of MW-2

Depth, feet	SAMPLES Type	Blow Count per Interval (N-Value)	Graphic Log	MATERIAL DESCRIPTION	WELL SCHEMATIC and CONSTRUCTION DETAILS	REMARKS AND OTHER TESTS
65		3, 4, 5, 9				
70		3, 5, 9, 14		seams of increasing and decreasing silt content	2"dia, Sch 40, PVC Casing; Medium Bentonite Pellets	
				decrease in silt		
75		6, 10, 12, 22		**SP** Sand, Poorly-Graded: medium dense, fine grained, damp, olive brown	#2/12 Sand	
				increase in silt		
80		8, 10, 14, 24		**SM** Sand, Silty: medium dense, fine grained, damp, olive brown; **SP-SM** Sand /w Silt: medium dense, fine grained, moist, olive brown	∇ 2"dia, Sch 40, 0.020" slotted, PVC Screen	
85		2, 3, 5, 8		increase in silt, loose, wet		
90						
95					#2/12 Sand	
100						

URS

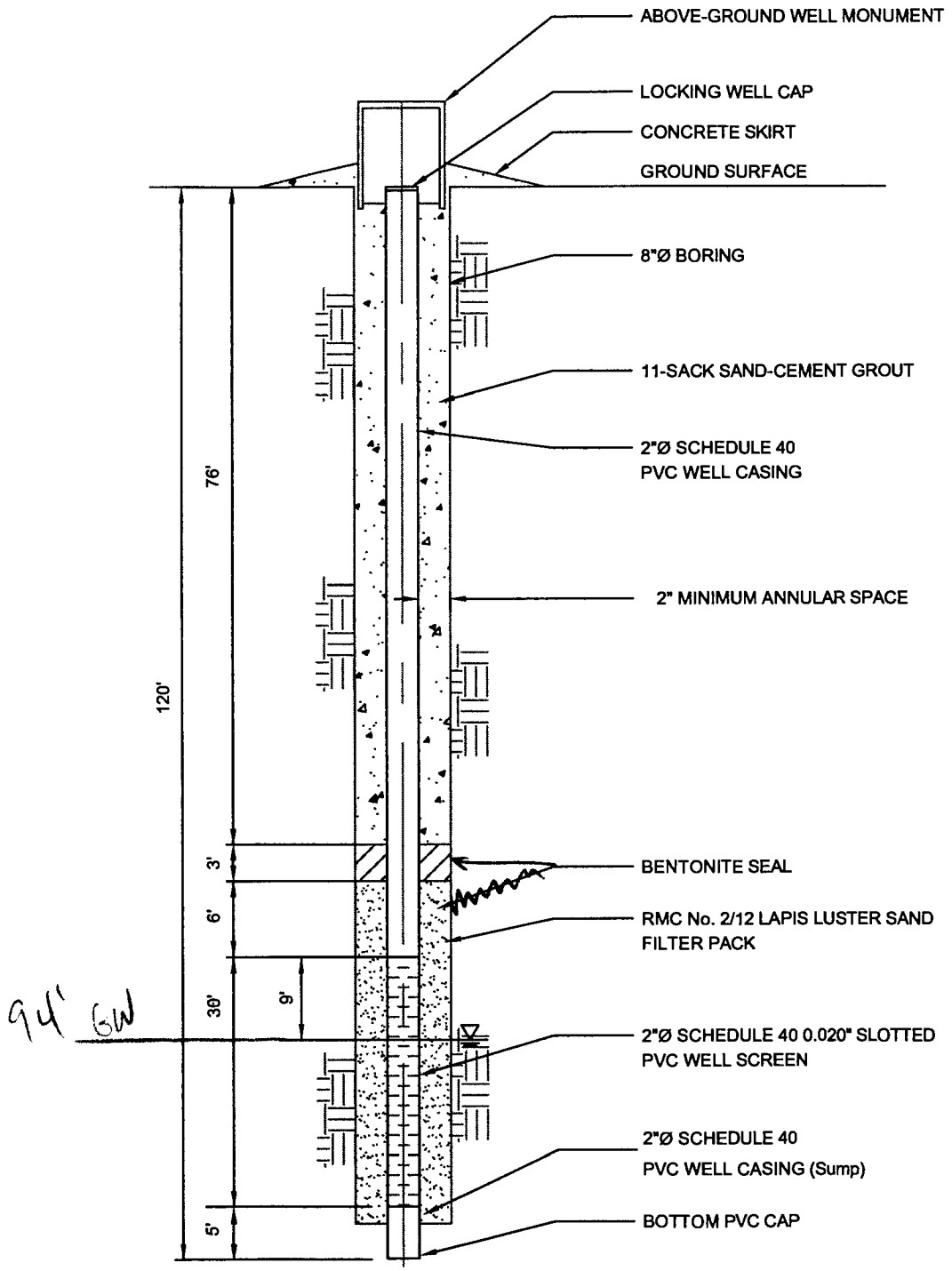
Project: J. Troost Dairy
Project Location: 24868 Road 9, Madera County, California
Project Number: 18715077

Log of MW-2

Depth, feet	SAMPLES: Type	SAMPLES: Blow Count per Interval (N-Value)	Graphic Log	MATERIAL DESCRIPTION	WELL SCHEMATIC and CONSTRUCTION DETAILS	REMARKS AND OTHER TESTS
				CL Clay, Sandy: stiff, fine grained, wet, medium plasticity, grayish brown	2"dia, Sch 40, 0.020" slotted, PVC Screen	
105					#2/12 Sand	
110					Native backfill	
115					2"dia, Sch 40, PVC Casing /w End Cap	
120				Bottom of Boring at 118 feet bgs		
125						
130						
135						

Report: GEO_10_FRESNO_MW; File: TROOST DAIRY.GPJ; 2/2/2006 MW-2

URS



Note:
Refer to accompanying Monitoring Well Installation Report for further descriptions of monitoring well constructionand installation procedures

URS 30 River Park Place West, Suite 180 Fresno, California 93720 Tel. (559) 256-1444	DRAWN BLS APPR CVK DATE 02/01/06 JOB NO. 18715077	WELL CONSTRUCTION DETAIL MONITORING WELL MW-3 TROOST DAIRY NEAR CHOWCHILLA, MADERA COUNTY, CA	FIGURE NO. B-2

Project: J. Troost Dairy
Project Location: 24868 Road 9, Madera County, California
Project Number: 18715077

Log of MW-3

Date(s) Drilled	12/05/05	Logged By	CVK	Checked By	BLS
Drilling Method	Hollow Stem Auger	Drill Bit Size/Type	8 1/2-inch Drag	Total Depth of Borehole	120.0 feet
Drill Rig Type	CME 55	Drilling Contractor	Technicon	Approximate Surface Elevation	~180
Groundwater Level(s)	94-feet bgs 12/05/05	Sampling Method(s)	SPT	Hammer Data	Downhole
Borehole Backfill		Location	2130 feet South and 2150 feet East of the Intersection of Road 8 and Avenue 25		

Depth, feet	SAMPLES Type	Blow Count per Interval (N-Value)	Graphic Log	MATERIAL DESCRIPTION	WELL SCHEMATIC and CONSTRUCTION DETAILS	REMARKS AND OTHER TESTS
0				**SM** Sand, Silty: loose, fine to medium grained, damp, non-plastic, dark brown	Steel Above Ground Monument in Concrete Pad	
					11 sk Sand-Cement Grout	
5				medium dense, light gray		
10	6	7 7 14		**ML** Silt, Sandy: firm, fine to medium grained, damp, slight plasticity, light olive brown, (w/ mica), (possible Silty Sand)		
15	6	5 5 10		**SP-SM** Sand w/ Silt: loose, fine to medium grained, damp, light brown	2"dia, Sch 40, PVC Casing	
20	4	5 8 13		**ML** Silt, Sandy: stiff, fine grained, moist, slight plasticity, olive brown (possible Silty Sand)		
				decreasing stiffness		
25	3	6 7 13		**SP-SM** Sand w/ Silt: medium dense, fine to medium grained, damp, yellowish brown, (w/ mica)	11 sk Sand-Cement Grout	
				SM increasing denseness		
30						

URS

Project: J. Troost Dairy
Project Location: 24868 Road 9, Madera County, California
Project Number: 18715077

Log of MW-3

Depth, feet	SAMPLES Type	Blow Count per Interval (N-Value)	Graphic Log	MATERIAL DESCRIPTION	WELL SCHEMATIC and CONSTRUCTION DETAILS	REMARKS AND OTHER TESTS
30		4 6 9 15		**ML** Silt, Sandy: stiff, fine to medium grained, damp, slight plasticity, olive brown, (w/ some mica) increase in sand		
35		8 12 13 25		**SW** Sand, Well-Graded: medium dense, fine to coarse grained, (w/few gravels <1/2"), damp, pale yellow	11 sk Sand-Cement Grout	
40		8 14 8 22		**SM** Sand, Silty: medium dense, fine to medium grained, damp, light brown **ML** Silt w/ Sand: very stiff, fine grained, damp, slight plasticity, light olive brown		
45		3 6 6 12		**SM** Sand, Silty: medium dense, fine to medium grained, damp, olive brown with orange oxide mottling	2"dia, Sch 40, PVC Casing	
50		3 6 6 12		Sand, Silty: medium dense, fine to medium grained, damp, very pale brown w/ gray mottling **ML** Silt, Sandy: stiff, fine grained, moist, slight plasticity, olive brown		
55		8 11 15 26		decrease in sand, very stiff		
60		1 26 34 60		**SM** Sand, Silty: very dense, fine grained, damp, reddish brown, w/ black and gray mottling	11 sk Sand-Cement Grout	
65						

URS

Project: J. Troost Dairy
Project Location: 24868 Road 9, Madera County, California
Project Number: 18715077

Log of MW-3

Depth, feet	SAMPLES Type	Blow Count per Interval (N-Value)	Graphic Log	MATERIAL DESCRIPTION	WELL SCHEMATIC and CONSTRUCTION DETAILS	REMARKS AND OTHER TESTS
65		8, 9, 11, 20		**ML** Silt, Sandy: very stiff, fine grained, damp, non-plastic, light olive brown /w dark brown mottling (possible Silty Sand)		
70		4, 5, 7, 12		**SM** Sand, Silty: medium dense, fine grained, moist, olive brown	2"dia, Sch 40, PVC Casing	
75		6, 11, 14, 25		medium brown	Medium Bentonite Pellets; #2/12 Sand	
80		12, 13, 16, 29		increase in silt and clay (possible Sandy Silt)		
85		3, 5, 7, 12		**ML** Silt, Sandy: stiff, fine grained, moist, slight plasticity, light brown	2"dia, Sch 40, 0.020" slotted, PVC Screen	
90		8, 12, 24, 36		**SM** Sand, Silty: dense, fien to medium grained, moist, olive brown	#2/12 Sand	
95					2"dia, Sch 40, 0.020" slotted, PVC Screen	
				ML (Silt, Sandy), increasing clay content with depth, wet, gray		
100						

Report: GEO_10_FRESNO_MW; File: TROOST DAIRY.GPJ; 2/2/2006 MW-3

URS

Project: J. Troost Dairy
Project Location: 24868 Road 9, Madera County, California
Project Number: 18715077

Log of MW-3

Depth, feet	SAMPLES Type	SAMPLES Blow Count per Interval (N-Value)	Graphic Log	MATERIAL DESCRIPTION	WELL SCHEMATIC and CONSTRUCTION DETAILS	REMARKS AND OTHER TESTS
				CL-ML Clayey-Silt, Sandy: fine to medium grained, wet, gray		
105				**SC-SM** Sand, Clayey-Silty: fine to medium grained, wet, light brownish gray, (increasing sand content with depth)	2"dia, Sch 40, 0.020" slotted, PVC Screen	
110					#2/12 Sand	
115					Native backfill	
				SM Sand, Silty: fine to medium grained, wet, cemented		
120					2"dia, Sch 40, PVC Casing /w End Cap	
				Bottom of Boring at 120 feet bgs		
125						
130						
135						

Report: GEO_10_FRESNO_MW; File: TROOST DAIRY.GPJ; 2/2/2006 MW-3

URS

URS

March 27, 2006

Steven M. Hulbert
Regional Water Quality Control Board
Central Valley Region
1685 E Street
Fresno, CA 93706-2020

Re: Groundwater Monitoring Well Installation Report
Troost Dairy
24868 Road 9
Near Chowchilla, Madera County, CA
URS Job No. 18715077

Dear Mr. Hulbert:

On behalf of our Client, J. Troost Dairy, L.P., URS Corporation (URS) is submitting the enclosed well installation report documenting the installation of two new monitoring wells, designated MW-2 and MW-3, at the Troost Dairy (site). These activities were conducted under the oversight of URS in accordance with the July 6, 2005 Groundwater Monitoring Workplan (Workplan), which was approved in an October 7, 2005, California Regional Water Quality Control Board (RWQCB) letter to Client.

The report will also be submitted to the Madera County Environmental Health Department. Please contact us if you have any questions or comments regarding this report.

Respectfully submitted,
URS Corporation

Casper van Keppel, EIT
Project Engineer

Ralph Boyajian, PE, GE
Principal Engineer / Branch Manager

REGISTERED PROFESSIONAL ENGINEER
RALPH T. BOYAJIAN
No. 27722
Exp. 3/31/08
CIVIL
STATE OF CALIFORNIA

Enclosure: Report

c: Mr. John Troost, J. Troost Dairy, L.P., Chowchilla, CA
Madera County Environmental Health Department
URS file

URS Corporation
30 River Park Place West, Suite 180
Fresno, CA 93720
Tel: 559.256.1444
Fax: 559.256.1478

URS

JUN 30 2011

GROUNDWATER MONITORING PROGRAM
OCTOBER 2010 DATA TRANSMITTAL

J Troost Dairy, L.P.
24868 Road 9
Near Chowchilla, Madera County, CA

Prepared by:
URS Corporation

November 11, 2010

URS Job No. 18715238

URS

November 11, 2010

Mr. Steven M. Hulbert
Regional Water Quality Control Board
Central Valley Region
1685 E Street
Fresno, CA 93706-2020

Re: Groundwater Monitoring Program
October 2010 Data Transmittal
Troost Dairy
24868 Road 9
Near Chowchilla, Madera County, CA
URS Job No. 18715238

Dear Mr. Hulbert:

URS Corporation (URS) has prepared this data transmittal for J. Troost Dairy, L.P. (Client) in accordance with the July 6, 2005 Groundwater Monitoring Workplan (Workplan), which was approved in an October 7, 2005, California Regional Water Quality Control Board (RWQCB) letter to Client. This data transmittal presents the methodology and results of the October 5, 2010 groundwater monitoring event conducted by URS at the Troost Dairy (site).

SETTING

The site consists of a 65-acre dairy facility with 822 acres of associated cropland where liquid dairy waste is applied. The site lies south of Avenue 25, west of Road 9, about 5 miles west of Chowchilla. The site elevation is approximately 180 feet above mean sea level (amsl). The general topography in the area is relatively flat, and the ground surface slopes about 5 to 10 feet per mile to the west (United States Geological Service, 1969). Figure 1 shows a site vicinity map and Figure 2 shows the site and portions of the adjacent properties.

MONITORING PROGRAM ACTIVITIES

On October 5, 2010, URS conducted the following recurrent monitoring activities:

- Measured the groundwater depths in the site's three groundwater monitoring wells, using an electric sounding tape.
- Purged at least 3 well-casing volumes from each well and sampled the three monitoring wells using an electric submersible pump (MW-2 and 3) or bailer (MW-1). During the purging process, the purged water was monitored in the field for temperature, pH, and electrical conductivity.
- Purged and sampled the on-site water supply system. This system is supplied with water from one well (SW-1) which is screened at various intervals within a gravel

URS Corporation
30 River Park Place West, Suite 180
Fresno, CA 93720-1539
Tel: 559.256.1444
Fax: 559.256.1478
www.urscorp.com

filter pack that extends from about 320 feet bgs to a bottom depth of about 800 feet bgs. The sample was collected at the wellhead of well SW-1.

On October 5, 2010, URS submitted the water samples to a California Environmental Laboratory Accreditation Program (ELAP) certified laboratory (Dellavalle Laboratories in Fresno, California) for analysis. In accordance with the RWQCB's October 7, 2005 letter, the water samples were analyzed for the following constituents:

- Cations (ammonium, calcium, iron, magnesium, manganese, potassium, and sodium)
- Anions (chloride, nitrate, sulfate)
- Total Kjeldahl nitrogen (TKN)
- Total dissolved solids (TDS)
- Alkalinity (bicarbonate and carbonate)
- Electrical conductivity (EC)
- pH

Field documentation for the monitoring event is included in Appendix A. Chain of custody documentation is included in Appendix B.

GROUNDWATER OCCURRENCE

On October 5, 2010, the depth to groundwater was measured at 84.85, 85.29, and 79.64 feet below top of casing (btc) in wells MW-1, MW-2 and MW-3, respectively. These levels indicate that the water table had risen about 3 feet since September 9, 2009.

Groundwater elevation data for the 2010 monitoring event are presented on Table 1. A potentiometric surface map for this event is presented in Figure 3. The groundwater flow direction across the dairy facility and associated croplands appears to be southeasterly for this monitoring event. A graphical representation of the observed groundwater elevations is included in Appendix C. There is insufficient data to perform a trend analysis.

GROUNDWATER QUALITY

Based on its location relative to the groundwater flow direction and site operations, the water in MW-1 appears to be representative for background groundwater quality at the site. Samples collected from all three monitoring wells exceeded the MCLs for EC and TDS (900 μmhos/cm and 500 mg/L, respectively), however, were consistent with past results. The MCL for nitrate and TDS (10 mg/L) was exceeded in samples from the wells MW-2 and MW-3 and were also consistent with past results. For the sample collected from supply well SW-1, none of the analytes exceeded MCLs. The analytical results for the reporting period are summarized on Table 2. Field documentation for the monitoring

event is included in Appendix A. Copies of the laboratory reports and chain-of-custody documentation are included in Appendix B. A graphical representation of the observed nitrate concentrations in groundwater samples is included in Appendix C. There is insufficient data to perform a trend analysis.

LIMITATIONS

This report has been prepared for the exclusive use of J. Troost Dairy and regulatory agencies with oversight responsibility for this project, in accordance with generally accepted environmental engineering practices in Madera County, California at the time the services were performed. URS' services were performed solely for the objective stated herein.

Please contact us if you have any questions.

Respectfully submitted,
URS Corporation

Casper van Keppel, PE
Project Chemical Engineer

Frank L. Gegunde, RG
Senior Geologist

PROFESSIONAL GEOLOGIST
FRANK GEGUNDE
No. 7998
Exp. 6/30/11
STATE OF CALIFORNIA

c: John Troost, J. Troost Dairy, L.P.
URS File

Attachments: See list of attachments on next page

URS

LIST OF ATTACHMENTS

TABLES

1 Groundwater Elevations
2 Groundwater Analytical Results

FIGURES

1 Vicinity Map
2 Monitoring Well Location Map
3 Potentiometric Contour Map October 2010

APPENDICES

A Field Documentation
B Chain-of-Custody Documentation and Analytical Results
C Groundwater Elevation and Nitrate Trends

TABLES

TABLE 1
GROUNDWATER ELEVATIONS
Troost Dairy
24868 Road 9
Near Chowchilla, Madera County, CA

Monitoring Well	Top of Casing Elevation (Feet, amsl)	Screened Interval Depth (Feet, btc)	Screened Interval Elevation (Feet, amsl)	Sample Date	Measured Depth to Water (Feet, btc)	Groundwater Elevation (ft. amsl) (Feet, amsl)
MW-1	184.82	60.0 - 89.0	124.8 - 95.8	1/11/2006	77.27	107.55
				6/28/2006	78.50	106.32
				9/26/2006	72.55	112.27
				1/17/2007	70.50	114.32
				6/3/2008	83.11	101.71
				6/23/2009	87.12	97.70
				9/9/2009	87.93	96.89
				10/5/2010	84.85	99.97
MW-2	182.55	83.0 - 113.0	99.5 - 69.6	1/11/2006	85.82	96.73
				6/28/2006	87.48	95.07
				9/26/2006	83.17	99.38
				1/17/2007	80.80	101.75
				6/3/2008	95.31	87.24
				6/23/2009	101.70	80.85
				9/9/2009	91.03	91.52
				10/5/2010	85.29	97.26
MW-3	179.65	85.0 - 115.0	94.7 - 64.7	1/11/2006	78.66	100.99
				6/28/2006	80.13	99.52
				9/26/2006	73.95	105.70
				1/17/2007	73.10	106.55
				6/3/2008	85.66	93.99
				6/23/2009	91.05	88.60
				9/9/2009	81.84	97.81
				10/5/2010	79.64	100.01

Notes:

amsl above mean sea level
btc below top of casing

The top of casing elevations relative to mean sea level were provided by Mc. Dougal and Sons, Professional Land Surveyors.

Near Chowchilla, Madera County, CA

EC (µmhos/cm)	TDS (mg/L)	Nitrate (mg/L N equivalents)	Nitrite (mg/L N equivalents)	Ammonium (mg/L N equivalents)	TKN (mg/L)	Calcium (mg/L)	Iron (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfat (mg/L
915	600	10.2	< 0.10	< 0.50	< 1	123	<0.5	27.5	<0.1	3.1	37.7	59.4	25.0
950	630	9.4	< 0.10	< 0.50	< 1	115	<0.01	25.7	<0.01	3.2	33.1	60.3	23.5
1036	660	12.9	< 0.10	< 0.50	< 1	122	<0.01	27.5	<0.01	3.5	46.0	85.5	26.9
873	603	11.5	< 0.10	< 0.50	< 1	114	<0.01	26.7	<0.01	4.4	37.0	75.8	<0.2
1150	880	9.9	< 0.10	< 0.50	< 1	203	<0.01	45.1	<0.01	5.1	51.0	85.0	39.8
944	850	9.3	n.a.	< 0.50	< 1	180	<0.01	40.2	<0.01	4.3	49.0	72.0	31.8
1,313	860	40.4	< 0.10	< 0.50	< 1	168	1.9	37.9	0.2	5.9	55.3	131	34.2
1,510	1,120	44.0	< 0.10	< 0.50	< 1	202	<0.01	42.3	<0.01	5.1	55.9	136	56.7
1,288	892	54.8	< 0.10	< 0.50	< 1	157	<0.01	32.0	<0.01	3.6	49.0	117	37.5
1,201	863	46.5	< 0.10	< 0.50	< 1	155	<0.01	30.8	<0.01	4.0	51.0	106	<0.2
1,290	1,110	62.2	< 0.10	< 0.50	< 1	176	<0.01	40.9	<0.01	4.1	65.0	128	51.2
1,050	1,090	62.8	n.a.	< 0.50	< 1	188	0.03	38.4	<0.01	4.0	61.0	114	47.7
1,024	673	32.1	< 0.10	< 0.50	< 1	133	1.5	26.5	<0.1	4.7	51.0	99.9	22.6
869	628	16.9	< 0.10	< 0.50	< 1	97	<0.01	19.4	<0.01	4.9	35.3	104	16
969	665	26.1	< 0.10	< 0.50	< 1	111	<0.01	19.9	<0.01	4.5	39.0	114	18.7
956	665	31.4	< 0.10	< 0.50	< 1	120	<0.01	24.4	<0.01	5.6	48.0	91.7	<0.2
1050	843	36.2	< 0.10	< 0.50	< 1	148	<0.01	31.0	<0.01	6.3	59.0	113	21.5
1070	1,110	61.9	n.a.	< 0.50	< 1	187	<0.01	39.5	<0.01	7.1	68.0	135	21.9
369	243	1.7	< 0.10	< 0.50	< 1	25.7	<0.5	5.9	0.1	2.0	46.0	45.2	3.0
300	200	<0.1	< 0.10	< 0.50	< 1	9.3	<0.01	1.8	0.1	1.7	47.3	33.1	0.7
376	235	2.2	< 0.10	< 0.50	< 1	30.8	<0.01	4.4	<0.01	2.5	42.0	44.9	3.1
353	245	1.8	< 0.10	< 0.50	< 1	21.6	<0.01	5.0	0.05	2.8	44.0	43.3	<0.2
338	263	1.0	< 0.10	< 0.50	< 1	17.3	<0.01	4.2	0.08	2.9	52.0	38.8	2.2
319	193	0.7	n.a.	< 0.50	< 1	18.5	<0.01	4.4	0.08	3.1	45.0	35.8	1.6

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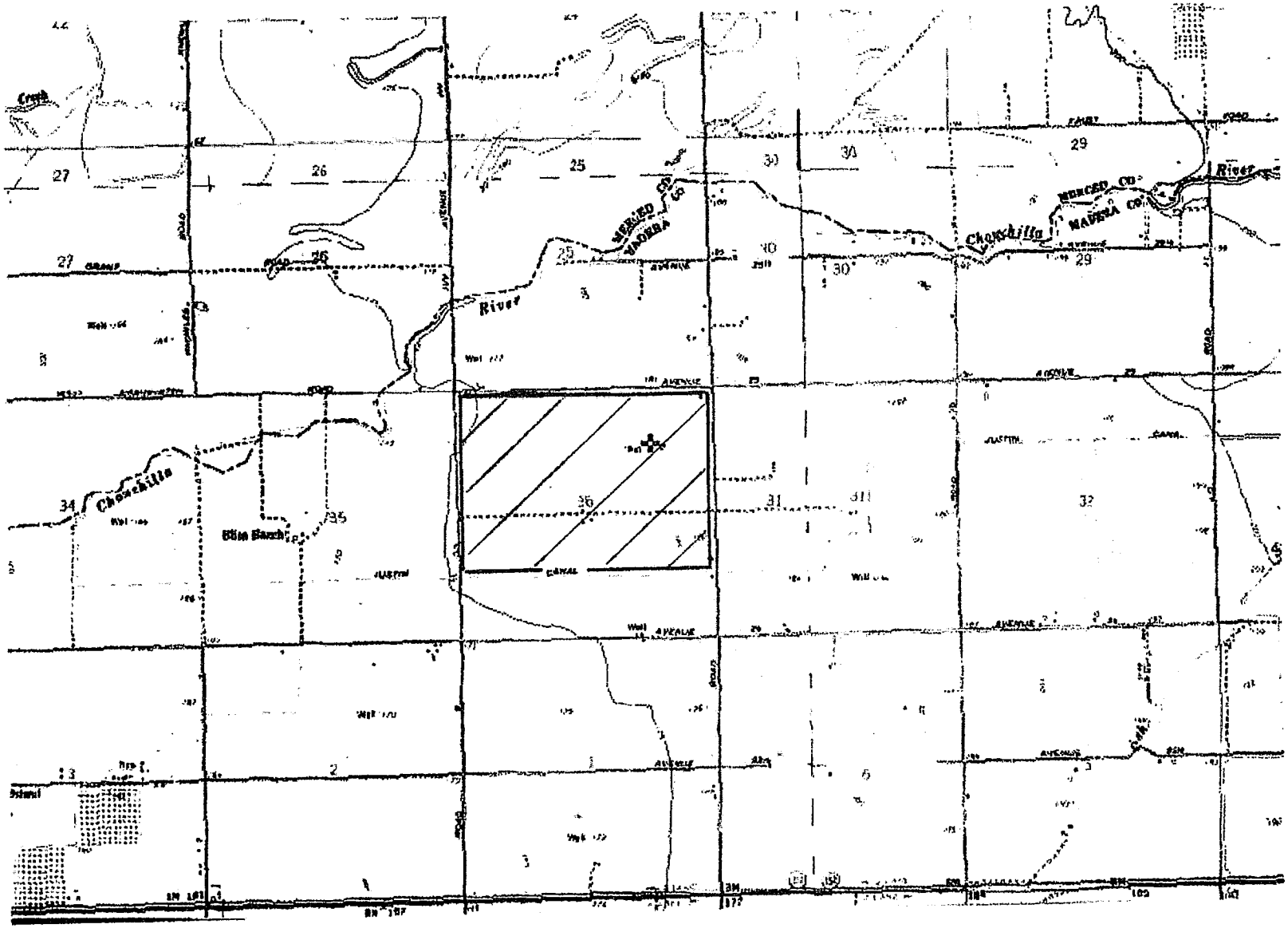
per centimeter
:uivalents
lved Solids
ahl Nitrogen

FIGURES



N

Troost Dairy

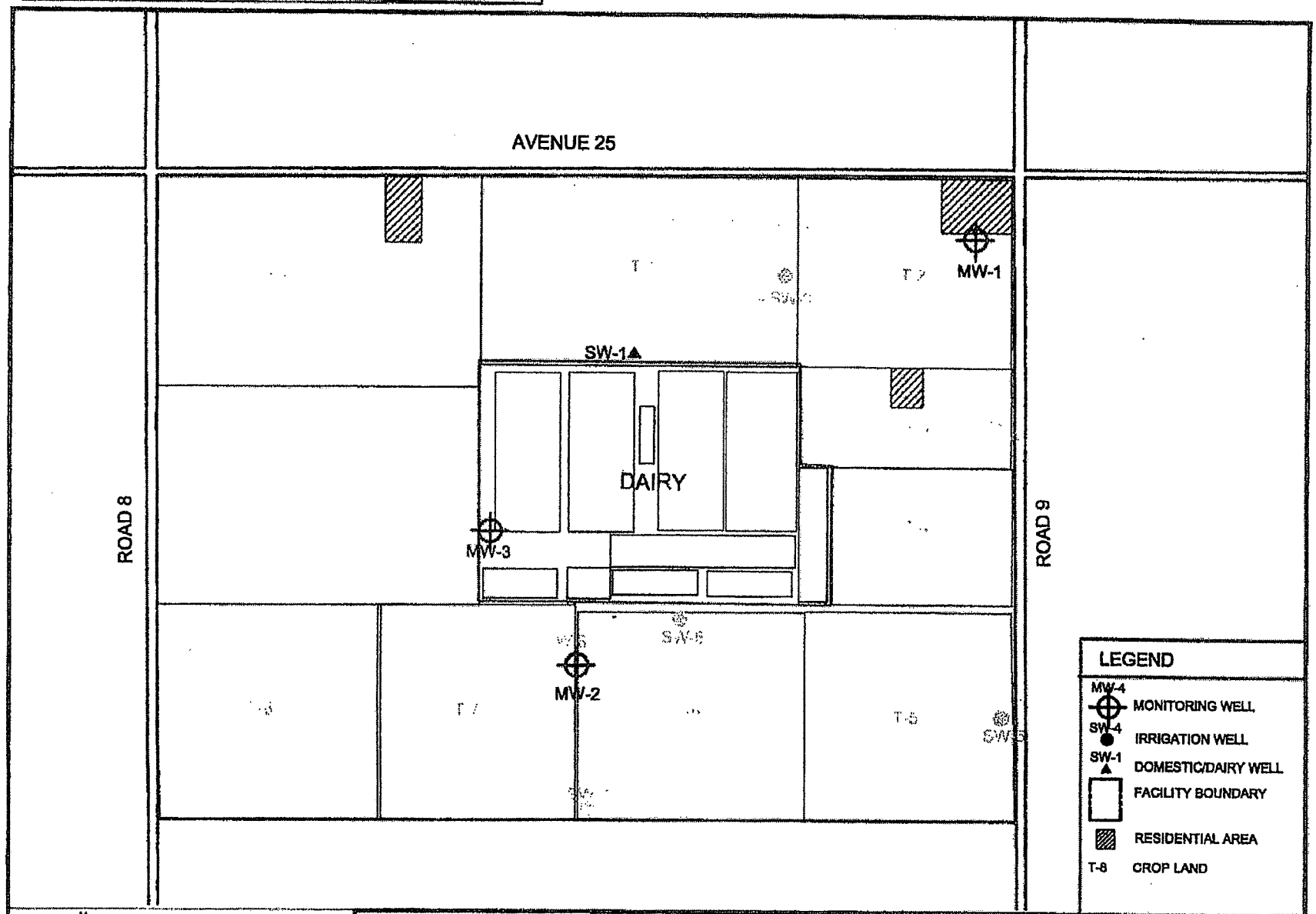
0 0.25 0.5
(MILES)

URS
30 River Park Place West,
Suite 180
Fresno, California 93720
Tel. (559) 256-1444

DRAWN	BLS
APPR	CVK
DATE	12-01-04
JOB NO.	18715077

VICINITY MAP
TROOST DAIRY
NEAR CHOWCHILLA, MADERA COUNTY, CA

FIGURE NO. 1



N

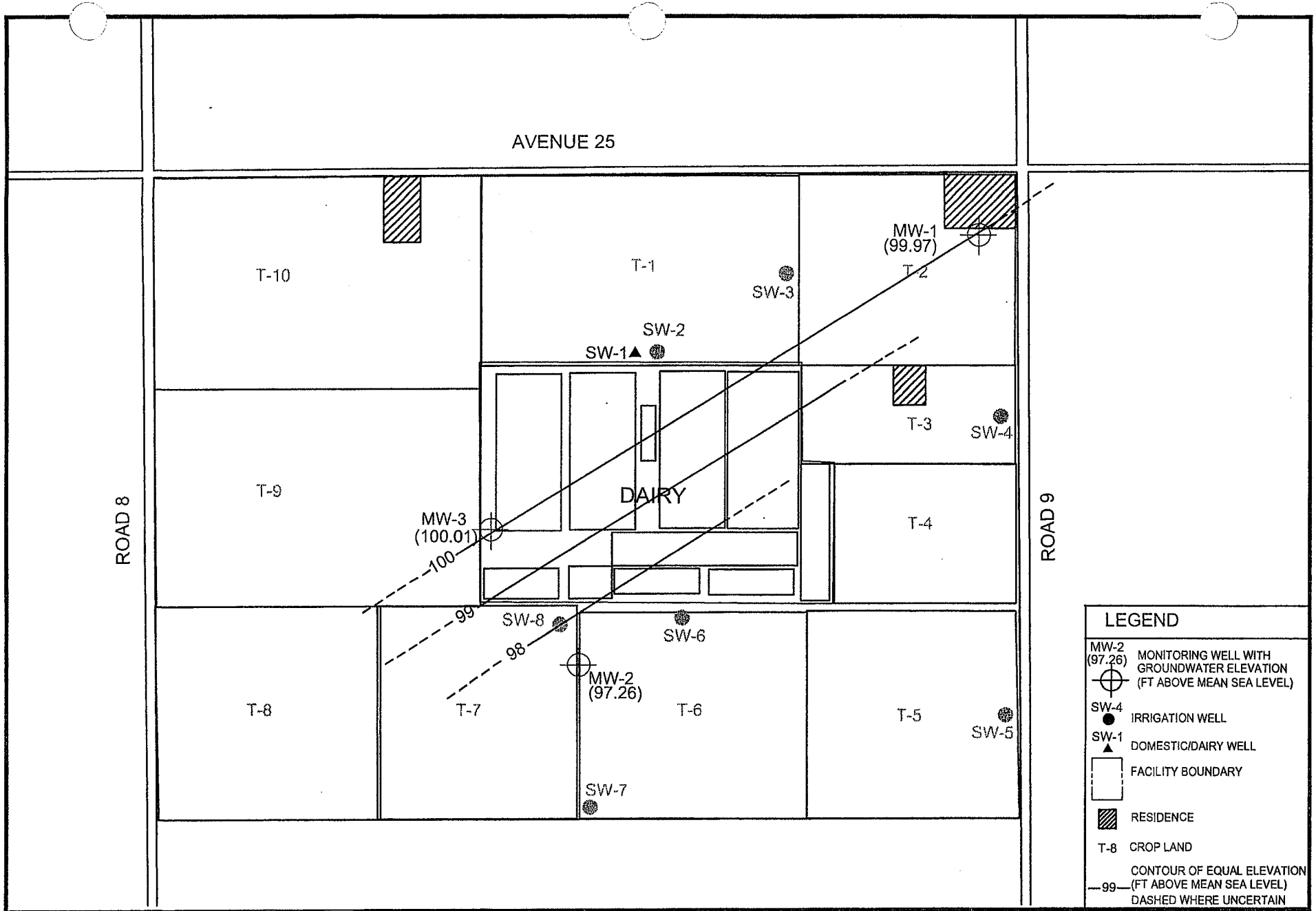
0 400 800
(FEET)

URS
30 River Park Place West,
Suite 180
Fresno, California 93720
Tel. (559) 256-1444

DRAWN	BLS
APPR	CVK
DATE	02/01/06
JOB NO.	18715077

MONITORING WELL LOCATION MAP
TROOST DAIRY
NEAR CHOWCHILLA, MADERA COUNTY, CA

FIGURE NO. 2



N

0 400 800
(FEET)

URS
30 River Park Place West,
Suite 150
Fresno, California 93720
Tel. (559) 256-1444

DRAWN	CvK
APPR	CvK
DATE	11/11/10
JOB NO.	18715238

POTENTIOMETRIC CONTOUR MAP
OCTOBER 2010
TROOST DAIRY
NEAR CHOWCHILLA, MADERA COUNTY, CA

FIGURE NO. 3

APPENDIX A
Field Documentation

FIELD RECORD OF WATER SAMPLING

URS CORPORATION

Site Name	Troost Dairy	Date	October 5, 2010
Job Number	18715238.09001		
Sampler's Name	Casper van Keppel	File	

Well Identification No.	MW-1	Depth to Water (ft. to TOC)	84.85
Casing Type/ Diameter:	3"	Water Column (TD-DTW ft.)	6.15
Depth of Well (ft. bgs)	91.0	One Casing Volume	2.28
		Three Casing Volumes	6.83
Pump Intake Depth (ft bgs)	Not applicable	Casing volume per foot: 2"-.17 2.5"-.26 3"-.37 4"-.65 4.5"-.83 5"-1.0 6"-1.5 8"-2.6 10"-4.1 12"-5.9 15"-9.2 Formula (I.D. in inches/24)^2 * π * 7.48=G/ft	
Well sealed and locked	yes	Purge Method	bailer
Water inside Monument	no	Purge Storage	bucket

General Condition of Well: new (good) fair poor

Time	Temp °C	DO (mg/L)	EC (µS/cm)	pH	Turbidity (NTU's)	Eh (mV)	Purge Volume (Gallons)	Comments	Sampler's Initials
900							N/A	Begin Purge	CvK
908	18.8		1168	6.90			2.2	slight turbidity	CvK
920	18.6		1153	6.91			4.4	"	CvK
930	18.6		1157	6.88			6.85	" ; end purge	CvK

Total Purge Volume (Gallons)	6.85	Purge Volume Measurement:	bucket
Total Purge Time (min.)	30 min	Purge Rate (Gal./Min.)	n/a

RECORD OF SAMPLING

Sampling Method :	Bailer	Temp	18.6
Date of Sample	October 5, 2010	EC	1157
Sample Time		pH	6.88
Sample Identification	MW-1	DO	—

Sample Container Type	Number of containers
non-preserved 1 liter poly	1
HNO3 preserved 250 ml poly	1
H2SO4 preserved 250 ml poly	1

Measured Parameter	Instrument Used	Instrument Serial No.	Source	Calibration Date
Water Level	Durham GeoSlope	31781	URS	not applicable
Temperature	Hanna	98129	URS	not applicable
EC	Hanna	98129	URS	4-Oct-10
pH	Hanna	98129	URS	4-Oct-10
DO	not applicable			
ORP	not applicable			
Turbidity	not applicable			

FIELD RECORD OF WATER SAMPLING

URS CORPORATION

Site Name	Troost Dairy	Date	October 5, 2010
Job Number	18715238.09001		
Sampler's Name	Casper van Keppel	File	

Well Identification No.	MW-2	Depth to Water (ft. to TOC)	85.29
Casing Type/ Diameter:	2"	Water Column (TD-DTW ft.)	30.71
Depth of Well (ft. bgs)	116.0	One Casing Volume	5.22
		Three Casing Volumes	15.66
Pump Intake Depth (ft bgs)	Not applicable	Casing volume per foot: 2"-.17 2.5"-.26 3"-.37 4"-.65 4.5"-.83 5"-1.0 6"-1.5 8"-2.6 10"-4.1 12"-5.9 15"-9.2 Formula (I.D. in Inches/24)^2 * π * 7.48=G/ft	
Well sealed and locked	yes	Purge Method	bailer
Water inside Monument	no	Purge Storage	bucket

General Condition of Well: new, (good), fair, poor — Wasp nest in monument. Killed wasps prior to sampling

Time	Temp °C	DO (mg/L)	EC (µS/cm)	pH	Turbidity (NTU's)	Eh (mV)	Purge Volume (Gallons)	Comments	Sampler's Initials
11:48							N/A	Begin Purge	CVK
12:02	20.5		1365	6.80			5	Sl. turbidity	CVK
12:25	20.5		1370	6.82			11	"	CVK
12:50	20.4		1363	6.83			16	"; End purge	CVK

Total Purge Volume (Gallons)	16	Purge Volume Measurement:	bucket
Total Purge Time (min.)	50	Purge Rate (Gal./Min.)	n/a

RECORD OF SAMPLING

Sampling Method :	Bailer	Temp	20.4
Date of Sample	October 5, 2010	EC	1363
Sample Time	12:50	pH	6.83
Sample Identification	MW-2	DO	—

Sample Container Type	Number of containers
non-preserved 1 liter poly	1
HNO3 preserved 250 ml poly	1
H2SO4 preserved 250 ml poly	1

Measured Parameter	Instrument Used	Instrument Serial No.	Source	Calibration Date
Water Level	Durham GeoSlope	31781	URS	not applicable
Temperature	Hanna	98129	URS	not applicable
EC	Hanna	98129	URS	4-Oct-10
pH	Hanna	98129	URS	4-Oct-10
DO	not applicable			
ORP	not applicable			
Turbidity	not applicable			

FIELD RECORD OF WATER SAMPLING

URS CORPORATION

Site Name	Troost Dairy	Date	October 5, 2010
Job Number	18715238.09001		
Sampler's Name	Casper van Keppel	File	

Well Identification No.	MW-3	Depth to Water (ft. to TOC)	79.64
Casing Type/ Diameter:	2"	Water Column (TD-DTW ft.)	42.76
Depth of Well (ft. bgs)	122.4	One Casing Volume	7.27
		Three Casing Volumes	21.81
Pump Intake Depth (ft bgs)	Not applicable	Casing volume per foot: 2"-.17 2.5"-.26 3"-.37 4"-.65 4.5"-.83 5"-1.0 6"-1.5 8"-2.6 10"-4.1 12"-5.9 15"-9.2 Formula (I.D. in inches/24)^2 * π * 7.48=G/ft	
Well sealed and locked	yes	Purge Method	bailer
Water inside Monument	no	Purge Storage	bucket

General Condition of Well: new (good) fair poor

Time	Temp °C	DO (mg/L)	EC (µS/cm)	pH	Turbidity (NTU's)	Eh (mV)	Purge Volume (Gallons)	Comments	Sampler's Initials
9:40							N/A	Begin Purge	CvK
10:10	18.7		1385	7.23			7.3	sl. turbidity	CvK
10:40	18.8		1450	7.01			15	"	CvK
11:10	18.8		1447	7.01			22	" end purge	CvK

Total Purge Volume (Gallons)	22 gal	Purge Volume Measurement:	bucket
Total Purge Time (min.)	1hr 30 min	Purge Rate (Gal./Min.)	n/a

RECORD OF SAMPLING

Sampling Method :	Bailer	Temp	18.8
Date of Sample	October 5, 2010	EC	1447
Sample Time	11:10	pH	7.01
Sample Identification	MW-3	DO	—

Sample Container Type	Number of containers
non-preserved 1 liter poly	1
HNO3 preserved 250 ml poly	1
H2SO4 preserved 250 ml poly	1

Measured Parameter	Instrument Used	Instrument Serial No.	Source	Calibration Date
Water Level	Durham GeoSlope	31781	URS	not applicable
Temperature	Hanna	98129	URS	not applicable
EC	Hanna	98129	URS	4-Oct-10
pH	Hanna	98129	URS	4-Oct-10
DO	not applicable			
ORP	not applicable			
Turbidity	not applicable			

FIELD RECORD OF WATER SAMPLING

URS CORPORATION

Site Name	Troost Dairy	Date	October 5, 2010
Job Number	18715238.09001		
Sampler's Name	Casper van Keppel	File	

Well Identification No.	SW-1	Depth to Water (ft. to TOC)	n/a
Casing Type/ Diameter:	n/a	Water Column (TD-DTW ft.)	n/a
Depth of Well (ft. bgs)	n/a	One Casing Volume	n/a
		Three Casing Volumes	n/a
Pump Intake Depth (ft bgs)	Not applicable	Casing volume per foot: 2"-.17 2.5"-.26 3"-.37 4"-.65 4.5"-.83 5"-1.0 6"-1.5 8"-2.6 10"-4.1 12"-5.9 15"-9.2 Formula (I.D. in inches/24)^2 * π * 7.48=G/ft	
Well sealed and locked	n/a	Purge Method	faucet on supply line near tank
Water inside Monument	n/a	Purge Storage	n/a

General Condition of Well: new (good) fair poor

Time	Temp °C	DO (mg/L)	EC (µS/cm)	pH	Turbidity (NTU's)	Eh (mV)	Purge Volume (Gallons)	Comments	Sampler's Initials
11:40							N/A	Begin Purge	CvK
11:42	21.1		335	8.23			N/A		CvK
11:43	21.2		338	8.25			N/A		CvK
11:44	21.1		335	8.22			N/A	End Purge	CvK

Total Purge Volume (Gallons)	n/a	Purge Volume Measurement:	n/a
Total Purge Time (min.)	n/a	Purge Rate (Gal./Min.)	n/a

RECORD OF SAMPLING

Sampling Method :	edicated supply well pum	Temp	21.1
Date of Sample	October 5, 2010	EC	335
Sample Time	11:44	pH	8.25
Sample Identification	SW-1	DO	—

Sample Container Type	Number of containers
non-preserved 1 liter poly	1
HNO3 preserved 250 ml poly	1
H2SO4 preserved 250 ml poly	1

Measured Parameter	Instrument Used	Instrument Serial No.	Source	Calibration Date
Water Level	Durham GeoSlope	31781	URS	not applicable
Temperature	Hanna	98129	URS	not applicable
EC	Hanna	98129	URS	4-Oct-10
pH	Hanna	98129	URS	4-Oct-10
DO	not applicable			
ORP	not applicable			
Turbidity	not applicable			

APPENDIX B
Chain-of-Custody Documentation and Analytical Results

DELLAVALLE Laboratory, Inc.
Chemists and Consultants

Report of Water Analysis

1910 W. McKinley, Suite 110, Fresno, CA 93728
FAX (559) 268-8174 - (800) 228-9896 - (559) 233-6129

URS Corporation, Fresno
30 River Park Place, W #180
Fresno CA 93720
13626
50

Material Submitted: Water

Lab No. 149618
Sample Date 10/5/2010
Sample Time
Submitted Date 10/5/2010
Submitted by Casper
Reported Date 10/25/2010
Location/Project Troost Dairy
Copy To
Fax (559) 256-1478
e-mail casper_vankeppel@urscorp.com

	pH	EC	EC	CO3 as $CaCO_3$	HCO3 as $CaCO_3$	Cl	SO_4	NO_3-N	Total NH_4-N	Total TKN	TDS	Ca
	unit	µmhos/cm	dS/m	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MCL--->		900-2200	0.90-2.2			250	250	10.2			500	
MDL--->				0.9	3	0.03	0.03	0.01	0.2	0.7	10.0	0.1
RL--->	1.0 to 14.0	10	0.01	1.0	5	0.1	0.2	0.1	0.5	1	10.0	0.1
SM--->	4500H B	2510 B	2510 B	2320 B	2320 B	SM 4500-Cl E	M 4500-SO4	Lat. 10.107.05.1.A	4500NH3 G	4500NH3 G	2540 C	3120 B
EPA--->						300	300	300				
Analysis Date:	10/6/2010	10/6/2010	10/6/2010	10/6/2010	10/6/2010	10/6/2010	10/6/2010	10/6/2010	10/13/2010	10/11/2010	10/7/2010	10/7/2010
001 MW-1 @ 09:30	6.8	944	0.94	<1	513	72.0	31.8	9.3	<0.5	<1.0	850	180
002 MW-2 @ 12:50	6.8	1050	1.05	<1	309	114	47.7	62.8	<0.5	<1.0	1090	188
003 MW-3 @ 11:10	7.2	1070	1.07	<1	343	135	21.9	61.9	<0.5	<1.0	1110	187
004 SW-1 @ 11:44	7.8	319	0.32	<1	108	35.8	1.6	0.7	<0.5	<1.0	193	18.5

*See external laboratory documentation
MCL = Maximum Contaminant Level according to the California Domestic Water Quality and Monitoring Regulations (Title 22)
MDL = Method Detection Limit; RL = Reporting Limit
SM = Standard Methods for the Examination of Water and Wastewater, 19th ed., 1995
EPA = Environmental Protection Agency methods used unless otherwise indicated.
Dissolved metals (**bolded**) were filtered.
MBAS molecular weight = 340 grams.
QA/QC available upon request.

Approved By: Scott M. Fredericks
ELAP Certification #1595

Report of Water Analysis

DELLAVALLE Laboratory, Inc.
Chemists and Consultants

1910 W. McKinley, Suite 110, Fresno, CA 93728
FAX (559) 268-8174 - (800) 228-9896 - (559) 233-6129

URS Corporation, Fresno
30 River Park Place, W #180
Fresno CA 93720
13626
50

Material Submitted: Water

Lab No. 149618
Sample Date 10/5/2010
Sample Time
Submitted Date 10/5/2010
Submitted by Casper
Reported Date 10/25/2010
Location/Project Troost Dairy
Copy To
Fax (559) 256-1478
e-mail casper_vankeppel@urscorp.com

	Mg mg/L	Na mg/L	Fe mg/L	Mn mg/L	K mg/L	Cation/ Anion Balance	Total P mg/L
MCL--->			0.3	0.1			
MDL--->	0.1	0.15	0.004	0.002	0.3		0.02147
RL--->	0.1	1.0	0.01	0.01	0.5	0.9-1.1	0.1
SM--->	3120 B	3120 B	3120 B	3120 B	3120 B	Calc	4500P E
EPA--->							
Analysis Date:	*10/7/2010*	*10/7/2010*	*10/7/2010*	*10/7/2010*	*10/7/2010*	*10/18/2010*	*10/14/2010*
MW-1 @ 09:30	40.2	49	<0.01	<0.01	4.3	1.1	<0.1
MW-2 @ 12:50	38.4	61	0.03	<0.01	4.0	1.0	<0.1
MW-3 @ 11:10	39.5	68	<0.01	<0.01	7.1	1.0	<0.1
SW-1 @ 11:44	4.4	45	<0.01	0.08	3.1	1.0	<0.1

QC Analysis Report

DELLAVALLE® Laboratory, Inc.
Chemists and Consultants

1910 W. McKinley, Suite 110, Fresno, CA 93728
FAX (559) 268-8174 - (800) 228-9896 - (559) 233-6129

URS Corporation, Fresno
30 River Park Place, W #180
Fresno CA 93720
13626
50

Material Submitted:

Lab No. 149618
Sample Date 10/5/2010
Sample Time
Submitted Date 10/5/2010
Submitted by Casper
Reported Date 10/25/2010
Location/Project Troost Dairy
Copy To
Fax (559) 256-1478
e-mail casper_vankeppel@urscorp.com

Sample ID	Lims ID	QC Code	Analysis Date	Test ID	Lot	Reported Result	Units	% R or RPD	Flag	% RPD for MSD	Flag	Low Limit	High Limit	Amount Added	Dilution
149618	08-020491-001dup	dup	10/11/2010	TKN		1.0	mg/L	0							1
149618	08-020491-001S	S	10/11/2010	TKN		8.0	mg/L	0							1
149618	08-020498-003dup	dup	10/7/2010	TDS		880	mg/L	7							1
149618	08-020498-003dup	dup	10/7/2010	VDS		467	mg/L	8							1
149618	08-020503-001dup	dup	10/6/2010	Cl;IC		4.3	mg/L	0							1
149618	08-020503-001dup	dup	10/6/2010	SO4;IC		1.4	mg/L	4							1
149618	08-020503-001S	S	10/6/2010	Cl;IC		12.8	mg/L	0							1
149618	08-020503-001S	S	10/6/2010	SO4;IC		9.1	mg/L	0							1
149618	08-020508-001dup	dup	10/7/2010	Ca		174	mg/L	3							1
149618	08-020508-001dup	dup	10/7/2010	Fe		0.01	mg/L	32							1
149618	08-020508-001dup	dup	10/7/2010	K		4.2	mg/L	2							1
149618	08-020508-001dup	dup	10/7/2010	Mg		39.1	mg/L	3							1
149618	08-020508-001dup	dup	10/7/2010	Mn		0.01	mg/L	0							1
149618	08-020508-001dup	dup	10/7/2010	Na		48	mg/L	2							1
149618	08-020508-001S	S	10/7/2010	Ca		203	mg/L	0							1
149618	08-020508-001S	S	10/7/2010	Fe		7.67	mg/L	0							1
149618	08-020508-001S	S	10/7/2010	K		38.5	mg/L	0							1
149618	08-020508-001S	S	10/7/2010	Mg		79.4	mg/L	0							1
149618	08-020508-001S	S	10/7/2010	Mn		7.64	mg/L	0							1
149618	08-020508-001S	S	10/7/2010	Na		80	mg/L	0							1
149618	08-020508-004dup	dup	10/13/2010	NH4-N		0.5	mg/L	0							1
149618	08-020508-004S	S	10/13/2010	NH4-N		8.8	mg/L	0							1
149618	08-020528-001dup	dup	10/6/2010	CO3		28	mg/L	1							1
149618	08-020528-001dup	dup	10/6/2010	EC(umhos)		742	umhos/cm	0							1
149618	08-020528-001dup	dup	10/6/2010	HCO3		215	mg/L	0							1
149	08-020528-001dup	dup	10/6/2010	OH		1	mg/L	0							1

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Chemists and Consultants

QC Analysis Report

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URS Corporation, Fresno
30 River Park Place, W #180
Fresno CA 93720
13626
50

Material Submitted:

Lab No. 149618
Sample Date 10/5/2010
Sample Time
Submitted Date 10/5/2010
Submitted by Casper
Reported Date 10/25/2010
Location/Project Troost Dairy
Copy To
Fax (559) 256-1478
e-mail casper_vankeppel@urscorp.com

Sample ID	Lims ID	QC Code	Analysis Date	Test ID	Lot	Reported Result	Units	% R or RPD	Flag	% RPD for MSD	Flag	Low Limit	High Limit	Amount Added	Dilution
149618	08-020528-001dup	dup	10/6/2010	pH		8.8	units	0							1
149618	08-020568-001dup	dup	10/14/2010	P;N		0.1	mg/L	7							1
149618	08-020568-001lfb	lfb	10/14/2010	P;N		10.2	mg/L	0							1
149618	08-020568-002S	S	10/14/2010	P;N		10.5	mg/L	0							1
149618	blk40160	blk	10/6/2010	CO3		1	mg/L	0							1
149618	blk40160	blk	10/6/2010	EC(umhos)		10.0	umhos/cm	0							1
149618	blk40160	blk	10/6/2010	HCO3		5	mg/L	0							1
149618	blk40160	blk	10/6/2010	OH		1	mg/L	0							1
149618	blk40160	blk	10/6/2010	pH		5.6	units	0							1
149618	blk40264	blk	10/7/2010	Ca		0.1	mg/L	0							1
149618	blk40264	blk	10/7/2010	Fe		0.01	mg/L	0							1
149618	blk40264	blk	10/7/2010	K		0.5	mg/L	0							1
149618	blk40264	blk	10/7/2010	Mg		0.1	mg/L	0							1
149618	blk40264	blk	10/7/2010	Mn		0.01	mg/L	0							1
149618	blk40264	blk	10/7/2010	Na		1	mg/L	0							1
149618	blk40294	blk	10/6/2010	Cl;IC		0.1	mg/L	0							1
149618	blk40294	blk	10/6/2010	SO4;IC		0.2	mg/L	0							1
149618	blk40382	blk	10/11/2010	TKN		1.0	mg/L	0							1
149618	blk40410	blk	10/7/2010	TDS		10	mg/L	0							1
149618	blk40410	blk	10/7/2010	VDS		10	mg/L	0							1
149618	blk40437	blk	10/14/2010	P;N		0.1	mg/L	0							1
149618	blk40490	blk	10/13/2010	NH4-N		0.5	mg/L	0							1
149618	Calib Check40161	K	10/6/2010	pH		10.0	units	100						10	1
149618	Calib Check40295	K	10/6/2010	Cl;IC		24.9	mg/L	100						25	1
149618	Calib Check40295	K	10/6/2010	SO4;IC		24.7	mg/L	99						25	1
1496[illegible]	Calib Check40383	K	10/11/2010	TKN		9.4	mg/L	94						10	1

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Fax (559) 256-1478
e-mail casper_vankeppel@urscorp.com

Sample ID	Lims ID	QC Code	Analysis Date	Test ID	Lot	Reported Result	Units	% R or RPD	Flag	% RPD for MSD	Flag	Low Limit	High Limit	Amount Added	Dilution
149618	Calib Check40438	K	10/14/2010	P;N		0.2	mg/L	100						0.24	1
149618	Calib Check40491	K	10/13/2010	NH4-N		10.8	mg/L	109						10	1
149618	d1qc40265	d1qc	10/7/2010	B	32-MEB30613	0.98	mg/L	98				90	110	1.001	1
149618	d1qc40265	d1qc	10/7/2010	Ca	32-MEB30613	1.0	mg/L	104				90	110	0.998	1
149618	d1qc40265	d1qc	10/7/2010	Fe	32-MEB30613	1.01	mg/L	101				90	110	0.998	1
149618	d1qc40265	d1qc	10/7/2010	K	32-MEB30613	1.2	mg/L	118	*			90	110	0.998	1
149618	d1qc40265	d1qc	10/7/2010	Mg	32-MEB30613	1.0	mg/L	101				90	110	0.998	1
149618	d1qc40265	d1qc	10/7/2010	Mn	32-MEB30613	0.99	mg/L	100				90	110	0.998	1
149618	d1qc40265	d1qc	10/7/2010	Na	32-MEB30613	1	mg/L	102				90	110	0.998	1
149618	d3qc40266	d3qc	10/7/2010	Ca	32-MEB29313	97.5	mg/L	97				90	110	100	1
149618	d3qc40266	d3qc	10/7/2010	Fe	32-MEB29313	4.90	mg/L	98				90	110	5.004	1
149618	d3qc40266	d3qc	10/7/2010	K	32-MEB29313	96.7	mg/L	97				90	110	99.9	1
149618	d3qc40266	d3qc	10/7/2010	Mg	32-MEB29313	48.2	mg/L	96				90	110	50.14	1
149618	d3qc40266	d3qc	10/7/2010	Mn	32-MEB29313	4.70	mg/L	94				90	110	4.983	1
149618	d3qc40266	d3qc	10/7/2010	Na	32-MEB29313	1.0	mg/L	1	*			90	110	100.3	1
149618	d4qc40267	d4qc	10/7/2010	B	32-MEB29313	4.86	mg/L	97				90	110	5.011	1
149618	d5qc40296	d5qc	10/6/2010	Cl;IC	2-MEB303613	12.5	mg/L	100				90	110	12.5	1
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149618	d5qc40296	d5qc	10/6/2010	SO4;IC	2-MEB303613	4.5	mg/L	89	*			90	110	4.99	1
149618	hard40269	hard	10/7/2010	Ca	P176-507	67.4	mg/L	96				90	110	70.5	1
149618	hard40269	hard	10/7/2010	Mg	P176-507	10.2	mg/L	95				90	110	10.8	1
149618	min40163	min	10/6/2010	EC(umhos)	P179-506	427	umhos/cm	95				90	110	451	1
149618	min40270	min	10/7/2010	K	P179-506	27.5	mg/L	96				90	110	28.8	1
149	min40270	min	10/7/2010	Na	P179-50	79	mg/L	96				90	11	82.2	1

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Sample ID	Lims ID	QC Code	Analysis Date	Test ID	Lot	Reported Result	Units	% R or RPD	Flag	% RPD for MSD	Flag	Low Limit	High Limit	Amount Added	Dilution
149618	min40298	min	10/6/2010	Cl;IC	P179-506	52.8	mg/L	102				90	110	52	1
149618	min40298	min	10/6/2010	SO4;IC	P179-506	27.6	mg/L	97				90	110	28.5	1
149618	min40412	min	10/7/2010	TDS	P179-506	358	mg/L	96				90	110	373	1
149618	nut c40385	nut c	10/11/2010	TKN	125379	7	mg/L	84	*			90	100	8.58	1
149618	nut c40441	nut c	10/14/2010	P;N	125379	1.87	mg/L	100				90	100	1.87	1
149618	nut s40299	nut s	10/6/2010	NO3N;IC	P176-505	2.8	mg/L	92				88.82	111.18	3.04	1
149618	nut s40299	nut s	10/6/2010	PO4P	P176-505	1.51	mg/L	88	*			90.7	106.98	1.72	1
149618	nut s40493	nut s	10/13/2010	NH4-N	P176-505	5.93	mg/L	103				85.37	114.66	5.73	1
149618	pH40164	pH	10/6/2010	pH	P 184-977	7.6	Units	101				0.982	101.86	7.53	1
149618	trace40272	trace	10/7/2010	B	P177-500	0.83	mg/L	97				90.01	111.96	0.861	1
149618	trace40272	trace	10/7/2010	Fe	P177-500	1.86	mg/L	100				91.98	110.16	1.87	1
149618	trace40272	trace	10/7/2010	Mn	P177-500	0.25	mg/L	99				91.44	108.56	0.257	1

MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference

149618 4

10-5-2010 16:48

DELLAVALLE LABORATORY, INC.

1910 W. McKinley Avenue, Suite 110 • Fresno, CA 93728
www.dellavallelab.com 559 233-6129 • 800 228-9896 • Fax 559 268-8174

WORK REQUEST

No. of Samples _____ No. of Bottles _____

Logged By _____ Results Needed By _____

BILL TO 13626 / 50 (Acct#/Cons.) Purchase Order No. _____

Name: URS Corporation-Fresno

Address: 30 River Park Place West Ste. 180

City, State, Zip: Fresno 93720

Telephone: 559 256-1444 Fax: 559 256 1478

~~Nelson 559-259-0721~~ c

Cell/Email: casper_van keppel@urscorp.com

Water Type: [ ] Drinking Water [ ] Wastewater [ ] Ag Water [X] Groundwater [ ] Monitoring Well

Other: _____

Analysis and Bottles Required:
[X] DGW2 plus ~~TR, Fe, Mn~~ (1 liter plastic, unpreserved; 250 ml plastic w/H2SO4; ~~500 ml clear glass, unpreserved) (dli)~~

Lab, please filter for Dissolved Metals

COPIES TO: None

SUBMITTED BY Casper

PROJECT Troost Dairy

CROP — INTENDED —

SAMPLED BY Casper

[ ] Co. Health Dept _____
[ ] RWQCB [ ] Copy of Chains
[ ] State Forms

	Description of Sample	Date/Time Sampled	Rec'd Temp °C
1.	MW-1	10/5/10 9:30	10.9
2.	MW-2	10/5/10 12:50	
3.	MW-3	10/5/10 11:10	
4.	SW-1	10/5/10 11:44	
5.	~~LAST SAMPLE~~		
6.			
7.			
8.			
9.			
10.			

CHAIN OF CUSTODY

~~Carrier~~	Signature	Company	Received (Date/Time)	Relinquished (Date/Time)
First		URS Corp		10/5/10 4:40
Second	[illegible]	DLI	10-5-10 4:40pm	
Third		DLI	10-5 4:40	
Fourth				

I guarantee that as the client, or on behalf of client named, I have the authority to contract the above requested services. Should it be found that I do not have such authority, I agree to be personally liable for all costs and, if there should be action against me for this breach, reasonable attorneys' fees. It is understood that payment is expected to be cash with samples unless terms have been previously arranged. Terms are net 30 days; overdue accounts will be charged a dated damage fee of 2% per month (annually 24%) or $5.00 per month whichever is greater.

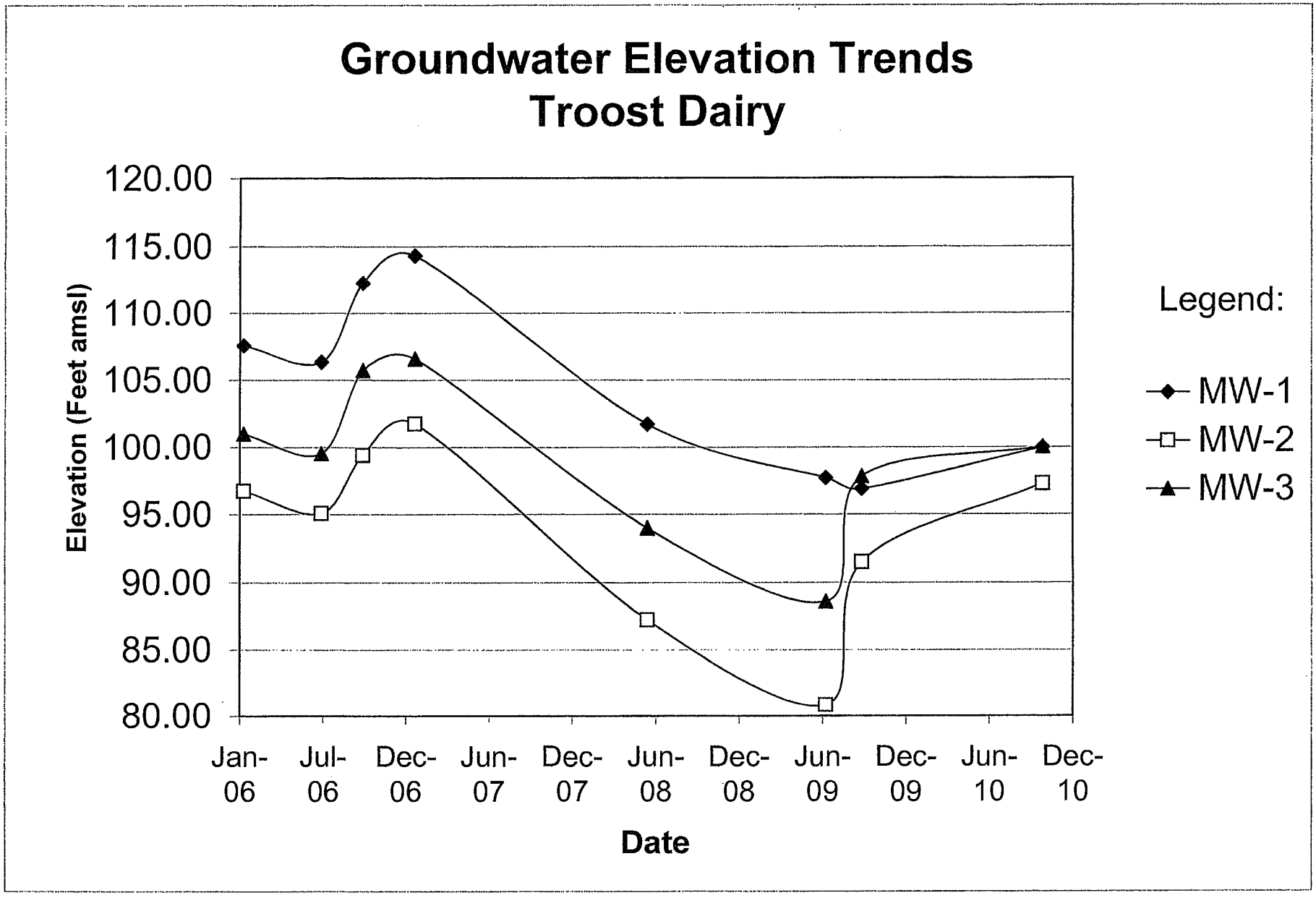
If payment is not made when due and a legitimate dispute exists concerning the product or services of Dellavalle Laboratory, Inc., it will be submitted to mediation under the Rules and Procedures of Creative Alternative to Litigation, Inc. (*cal*). If the dispute is not resolved in mediation, then the dispute will be submitted to binding arbitration through *cal* under its Rules and Procedures. The parties will equally bear the costs of mediation/arbitration. If, however, the mediator declares that no legitimate dispute exists, then debtor will pay all mediation and arbitration costs, and in the event of arbitration, reasonable attorneys' fees of Dellavalle Laboratory.

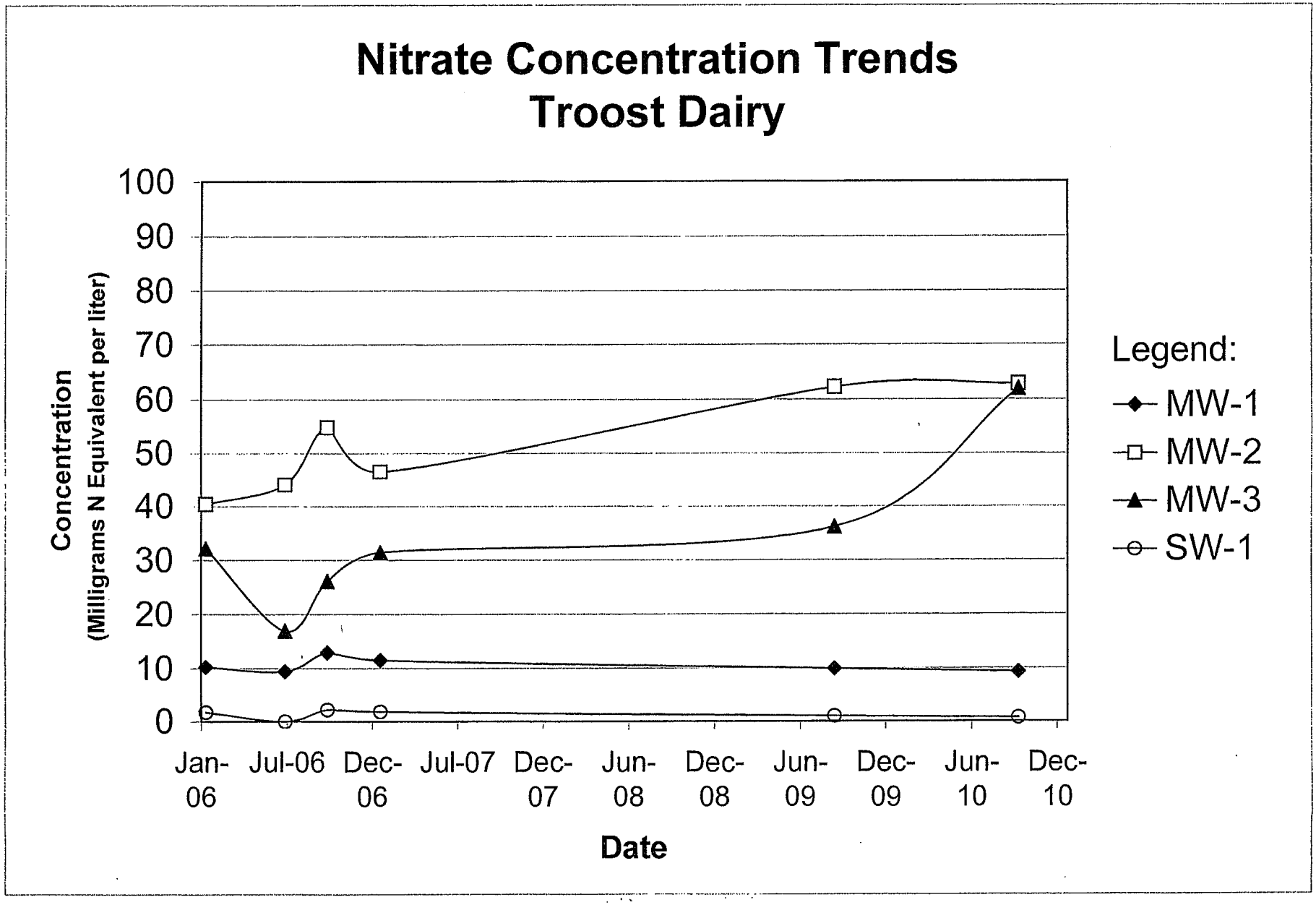
Invoicing Information:

Shipping
$_____ In
$_____ Out

Signature _____

APPENDIX C
Groundwater Elevation and Nitrate Trends


Groundwater Elevation Trends
Troost Dairy
Elevation (Feet amsl)
120.00
115.00
110.00
105.00
100.00
95.00
90.00
85.00
80.00
Jan-06
Jul-06
Dec-06
Jun-07
Dec-07
Jun-08
Dec-08
Jun-09
Dec-09
Jun-10
Dec-10
Date
Legend:
MW-1
MW-2
MW-3


Nitrate Concentration Trends
Troost Dairy
Concentration
(Milligrams N Equivalent per liter)
100
90
80
70
60
50
40
30
20
10
0
Jan-06
Jul-06
Dec-06
Jul-07
Dec-07
Jun-08
Dec-08
Jun-09
Dec-09
Jun-10
Dec-10
Date
Legend:
MW-1
MW-2
MW-3
SW-1

WOO

CHK

MONITORING WELL INSTALLATION COMPLETION REPORT AND HYDROGEOLOGIC INVESTIGATION SUMMARY

for the

WOODS DAIRY

Prepared for

PLANNING PARTNERS
AND
THE WOODS FAMILY

Revision 0
February 2011
DE Project No. 103-27

Dunn
ENVIRONMENTAL, INC.

CERTIFICATION

This Monitoring Well Installation Completion Report and Hydrogeolgic Investigation Summary for the Woods Dairy, San Joaquin County, California was prepared under my direct supervision. I am a California Professional Geologist and Certified Hydrogeologist, pursuant to Section 7850 of the Business and Professional Code.

I certify under penalty of law that I have personally examined and I am familiar with the information submitted in this document. Based on my direct knowledge or inquiry of other individuals immediately responsible for obtaining information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature of Professional
Patrick F. Dunn, P.G., C. Hg.

California Professional Geologist No. 7001
California Certified Hydrogeologist No. 900

2/15/11
Date

PROFESSIONAL GEOLOGIST
Patrick F. Dunn
No. 900
Certified
Hydrogeologist
Exp. 3/31/13
STATE OF CALIFORNIA

RECEIVED
SACRAMENTO
CVRWQCB
11 FEB 16 AM 10: 18

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ATTACHMENT A BORING LOGS, MONITORING WELL DETAILS AND SURVEYOR REPORT
ATTACHMENT B FIELD DATA SHEETS (WELL DEVELOPMENT AND SAMPLING EVENT)
ATTACHMENT C LABORATORY ANALYTICAL RESULTS

1. GENERAL INFORMATION

Dunn Environmental, Inc. (DE) was retained by Planning Partners on the behalf of Woods Dairy to install monitoring wells and provide this report. In order to comply with the Regional Water Quality Control Board (RWQCB) regulatory requirements for expanding existing dairies, DE completed and gained approval for a Monitoring Well Installation and Sampling Plan (MWISP). DE performed geologic logging and provided oversight during the installation of a monitoring well network. The MWISP was developed by DE in March 2010 and approved by the RWQCB in a letter dated March 17, 2010. The monitoring well network design and construction meet the Monitoring Well Installation Completion requirements provided by the RWQCB, Central Valley Region.

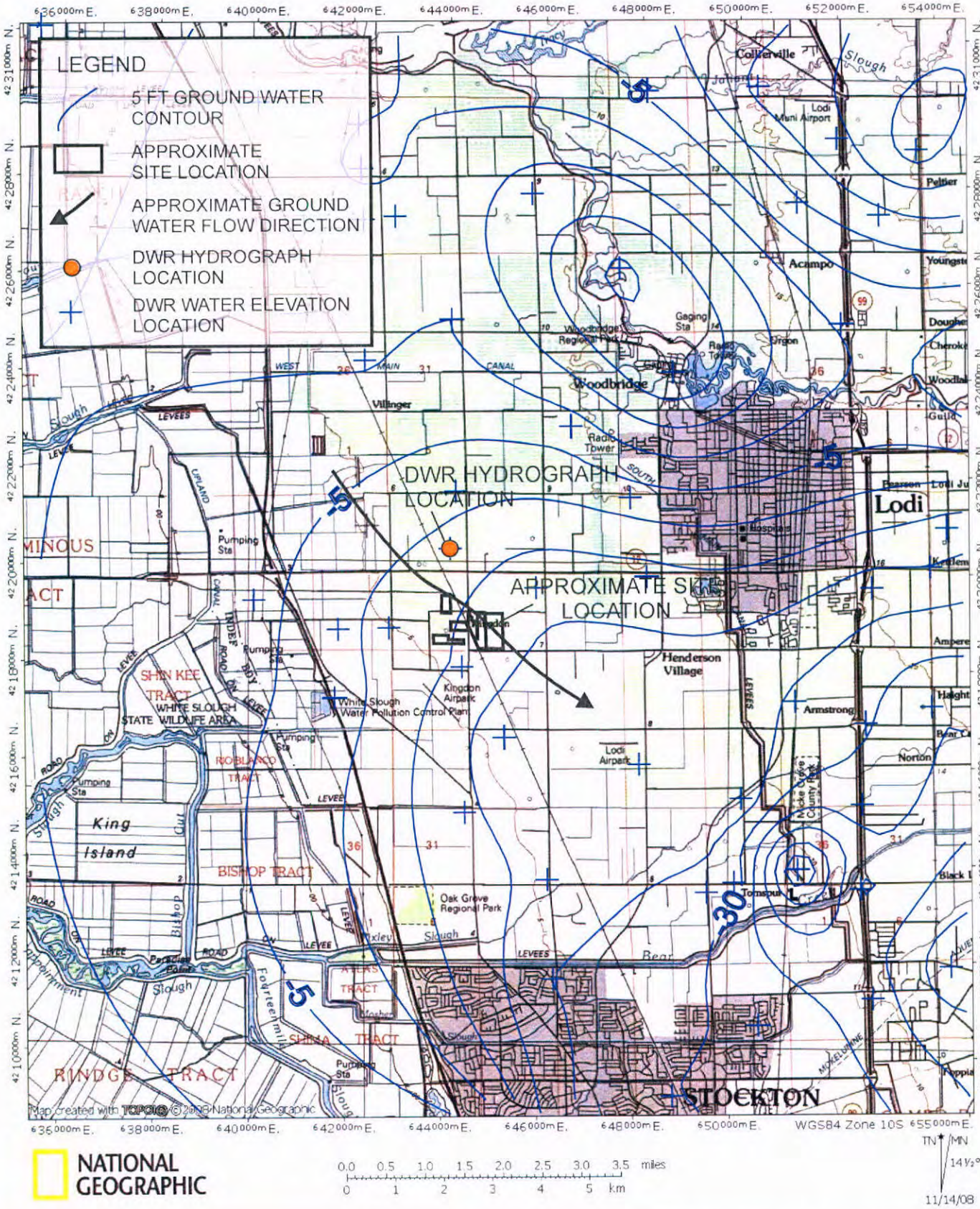
This report presents the findings and results of field and laboratory methods utilized. Activities under the approved work plan included drilling and installation of three monitoring wells, well development and sampling of water supply wells and the newly installed monitoring wells. The approved work plan was used to guide onsite investigation activities. The focus of the investigation was to identify a continuous "monitorable" uppermost aquifer that will be used to plan and install a long term monitoring network. Work plan elements were followed with slight field adjustments made as necessary based on field conditions. One water quality sampling event was completed during June 2010.

address ?

The existing Woods Dairy is located west of Lodi, CA at N. Devries Road and Harney Lane in San Joaquin County. Figure 1 provides the location of the site. The dairy facility and application fields lie within Sections 17 and 18 of Township 3 North, Range 6 East. Based on draft revisions of the nutrient and waste management plans, this proposed dairy expansion may house an additional estimated 350 milk cows from the existing 150 milk cows with an appropriate increase in support herd. This dairy facility is located on approximately 6 acres, with an additional 148 acres used for manure application. An additional 66 acres are available for solid manure application as needed. Field locations are shown on Figure 2. Note that as of the date of this report, issuance the Final NMP and WMP have not been completed for the proposed herd. Pending approval of these documents, impact statements will be added to a revision of this report.

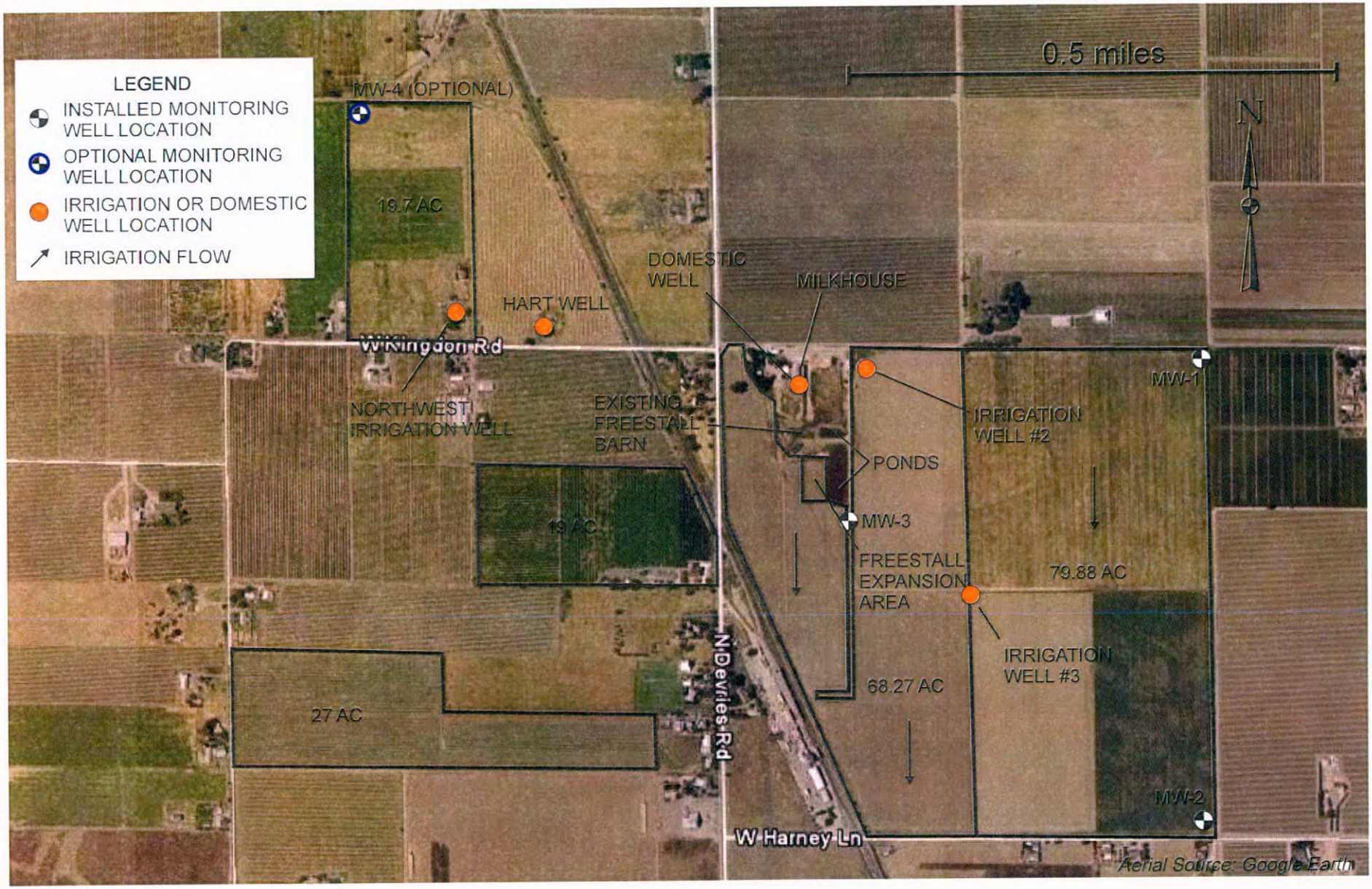
The following regulatory database search and sensitivity analysis summary for the Woods Dairy site were used to develop the MWISP:

- The regional topography is flat. Soils are composed of Acampo and Devries sandy loams and Tokay fine sandy loam. The drainage is generally somewhat poorly to moderately well drained with granitic alluvium parent material.
- Beneficial use – the primary use of ground water is for irrigation. No homes, other than the owner's home, exist within the proposed land application area. Greater than 20 homes exist within a quarter mile of the dairy and application fields.
- Environmental setting - A railroad runs north-northwest and adjacent to two of the application fields. A preliminary government regulatory database search lists three potentially hazardous sites within a half mile of the dairy facility. The Simplot Soilbuilders facility, located within a half mile to the south of the dairy, is listed under the RCRA Small Quantity Generator database, several underground storage tank (UST) databases, and the California Hazardous Material Incident database. The Grape Nursery, just west of the dairy facility, is listed under the CA FID UST database as an inactive underground storage tank location. The MCI Telecommunications Corp., within a quarter mile of the dairy facility to the southwest, is listed under several UST databases and the local air pollution agency toxics and criteria pollutant emissions database (EMI).
- Environmental setting (site specific) - The Woods Dairy was listed under the Historical Underground Storage Tank Database as having a diesel UST and a waste oil UST. Eight other sites, located within 0.5 to 1 mile of the dairy facility to the west, north, and northeast were identified on the RWQCB Geotracker web site.
- Existing dairy conditions – A dairy and an extensive irrigation and tailwater return system exists onsite. The proposed dairy expansion design involves the placement of additional freestalls to the south of the existing freestalls. Additional settling basins will need to be constructed to accommodate the increased herd size. The anticipated footprint for the expanded freestalls is shown on Figure 2 as the "Freestall Expansion Area".
- Irrigation water is derived from three on-site irrigation wells.



Dunn ENVIRONMENTAL, INC.

DATE: 11/14/2008	LOCATION MAP AND 1Q08 REGIONAL GROUND WATER CONTOURS WOODS DAIRY SAN JOAQUIN COUNTY, CALIFORNIA
SCALE: AS SHOWN	
PROJECT NO: 103-27	
DRAWN: MM	
CHECKED: PD	
FIGURE: 1	



Dunn ENVIRONMENTAL, INC.

DATE: 01/03/2011	
SCALE: 1":730'	
PROJECT NO: 103-27	
DRAWN: MM	
CHECKED: PFD	
FIGURE: 2	

FIELD LOCATIONS AND
MONITORING WELL LOCATIONS
WOODS DAIRY
SAN JOAQUIN COUNTY, CALIFORNIA

2. DRILLING AND MONITORING WELL INSTALLATION

In support of the hydrogeologic/geologic study, drilling and ground water sampling activities were performed in accordance with the approved workplan.

2.1 DRILLING ACTIVITIES AND WELL CONSTRUCTION

Monitoring well installation permits were obtained from San Joaquin County Environmental Health Department (SJCEHD) before drilling was initiated. Drilling was completed by All Well Abandonment, a Slagle Drilling Company based in Diamond Springs, California using a truck mounted CME 75 and a CME 75 based Limited Access Rig (LAR). 8-inch outside diameter hollow-stem augers were used to advance each borehole. Downhole drilling equipment was steam cleaned between each boring. Soil samples for logging and testing were collected using a standard split-spoon technique (SPT) sampler and 140 lb hammer with 2 foot stroke. The split spoon sampler was washed with water before each sample was collected.

Boreholes were first advanced to 5 feet in depth using a hand auger for utility location confirmation. Soil samples were collected every 5 feet, beginning at 4 feet, using the SPT. The SPT sample tube was 1.5 feet in length. During drilling, sample recovery percentage and blow counts for each sample were recorded on the boring logs. Soil samples were logged using the Unified Soil Classification System (USCS) based on type, color, grain size, stiffness, moisture content and plasticity when appropriate. Soil moisture content and the observation of water on the SPT sample rod were used to establish first encountered ground water. In addition, ground water was allowed to stabilize overnight at the first bore hole (MW-1) so an accurate determination of first encountered ground water could be made. Detailed boring logs are provided in Attachment A.

Borings were converted to monitoring wells using 2-inch inside diameter (I.D.) Schedule 40 PVC casing. The riser pipe and screen were joined using flush-thread joints with o-rings. The bottom cap was also flush thread jointed. Screen intervals were constructed using five feet and ten feet length 0.010 inch machine slotted casing. A sand envelope (filter pack) consisting of RMC #2/12 Monterey Natural Beach Sand was placed opposite the well screen extending at least two feet above the top of screen. A seal between sand pack and grout of 1.5 to 2 feet was constructed using Cetco™ ¼" to ⅜" bentonite chips. Cement grout, mixed using 94 pound bags of Basalite Type II-IV Cement, was tremmied through the augers. Well casing was capped using a j-plug. A lockable, steel, above ground protective casing was placed over each monitoring well

and secured within a two foot square concrete pad. Up to three steel bollards were installed around each monitoring well for protection.

A SJCEHD representative was present for inspections during the cement grout seal placement of monitoring well MW-3 and the abandonment of the initial borehole MW-3. Boring logs and monitoring well completion diagrams are provided in Attachment A.

Boring MW-1 was drilled first and is located at the northeastern corner of the easternmost field. The location of boring MW-1 was moved approximately 640 feet to the east due to pooling water and muddy conditions which created poor access at the original proposed location. Refer to Figure 2 for the monitoring well locations. The borehole was drilled to 45 feet bgs and left overnight due to a mechanical failure on the drill rig. The boring was advanced to a final depth of 55 feet bgs on June 2nd, 2010. Encountered sediment included sandy silt, silty sand, and sand. Silty sand was observed from surface to 9 feet bgs. Sandy silt to silt was observed from 9 to 29 feet bgs. Sand was observed from 29 to 39 feet bgs with sandy silt from 39 to 49 ft bgs. Silty sand to sandy silt was observed from 49 to 54 ft bgs; followed by sandy silt to the bottom of the borehole. First ground water was encountered within sandy silt at 43.6 feet bgs. Due to the rig equipment failure, ground water was allowed to stabilize overnight before boring was advanced to the final depth and the monitoring well was installed. The stabilized ground water level taken the following day was 42.4 ft bgs. Monitoring well MW-1 was completed by installing 15 feet of screen from 38 to 53 feet bgs, with sand pack to 36 feet bgs, bentonite to 34 ft bgs and cement grout was placed to surface.

MW-1

Boring MW-2 was drilled second and is located at the southeastern corner of the southeastern field. The boring was advanced to a final depth of 55 feet bgs on June 2nd, 2010. Encountered sediment included sandy silt, silty sand, and sand. Sand with silt was observed from surface to 9 feet bgs. Silty sand was observed from 9 to 14 feet bgs and sandy silt was observed from 14 to 39 feet bgs. Sand and silty sand was observed from 39 to 49 ft bgs, sandy silt was observed from 49 to 54 ft bgs, and sandy clay was observed from 54 ft bgs to the bottom of the borehole. First encountered ground water was within sand at 40.0 feet bgs. Due to the similarity of this reading to the stabilized ground water level at MW-1 and the near-level terrain onsite, it was determined that the ground water encountered at these two boreholes is part of a continuous monitorable unit. Drilling was paused for five to ten minutes and ground water was measured at 40.1 ft bgs. Monitoring well MW-2 was completed by installing 15 feet of screen from 38 to 53 feet bgs, with gravel pack to 36 feet bgs, bentonite to 34 ft bgs, and cement grout to surface.

MW-2

Boring MW-3 was drilled third and is located at the southeastern corner of the settling pond. The initial boring was drilled to 60 feet bgs on June 2nd, 2010; however, the rig hammer became lodged in the borehole and a new boring was initiated 10 feet to the south while efforts were made to retrieve the hammer. The hammer was eventually retrieved and this initial boring was abandoned as described in the following section. The new boring was drilled and completed on June 3rd, 2010. The boring was advanced to a final depth of 60.5 feet bgs. Encountered sediment was primarily sand with two five foot sections of sandy silt from 19 to 24 ft bgs and 34 to 39 ft bgs. First ground water was encountered within sand at 42.7 feet bgs. This ground water level was similar to the other two monitoring wells and determined to be within the same monitorable unit. The stabilized ground water level was approximately 42 ft bgs. Monitoring well MW-3 was completed by installing 15 feet of screen from 39.5 to 54.5 feet bgs, with gravel pack to 37.5 feet bgs, bentonite to 36 ft bgs, and cement grout to surface.

MW-3

2.2 ABANDONMENT OF THE INITIAL MW-3 BORING

A SJCEHD representative was present throughout the abandonment of the initial borehole for monitoring well MW-3. The abandonment was completed on June 3rd, 2010 using the truck mounted CME 75 drill rig. The borehole was abandoned for the reasons described above within the monitoring well MW-3 installation description.

Grout was tremmied into the borehole using the auger and not allowed to free-fall greater than 20 feet. Approximately five and a half (94 lb) bags of Basalite Type II-IV cement were used (approximately 60 gallons of grout mix). Grout was brought to surface and leveled off to the surrounding grade.

2.3 WELL DEVELOPMENT

Monitoring wells were developed on June 9th, 2010. The wells were purged using an airlift technique using an MMD Equipment Airman air compressor to remove fine grained sediment from the well and surrounding sand pack. Each well was surged at least twice. Purging continued until discharge water was free of coarse grained sediment and turbidity was below 100 NTUs. Over the course of development, pH, Electrical Conductance (E.C.), temperature, and turbidity measurements were taken a minimum of seven times at each well to ensure sediment was removed and aquifer representation was obtained. Wells were purged until a minimum of ten pore volumes were removed and field parameters had stabilized within 10 % of the previous two

readings. Despite an excess of 16 water column volumes removed at each well, the turbidity goal was not met until sampling was completed the following day.

During development of monitoring well MW-1, approximately 39 gallons or an equivalent of 24 water column volumes were removed. Final field parameters were measured at 23.67°C for temperature, 8.50 for pH, 1,268 μmhos/cm for E.C. and 69.04 NTU for turbidity. During development of MW-2, approximately 82 gallons or an equivalent or 36 water column volumes were removed. Final field parameters were reported at 21.29°C for temperature, 8.50 for pH, 1,091 μmhos/cm for E.C. and 87.91 NTU for turbidity. During development of monitoring well MW-3, approximately 38 gallons or an equivalent of 16 water column volumes were removed from MW-3. Final field parameters were reported at 22.65°C for temperature, 8.00 for pH, 2,037 μmhos/cm for E.C., and 20.29 NTU for turbidity. Table 1 presents the well development data and Attachment B contains the well development field data sheets.

Table 1
Well Development Parameters
Woods Dairy

	Temperature (°C)	pH	Turbidity (NTU)	Conductivity (μS/cm)	Gallon Purged	Water Column Volumes Purged
MW-1	23.67	8.50	69.04	1,268	39	24
MW-2	21.29	8.50	87.91	1,091	82	36
MW-3	22.65	8.00	20.29	2,037	38	16

3. GROUND WATER SAMPLING RESULTS

This section describes the ground water sampling and analytical results for the newly installed monitoring wells at the Woods Dairy.

3.1 PREVIOUS DOMESTIC AND IRRIGATION WELL ANALYTICAL DATA

Two rounds of water quality have been performed by the owner for the domestic well and the two of the irrigation wells. Results are presented on the table below:

Sample Location	Date	Conductivity (µS/cm)	Nitrate as N (mg/L)	TKN (mg/L)	Total Nitrogen (mg/L)
Domestic Well	10/18/2007	1,030	11.6 *	-	-
Irrigation Well #2	10/18/2007	901	10.4 *	-	-
Irrigation Well #3	10/18/2007	916	10.8 *	-	-
Domestic Well	6/24/2008	1,150	14.5	-	-
Irrigation Well #2	6/24/2008	942	10.7	ND	10.7
Irrigation Well #3	6/24/2008	869	7.9	ND	7.9

* Calculated from nitrate as NO3 by dividing by 4.5

Nitrate as N ranges from 7.9 to 14.5 mg/L for the domestic and irrigation wells. Conductivity ranges from 901 to 1,150 µS/cm for the sampled wells. Total Kjeldahl Nitrogen was non-detect for the irrigation wells during June 2008. For nitrate as N and conductivity, the domestic well is elevated in comparison to the irrigation wells.

3.2 GROUND WATER SAMPLING

Ground water samples were collected from monitoring wells MW-1 through MW-3 during the initial round of sampling conducted on June 10th, 2010. Three onsite irrigation wells and one domestic well located west of the milk house were also sampled. Refer to Figure 2 for location of sampled irrigation and domestic wells. Sampling was conducted by DE personnel. Field Data Sheets and laboratory results are provided in Attachment B and summarized on Table 2. The following procedure was used for monitoring well and production well sampling:

- The static depth to ground water was measured using a water depth meter; depth to ground water was recorded on the Field Data Sheet.
- Monitoring wells were purged and sampled using a Redi Flo 2™ submersible pump. Field parameters were taken for pH, specific conductance (S.C.), turbidity and temperature. Wells were purged until field parameters had stabilized and a minimum of three water column volumes were removed. Field parameters were considered stabilized once three consecutive measurements ranged less than ten percent.
- Production well run time for the day was confirmed prior to sampling these wells. The production wells were run extensively on the day of sampling.
- After wells were purged, samples were collected for laboratory analysis. filtered?
- Samples were placed on ice within coolers and delivered to California Laboratory Services of Rancho Cordova, CA under chain of custody documentation. Samples were analyzed for monitoring parameters listed in MRP Table 4.

As part of the sampling effort a blind field duplicate sample labeled MW-10 was collected and analyzed from monitoring well MW-3.

3.3 2Q2010 ANALYTICAL RESULTS

Monitoring well samples were analyzed for monitoring parameters listed in the table below. Irrigation and domestic wells were sampled for nitrate as N only.

Parameters	Sample Volume (mL)	Container Type	Preservative	Hold Time
NH_3	500	Poly	H_2SO_4	28 Days
Totals – Ca, Mg, Na	500	Poly	Nitric Acid	6 Months
Totals - Cl, bicarbonate, carbonate, PO_4, NO_3, SO_4, TDS	1000	Poly	Not preserved	48 Hours

Sampling results of monitoring wells are described below. Stabilized field parameters are summarized as follows: pH ranged from 7.10 to 8.80; temperature ranged from 18.14

to 20.27 °C; E.C. ranged from 877 to 2,112 μmhos/cm; and turbidity ranged from 11.68 to 22.58 NTU. Refer to Table 2 for a summary.

Laboratory analytical results for the December 2010 round are summarized in Table 2 and are as follows: ammonia as N was reported as non-detect, bicarbonate as $CaCO_3$ ranged from 140 to 660 mg/L, carbonate as $CaCO_3$ was non-detect, chloride ranged from 100 to 120 mg/L, hydroxide as $CaCO_3$ was non-detect, nitrate as N ranged from 8 to 60 mg/L, orthophosphate as PO_4 was non-detect, sulfate as SO_4 ranged from 36 to 79 mg/L, total alkalinity ranged from 140 to 660 mg/L, and total dissolved solids (TDS) ranged from 850 to 1,400 mg/L. Fecal coliforms were non-detect and total coliform detections ranged from 7.8 to 49 MPN/100 mL.

Metal parameters were reported as follows: calcium ranged from 110 to 230 mg/L, magnesium ranged from 54 to 100 mg/L, and sodium ranged from 79 to 170 mg/L.

Maximum Contaminant Level (MCL) exceedances were observed. The monitoring wells exceeded the primary MCL for nitrate as N and total coliforms, and the monitoring wells exceeded the secondary MCL for total dissolved solids. Exceedances were observed at both the upgradient and downgradient wells, with higher concentrations tending to occur at the downgradient wells. TDS and nitrate as N were elevated relative to the other wells at downgradient monitoring well MW-3. The secondary MCL for pH was exceeded at Irrigation Well #3 and the secondary MCL for conductivity was exceeded at the monitoring and irrigation wells except for Irrigation Well #2. It should be noted that only one round of sampling has been completed and additional sampling should be completed to establish temporal and spatial trends in ground water quality.

3.4 QUALITY ASSURANCE/QUALITY CONTROL

As part of the Quality Assurance/ Quality Control a blind field duplicate was taken and submitted for analysis. Laboratory performance is the evaluated through Relative Percentage Difference (RPD). Acceptable limits are below 20%. RPD Results are listed in Table 3. To calculate the RPD, the following formula was used:

$$\frac{|obs1-obs2| \times 100}{mean}$$

Where:

obs1 = result of the original sample;

obs2 = result of the duplicate sample;

obs1-obs2 = absolute value of the difference of the results;
mean = mean of the two results.

RPD ranges from 0.0 to 50%. Parameters calcium and total coliforms exceeded the limit of 20%. The high RPD seen for these two parameters may be related to differing amounts of colloidal material in the samples.

Table 2
June 2010 Ground Water Sampling Analytical Results
Woods Dairy

ANALYTE	UNITS	MCL	MW-1	MW-2	MW-3	MW-10*	Hart Well	Irrigation Well #2	Irrigation Well #3	Northwest Irrigation Well
Field Parameters										
pH	pH units	6.5-8.5[2]	7.48	7.76	7.13	-	7.90	8.03	**8.75**	7.90
Specific Conductance	µS/cm	900[2]	**1,389**	**1,138**	**2,112**	-	**1,166**	877	**928**	**1,166**
Temperature	°C	NA	20.16	20.27	18.14	-	18.51	19.23	19.32	18.51
Turbidity	NTU	NA	22.58	16.24	12.7	-	11.68	13.44	17.38	11.68
Laboratory Parameters										
Ammonia as N	mg/L	NA	<0.10	<0.10	<0.10	<0.10	-	-	-	-
Bicarbonate as CaCO3	mg/L	NA	360	140	660	660	-	-	-	-
Calcium	mg/L	NA	130	110	230	160	-	-	-	-
Carbonate as CaCO3	mg/L	NA	<5.0	<5.0	<5.0	<5.0	-	-	-	-
Chloride	mg/L	250[2]	100	100	120	120	-	-	-	-
Fecal Coliforms	MPN/100 mL	2.2[1]	<1.8	<1.8	<1.8	<1.8	-	-	-	-
Hydroxide as CaCO3	mg/L	NA	<5.0	<5.0	<5.0	<5.0	-	-	-	-
Magnesium	mg/L	NA	58	54	100	87	-	-	-	-
Nitrate as N	mg/L	10[1]	**17**	**18**	**60**	**60**	9.2	8	9.3	9.4
Orthophosphate as PO4	mg/L	NA	<0.15	<0.15	<0.15	<0.15	-	-	-	-
Sodium	mg/L	NA	130	79	170	160	-	-	-	-
Sulfate as SO4	mg/L	250[2]	58	36	78	79	-	-	-	-
Total Alkalinity	mg/L	NA	360	140	660	660	-	-	-	-
Total Coliforms	MPN/100 mL	2.2[1]	**49**	**11**	**7.8**	**13**	-	-	-	-
Total Dissolved Solids	mg/L	500[2]	**850**	**680**	**1,400**	**1,400**	-	-	-	-

Notes: [1] Primary MCL; [2] Secondary MCL; **bold** indicates MCL exceedance
* MW-10 is a duplicate sample of MW-3

Table 3 Relative Percent Difference Results
Woods Dairy

Sample Name	Units	MW-3	MW-10	RPD
Ammonia as N	mg/L	<0.10	<0.10	-
Bicarbonate as CaCO3	mg/L	660	660	0.00%
Calcium	mg/L	230	160	35.90%
Carbonate as CaCO3	mg/L	<5.0	<5.0	-
Chloride	mg/L	120	120	0.00%
Fecal Coliforms	MPN/100 mL	<1.8	<1.8	-
Hydroxide as CaCO3	mg/L	<5.0	<5.0	-
Magnesium	mg/L	100	87	13.90%
Nitrate as N	mg/L	60	60	0.00%
Orthophosphate as PO4	mg/L	<0.15	<0.15	-
Sodium	mg/L	170	160	6.06%
Sulfate as SO4	mg/L	78	79	1.27%
Total Alkalinity	mg/L	660	660	0.00%
Total Coliforms	MPN/100 mL	7.8	13	50.00%
Total Dissolved Solids	mg/L	1400	1400	0.00%

3.5 WELL SURVEY AND GROUND WATER ELEVATIONS

The monitoring wells were surveyed by Shoup Land Surveying of Clements, CA on June 14th, 2010. Horizontal coordinates were based on NAD 83, Zone 3 and within one foot lateral accuracy. Elevation was based on NAVD 88 and within ±0.5 foot absolute accuracy and within ±0.1 foot relative accuracy. Topcon GR-3 receivers were used for lateral measurements and a Topcon Digital Level Model DL-102 was used for elevation. Measuring point and ground water elevations for 2Q2010 are given on Table 4. The surveyor report is provided in Attachment A. This report contains license, coordinate and reference point information.

Ground water elevations were calculated by subtracting the measured depth to water from the measuring point elevation (top of casing - T.O.C) for each well. Depth to water measurements taken on June 10th ranged from 42.61 to 45.58 feet and ground water elevation ranged from -19.46 to -18.40 feet MSL. These water levels were taken seven to eight days after installation of the monitoring wells and approximately 24 hours after well development.

Table 4
Surveying and 2Q2010 Water Level Data
Woods Dairy

Monitoring Well	Northing (meters)	Easting (meters)	Top of Casing (ft MSL)	Ground Surface (ft MSL)	6/10/2010 Depth to Water (ft BGS)	6/10/2010 Water Surface Elevation (ft MSL)
MW-1	2,227,167.70	6,319,052.00	26.93	24.83	45.58	-18.65
MW-2	2,224,571.70	6,319,061.70	23.15	20.55	42.61	-19.46
MW-3	2,226,249.80	6,317,117.60	25.65	23.33	44.05	-18.40

4. PHYSICAL AND HYDROGEOLOGIC SETTING AND HYDROGEOLGICAL SUMMARY

4.1 PHYSIOGRAPHIC AND GEOLOGIC SETTING

The Great Central Valley of California consists of ancient alluvium ranging in depth of less than 20 feet near the bedrock highs on the rolling hills to the east and up to over 20,000 feet below ground surface (bgs) near the center of the basin. These sediments are comprised of terrestrial, marine and volcanic sediments deposited during periodic inundation by the Pacific Ocean and erosion of the surrounding mountains respectively.

Sediment deposits beneath the site can be subdivided into consolidated and unconsolidated deposits, with the consolidated sediments underlying the unconsolidated sediments. With depth the stratigraphy of unconsolidated sediments consist of Recent to Pleistocene Age alluvial deposits of the Modesto, Riverbank Formations. Sediments encountered consist of unconsolidated sands and gravels interbedded with significant silts and clays. These clays separate the upper sediments from the lower Late Plio-Pleistocene Age Laguna Formation and the older Eocene to Pliocene Age Mehrten Formation, these units are poorly consolidated sediments and are differentiated based on color and sand type. The Laguna formation is typical light brown in color, and the differentiated characteristic of the Mehrten is the black sands derived from volcanic detritus. Valley Springs and Ione formation are known to exist below the Mehrten Formation. The formations have a distinct geologic dip and thickness to the west. The Laguna and Mehrten Formations ranges from 200 to 1,000 feet in thickness from east to west.

SITE SPECIFIC SOILS AND GEOLOGY

The Woods Dairy site lies within alluvial deposits with parent materials originating from sandy granitic alluvium. Based on Web Soil Survey 2.1 through the National Resource Conservation Service, soils found at the Woods Dairy site are composed of sandy loam to fine sandy loam. Soil units consist of the Acampo and Devries sandy loams and the Tokay fine sandy loam. The Acampo sandy loam is a low salinity, moderately well drained soil with duripan at 40 to 60 inches below surface. The Devries sandy loam is a low salinity, somewhat poorly drained soil with duripan at 20 to 40 inches below surface. The Tokay fine sandy loam is a low salinity, well drained soil with no restrictive features within 80 inches of surface. The Acampo and Devries

sandy loams underlie the majority of the fields, with the Tokay underlying less than 20%.

4.2 HYDROGEOLOGY

The regional ground water system in San Joaquin County lies within the San Joaquin Hydrogeologic Region, which is divided in to three subbasins - the Eastern San Joaquin, Tracy, and Cosumnes Subbasins. The Tracy subbasin is bounded by Tertiary and older sediments of the Coastal Range on the west and the San Joaquin River on the east. The Eastern San Joaquin Subbasin is bounded by the San Joaquin River on the west, the Mokelumne River on the North, the Stanislaus River to the south, and the crystalline bedrock of the Sierra Nevada Mountains on the east. The Cosumnes Subbasin is bounded by the Mokelumne River to the South, the Cosumnes River to the north, and the Sierra Nevada Mountains to the east.

The Site lies within the Eastern San Joaquin Subbasin. This fresh water basin is defined vertically in depth by the extremely variable, interbedded Quaternary and modern alluvial deposits. With depth, three aquifer types are found. The shallow, near surface aquifer is an unconfined aquifer, underlain by a semi-confined aquifer, and a confined aquifer system within the Mehrten Formation. Differentiation between the unconfined, semi-confined, and confined aquifers is due to existence of clay layers within the Riverbank/Modesto and Laguna Formations. The interbedded nature of the alluvial sediments is significant.

Approximately 143 DWR well logs have been collected for the property and the area within one mile of the property. One domestic well exists onsite and is utilized presently. This well is believed to have been drilled in 1965 and is 12 inches in diameter to a depth of 130 ft bgs. Three irrigation wells are used onsite. Irrigation Well #2 was drilled in 1940 to an estimated depth of 70 feet with a 10-inch surface seal. Irrigation Well #3 was drilled in 1966. This data has not been confirmed as a well log could not be found for the third irrigation well, labeled "Northwest Irrigation Well". The locations of the domestic and irrigation wells are presented on Figure 2. The area production wells appear to be installed above a depth of 300 ft bgs and within deeper interbedded sands as depicted on the cross-sections.

In addition to the three monitoring well boring logs, these well logs were used to create a west-east trending cross section and a north-south trending cross section. The locations of these cross sections are presented on Figure 3 and the west-east and north-south cross sections are presented as Figures 4 and 5, respectively. The cross sections indicate that interbedded clay, silt, and sand deposits dominate the geology in

proximity to the facility. Semi-continuous sand deposits approximately 5 feet in thickness are found at near surface depths of approximately 30 to 60 feet below ground surface (bgs). In conjunction with other nearby driller's logs, the boring logs for monitoring wells MW-2 and MW-3 suggest a laterally continuous sand layer 10 to 25 feet thick at a depth of approximately 40 feet beneath the site; refer to Figure 6. Thicker sand layers exist at greater than 60 feet in depth. Clay layers within 100 feet of surface are 10 to 30 feet in thickness and gravel interbeds are present at depth.

Drilling confirmed shallow depth to ground water and the somewhat continuous sand bedding near surface. The placement of monitoring wells screens focused on the ability of the network to identify ground water levels and water quality within this uppermost continuous aquifer system.

Ground water levels in nearby wells provided by the interactive DWR San Joaquin Valley web site (http://wdl.water.ca.gov/gw/) indicate ground water elevations of approximately -15 to -20 feet MSL. Ground water levels taken at the monitoring wells installed during June 2010 confirmed these ranges of approximately 40 feet bgs.

DWR ground water contour maps support ground water flow to the southeast. Regional ground water flow is influenced by the historic ground water depression northeast of Stockton. Refer to Figure 1.

First encountered ground water was found unconfined within regionally continuous sands. Multi-year fluctuations are anticipated to be over 10 feet as depicted on the DWR hydrograph below. The DWR hydrograph well location is provided on Figure 1.

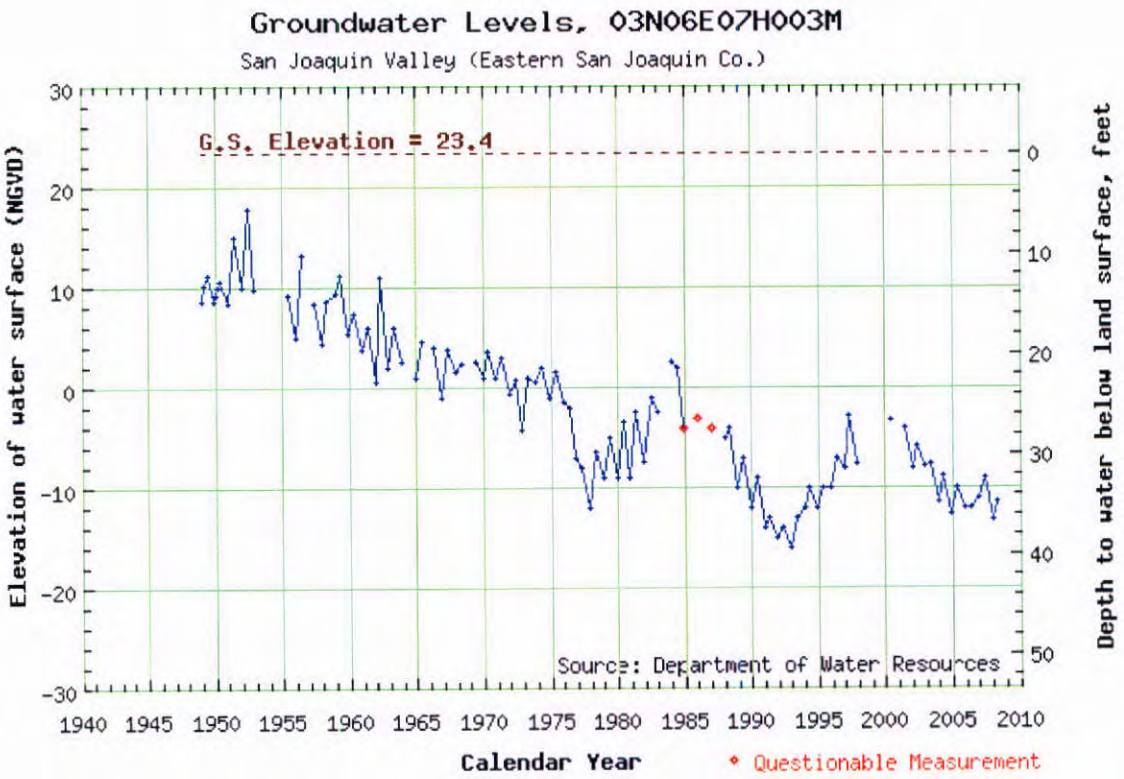
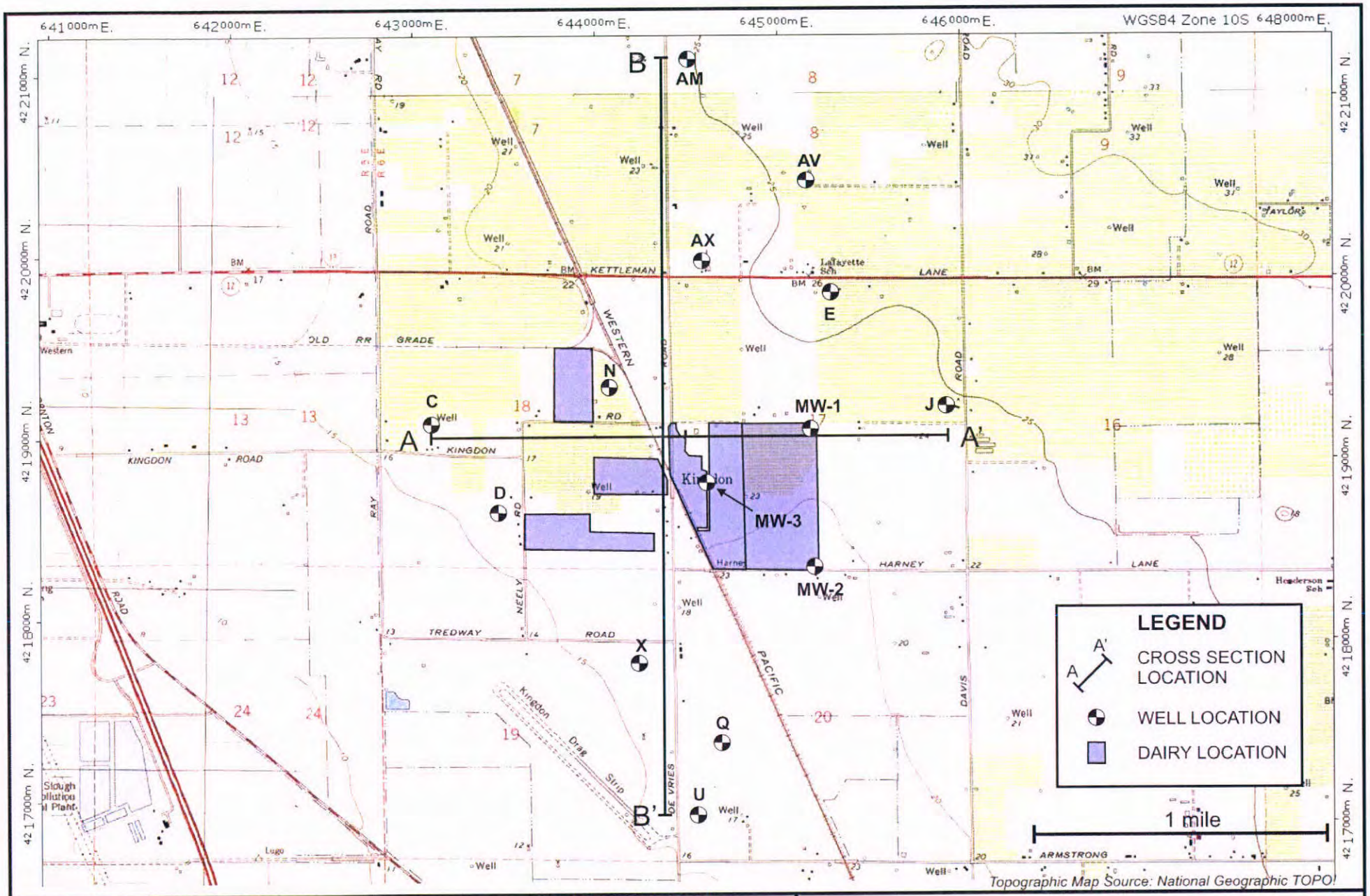


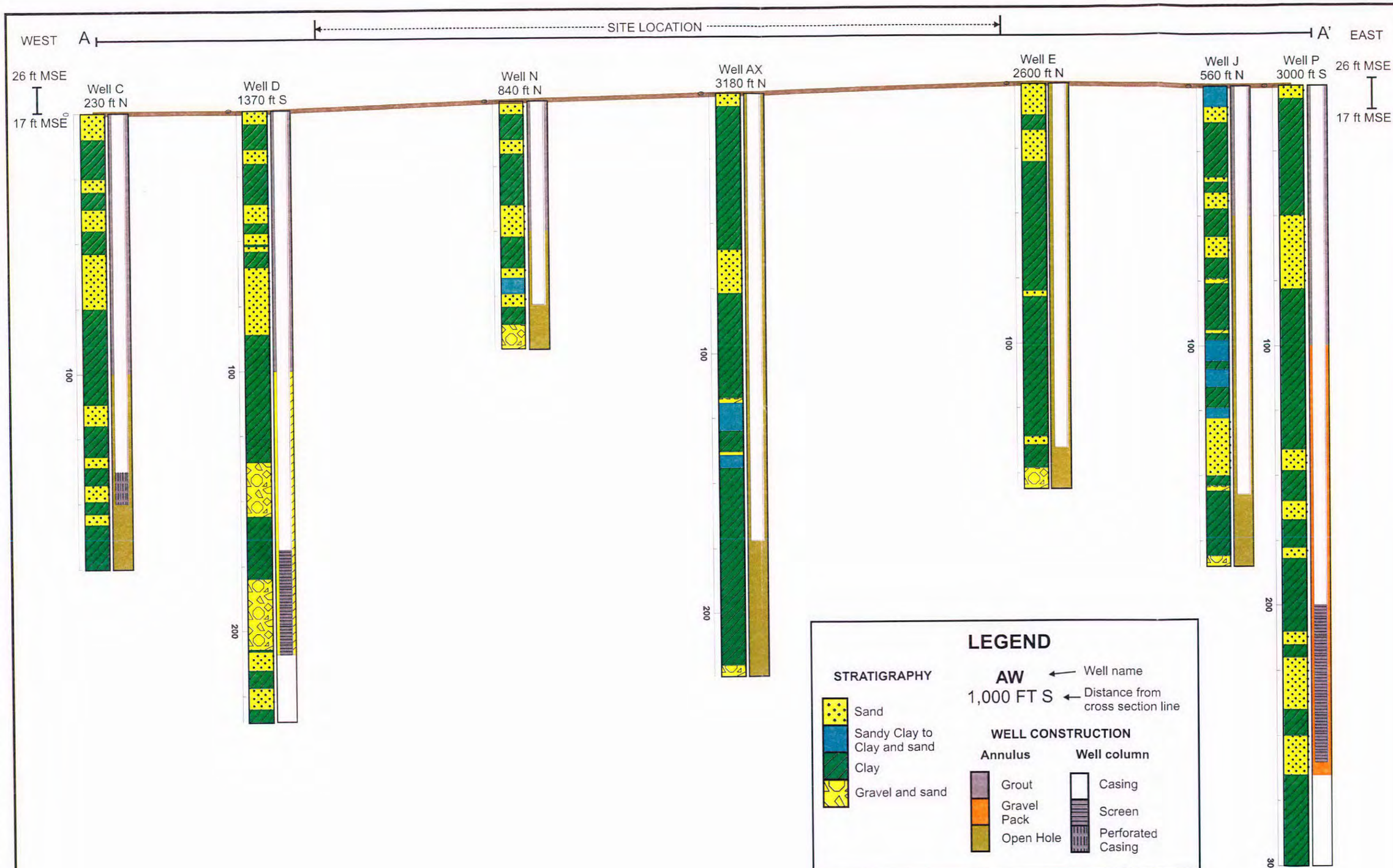
Figure 6 depicts ground water elevation contours and flow direction for the monitoring well network during 2Q10. The ground water flow direction is to the southeast. The ground water flow gradient is calculated by dividing the difference in ground water elevations in monitoring wells MW-3 and MW-2 by the horizontal distance between the wells. Ground water elevations were -18.40 and -19.46 feet MSL for MW-3 and MW-2, respectively, with a difference in elevation of 21.39 feet. The horizontal distance between wells is approximately 2,600 feet. The ground water flow gradient is calculated at 0.0004 feet/feet.



Dunn ENVIRONMENTAL, INC.

DATE: 01/07/2011	
SCALE: 1":2325'	
PROJECT NO: 103-27	
DRAWN: MM	
CHECKED: PFD	
FIGURE: 3	

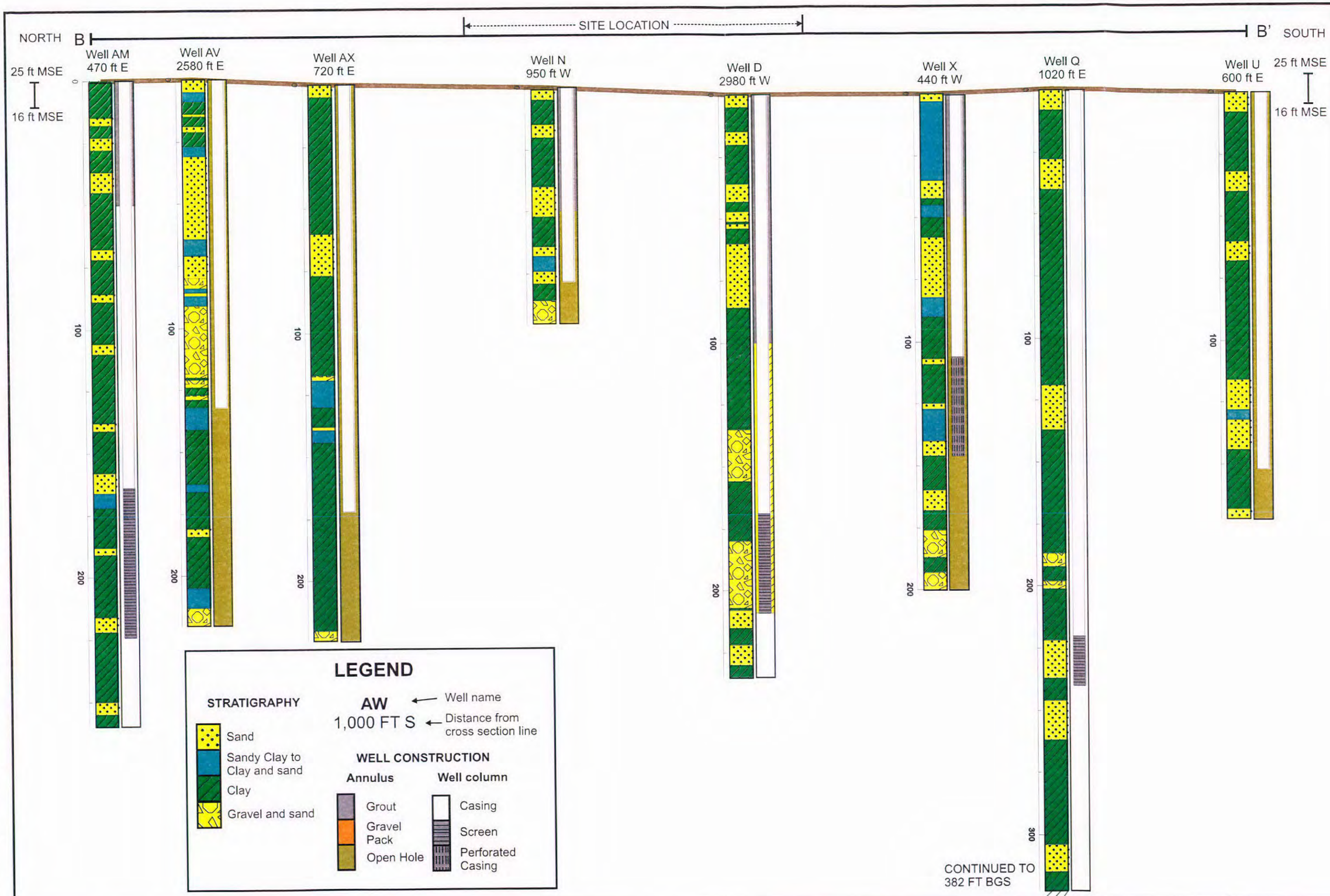
REGIONAL MAP WITH CROSS SECTION LOCATIONS
WOODS DAIRY
SAN JOAQUIN COUNTY, CALIFORNIA



HYDROGEOLOGIC CROSS SECTION A-A'
WOODS DAIRY
SAN JOAQUIN COUNTY , CALIFORNIA

DATE: 02/16/10
SCALE: H 1": 690' V 1":35'
PROJECT NO: 103-27
DRAWN: MM
CHECKED: PFD
FIGURE: 4

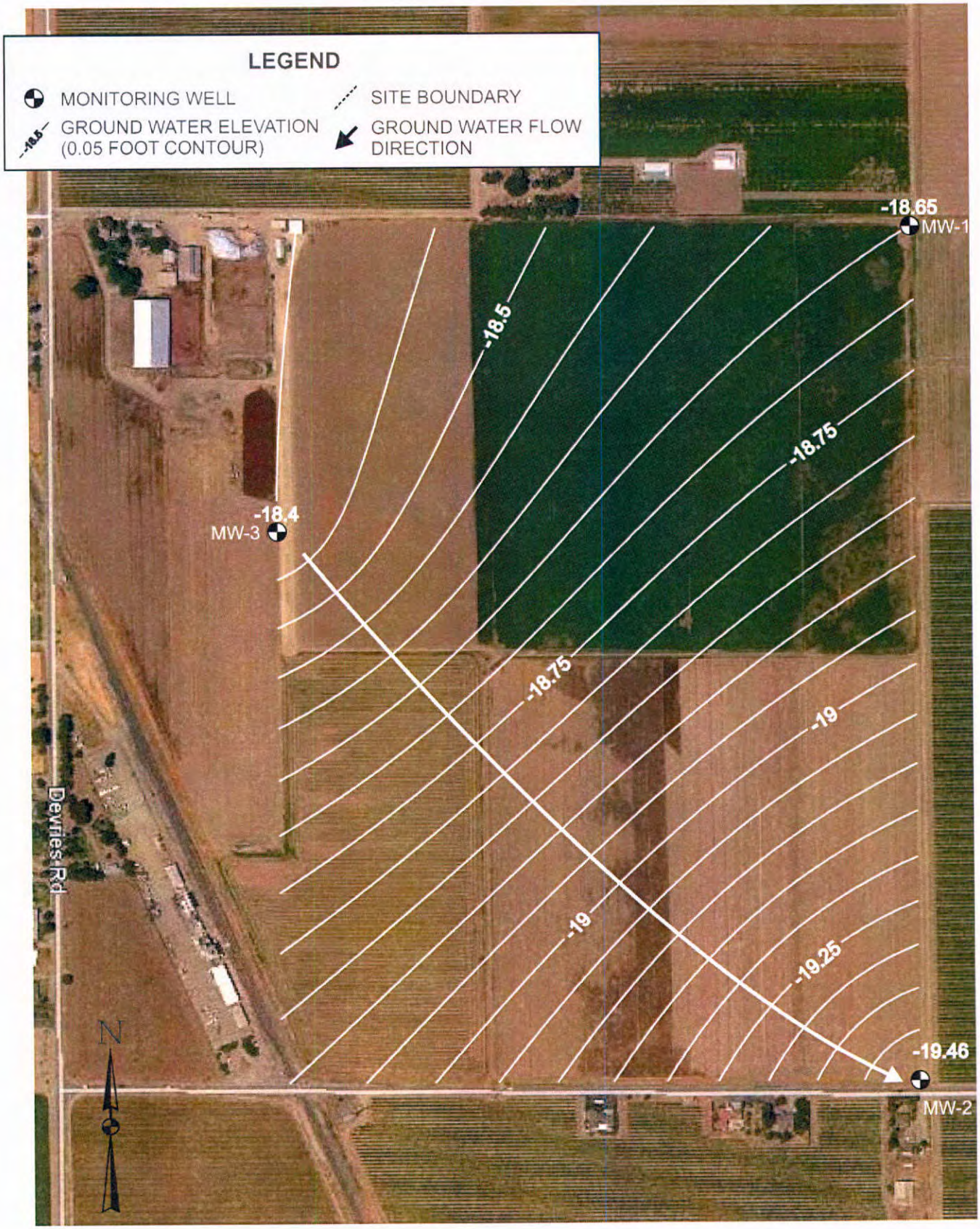
Dunn ENVIRONMENTAL, INC.



HYDROGEOLOGIC CROSS SECTION B-B'
WOODS DAIRY
SAN JOAQUIN COUNTY, CALIFORNIA

DATE: 02/16/10
SCALE: H 1": 1030' V 1":35'
PROJECT NO: 103-27
DRAWN: MM
CHECKED: PFD
FIGURE: 5

Dunn ENVIRONMENTAL, INC.



Dunn ENVIRONMENTAL, INC.

DATE: 01/03/2011	JUNE 2010 GROUND WATER ELEVATION CONTOURS WOODS DAIRY SAN JOAQUIN COUNTY, CALIFORNIA
SCALE: 1":400'	
PROJECT NO: 103-27	
DRAWN: MM	
CHECKED: PFD	
FIGURE: 6	

5. CONCLUSIONS

The following conclusions can be made based on the ground water monitoring well installation efforts:

- Encountered geology consisted of alluvial sandy silts, silty sands, and sands.
- Continuous first encounter ground water existed as unconfined conditions within sandy silts and sands. Ground water was first encountered from 40 to 43 feet bgs. Three 2-inch diameter PVC monitoring wells were installed in accordance with the approved RWQCB MWISP and San Joaquin County well standards.
- Based on surveyed monitoring well ground water elevation, the local ground water gradient flows to the southeast and mimics the regional flow direction. Ground water flow may be subject to pumping influences and seasonal variations. The ground water flow gradient was calculated at 0.0004 feet/feet.
- One round of ground water sampling was completed in June 2010. This round included the three monitoring wells, one off-site domestic well and three on site irrigation wells. Additional sampling of monitoring wells should be completed to establish spatial and temporal trends in ground water quality. This report will be revised once additional sampling has been completed and the WMP and NMP have been finalized.
- Ground water quality goal exceedances were observed at the three monitoring wells for parameters nitrate as N, TDS, and total coliforms. The above exceedances were observed for both upgradient and downgradient locations.
- The domestic and irrigation wells were tested for nitrate as N and no exceedances were reported.

ATTACHMENT A

BORING LOGS
WELL DETAILS
SURVEYOR REPORT

Dunn
ENVIRONMENTAL, INC.

Boring Log

Project Name	Project No.	Drilling Company
Woods Dairy	103-27	All Well Abandonment

Boring No.	Location	Ground Surface El	Drilling Rig Type and Drilling Method
MW-1	NE corner of site	Approx. 24 ft MSL	CME 75 LAR

Depth (ft)	Sample No.	Time	Soil Sample Recovery %	Soil Sample Blow Count Per 6"	Water Level	Lithology	Description (USCS)
0							Silty sand (SM); dark yellowish brown 10YR 4/4; 30-40% silt, 40-50% fine sand, 10% medium sand; dry, loose
-5		11:10	80%	18/20/22			Silty sand (SM); dark yellowish brown 10YR 4/4; 30-40% silt, 40-50% fine sand, 10% medium sand; dry, loose
-10		11:26	65%	12/20/29			Sandy silt (ML); light olive brown 2.5Y 5/4; 80% silt, 20% fine sand; moist, iron staining
-15		11:36	35%	17/21/28			Sandy silt (ML); mottled dark yellowish brown to dark brown 10YR 4/4 to 3/3; clay 15%. 75% silt, 10% fine sand; moist, slightly cohesive (dry gray silt material encountered above)
-20		11:45	95%	14/21/23			Sandy silt to silt (ML); dark yellowish brown 10YR 4/4; 90% silt, 10% fine sand; moist, reddish mottling
-25		11:54	95%	14/18/21			Sandy silt (ML); brown to dark yellowish brown 10YR 5/3 to 4/4; 15% clay, 70% silt, 15% fine sand; slightly cohesive, moist, sand stringers
-30		12:02	95%	12/15/20			Sand (SP); light olive brown 2.5Y 5/3; trace silt, 85% fine sand, 15% medium sand; loose, very moist, silt interbeds
-35		12:10	95%	14/14/18			
-40		12:22	95%	12/14/21	▼		Sandy silt (ML); olive brown 2.5Y 4/3; 70% silt, 30% fine sand; moist to wet. Loose, interbeds of fine sand and hard silt
-45		12:36	90%	15/18/19			Sandy silt (ML); light olive brown 2.5Y 5/3; 15-20% clay, 65% silt, 15% fine sand, 5-10% medium sand; moist, slightly cohesive, drier than above
-50		6/2/2010 10:48	80%	19/24/29			Sandy silt (SM); olive brown 2.5Y 4/3; 70% silt, 30% fine sand, trace medium sand; moist, compacted
-55		11:09	60%	23/29/32			Sandy silt (ML); olive brown 2.5Y 4/3; 70% silt, 30% fine sand, trace medium sand; moist, compacted

Well Completion

Water Level Data:			Logged By: MM	Signature for MM
While Drilling ▽ 43.6	After Drilling ▼ 42.4	Hours after Drilling:+48	Date Started: 06/01/10	Date Completed: 06/02/10

Dunn ENVIRONMENTAL, INC.

Boring Log

Project Name	Project No.	Drilling Company
Woods Dairy	103-27	All Well Abandonment

Boring No.	Location	Ground Surface El	Drilling Rig Type and Drilling Method
MW-2	Near Harney Road	Approx. 22 ft MSL	CME 75 LAR

Depth (ft)	Sample No.	Time	Soil Sample Recovery %	Soil Sample Blow Count Per 6"	Water Level	Lithology	Description (USCS)	Well Completion
0							Sand with silt (SP); dark yellowish brown 10YR 4/4; 10% silt, 70% fine sand, 20% medium sand; moist, loose	grouted annulus; 2 inch diameter schedule 40 PVC
-5		12:20	100%	12/14/18				
-10		12:41	100%	15/18/26			Silty sand (SM); olive brown 2.5Y 4/3; 40% silt, 60% fine sand; moist, soft	
-15		12:50	100%	14/20/25			Sandy silt (ML); olive brown 2.5Y 4/3 with reddish mottling; 70% silt, 30% fine sand; moist, soft, iron staining	
-20		13:00	100%	15/17/20			Sandy silt (ML); light olive brown to olive brown 2.5Y 5/3 to 4/3; 20% clay, 70% silt, 10% fine sand; moist, slightly cohesive	
-25		13:09	100%	18/21/24			Sandy silt (ML); dark yellowish brown 10YR 4/4; 20% clay, 70% silt, 10% fine sand; moist, slightly cohesive, white discolorations	
-30		13:17	95%	12/12/15			Sandy silt (ML); light olive brown to olive brown 2.5Y 5/3 to 4/3; 20% clay, 70% silt, 10% fine sand; moist, slightly cohesive	
-35		13:30	100%	10/15/18				
-40		13:44	95%	15/18/24			Sand (SP); black and white; 70% fine sand, 30% medium sand; wet, loose, clean	#2/12 sand; 0.010 machine slot
-45		14:17	95%	17/21/29			Silty sand (SM); black, white, and brown; 10% silt, 90% fine to medium sand; wet, loose	
-50		14:42	60%	18/21/27			Sandy silt (ML); brown; 20% clay, 55-60% silt, 20% fine to medium sand; moist, cohesive	
-55		15:00	40%	18/20/25			Sandy clay (CL); brown; 50% clay, 30% silt, 20% fine to medium sand	

Water Level Data:			Logged By: ASM	Signature [signature] for MM
While Drilling 40	After Drilling 40.1	Hours after Drilling: 48	Date Started: 06/02/10	Date Completed: 06/02/10

Dunn ENVIRONMENTAL, INC.

Boring Log

Project Name	Project No.	Drilling Company
Woods Dairy	103-27	All Well Abandonment

Boring No.	Location	Ground Surface El	Drilling Rig Type and Drilling Method
MW-3	Near Pond	Approx. 24 ft MSL	CME 75 LAR

Depth (ft)	Sample No.	Time	Soil Sample Recovery %	Soil Sample Blow Count Per 6"	Water Level	Lithology	Description (USCS)
0							Sand (SP); dark brown 10YR 3/3; 5% silt, 75% fine sand, 20% medium sand; soft, moist, loose
-5		16:28	90%	5/6/8			
-10		16:32	90%	7/10/14			Sand (SP); dark yellowish brown 10YR 4/4; trace silt, 60% fine sand, 40% medium sand; soft, moist, loose
-15		16:35	95%	6/9/12			Sand (SP); dark yellowish brown 10YR 4/4; trace silt, 45% fine sand, 40% medium sand, 15% coarse sand; soft, moist, loose
-20		16:38	90%	7/10/14			Sandy silt (ML); light olive brown 2.5Y 5/3; minor clay content, 80% silt, 20% fine sand; stiff, moist
-25		16:44	90%	7/14/22			Silty sand (SM); dark yellowish brown 10YR 4/4; 20% silt, 60% fine sand, 20% medium sand
-30		16:50	100%	7/10/14			Sand (SP); dark yellowish brown 10YR 4/4; 5-10% silt, 75% fine sand, 15-20% medium sand; soft, loose, moist
-35		17:04	40%	6/9/16			Silty sand to sandy silt (SM-ML); dark yellowish brown 10YR 4/4; 50% silt, 50% fine sand; moist, slightly cohesive
-40		17:09	70%	8/11/17	▽		Sand (SP); dark yellowish brown 10YR 4/6; fine to medium grained; wet, loose
-45		17:16	100%	5/7/10			Sand (SP); black and white; 30% fine sand, 60% medium sand, 10% coarse sand; loose, wet
-50		17:19	80%	8/12/10			Sand (SP); black and white; 30% fine sand, 60% medium sand, 10% coarse sand; loose, wet, sandy silt interbed
-55		17:22	80%	9/14/22			Sand (SP); black and white; 20% fine sand, 80% medium sand; soft, wet
-60		17:35	90%	7/12/25			Sand (SP); black and white; 40% fine sand, 50% medium sand, 10% coarse; loose, wet

Water Level Data:			Logged By: MM	Signature for MM
While Drilling ▽ 42.7	After Drilling ▼ 41.85	Hours after Drilling:+48	Date Started: 06/02/10	Date Completed: 06/03/10

Dunn
ENVIRONMENTAL, INC.

ABOVE GRADE
Monitoring Well Construction

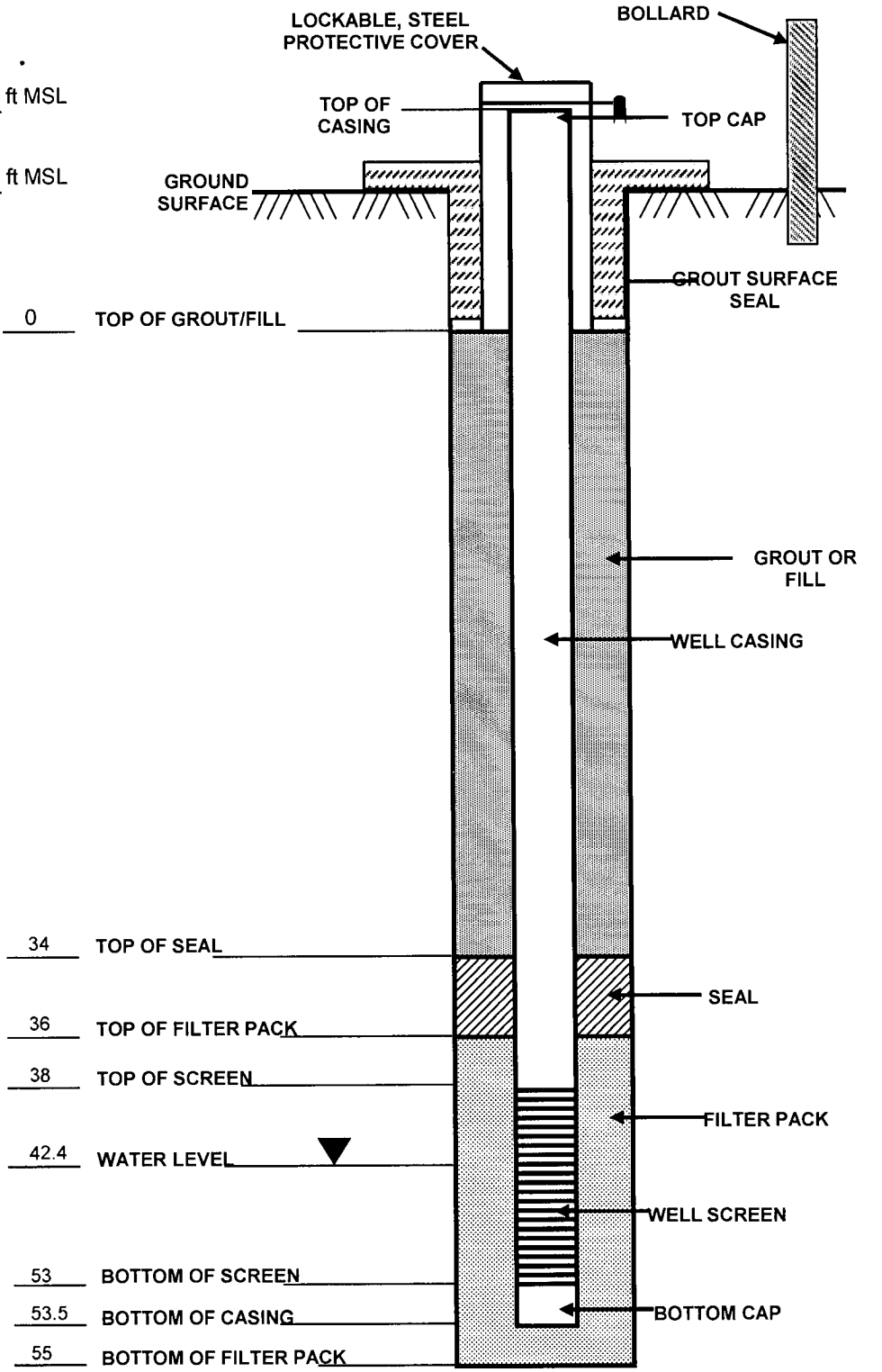
Project Name		Project No.	Drilling Company	Date Drilled
Woods Dairy		103-27	All Well Abandonment	6/1/2010
Well No.	**Location**	**Ground Surface El.**	**Drilling Rig Type & Method**	**Date Constructed**
MW-1	Northeast corner of fields	24.83	CME 75	6/2/2010

Borehole Diameter	8 inch
Survey Reference Point	NGS
Joint Type	Flush threaded w/ O-ring
Type/Size of Casing	Schedule 40 PVC, 2 inch diameter
Type/Size of Screen	Schedule 40 PVC, 2 inch diameter
Screen Slot Size	0.010 machine slot
Type/Amount of Grout Fill	Basalite Type II-V Cement 8 94 lb bags, 75 gal.
Type/Amount of Seal	Cetco Puregold Medium Bentonite Chips - 1 50 lb bag
Type/Amount of Filter Pack	Cemex Monterey Beach Sand #2/12 7 100 lb bags
Development Technique	Air lift
Water Volume Removed	39

Elevation

26.93 ft MSL — TOP OF CASING

24.83 ft MSL — GROUND SURFACE



Dunn ENVIRONMENTAL, INC.

ABOVE GRADE
Monitoring Well Construction

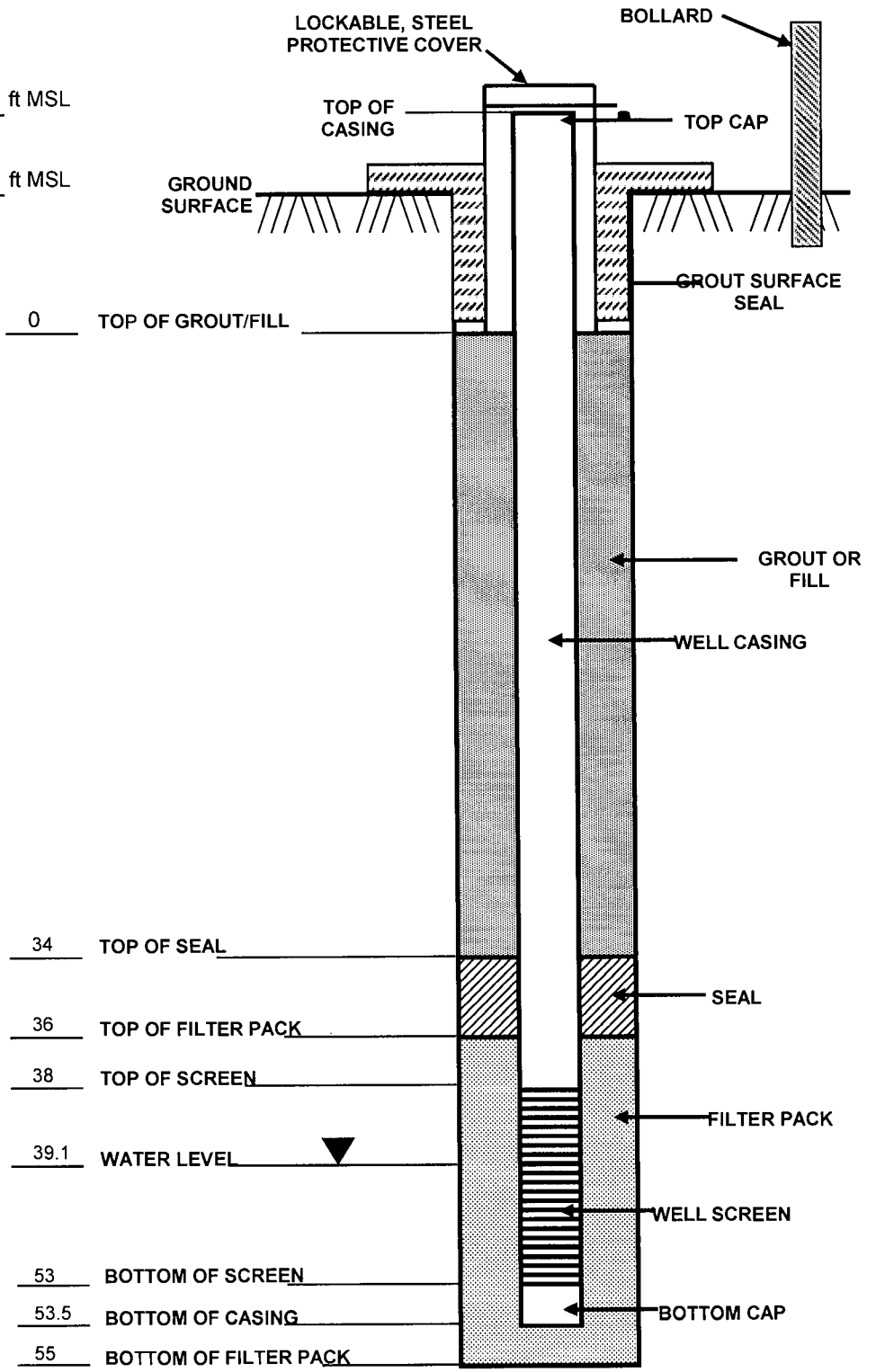
Project Name		Project No.	Drilling Company	Date Drilled
Woods Dairy		103-27	All Well Abandonment	6/2/2010
Well No.	**Location**	**Ground Surface El.**	**Drilling Rig Type & Method**	**Date Constructed**
MW-2	Southwest corner of fields	20.55	CME 75	6/2/2010

Borehole Diameter	8 inch
Survey Reference Point	NGS
Joint Type	Flush threaded w/ O-ring
Type/Size of Casing	Schedule 40 PVC, 2 inch diameter
Type/Size of Screen	Schedule 40 PVC, 2 inch diameter
Screen Slot Size	0.010 machine slot
Type/Amount of Grout Fill	Basalite Type II-V Cement 6 94 lb bags, 75 gal.
Type/Amount of Seal	Cetco Puregold Medium Bentonite Chips - 1 50 lb bag
Type/Amount of Filter Pack	Cemex Monterey Beach Sand #2/12 - 7 100 lb bags
Development Technique	Air Lift
Water Volume Removed	82

Elevation

23.15 ft MSL

20.55 ft MSL

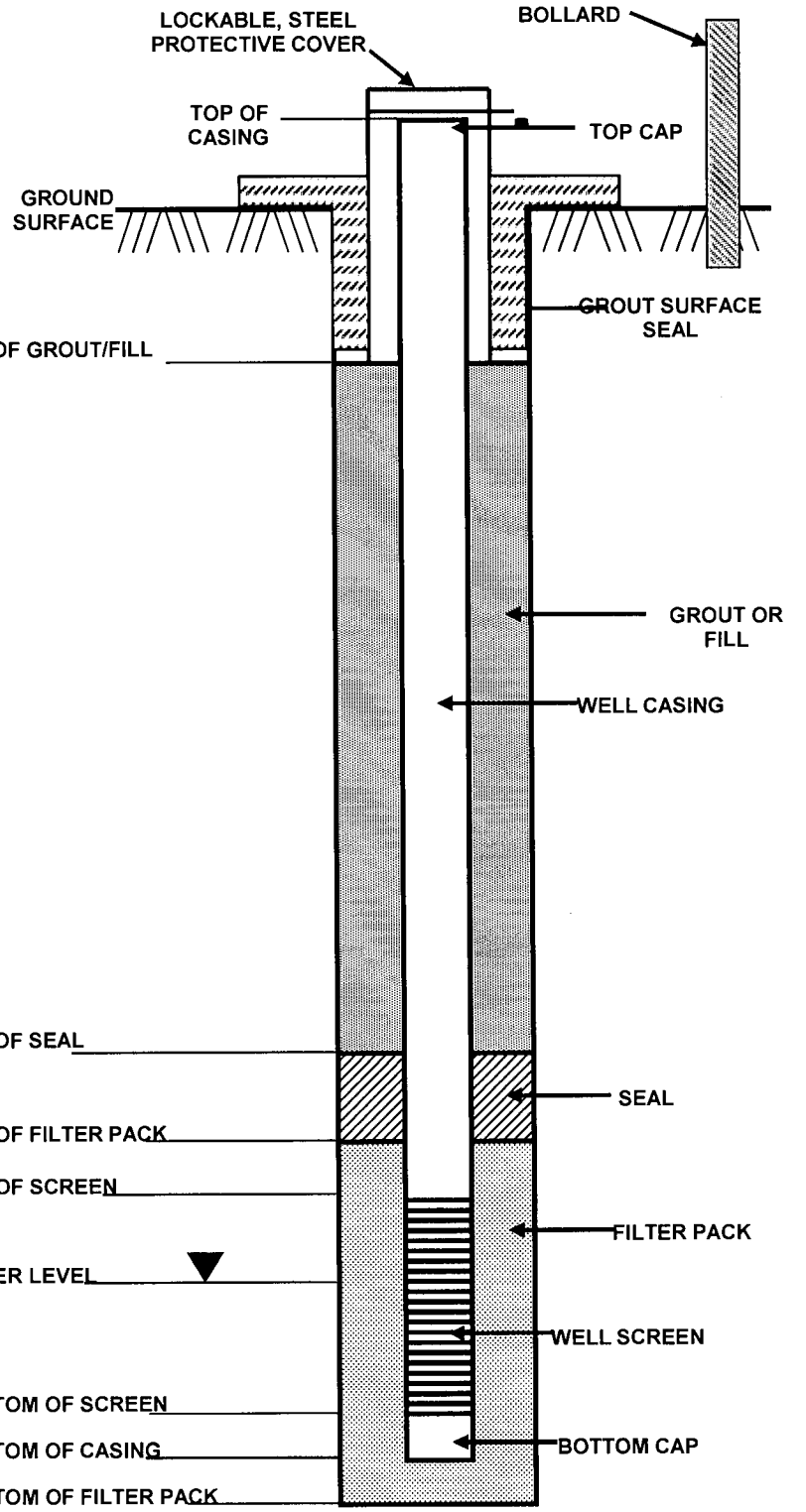


Dunn ENVIRONMENTAL, INC.

ABOVE GRADE
Monitoring Well Construction

Project Name		Project No.	Drilling Company	Date Drilled
Woods Dairy		103-27	All Well Abandonment	6/3/2010
Well No.	**Location**	**Ground Surface El.**	**Drilling Rig Type & Method**	**Date Constructed**
MW-3	SE side of lagoon	25.65	CME 75	6/3/2010

Borehole Diameter 8 inch	**Elevation**	
Survey Reference Point NGS	25.65	ft MSL
Joint Type Flush threaded w/ O-ring	23.33	ft MSL
Type/Size of Casing Schedule 40 PVC, 2 inch diameter	0	TOP OF GROUT/FILL
Type/Size of Screen Schedule 40 PVC, 2 inch diameter		
Screen Slot Size 0.010 machine slot		
Type/Amount of Grout Fill Basalite Type II-V Cement - 7.5 94 lb bags, 60 gal.		
Type/Amount of Seal Cetco Puregold Medium Bentonite Chips - 1 50 lb bag	36	TOP OF SEAL
Type/Amount of Filter Pack Cemex Monterey Beach Sand #2/12 - 6 100 lb bags	37.5	TOP OF FILTER PACK
Development Technique Air lift	39.5	TOP OF SCREEN
Water Volume Removed 38	42.7	WATER LEVEL
	54.5	BOTTOM OF SCREEN
	55	BOTTOM OF CASING
	60	BOTTOM OF FILTER PACK



Shoup Land Surveying

Walter John Shoup, PLS 7736
P.O. Box 658, Clements, CA 95227
209-333-1872 (Office & Fax) 209-747-4648 (Mobile)
john@shouplandsurveying.com

June 21, 2010

Mr. Patrick Dunn
Dunn Environmental, Inc.
5060 Robert J. Mathews Parkway, Suite 2
El Dorado Hills, CA 95762

RE: Monitoring Well Survey
Woods Dairy, 14250 N. DeVries Road, Lodi, CA

This letter is to confirm that we have completed our field survey as requested for your client project as referenced above. The primary survey control point is designated by the National Geodetic Survey as "VALVE" and values are referenced to NAD 83 coordinates and NAVD 88 elevation. This control point is located at the southeast corner of Turner & Davis Road, as noted by "The NGS Data Sheet" for this station, and has a benchmark elevation of 35.2' (NAVD 88).

The horizontal coordinates are based on NAD 83, Zone 3 (epoch date 2007.00) for each of the monitoring wells. We used Topcon GR-3 receivers for our GPS observations and to establish our site benchmark. The horizontal coordinates are within minimum horizontal position standards, within one-foot lateral accuracy, as required by California Regional Water Quality Control Board, Central Valley Region Order No. R5-2007-0035.

The elevation for each of the monitoring wells is based on NAVD 88. The elevations for the monitoring well top of casing (TOC) were established by standard leveling techniques using at Topcon Digital level Model DL-102. The elevations are within minimum elevation standards, absolute accuracy to within 0.5'+/- and relative accuracy within 0.01'+/-, as required by California Regional Water Quality Control Board, Central Valley Region Order No. R5-2007-0035.

Below please find a table of our survey coordinates and elevations:

Latitude (N)	Longitude (W)	Northing	Easting	Elev.	Description
38°06'30.39313"	121°20'35.63347"	2,227,167.7'	6,319,052.0'	26.93'	MW-1 TOC
(Natural ground elevation, "GS" taken 2' north of monitoring well)				24.83'	GS
38°06'04.73078"	121°20'35.21945"	2,224,571.7'	6,319,061.7'	23.15'	MW-2 TOC
(Natural ground elevation, "GS" taken 2' north of monitoring well)				20.55'	GS
38°06'21.14554"	121°20'59.73105"	2,226,249.8'	6,317,117.6'	25.65'	MW-3 TOC
(Natural ground elevation, "GS" taken 2' north of monitoring well)				23.33'	GS
38°06'30.50354"	121°21'04.34096"	2,227,199.6'	6,316,757.8'	23.92'	NEC Milk Barn
(Coordinates taken at NE Corner of Milk Barn Overhand, ground elevation = "GS" at that location)					
38°06'22.19277"	121°20'59.78821"	2,226,355.8'	6,317,114.0'	24.04'	SEC Lagoon
(Coordinates taken at SE Corner of Lagoon, ground elevation = "Top of Bank" at that location)					

Sincerely,

Walter John Shoup, PLS 7736

LICENSED LAND SURVEYOR
WALTER JOHN SHOUP
NO. 7736
Exp. 12/31/11
STATE OF CALIFORNIA

WOODS DAIRY MONITORING WELL ELEVATION SURVEY "LEVEL NOTES"
DATE: 06/14/10, PERFORM BY: SHOUP LAND SURVEYING
SLS FB 14-9/10, JOB #10-030, PARTY CHIEF: WALTER JOHN SHOUP, PLS 7736
EQUIPMENT: TOPCON DIGITAL LEVEL MODEL DL-102

STA	BS	HI	FS	ELEV	DESC
TBM				22.42	BM WX-14, SJCO BM (NAVD 88 BY GPS)
	3.31	25.73			
			5.18	20.55	GS
			2.37	23.36	TOP 6" PIPE N.RIM
MW-2			2.577	23.153	TOP 2" PVC CASING AT N. SIDE
TP1			5.273	20.457	SET GINNY
	5.835	26.292			
TP2			5.311	20.981	SET GINNY
	5.7	26.681			
TP3			5.242	21.439	SET GINNY
	5.954	27.393			
TP4			5.476	21.917	SET GINNY
	6.311	28.228			
TP5			5.843	22.385	SET GINNY
	5.767	28.152			
TP6			5.632	22.52	SET GINNY
	5.51	28.03			
			4.7	23.33	GS
			2.04	25.99	TOP 6" PIPE N.RIM
MW-3			2.385	25.645	TOP 2" PVC CASING AT N. SIDE
	3.656	29.301			
TP7			4.973	24.328	SET GINNY
	5.812	30.14			
TP8			4.898	25.242	NW COR. CONC. PAD
	5.735	30.977			
TP9			5.784	25.193	SET GINNY
	4.915	30.108			
TP10			5.798	24.31	SET GINNY
	5.951	30.261			
TP11			5.915	24.346	SET GINNY
	6.17	30.516			
TP12			6.388	24.128	SET GINNY
	5.98	30.108			
			5.28	24.828	GS
			2.71	27.398	TOP 6" PIPE N.RIM
MW-1			3.182	26.926	TOP 2" PVC CASING AT N. SIDE
	2.757	29.683			
TP13			5.769	23.914	SET GINNY
	5.148	29.062			
TP14			5.861	23.201	SET GINNY
	5.03	28.231			
TP15			5.718	22.513	SET GINNY
	4.505	27.018			
TP16			5.606	21.412	SET GINNY
	5.448	26.86			
TP17			5.954	20.906	SET GINNY
	5.544	26.45			
BM			4.026	22.424	WX-14 SJCO

LICENSED LAND SURVEYOR
WALTER JOHN SHOUP
NO. 7736
Exp. 12/31/11
STATE OF CALIFORNIA

ATTACHMENT B

FIELD DATA SHEETS (Well Development and Sampling Event)

Dunn ENVIRONMENTAL, INC.

DEVELOPMENT FIELD DATA SHEET

DE PROJECT NUMBER: 103-27

SITE: Woods Dairy **PAGE** 1 **of** 4

SAMPLING EVENT: Development **OTHER:**

MONITORING GROUP: **QUARTERLY** ____ **SEMIANNUAL** ____ **ANNUAL** ____

FIVE YEAR ____ **OTHER:**

Sample Location: **MW-1** Date: 6/9/10

Sample Media: GW **X** SW ____ Leachate ____ Other ____

Sampler(s): Max Marchol Miguel – Slagle Drilling

Depth to Water: 45.16 ft. Well Depth: 55.39 ft. Well Diam.: 2 in.

Well Casing Volume: 1.64 gal. Purge Volume: 16.4 gal. (10 x WCV)

Purge Start Time: 1044 Purge Rate: 0.4 - 0.5 gpm

Equipment used to purge: See below Equipment used to sample: NA

Time	Temperature (C)	pH	Turbidity (NTU)	Specific Conductance (µmhos/cm)	Approximate Gallons Purged
10:59	23.04	8.36	>1100	1010	7
11:24	22.69	8.44	>1100	798	12
12:26	24.03	8.51	264.9	1285	28
12:31	23.72	8.49	98.99	1275	31
12:38	23.67	8.50	71.02	1270	34
12:44	23.60	8.52	68.72	1274	36
12:49	23.67	8.50	69.04	1268	39

Sample Collection Time: NA VOC collection Rate: ____ ml/ min.

Duplicate QC Sample Collected? NO ____ YES ____ Duplicate ID: ____

Additional Analyses: ____

Weather Conditions: Sunny, warm, breezy

Notes: 10:59 Shutdown, 1101 restart
1119 shutdown, 1121 restart
Well depth measurement taken before development. Compressor: Airflow Tech Airmon air compressor -49 Hp

Dunn ENVIRONMENTAL, INC.

DEVELOPMENT FIELD DATA SHEET

DE PROJECT NUMBER: 103-27

SITE: Woods Dairy **PAGE** 2 **of** 4

SAMPLING EVENT: Development **OTHER:**

MONITORING GROUP: **QUARTERLY** ____ **SEMIANNUAL** ____ **ANNUAL** ____ **FIVE YEAR** ____ **OTHER:**

Sample Location: **MW-2 (Page 1 of 2)** Date: 6/9/10

Sample Media: GW **X** SW ____ Leachate ____ Other ____

Sampler(s): Max Marchol Miguel – Slagle Drilling

Depth to Water: 42.54 ft. Well Depth: 54.02 ft. Well Diam.: 2 in.

Well Casing Volume: 2.24 gal. Purge Volume: 22.4 gal. (10 x WCV)

Purge Start Time: 8:40 Purge Rate: 0.7 - 1.0 gpm

Equipment used to purge: See below Equipment used to sample: NA

Time	Temperature (C)	pH	Turbidity (NTU)	Specific Conductance (µmhos/cm)	Approximate Gallons Purged
8:55	20.51	8.30	>1100	1297	15
9:03	20.45	8.47	>1100	1195	23
9:08	20.38	8.45	>1100	1165	28
9:23	20.44	8.54	>1100*	1131	39
9:42	20.89	8.50	410.0	1106	45
9:49	21.07	8.51	297.5	1101	52
9:54	20.98	8.54	147.3	1100	56
9:59	20.74	8.47	82.83	1099	61
10:04	20.97	8.49	101.4	1090	66

Sample Collection Time: NA VOC collection Rate: ____ ml/ min.

Duplicate QC Sample Collected? NO ____ YES ____ Duplicate ID: ____

Additional Analyses: ____

Weather Conditions: Partly cloudy, windy, warm,

Notes: Well depth measurement taken after development. Compressor: Airflow Tech Airmon air compressor -49 Hp
Shutdown at 0912, restart at 0916; Shutdown at 0931, restart at 0933
*visually, turbidity appears to be improving

Dunn ENVIRONMENTAL, INC.

DEVELOPMENT FIELD DATA SHEET

DE PROJECT NUMBER: 103-27

SITE: **Woods Dairy** **PAGE** 3 **of** 4

SAMPLING EVENT: Development **OTHER:**

MONITORING GROUP: **QUARTERLY** ____ **SEMIANNUAL** ____ **ANNUAL** ____

FIVE YEAR ____ **OTHER:**

Sample Location: **MW-2 (Page 2 of 2)** Date: 6/9/10

Sample Media: GW **X** SW ____ Leachate ____ Other ____

Sampler(s): Max Marchol Miguel – Slagle Drilling

Depth to Water: 42.54 ft. Well Depth: 54.02 ft. Well Diam.: 2 in.

Well Casing Volume: 2.24 gal. Purge Volume: 22.4 gal. (10 x WCV)

Purge Start Time: 840 Purge Rate: 0.7 – 1.0 gpm

Equipment used to purge: As before Equipment used to sample: NA

Time	Temperature (C)	pH	Turbidity (NTU)	Specific Conductance (µmhos/cm)	Approximate Gallons Purged
10:09	21.08	8.50	106.4	1095	71
10:15	21.27	8.48	77.63	1092	77
10:20	21.29	8.50	87.91	1091	82

Sample Collection Time: NA VOC collection Rate: ____ ml/ min.

Duplicate QC Sample Collected? NO ____ YES ____ Duplicate ID: ____

Additional Analyses: ____

Weather Conditions: Sunny, warm, breezy

Notes: ____

Dunn ENVIRONMENTAL, INC.

DEVELOPMENT FIELD DATA SHEET

DE PROJECT NUMBER: 103-27

SITE: Woods Dairy **PAGE** 4 **of** 4

SAMPLING EVENT: Development **OTHER:**

MONITORING GROUP: **QUARTERLY** ____ **SEMIANNUAL** ____ **ANNUAL** ____ **FIVE YEAR** ____ **OTHER:**

Sample Location: **MW-3** Date: 6/9/10

Sample Media: GW **X** SW ____ Leachate ____ Other ____

Sampler(s): Max Marchol Miguel – Slagle Drilling

Depth to Water: 43.53 ft. Well Depth: 58.03 ft. Well Diam.: 2 in.

Well Casing Volume: 2.31 gal. Purge Volume: 23.1 gal. (10 x WCV)

Purge Start Time: 1313 Purge Rate: 0.5 gpm

Equipment used to purge: See below Equipment used to sample: NA

Time	Temperature (C)	pH	Turbidity (NTU)	Specific Conductance (µmhos/cm)	Approximate Gallons Purged
13:21	23.12	8.21	>1100	2035	4
13:29	23.56	8.11	401.1	2017	8
13:42	22.96	8.14	32.97	2043	14
13:47	22.88	8.08	20.40	2039	17
13:52	22.63	8.05	18.28	2029	20
14:09	22.78	8.06	61.02	2046	28
14:16	22.46	8.01	24.28	2021	31
14:23	22.55	7.95	21.08	2032	35
14:29	22.65	8.10	20.29	2037	38

Sample Collection Time: NA VOC collection Rate: ____ ml/ min.

Duplicate QC Sample Collected? NO ____ YES ____ Duplicate ID: ____

Additional Analyses: ____

Weather Conditions: Partially cloudy, warm, very windy

Notes: Well depth measurement taken before development. Compressor: Airflow Tech Airmon air compressor -49 Hp
Shutdown at 13:32, restart at 13:34
Tubing moved at 1358 and turbidity increased.

Dunn ENVIRONMENTAL, INC.

FIELD DATA SHEET

DE PROJECT NUMBER: 103-27

SITE: Woods Dairy **PAGE** 1 **of** ____

SAMPLING EVENT: Initial **OTHER:** ____

MONITORING GROUP: **QUARTERLY** ____ **SEMIANNUAL** ____ **ANNUAL** ____ **FIVE YEAR** ____ **OTHER:** ____

Sample Location: **MW-1** Date: 6/10/10

Sample Media: GW **X** SW ____ Leachate ____ Other ____

Sampler(s): Max Marchol Cassie Tremblay

Depth to Water: 45.58 ft. Well Depth: 55.35 ft. Well Diam.: 2 in.

Well Casing Volume: 1.56 gal. Purge Volume: 4.68 gal. (3 x WCV)

Purge Start Time: 10:03 Purge Rate: 0.5 gpm

Equipment used to purge: Redi-Flo 2 Equipment used to sample: Redi-Flo 2

Time	Temperature (C)	pH	Turbidity (NTU)	Specific Conductance (µmhos/cm)	Approximate Gallons Purged
10:07	20.00	7.83	215.0	1338	2
10:13	19.80	7.66	83.44	1337	4
10:20	20.06	7.52	53.72	1367	6
10:24	19.87	7.49	49.07	1372	8
10:30	20.16	7.48	22.58	1389	10

Sample Collection Time: 10:20 VOC collection Rate: ____ ml/ min.

Duplicate QC Sample Collected? NO X YES ____ Duplicate ID: ____

Additional Analyses: ____

Weather Conditions: Sunny, warm, breezy

Notes: Top of well casing 3.2 ft from ground surface; water level at 45.99 ft at 10:19

Dunn ENVIRONMENTAL, INC.

FIELD DATA SHEET

DE PROJECT NUMBER: 103-27

SITE: Woods Dairy **PAGE** 2 **of** ____

SAMPLING EVENT: Initial **OTHER:** ____

MONITORING GROUP: **QUARTERLY** ____ **SEMIANNUAL** ____ **ANNUAL** ____ **FIVE YEAR** ____ **OTHER:** ____

Sample Location: **MW-2** Date: 6/10/10

Sample Media: GW X SW ____ Leachate ____ Other ____

Sampler(s): Max Marchol Cassie Tremblay

Depth to Water: 42.61 ft. Well Depth: 54.02 ft. Well Diam.: 2 in.

Well Casing Volume: 1.83 gal. Purge Volume: 5.49 gal. (3 x WCV)

Purge Start Time: 11:02 Purge Rate: 0.5 gpm

Equipment used to purge: Redi-Flo 2 Equipment used to sample: Redi-Flo 2

Time	Temperature (C)	pH	Turbidity (NTU)	Specific Conductance (µmhos/cm)	Approximate Gallons Purged
11:06	20.63	7.92	76.90	1156	2
11:09	19.70	7.94	29.25	1141	4
11:13	19.56	7.86	22.77	1131	6
11:15	20.27	7.76	16.24	1138	8

Sample Collection Time: 11:30 VOC collection Rate: ____ ml/ min.

Duplicate QC Sample Collected? NO X YES ____ Duplicate ID: ____

Additional Analyses: ____

Weather Conditions: Sunny, warm, windy

Notes: 2.5 feet of casing stickup; turbidity at 11:14 is 19.02 NTU

Dunn ENVIRONMENTAL, INC.

FIELD DATA SHEET

DE PROJECT NUMBER: 103-27

SITE: Woods Dairy **PAGE** 3 **of** ____

SAMPLING EVENT: Initial **OTHER:** ____

MONITORING GROUP: **QUARTERLY** ____ **SEMIANNUAL** ____ **ANNUAL** ____

FIVE YEAR ____ **OTHER:** ____

Sample Location: **MW-3** Date: 6/10/10

Sample Media: GW X SW ____ Leachate ____ Other ____

Sampler(s): Max Marchol Cassie Tremblay

Depth to Water: 44.05 ft. Well Depth: 58.07 ft. Well Diam.: 2 in.

Well Casing Volume: 2.24 gal. Purge Volume: 6.72 gal. (3 x WCV)

Purge Start Time: 12:41 Purge Rate: 1.0 gpm

Equipment used to purge: Redi-Flo 2 Equipment used to sample: Redi-Flo 2

Time	Temperature (C)	pH	Turbidity (NTU)	Specific Conductance (µmhos/cm)	Approximate Gallons Purged
12:45	19.58	7.61	15.91	2136	2.5
12:50	18.44	7.54	14.07	2127	7.0
12:55	18.38	7.31	13.01	1229	11
13:00	18.36	7.18	14.46	2134	14.5
13:05	18.25	7.11	14.34	2126	17.0
13:09	18.14	7.13	12.70	2112	21

Sample Collection Time: 13:40 VOC collection Rate: ____ ml/ min.

Duplicate QC Sample Collected? NO ____ YES X Duplicate ID: MW-10 at 13:30

Additional Analyses: ____

Weather Conditions: Sunny, windy, warm

Notes: 2.2 ft well casing stick up

Dunn ENVIRONMENTAL, INC.

FIELD DATA SHEET

DE PROJECT NUMBER: 103-27

SITE: Woods Dairy **PAGE** 4 **of** ____

SAMPLING EVENT: Initial **OTHER:** ____

MONITORING GROUP: **QUARTERLY** ____ **SEMIANNUAL** ____ **ANNUAL** ____ **FIVE YEAR** ____ **OTHER:** ____

Sample Location: **Irrigation Well #2** Date: 6/10/10

Sample Media: GW X SW ____ Leachate ____ Other ____

Sampler(s): Max Marchol Cassie Tremblay

Depth to Water: - ft. Well Depth: ~210 ft. Well Diam.: 8 in.

Well Casing Volume: ____ gal. Purge Volume: ____ gal. (3 x WCV)

Purge Start Time: All day Purge Rate: ____ gpm

Equipment used to purge: ____ Equipment used to sample: ____

Time	Temperature (C)	pH	Turbidity (NTU)	Specific Conductance (µmhos/cm)	Approximate Gallons Purged
13:39	19.23	8.03	13.44	877	

Sample Collection Time: 13:40 VOC collection Rate: ____ ml/ min.

Duplicate QC Sample Collected? NO ____ YES ____ Duplicate ID: ____

Additional Analyses: ____

Weather Conditions: Sunny, windy, warm

Notes: Well is in center of property

Dunn ENVIRONMENTAL, INC.

FIELD DATA SHEET

DE PROJECT NUMBER: 103-27

SITE: Woods Dairy **PAGE** 5 **of** ____

SAMPLING EVENT: Initial **OTHER:** ____

MONITORING GROUP: **QUARTERLY** ____ **SEMIANNUAL** ____ **ANNUAL** ____

FIVE YEAR ____ **OTHER:** ____

Sample Location: **Irrigation Well #3** Date: 6/10/10

Sample Media: GW X SW ____ Leachate ____ Other ____

Sampler(s): Max Marchol Cassie Tremblay

Depth to Water: - ft. Well Depth: - ft. Well Diam.: 8 in.

Well Casing Volume: ____ gal. Purge Volume: ____ gal. (3 x WCV)

Purge Start Time: Running majority of the day Purge Rate: ____ gpm

Equipment used to purge: ____ Equipment used to sample: ____

Time	Temperature (C)	pH	Turbidity (NTU)	Specific Conductance (µmhos/cm)	Approximate Gallons Purged
14:12	19.32	8.75	17.38	928	

Sample Collection Time: 1400 VOC collection Rate: ____ ml/ min.

Duplicate QC Sample Collected? NO X YES ____ Duplicate ID: ____

Additional Analyses: ____

Weather Conditions: Sunny, windy, warm

Notes: Pump bowls set at approximately 70 ft

Dunn ENVIRONMENTAL, INC.

FIELD DATA SHEET

DE PROJECT NUMBER: 103-27

SITE: **Woods Dairy** **PAGE** 6 **of** ____

SAMPLING EVENT: Initial **OTHER:** ____

MONITORING GROUP: **QUARTERLY** ____ **SEMIANNUAL** ____ **ANNUAL** ____

FIVE YEAR ____ **OTHER:** ____

Sample Location: **Northwest Irrigation Well** Date: 6/10/10

Sample Media: GW X SW ____ Leachate ____ Other ____

Sampler(s): Max Marchol Cassie Tremblay

Depth to Water: ____ ft. Well Depth: ____ ft. Well Diam.: 8 in.

Well Casing Volume: ____ gal. Purge Volume: ____ gal. (3 x WCV)

Purge Start Time: All day Purge Rate: ____ gpm

Equipment used to purge: ____ Equipment used to sample: ____

Time	Temperature (C)	pH	Turbidity (NTU)	Specific Conductance (µmhos/cm)	Approximate Gallons Purged
14:23	18.51	7.90	11.68	1166	

Sample Collection Time: 14:30 VOC collection Rate: ____ ml/ min.

Duplicate QC Sample Collected? NO X YES ____ Duplicate ID: ____

Additional Analyses: ____

Weather Conditions: Sunny, windy, warm

Notes: Well is in northwest field south southwest of the barn

Dunn ENVIRONMENTAL, INC.

FIELD DATA SHEET

DE PROJECT NUMBER: 103-27

SITE: Woods Dairy **PAGE** 7 **of** ____

SAMPLING EVENT: Initial **OTHER:** ____

MONITORING GROUP: **QUARTERLY** ____ **SEMIANNUAL** ____ **ANNUAL** ____ **FIVE YEAR** ____ **OTHER:** ____

Sample Location: **Hart Well** Date: 6/10/10

Sample Media: GW X SW ____ Leachate ____ Other ____

Sampler(s): Max Marchol Cassie Tremblay

Depth to Water: ____ ft. Well Depth: ~70 ft. Well Diam.: 2 in.

Well Casing Volume: ____ gal. Purge Volume: ____ gal. (3 x WCV)

Purge Start Time: ____ Purge Rate: ____ gpm

Equipment used to purge: ____ Equipment used to sample: ____

Time	Temperature (C)	pH	Turbidity (NTU)	Specific Conductance (µmhos/cm)	Approximate Gallons Purged
14:39	22.54	7.70	12.64	888	

Sample Collection Time: 14:35 VOC collection Rate: ____ ml/ min.

Duplicate QC Sample Collected? NO X YES ____ Duplicate ID: ____

Additional Analyses: ____

Weather Conditions: Sunny, windy, warm

Notes: Owner reports well runs most of the day. Sampled from the tap near the house after pressure tank.

ATTACHMENT C

LABORATORY ANALYTICAL DATA

CALIFORNIA LABORATORY SERVICES

3249 Fitzgerald Road Rancho Cordova, CA 95742

June 16, 2010

CLS Work Order #: CTF0512
COC #:

Max Marchol
Dunn Environmental
5060 Robert J. Mathews, Ste 2
El Dorado Hills, CA 95672

Project Name: Woods Dairy

Enclosed are the results of analyses for samples received by the laboratory on 06/10/10 15:52. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness. Any comments and exceptions are addressed under the Notes and Definitions section.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D.
Laboratory Director

CA DOHS ELAP Accreditation/Registration number 1233

CTF0512

Chain of Custody

Project No. 103-27

Project Name: Woods Dairy

Sampler (Signature)

(Print) Max Marchal

Page _ of _ .

Report To:

Invoice To:

Copy To:

Sample Identification Number	Date	Time	Water	Soil	Other	Sampling Location	No. of Containers	Fecal Coliform	SO4	NO3-N	Ortho-Phos	Alkalinity, TDS	Chloride	Ca, Mg, Na	NH3	Remarks:
Hart Well	6/10/10	1435					1			X						Please discuss quote/ pricing with me tomorrow morning
Northwest Irrigation Well	6/10/10	1430					1			X						
Irrigation Well #3	6/10/10	1400					1			X						
Irrigation Well #2	6/10/10	1340					1			X						
MW-3	6/10/10	1340					4	X	X	X	X	X	X	X	X	
MW-10	6/10/10	13:30					4	X	X	X	X	X	X	X	X	
MW-1	6/10/10	10:20					4	X	X	X	X	X	X	X	X	
MW-2	6/10/10	11:30					4	X	X	X	X	X	X	X	X	

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Date/Time
	6/10/10 15:52		6-10-10 15:52
Max Marchal (Print)	Company Dunn Fence	Jon R (Print)	Company CLS 8-8°C
Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Date/Time
(Print)	Company	(Print)	Company

CALIFORNIA LABORATORY SERVICES

06/16/10 10:28

Dunn Environmental	Project: Woods Dairy	
5060 Robert J. Mathews, Ste 2	Project Number: 103-27	**CLS Work Order #: CTF0512**
El Dorado Hills CA, 95672	Project Manager: Max Marchol	COC #:

Conventional Chemistry Parameters by APHA/EPA Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Hart Well (CTF0512-01) Water Sampled: 06/10/10 14:35 Received: 06/10/10 15:52									
Nitrate as N	**9.2**	0.50	mg/L	1	CT04188	06/11/10	06/11/10	EPA 300.0	
Northwest Irrigation Well (CTF0512-02) Water Sampled: 06/10/10 14:30 Received: 06/10/10 15:52									
Nitrate as N	**9.4**	0.50	mg/L	1	CT04188	06/11/10	06/11/10	EPA 300.0	
Irrigation Well #3 (CTF0512-03) Water Sampled: 06/10/10 14:00 Received: 06/10/10 15:52									
Nitrate as N	**9.3**	2.5	mg/L	5	CT04188	06/11/10	06/14/10	EPA 300.0	HT-4
Irrigation Well #2 (CTF0512-04) Water Sampled: 06/10/10 13:40 Received: 06/10/10 15:52									
Nitrate as N	**8.0**	0.50	mg/L	1	CT04188	06/11/10	06/11/10	EPA 300.0	
MW-3 (CTF0512-05) Water Sampled: 06/10/10 13:40 Received: 06/10/10 15:52									
Total Alkalinity	**660**	5.0	mg/L	1	CT04195	06/11/10	06/11/10	SM2310B	
Bicarbonate as CaCO3	**660**	5.0	"	"	"	"	"	"	
Carbonate as CaCO3	ND	5.0	"	"	"	"	"	"	
Hydroxide as CaCO3	ND	5.0	"	"	"	"	"	"	
Ammonia as N	ND	0.10	"	"	CT04199	06/11/10	06/11/10	SM4500-NH3C	
Chloride	**120**	5.0	"	10	CT04188	06/11/10	06/11/10	EPA 300.0	
Nitrate as N	**60**	5.0	"	"	"	"	06/11/10	"	
Orthophosphate as PO4	ND	0.15	"	1	CT04191	06/11/10	06/11/10	SM4500-P E	
Sulfate as SO4	**78**	5.0	"	10	CT04188	06/11/10	06/11/10	EPA 300.0	
Total Dissolved Solids	**1400**	10	"	1	CT04234	06/14/10	06/15/10	SM2540C	
MW-10 (CTF0512-06) Water Sampled: 06/10/10 13:30 Received: 06/10/10 15:52									
Total Alkalinity	**660**	5.0	mg/L	1	CT04195	06/11/10	06/11/10	SM2310B	
Bicarbonate as CaCO3	**660**	5.0	"	"	"	"	"	"	
Carbonate as CaCO3	ND	5.0	"	"	"	"	"	"	
Hydroxide as CaCO3	ND	5.0	"	"	"	"	"	"	
Ammonia as N	ND	0.10	"	"	CT04199	06/11/10	06/11/10	SM4500-NH3C	
Chloride	**120**	5.0	"	10	CT04188	06/11/10	06/11/10	EPA 300.0	
Nitrate as N	**60**	5.0	"	"	"	"	06/11/10	"	
Orthophosphate as PO4	ND	0.15	"	1	CT04191	06/11/10	06/11/10	SM4500-P E	
Sulfate as SO4	**79**	5.0	"	10	CT04188	06/11/10	06/11/10	EPA 300.0	
Total Dissolved Solids	**1400**	10	"	1	CT04234	06/14/10	06/15/10	SM2540C	
MW-1 (CTF0512-07) Water Sampled: 06/10/10 10:20 Received: 06/10/10 15:52									
Total Alkalinity	**360**	5.0	mg/L	1	CT04195	06/11/10	06/11/10	SM2310B	

CALIFORNIA LABORATORY SERVICES

06/16/10 10:28

Dunn Environmental 5060 Robert J. Mathews, Ste 2 El Dorado Hills CA, 95672	Project: Woods Dairy Project Number: 103-27 Project Manager: Max Marchol	**CLS Work Order #: CTF0512** COC #:

Conventional Chemistry Parameters by APHA/EPA Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-1 (CTF0512-07) Water Sampled: 06/10/10 10:20 Received: 06/10/10 15:52									
Bicarbonate as CaCO3	**360**	5.0	mg/L	1	CT04195	"	06/11/10	SM2310B	
Carbonate as CaCO3	ND	5.0	"	"	"	"	"	"	
Hydroxide as CaCO3	ND	5.0	"	"	"	"	"	"	
Ammonia as N	ND	0.10	"	"	CT04199	06/11/10	06/11/10	SM4500-NH3C	
Chloride	**100**	5.0	"	10	CT04188	06/11/10	06/11/10	EPA 300.0	
Nitrate as N	**17**	5.0	"	"	"	"	"	"	
Orthophosphate as PO4	ND	0.15	"	1	CT04191	06/11/10	06/11/10	SM4500-P E	
Sulfate as SO4	**58**	5.0	"	10	CT04188	06/11/10	06/11/10	EPA 300.0	
Total Dissolved Solids	**850**	10	"	1	CT04234	06/14/10	06/15/10	SM2540C	
MW-2 (CTF0512-08) Water Sampled: 06/10/10 11:30 Received: 06/10/10 15:52									
Total Alkalinity	**140**	5.0	mg/L	1	CT04195	06/11/10	06/11/10	SM2310B	
Bicarbonate as CaCO3	**140**	5.0	"	"	"	"	"	"	
Carbonate as CaCO3	ND	5.0	"	"	"	"	"	"	
Hydroxide as CaCO3	ND	5.0	"	"	"	"	"	"	
Ammonia as N	ND	0.10	"	"	CT04199	06/11/10	06/11/10	SM4500-NH3C	
Chloride	**100**	5.0	"	10	CT04188	06/11/10	06/11/10	EPA 300.0	
Nitrate as N	**18**	5.0	"	"	"	"	"	"	
Orthophosphate as PO4	ND	0.15	"	1	CT04191	06/11/10	06/11/10	SM4500-P E	
Sulfate as SO4	**36**	0.50	"	"	CT04188	06/11/10	06/11/10	EPA 300.0	
Total Dissolved Solids	**680**	10	"	"	CT04234	06/14/10	06/15/10	SM2540C	

CALIFORNIA LABORATORY SERVICES

06/16/10 10:28

Dunn Environmental	Project: Woods Dairy	
5060 Robert J. Mathews, Ste 2	Project Number: 103-27	**CLS Work Order #: CTF0512**
El Dorado Hills CA, 95672	Project Manager: Max Marchol	COC #:

Metals by EPA 200 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-3 (CTF0512-05) Water Sampled: 06/10/10 13:40 Received: 06/10/10 15:52									
Calcium	**230000**	1000	µg/L	1	CT04192	06/11/10	06/14/10	EPA 200.7	
Magnesium	**100000**	1000	"	"	"	"	"	"	
Sodium	**170000**	1000	"	"	"	"	"	"	
MW-10 (CTF0512-06) Water Sampled: 06/10/10 13:30 Received: 06/10/10 15:52									
Calcium	**160000**	1000	µg/L	1	CT04192	06/11/10	06/14/10	EPA 200.7	
Magnesium	**87000**	1000	"	"	"	"	"	"	
Sodium	**160000**	1000	"	"	"	"	"	"	
MW-1 (CTF0512-07) Water Sampled: 06/10/10 10:20 Received: 06/10/10 15:52									
Calcium	**130000**	1000	µg/L	1	CT04192	06/11/10	06/14/10	EPA 200.7	
Magnesium	**58000**	1000	"	"	"	"	"	"	
Sodium	**130000**	1000	"	"	"	"	"	"	
MW-2 (CTF0512-08) Water Sampled: 06/10/10 11:30 Received: 06/10/10 15:52									
Calcium	**110000**	1000	µg/L	1	CT04192	06/11/10	06/14/10	EPA 200.7	
Magnesium	**54000**	1000	"	"	"	"	"	"	
Sodium	**79000**	1000	"	"	"	"	"	"	

CALIFORNIA LABORATORY SERVICES

06/16/10 10:28

Dunn Environmental	Project: Woods Dairy	
5060 Robert J. Mathews, Ste 2	Project Number: 103-27	**CLS Work Order #: CTF0512**
El Dorado Hills CA, 95672	Project Manager: Max Marchol	COC #:

Microbiological Parameters by APHA Standard Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-3 (CTF0512-05) Water Sampled: 06/10/10 13:40 Received: 06/10/10 15:52									
Total Coliforms	**7.8**	1.8	MPN/100 mL	1	CT04177	06/10/10	06/14/10	SM 9221	
Fecal Coliforms	<1.8	1.8	"	"	"	"	"	"	
MW-10 (CTF0512-06) Water Sampled: 06/10/10 13:30 Received: 06/10/10 15:52									
Total Coliforms	**13**	1.8	MPN/100 mL	1	CT04177	06/10/10	06/14/10	SM 9221	
Fecal Coliforms	<1.8	1.8	"	"	"	"	"	"	
MW-1 (CTF0512-07) Water Sampled: 06/10/10 10:20 Received: 06/10/10 15:52									
Total Coliforms	**49**	1.8	MPN/100 mL	1	CT04177	06/10/10	06/14/10	SM 9221	
Fecal Coliforms	<1.8	1.8	"	"	"	"	"	"	
MW-2 (CTF0512-08) Water Sampled: 06/10/10 11:30 Received: 06/10/10 15:52									
Total Coliforms	**11**	1.8	MPN/100 mL	1	CT04177	06/10/10	06/14/10	SM 9221	
Fecal Coliforms	<1.8	1.8	"	"	"	"	"	"	

CALIFORNIA LABORATORY SERVICES

06/16/10 10:28

Dunn Environmental	Project: Woods Dairy	
5060 Robert J. Mathews, Ste 2	Project Number: 103-27	**CLS Work Order #: CTF0512**
El Dorado Hills CA, 95672	Project Manager: Max Marchol	COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch CT04188 - General Prep										
Blank (CT04188-BLK1)				Prepared & Analyzed: 06/11/10						
Sulfate as SO4	ND	0.50	mg/L							
Chloride	ND	0.50	"							
Nitrate as N	ND	0.50	"							
LCS (CT04188-BS1)				Prepared & Analyzed: 06/11/10						
Sulfate as SO4	4.90	0.50	mg/L	5.00		98	80-120			
Chloride	1.97	0.50	"	2.00		99	80-120			
Nitrate as N	0.457	0.50	"	0.451		101	80-120			
LCS Dup (CT04188-BSD1)				Prepared & Analyzed: 06/11/10						
Chloride	1.93	0.50	mg/L	2.00		96	80-120	2	20	
Sulfate as SO4	4.78	0.50	"	5.00		96	80-120	3	20	
Nitrate as N	0.444	0.50	"	0.451		99	80-120	3	20	
Matrix Spike (CT04188-MS1)		**Source: CTF0490-01**		Prepared & Analyzed: 06/11/10						
Sulfate as SO4	40.7	0.50	mg/L	5.00	37.3	68	75-125			QM-4X
Chloride	28.7	0.50	"	2.00	27.8	44	75-125			QM-4X
Nitrate as N	8.36	0.50	"	0.451	8.27	21	80-120			QM-4X
Matrix Spike Dup (CT04188-MSD1)		**Source: CTF0490-01**		Prepared & Analyzed: 06/11/10						
Sulfate as SO4	40.6	0.50	mg/L	5.00	37.3	65	75-125	0.3	25	QM-4X
Chloride	28.7	0.50	"	2.00	27.8	45	75-125	0.07	25	QM-4X
Nitrate as N	8.37	0.50	"	0.451	8.27	22	80-120	0.08	20	QM-4X
Batch CT04191 - General Preparation										
Blank (CT04191-BLK1)				Prepared & Analyzed: 06/11/10						
Orthophosphate as PO4	ND	0.15	mg/L							

CALIFORNIA LABORATORY SERVICES

06/16/10 10:28

Dunn Environmental	Project: Woods Dairy	
5060 Robert J. Mathews, Ste 2	Project Number: 103-27	**CLS Work Order #: CTF0512**
El Dorado Hills CA, 95672	Project Manager: Max Marchol	COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch CT04191 - General Preparation										
LCS (CT04191-BS1)				Prepared & Analyzed: 06/11/10						
Orthophosphate as PO4	0.929	0.15	mg/L	0.918		101	80-120			
LCS Dup (CT04191-BSD1)				Prepared & Analyzed: 06/11/10						
Orthophosphate as PO4	0.890	0.15	mg/L	0.918		97	80-120	4	20	
Matrix Spike (CT04191-MS1)		Source: CTF0512-05		Prepared & Analyzed: 06/11/10						
Orthophosphate as PO4	0.886	0.15	mg/L	0.918	0.0315	93	75-125			
Matrix Spike Dup (CT04191-MSD1)		Source: CTF0512-05		Prepared & Analyzed: 06/11/10						
Orthophosphate as PO4	0.937	0.15	mg/L	0.918	0.0315	99	75-125	6	25	
Batch CT04195 - General Preparation										
Blank (CT04195-BLK1)				Prepared & Analyzed: 06/11/10						
Total Alkalinity	ND	5.0	mg/L							
Bicarbonate as CaCO3	ND	5.0	"							
Carbonate as CaCO3	ND	5.0	"							
Hydroxide as CaCO3	ND	5.0	"							
Duplicate (CT04195-DUP1)		Source: CTF0401-01		Prepared & Analyzed: 06/11/10						
Total Alkalinity	13.6	5.0	mg/L		14.2			4	20	
Bicarbonate as CaCO3	13.6	5.0	"		14.2			4	20	
Carbonate as CaCO3	ND	5.0	"		ND				20	
Hydroxide as CaCO3	ND	5.0	"		ND				20	
Batch CT04199 - General Preparation										
Blank (CT04199-BLK1)				Prepared & Analyzed: 06/11/10						
Ammonia as N	ND	0.10	mg/L							

CALIFORNIA LABORATORY SERVICES

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Dunn Environmental	Project: Woods Dairy	
5060 Robert J. Mathews, Ste 2	Project Number: 103-27	**CLS Work Order #: CTF0512**
El Dorado Hills CA, 95672	Project Manager: Max Marchol	COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch CT04199 - General Preparation										
LCS (CT04199-BS1)				Prepared & Analyzed: 06/11/10						
Ammonia as N	0.407	0.10	mg/L	0.500		81	80-120			
LCS Dup (CT04199-BSD1)				Prepared & Analyzed: 06/11/10						
Ammonia as N	0.402	0.10	mg/L	0.500		80	80-120	1	25	
Matrix Spike (CT04199-MS1)		**Source: CTF0442-01**		Prepared & Analyzed: 06/11/10						
Ammonia as N	0.505	0.10	mg/L	0.500	ND	101	75-125			
Matrix Spike Dup (CT04199-MSD1)		**Source: CTF0442-01**		Prepared & Analyzed: 06/11/10						
Ammonia as N	0.510	0.10	mg/L	0.500	ND	102	75-125	1	25	
Batch CT04234 - General Preparation										
Blank (CT04234-BLK1)				Prepared: 06/14/10 Analyzed: 06/15/10						
Total Dissolved Solids	ND	10	mg/L							
Duplicate (CT04234-DUP1)		**Source: CTF0512-07**		Prepared: 06/14/10 Analyzed: 06/15/10						
Total Dissolved Solids	850	10	mg/L		852			0.2	20	

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Dunn Environmental	Project: Woods Dairy	
5060 Robert J. Mathews, Ste 2	Project Number: 103-27	**CLS Work Order #: CTF0512**
El Dorado Hills CA, 95672	Project Manager: Max Marchol	COC #:

Metals by EPA 200 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch CT04192 - EPA 3010A										
Blank (CT04192-BLK1)				Prepared: 06/11/10		Analyzed: 06/14/10				
Calcium	ND	1000	µg/L							
Magnesium	ND	1000	"							
Sodium	ND	1000	"							
LCS (CT04192-BS1)				Prepared: 06/11/10		Analyzed: 06/14/10				
Calcium	10300	1000	µg/L	10000		103	80-120			
Magnesium	11900	1000	"	10000		119	80-120			
Sodium	11700	1000	"	10000		117	80-120			
LCS Dup (CT04192-BSD1)				Prepared: 06/11/10		Analyzed: 06/14/10				
Calcium	10100	1000	µg/L	10000		101	80-120	2	20	
Magnesium	11700	1000	"	10000		117	80-120	2	20	
Sodium	11400	1000	"	10000		114	80-120	2	20	
Matrix Spike (CT04192-MS1)		**Source: CTF0520-01**		Prepared: 06/11/10		Analyzed: 06/14/10				
Calcium	66700	1000	µg/L	10000	54300	124	75-125			
Magnesium	90500	1000	"	10000	75000	155	75-125			QM-4X
Sodium	54600	1000	"	10000	40800	138	75-125			QM-4X
Matrix Spike Dup (CT04192-MSD1)		**Source: CTF0520-01**		Prepared: 06/11/10		Analyzed: 06/14/10				
Calcium	66500	1000	µg/L	10000	54300	122	75-125	0.3	25	
Magnesium	89700	1000	"	10000	75000	147	75-125	0.9	25	QM-4X
Sodium	53900	1000	"	10000	40800	132	75-125	1	25	QM-4X

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Dunn Environmental	Project: Woods Dairy	
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El Dorado Hills CA, 95672	Project Manager: Max Marchol	COC #:

Notes and Definitions

QM-4X	The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.
HT-4	Sample was originally analyzed within holding time. Due to high concentration of the analyte, the sample was reanalyzed with a dilution.
BT-4	<1.8
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

C44

Dunn
ENVIRONMENTAL, INC.

February 15, 2011

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11 FEB 16 AM 10: 18

Ms. Charlene Herbst, C.E.G.
California Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Drive, Suite 200
Rancho Cordova, CA 95670-6114

Re: Monitoring Well Installation Completion Report for the Woods Dairy
DE Project No. – 103-27

Dear Ms. Herbst:

Based on the approved March 2010 Monitoring Well Installation Sampling Plan and on the behalf of the Planning Partners and the Woods Dairy, the monitoring well installation effort as detailed in the attached document has been completed. Dunn Environmental, Inc. (DE) completed a preliminary hydrogeologic investigation in order to establish background conditions for both the upcoming CEQA and individual permit documents.

In summary, the uppermost monitorable aquifer and first encountered ground water have been identified at approximately 40 feet below ground surface. The ground water flow direction to the southeast has been confirmed. From one sampling event, ground water quality goal exceedances have been observed. Once additional sampling events are available and both the waste management and nutrient management plans are finalized for the planned expansion, the hydrogeologic report will be updated to address potential impacts to ground water.

If you have any question, please do not hesitate to call me at 916-941-3850.

Sincerely,
DUNN ENVIRONMENTAL, Inc.

Patrick F. Dunn, P.G., C.Hg.
PFD/
Enclosure

cc: Jim Woods, Woods Dairy
Bob Klousneer, Planning Partners

5060 Robert J. Mathews Pkwy. Suite 2 • El Dorado Hills, CA 95762 • Phone: (916) 941-3850 • Fax: (916) 941-3860