USGS

Water Resources skip navigation

Data Category: Ground Water | Geographic Area: United States | GO

USGS 345518117080301 010N002W31D001S

Available data for this site Station home page GO

LOCATION
Latitude 34°55'18", Longitude 117°08'03" NAD27,
San Bernardino County, California , Hydrologic Unit 18090207

WELL DESCRIPTION
The depth of the well is not determined. Altitude of land surface datum 2,175 feet above sea level NGVD29.

STATION DATA:

Data Type	Begin Date	End Date	Count
Ground-water levels	1993-01-19	2000-03-21	4

SITE OPERATION:
Record for this site is maintained by the USGS office in California

CONTACT INFORMATION
Email questions about this station to h2oteam@usgs.gov

Questions about data h2oteam@usgs.gov
Feedback on this websitegs-w_support_nwisweb@usgs.gov
Ground-water Site Information for USA: Ground-water Site Inventory
http://water.usgs.gov/nwis/gwsi?

Return to top of page

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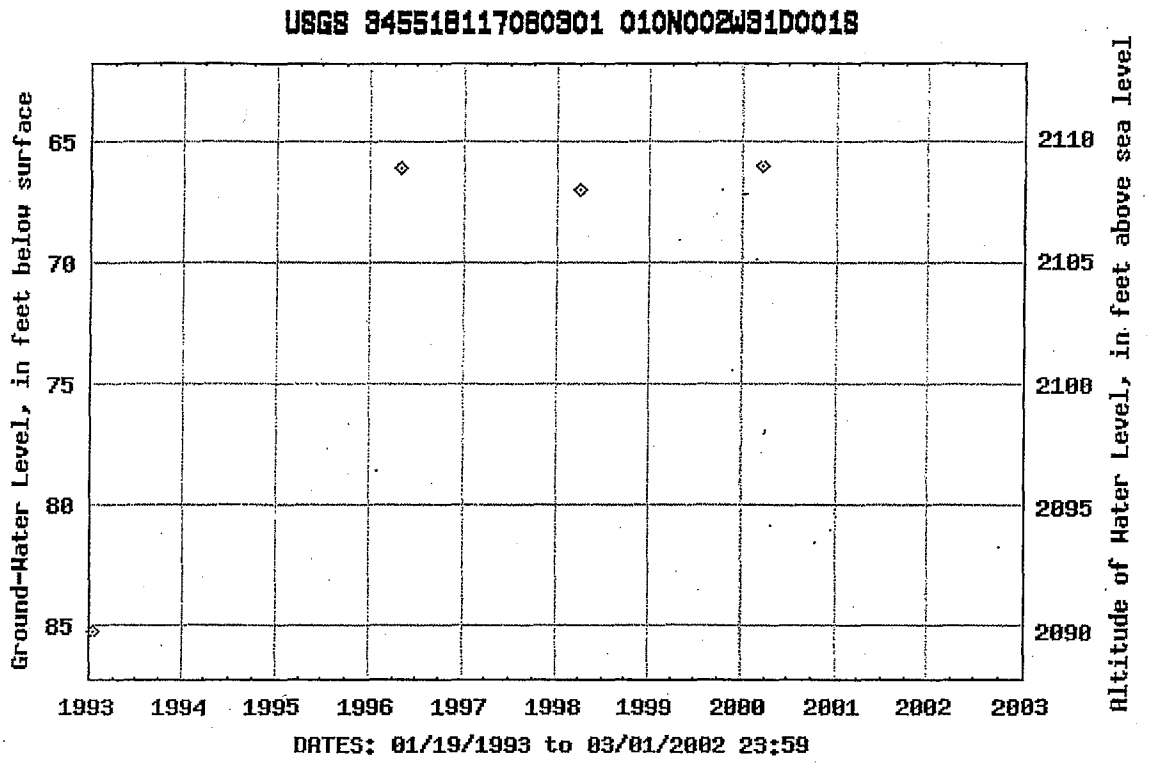
USGS



Provisional Data Subject to Revision

APPENDIX J.1

E.S. BABCOCK & SONS, INC.
ESTABLISHED 1906

Environmental Laboratory Certification #1156
6100 Quail Valley Court Riverside, CA 92507-0704
P.O. Box 432 Riverside, CA 92502-0432
PH (909) 653-3351 FAX (909) 653-1662
e-mail: esbsales@aol.com
www.babcocklabs.com

Laboratory Results

2817
Client:
Desert View Dairy
Paul Ryken
37501 Mountain View

Hinkley, CA 92347

Client I.D.: WELL #1
Site:
Description:

Matrix: water

Lab No.: L95372-001

Date Reported: 01/29/02

Collected By:
Date: 01/23/02
Time: 1100
Submitted By: L.Queen
Date: 01/23/02
Time: 1355

Constituent	Result		Method	RL	Date / Analyst
Total Hardness	1700	mg/L	Calculation	3.	020126/LT
Calcium	510	mg/L	EPA 200.7	1.	020126/LT
Magnesium	90.	mg/L	EPA 200.7	1.	020126/LT
Sodium	450	mg/L	EPA 200.7	1.	020126/LT
Potassium	7.	mg/L	EPA 200.7	1.	020126/LT
Total Alkalinity	300	mg/L	SM 2320 B	3.	020124/DT
Hydroxide	ND	mg/L	SM 2320 B	3.	020124/DT
Carbonate	ND	mg/L	SM 2320 B	3.	020124/DT
Bicarbonate	360	mg/L	SM 2320 B	3.	020124/DT
Sulfate	1060	mg/L	EPA 300.0	0.5	020126/KOS
Chloride	910	mg/L	EPA 300.0	1.	020126/KOS
Nitrate	67.	mg/L	EPA 300.0	1.	020124/KOS
pH	6.8	units	SM 4500-H	-	020123/IM
Specific Conductance	4740	umho/cm	SM 2510	1.0	020128/IM
Total Dissolved Solids	3650	mg/L	SM 2540C	10	020128/IDT
Sodium Adsorption Ratio	4.8	none	Calculation	0.2	020126/LT
Boron	1.4	mg/L	EPA 200.7	0.1	020126/LT
Hexavalent Chromium	ND	ug/L	EPA 218.6	1.0	020123/KOS

ND = None detected at RL (Reporting Limit). RL units same as result.

cc:

ESB Project Reviewer

E.S. BABCOCK & SONS, INC.
ESTABLISHED 1906

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e-mail: esbsales@aol.com
www.babcocklabs.com

Laboratory Results

2817
Client:
Desert View Dairy
Paul Ryken
37501 Mountain View

Hinkley, CA 92347

Client I.D.: WELL #1
Site:
Description:

Matrix: water

Lab No.: L90798-001

Date Reported: 10/22/01

Collected By:
Date: 10/09/01
Time: 1130
Submitted By: L.Queen
Date: 10/09/01
Time: 1425

Constituent	Result		Method	RL	Date / Analyst
Total Hardness	1000	mg/L	Calculation	3.	011016/LT
Calcium	320	mg/L	EPA 200.7	1.	011016/LT
Magnesium	55.	mg/L	EPA 200.7	1.	011016/LT
Sodium	340	mg/L	EPA 200.7	2.	011020/LT
Potassium	6.	mg/L	EPA 200.7	1.	011016/LT
Total Alkalinity	330	mg/L	SM 2320 B	3.	011010/SL
Hydroxide	ND	mg/L	SM 2320 B	3.	011010/SL
Carbonate	ND	mg/L	SM 2320 B	3.	011010/SL
Bicarbonate	400	mg/L	SM 2320 B	3.	011010/SL
Sulfate	740	mg/L	EPA 300.0	0.5	011010/KOS
Chloride	500	mg/L	EPA 300.0	1.	011010/KOS
Nitrate	55.	mg/L	EPA 300.0	1.	011009/KOS
pH	7.2	units	SM 4500-H	-	011009/BP
Specific Conductance	2770	umho/cm	SM 2510	1.0	011009/BP
Total Dissolved Solids	2170	mg/L	SM 2540C	10	011016/BP
Sodium Adsorption Ratio	4.6	none	Calculation	0.2	011016/LT
Boron	0.9	mg/L	EPA 200.7	0.1	011016/LT

ND = None detected at RL (Reporting Limit). RL units same as result.

cc:

ESB Project Reviewer

E.S. BABCOCK & SONS, INC.
ESTABLISHED 1906

6100 Quail Valley Court Riverside, CA 92507
P.O. Box 432 Riverside, CA 92502
PH (909) 653-3351 FAX (909) 653-1662
Environmental Laboratory Certification #1156

2817
Client:
Desert View Dairy
Paul Ryken
37501 Mountain View

Hinkley,CA 92347

Client I.D.: WELL #1
Site:
Description:

Matrix: water

Page: 1 of 1
Lab No.: L24652-001

Date Reported: 01/03/97

Collected By:
Date: 12/23/96
Time: 0000
Submitted By: Paul
Date: 12/23/96
Time: 1245

Constituent	Result		Method	RL	Date / Analyst
Total Hardness	1200	mg/L	Calculation	3.	961231/CW
Calcium	370	mg/L	EPA 200.7	1.	961231/CW
Magnesium	55.	mg/L	EPA 200.7	1.	961231/CW
Sodium	240	mg/L	EPA 200.7	1.	961231/DA
Potassium	6.	mg/L	EPA 200.7	1.	961231/DA
Total Cations	33.59	me/L	Calculation	0.05	961231/DA
Total Alkalinity	210	mg/L	SM 2320	3.	961224/KS
Hydroxide	ND	mg/L	SM 2320	3.	961224/KS
Carbonate	ND	mg/L	SM 2320	3.	961224/KS
Bicarbonate	260	mg/L	SM 2320	3.	961224/KS
Sulfate	600	mg/L	EPA 300.0	0.5	961226/LT
Chloride	530	mg/L	EPA 300.0	1.	961226/LT
Nitrate	44.	mg/L	EPA 300.0	1.	961223/CW
Total Anions	32.26	me/L	Calculation	0.05	961224/KS
pH	7.2	units	SM 4500-H	1.	961223/AB
Specific Conductance	2940	umho/cm	SM 2510	1.0	961223/AB
Total Dissolved Solids	2150	mg/L	SM 2540C	10	961227/TF
Sodium Adsorption Ratio	3.0	none	Calculation	0.2	961231/DA
Boron	0.8	mg/L	EPA 200.7	0.1	961231/CW
Hexavalent Chromium	ND	mg/L	SM3500Cr D	0.01	961224/KW

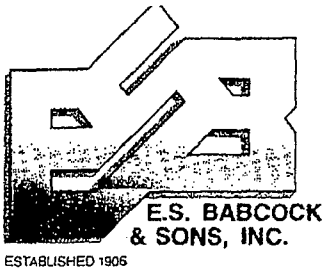
ND = None detected at RL (Reporting Limit). RL units same as result.

cc:

E. S. Babcock & Sons Inc.

BACTERIOLOGY
WATER TESTING
HAZARDOUS WASTE TESTING
CA DHS CERTIFICATION 1156

P.O. BOX 432
RIVERSIDE, CA 92502



909/653-3351
FAX 909/653-1662

LABORATORIES
6100 QUAIL VALLEY COURT
RIVERSIDE, CA 92507

10/14/94

To: Desert View Dairy
Attn:
37501 Mountain View
Hinkley, CA 92347

Sample Marked:
#1 Water

Lab No.	**L1346-001**
Invoice No.	**1346**

Submitted	Sampled
Paul 09/21/94 16:30	09/21/94 12:00

Chain of Custody on file: N

Parameter Name	Results	Parameter Name	Results
Total Hardness as $CaCO_3$	959 mg/L	pH	7.4 units
Calcium (Ca)	302 mg/L	Specific Conductance	2820 µmho/cm
Magnesium (Mg)	49 mg/L	Total Filterable Residue	1970 mg/L
Sodium (Na)	219 mg/L	Boron (B)	0.8 mg/L
Potassium (K)	7 mg/L	Hexavalent Chromium (Cr^{+6})	<0.01 mg/L
Total Cations	28.88 me/L	SAR	3.1
Total Alkalinity as $CaCO_3$	215 mg/L		
Hydroxide (OH)	<3 mg/L		
Carbonate (CO_3)	<3 mg/L		
Bicarbonate (HCO_3)	262 mg/L		
Sulfate (SO_4)	490 mg/L		
Chloride (Cl)	470 mg/L		
Nitrate (NO_3)	35 mg/L		
Total Anions	28.31 me/L		

Date analysis completed: 10/10/94
Notes:

cc: Joe Ferguson

Edward S. Babcock & Sons, Inc.

Lawrence J. Chrystal

APPENDIX J.2

E.S. BABCOCK & SONS, INC.
ESTABLISHED 1908

Environmental Laboratory Certification #1156
6100 Quail Valley Court Riverside, CA 92507-0704
P.O. Box 432 Riverside, CA 92502-0432
PH (909) 653-3351 FAX (909) 653-1662
e-mail: esbsales@aol.com
www.babcocklabs.com

Laboratory Results

2817
Client:
Desert View Dairy
Paul Ryken
37501 Mountain View

Hinkley,CA 92347

Client I.D.: WELL #3
Site:
Description:

Matrix: water

Lab No.: L69306-003

Date Reported: 05/19/00

Collected By:
Date: 05/11/00
Time: 1100
Submitted By: Larry
Date: 05/11/00
Time: 1600

Constituent	Result		Method	RL	Date / Analyst
Total Hardness	1100	mg/L	Calculation	3.	000515/LT
Calcium	360	mg/L	EPA 200.7	1.	000515/LT
Magnesium	61.	mg/L	EPA 200.7	1.	000515/LT
Sodium	250	mg/L	EPA 200.7	1.	000515/LT
Potassium	6.	mg/L	EPA 200.7	1.	000515/LT
Total Alkalinity	220	mg/L	SM 2320 B	3.	000512/AEC
Hydroxide	ND	mg/L	SM 2320 B	3.	000512/AEC
Carbonate	ND	mg/L	SM 2320 B	3.	000512/AEC
Bicarbonate	270	mg/L	SM 2320 B	3.	000512/AEC
Sulfate	650	mg/L	EPA 300.0	0.5	000512/KOS
Chloride	590	mg/L	EPA 300.0	1.	000512/KOS
Nitrate	54.	mg/L	EPA 300.0	1.	000511/RK
pH	7.4	units	SM 4500-H	1.	000511/DU
Specific Conductance	3160	umho/cm	SM 2510	1.0	000511/DU
Total Dissolved Solids	2300	mg/L	SM 2540C	10	000517/AEC
Sodium Adsorption Ratio	3.3	none	Calculation	0.2	000515/LT
Boron	0.7	mg/L	EPA 200.7	0.1	000515/LT
Hexavalent Chromium	ND	mg/L	SM3500Cr D	0.01	000512/LT

ND = None detected at RL (Reporting Limit). RL units same as result.

CR6 10AM

cc:

ESB Project Reviewer

APPENDIX J.3

E.S. BABCOCK & SONS, INC.
ESTABLISHED 1906

Environmental Laboratory Certification #1156
6100 Quail Valley Court Riverside, CA 92507-0704
P.O. Box 432 Riverside, CA 92502-0432
PH (909) 653-3351 FAX (909) 653-1662
e-mail: esbsales@aol.com
www.babcocklabs.com

Laboratory Results

2817
Client:
Desert View Dairy
Paul Ryken
37501 Mountain View

Hinkley,CA 92347

Client I.D.: WELL #6
Site:
Description:

Matrix: water

Lab No.: L95372-002

Date Reported: 01/29/02

Collected By:
Date: 01/23/02
Time: 1100
Submitted By: L.Queen
Date: 01/23/02
Time: 1355

Constituent	Result		Method	RL	Date / Analyst
Total Hardness	900	mg/L	Calculation	3.	020126/LT
Calcium	280	mg/L	EPA 200.7	1.	020126/LT
Magnesium	46.	mg/L	EPA 200.7	1.	020126/LT
Sodium	210	mg/L	EPA 200.7	1.	020126/LT
Potassium	6.	mg/L	EPA 200.7	1.	020126/LT
Total Alkalinity	230	mg/L	SM 2320 B	3.	020124/DT
Hydroxide	ND	mg/L	SM 2320 B	3.	020124/DT
Carbonate	ND	mg/L	SM 2320 B	3.	020124/DT
Bicarbonate	280	mg/L	SM 2320 B	3.	020124/DT
Sulfate	530	mg/L	EPA 300.0	0.5	020126/KOS
Chloride	430	mg/L	EPA 300.0	1.	020126/KOS
Nitrate	46.	mg/L	EPA 300.0	1.	020124/KOS
pH	7.2	units	SM 4500-H	-	020123/IM
Specific Conductance	2530	umho/cm	SM 2510	1.0	020123/IM
Total Dissolved Solids	1820	mg/L	SM 2540C	10	020128/IDT
Sodium Adsorption Ratio	3.0	none	Calculation	0.2	020126/LT
Boron	0.6	mg/L	EPA 200.7	0.1	020126/LT
Hexavalent Chromium	6.0	ug/L	EPA 218.6	1.0	020123/KOS

ND = None detected at RL (Reporting Limit). RL units same as result.

cc:

ESB Project Reviewer

E.S. BABCOCK & SONS, INC.
ESTABLISHED 1906

Environmental Laboratory Certification #1156
6100 Quail Valley Court Riverside, CA 92507-0704
P.O. Box 432 Riverside, CA 92502-0432
PH (909) 653-3351 FAX (909) 653-1662
e-mail: esbsales@aol.com
www.babcocklabs.com

Laboratory Results

2817
Client:
Desert View Dairy
Paul Ryken
37501 Mountain View

Hinkley,CA 92347

Client I.D.: WELL #6
Site:
Description:

Matrix: water

Lab No.: L90798-002

Date Reported: 10/22/01

Collected By:
Date: 10/09/01
Time: 1130
Submitted By: L.Queen
Date: 10/09/01
Time: 1425

Constituent	Result		Method	RL	Date / Analyst
Total Hardness	1000	mg/L	Calculation	3.	011016/LT
Calcium	320	mg/L	EPA 200.7	1.	011016/LT
Magnesium	52.	mg/L	EPA 200.7	1.	011016/LT
Sodium	230	mg/L	EPA 200.7	1.	011016/LT
Potassium	6.	mg/L	EPA 200.7	1.	011016/LT
Total Alkalinity	230	mg/L	SM 2320 B	3.	011010/SL
Hydroxide	ND	mg/L	SM 2320 B	3.	011010/SL
Carbonate	ND	mg/L	SM 2320 B	3.	011010/SL
Bicarbonate	280	mg/L	SM 2320 B	3.	011010/SL
Sulfate	600	mg/L	EPA 300.0	0.5	011010/KO
Chloride	500	mg/L	EPA 300.0	1.	011010/KO
Nitrate	50.	mg/L	EPA 300.0	1.	011009/KO
pH	7.2	units	SM 4500-H	-	011009/BP
Specific Conductance	2610	umho/cm	SM 2510	1.0	011009/BP
Total Dissolved Solids	2030	mg/L	SM 2540C	10	011016/BP
Sodium Adsorption Ratio	3.2	none	Calculation	0.2	011016/LT
Boron	0.7	mg/L	EPA 200.7	0.1	011016/LT

ND = None detected at RL (Reporting Limit). RL units same as result.

cc:

ESB Project Reviewer

E.S. BABCOCK & SONS, INC.
ESTABLISHED 1906

6100 Quail Valley Court Riverside, CA 92507
P.O. Box 432 Riverside, CA 92502
PH (909) 653-3351 FAX (909) 653-1662
Environmental Laboratory Certification #1156

2817
Client:
Desert View Dairy
Paul Ryken
37501 Mountain View

Hinkley,CA 92347

Client I.D.: WELL #6
Site:
Description:

Matrix: water

Page: 1 of 1
Lab No.: I24652-002

Date Reported: 01/03/97

Collected By:
Date: 12/23/96
Time: 0000
Submitted By: Paul
Date: 12/23/96
Time: 1245

Constituent	Result		Method	RL	Date / Analyst
Total Hardness	660	mg/L	Calculation	3.	961231/CW
Calcium	210	mg/L	EPA 200.7	1.	961231/CW
Magnesium	33.	mg/L	EPA 200.7	1.	961231/CW
Sodium	140	mg/L	EPA 200.7	1.	961231/DA
Potassium	4.	mg/L	EPA 200.7	1.	961231/DA
Total Cations	19.32	me/L	Calculation	0.05	961231/DA
Total Alkalinity	290	mg/L	SM 2320	3.	961224/KS
Hydroxide	ND	mg/L	SM 2320	3.	961224/KS
Carbonate	ND	mg/L	SM 2320	3.	961224/KS
Bicarbonate	360	mg/L	SM 2320	3.	961224/KS
Sulfate	330	mg/L	EPA 300.0	0.5	961223/CW
Chloride	180	mg/L	EPA 300.0	1.	961223/CW
Nitrate	41.	mg/L	EPA 300.0	1.	961223/CW
Total Anions	18.49	me/L	Calculation	0.05	961224/KS
pH	7.4	units	SM 4500-H	1.	961223/AB
Specific Conductance	1700	umho/cm	SM 2510	1.0	961223/AB
Total Dissolved Solids	1160	mg/L	SM 2540C	10	961227/TF
Sodium Adsorption Ratio	2.4	none	Calculation	0.2	961231/DA
Boron	0.5	mg/L	EPA 200.7	0.1	961231/CW
Hexavalent Chromium	ND	mg/L	SM3500Cr D	0.01	961224/KW

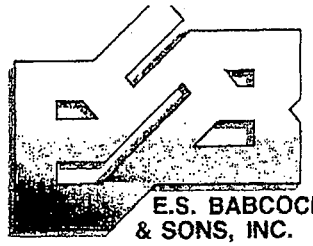
ND = None detected at RL (Reporting Limit). RL units same as result.

cc:

E. S. Babcock & Sons Inc.

BACTERIOLOGY
WATER TESTING
HAZARDOUS WASTE TESTING
CA DHS CERTIFICATION 1156

P.O. BOX 432
RIVERSIDE, CA 92502



909/653-3351
FAX 909/653-1662

LABORATORIES
6100 QUAIL VALLEY COURT
RIVERSIDE, CA 92507

10/14/94

To: Desert View Dairy
Attn:
37501 Mountain View
Hinkley, CA 92347 Dox

Lab No.	**L1346-002**
Invoice No.	**1346**

Sample Marked:
#2 Water

Well #6

Submitted	Sampled
Paul 09/21/94 16:30	09/21/94 12:00

Chain of Custody on file: N

Parameter Name	Results	Parameter Name	Results
Total Hardness as $CaCO_3$	742 mg/L	pH	7.6 units
Calcium (Ca)	230 mg/L	Specific Conductance	2230 µmho/cm
Magnesium (Mg)	40 mg/L	Total Filterable Residue	1590 mg/L
Sodium (Na)	196 mg/L	Boron (B)	0.2 mg/L
Potassium (K)	5 mg/L	Hexavalent Chromium (Cr^{+6})	0.03 mg/L
Total Cations	23.48 me/L	SAR	3.1
Total Alkalinity as $CaCO_3$	325 mg/L		
Hydroxide (OH)	<3 mg/L		
Carbonate (CO_3)	<3 mg/L		
Bicarbonate (HCO_3)	397 mg/L		
Sulfate (SO_4)	490 mg/L		
Chloride (Cl)	240 mg/L		
Nitrate (NO_3)	46 mg/L		
Total Anions	24.21 me/L		

Date analysis completed: 10/03/94
Notes:

cc: Joe Ferguson

Edward S. Babcock & Sons, Inc.

Laurence J. Chystek

BACTERIOLOGY
WATER TESTING
HAZARDOUS WASTE TESTING
CALIF. DHS CERTIFIED

LABORATORIES
3215 CHICAGO AVENUE, RIVERSIDE

E.S. BABCOCK & SONS, INC.
ESTABLISHED 1906

714/684-1881
FAX 714/684-9738

P.O. BOX 432
RIVERSIDE, CA 92502

08/07/92

To: Joe Ferguson
19738 Lake Dr.
Escondido, CA 92029
Attn:

Lab No. 920721-1608
Invoice No. 84498

Sample Marked:
Ryken
Water #6

Submitted	Sampled
JF 07/21/92 13:30	

Chain of Custody on file: N

Parameter Name	Results		Parameter Name	Results
Total Hardness as $CaCO_3$	1090	mg/L	pH	7.3 units
Calcium (Ca)	365	mg/L	Specific Conductance	3000 µmho/cr
Magnesium (Mg)	60	mg/L	Total Filterable Residue (1)	2300 mg/L
Sodium (Na)	250	mg/L	Boron (B)	0.8 mg/L
Potassium (K)	8	mg/L	Total Chromium (Cr)	<0.01 mg/L
Total Alkalinity as $CaCO_3$	228	mg/L	Selenium (Se)	<0.005 mg/L
Hydroxide (OH)	none	mg/L		
Carbonate (CO_3)	none	mg/L		
Bicarbonate (HCO_3)	278	mg/L		
Sulfate (SO_4)	750	mg/L		
Chloride (Cl)	540	mg/L		
Nitrate (NO_3)	44	mg/L		
Nitrite (NO_2)	<0.1	mg/L		

(1) up to 3000

Date analysis completed: 07/30/92

Sherman Babcock

Notes:

cc:

Edward S. Babcock & Sons, Inc.

BACTERIOLOGY
WATER TESTING
HAZARDOUS WASTE TESTING
CA DHS CERTIFICATION E756

LABORATORIES
6100 QUAIL VALLEY COURT, RIVERSIDE

E.S. BABCOCK & SONS, INC.
ESTABLISHED 1906

909/653-3351
FAX 909/653-1662

P.O. BOX 432
RIVERSIDE, CA 92502

06/02/93

To: Desert View Dairy
37501 Mountain View
Hinkley, CA 92347
Attn:

Lab No.	**930518-1318**
Invoice No.	**92386**

Sample Marked:
Desert View Dairy
Well Water #6

Submitted	Sampled
JF	PR
05/18/93	05/18/93
12:00	

Chain of Custody on file: N

Parameter Name	Results	Parameter Name	Results
Total Hardness as $CaCO_3$	964 mg/L	pH	7.3 units
Calcium (Ca)	307 mg/L	Specific Conductance	2900 µmho/c
agnesium (Mg)	47 mg/L	Total Filterable Residue	2080 mg/L
odium (Na)	240 mg/L	Boron (B)	0.8 mg/L
Potassium (K)	11 mg/L	Total Chromium (Cr)	<0.01 mg/L
otal Cations	29.98 me/L	Selenium (Se)	<0.005 mg/L
otal Alkalinity as $CaCO_3$	210 mg/L		
Hydroxide (OH)	none mg/L		
Carbonate (CO_3)	none mg/L		
icarbonate (HCO_3)	256 mg/L		
ulfate (SO_4)	540 mg/L		
Chloride (Cl)	530 mg/L		
itrate (NO_3)	34 mg/L		
otal Anions	30.93 me/L		
Nitrite (NO_2)	<0.1 mg/L		

Date analysis completed: 05/27/93

Notes:

cc: Joe Ferguson

Edward S. Babcock & Sons, Inc.

Allison Mack

APPENDIX J.4

E.S. BABCOCK & SONS, INC.
ESTABLISHED 1906

Environmental Laboratory Certification #1156
6100 Quail Valley Court Riverside, CA 92507-0704
P.O. Box 432 Riverside, CA 92502-0432
PH (909) 653-3351 FAX (909) 653-1662
e-mail: esbsales@aol.com
www.babcocklabs.com

Laboratory Results

2817
Client:
Desert View Dairy
Paul Ryken
37501 Mountain View

Hinkley,CA 92347

Client I.D.: WELL #7
Site:
Description:

Matrix: water

Lab No.: L95372-003

Date Reported: 01/29/02

Collected By:
Date: 01/23/02
Time: 1100
Submitted By: L.Queen
Date: 01/23/02
Time: 1355

Constituent	Result		Method	RL	Date / Analyst
Total Hardness	560	mg/L	Calculation	3.	020126/LT
Calcium	180	mg/L	EPA 200.7	1.	020126/LT
Magnesium	26.	mg/L	EPA 200.7	1.	020126/LT
Sodium	200	mg/L	EPA 200.7	1.	020126/LT
Potassium	9.	mg/L	EPA 200.7	1.	020126/LT
Total Alkalinity	210	mg/L	SM 2320 B	3.	020124/DT
Hydroxide	ND	mg/L	SM 2320 B	3.	020124/DT
Carbonate	ND	mg/L	SM 2320 B	3.	020124/DT
Bicarbonate	250	mg/L	SM 2320 B	3.	020124/DT
Sulfate	330	mg/L	EPA 300.0	0.5	020124/KOS
Chloride	310	mg/L	EPA 300.0	1.	020126/KOS
Nitrate	2.	mg/L	EPA 300.0	1.	020124/KOS
pH	7.6	units	SM 4500-H	-	020123/IM
Specific Conductance	1930	umho/cm	SM 2510	1.0	020123/IM
Total Dissolved Solids	1310	mg/L	SM 2540C	10	020128/IDT
Sodium Adsorption Ratio	3.6	none	Calculation	0.2	020126/LT
Boron	0.6	mg/L	EPA 200.7	0.1	020126/LT
Hexavalent Chromium	ND	ug/L	EPA 218.6	1.0	020123/KOS

ND = None detected at RL (Reporting Limit). RL units same as result.

cc:

ESB Project Reviewer

TRIPLICATE
Owner's Copy
Page 1 of 1

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

Owner's Well No. unk
No. 401872
Date Work Began 2/12/93, Ended 3/10/93
Local Permit Agency San Bernardino County Environmental Health
Permit No. 02-10-9352-V Permit Date 10FEB94; exp

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	18	Sand and gravel
18	22	Gravel and small rock
22	35	Gravel and rock
35	90	Medium sand, small percent of clay
90	125	Medium sand, 15% clay
125	160	Medium sand, 50% clay
160	170	Medium sand, begin blue/green clay layer
170	175	Blue clay
175	195	Blue & green clay, black volcanic granite
195	210	Black volcanic granite
210	225	Small gravel, 25% brown clay
225	265	Dark decomposed granite (Heavy basalt)
265	275	Light colored granite
275	300	Dark colored granite (basalt mix)
300	309	Light colored granite

TOTAL DEPTH OF BORING 309 (Feet)
TOTAL DEPTH OF COMPLETED WELL 285 (Feet)

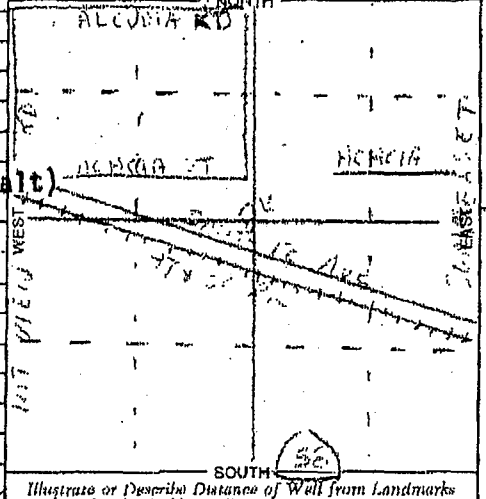
WELL OWNER

Name Paul Ryken - Desert View Dairy
Mailing Address 37801 Mountain View
Hinkley, CA 92347
CITY STATE ZIP

WELL LOCATION

Address Santa Fe & Mountain View
City Hinkley
County San BErnardino
APN Book ___ Page ___ Parcel 494-211-01
or Township 10N Range 3W Section 26
or 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) (∠)

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

DRILLING METHOD rotary FLUID bentonite

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH OF STATIC WATER LEVEL 85 (Ft.) & DATE MEASURED 3-2-93
ESTIMATED YIELD * 300-400 (GPM) & TEST TYPE Pump
TEST LENGTH ___ (Hrs.) TOTAL DRAWDOWN 53 (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	175	12¼	XX				PVC	8"	200	
175	280	12¼		XX			PVC	8"	200	7¼x1/8x8rows
280	285	12¼	XX				PVC	8"	200	
285	309	8¼	//////				no casing			

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (∠)	BENTONITE (∠)	FILL (∠)	FILTER PACK (TYPE / SIZE)
0	55	XX			6sk snd/slr
55	145			XX	gravel
145	150		XX		hole plug
150	285			XX	gravel
285	309			XX	gravel

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 Randall N. Wallis (PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
P.O. Box 1400, Barstow, CA 92311 ADDRESS CITY STATE ZIP
Signed Randall Wallis WELL DRILLER/AUTHORIZED REPRESENTATIVE
4/10/93 DATE SIGNED
515955 C-57 LICENSE NUMBER

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

APPENDIX K

PERCOLATION DATA

NOLTE
BEYOND ENGINEERING

SOILS SURVEY

Percolation Data:

Soil Series [1]	*Type* [1]	*USDA Texture* [1]	*Depth from Surface*	*Western San Bernardino, Mojave River Area Soils Table* [1]	*Soils Survey Map* [1]
Helendale	131, 132	Loamy Sand	0-4	Sheet 194	
		Sandy loam, fine sandy loam	37376		
Cajon	117	Loamy Sand	0-7	Sheet 193	
		Sand, Fine Sand	37457		

Table 13-9 [2]

Recommended rates of wastewater application for Trench and Bed Bottom Areas [a]		
Soil Texture	Percolation rate, min/In	*Application rate, gal / ft² x d* [b,c]
Gravel, coarse sand	<1	Not Suitable [d]
Coarse to medium sand	1-5	1.20
Fine sand, loamy sand	5-15	0.80
Sand loam, loam	16-30	0.60
Loam, porous silt loam	31-60	0.45
Silty clay loam, clay loam [a,f]	61-120	0.20
Clays, colloidal clays	>120	Not Suitable [g]

Use Application Rate of 0.8 to Fit 131 Classification"

[a] From U.S. EPA (1980).

[b] Rates based on septic tank effluent from a domestic waste source. A factor of safety may be desirable for wastewater's of significantly different strength or character.

[c] May be suitable for sidewall infiltration rates.

[d] Soils with percolation rates less than 1 min/in may be suitable for septic tank effluent if a 2ft layer of loamy sand or other soil is placed above or in place of the native topsoil.

[e] These soils are suitable if they are without significant amounts of expandable clays.

[f] Soil easily damaged during construction.

[g] Alternative pretreatment may be needed and alternative disposal (wetlands or evaporation systems) may be required.

Bibliography:

1 Arnold a. Knecht, United States Department of Agriculture, Soil Conservation Service and United States Department of the Interior, "Soil Survey of Western Riverside Area, California", Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. , 1971

2 Crites & Tchobanoglous, "Small and Decentralized Wastewater Management Systems", McGraw-Hill, Boston, 1998

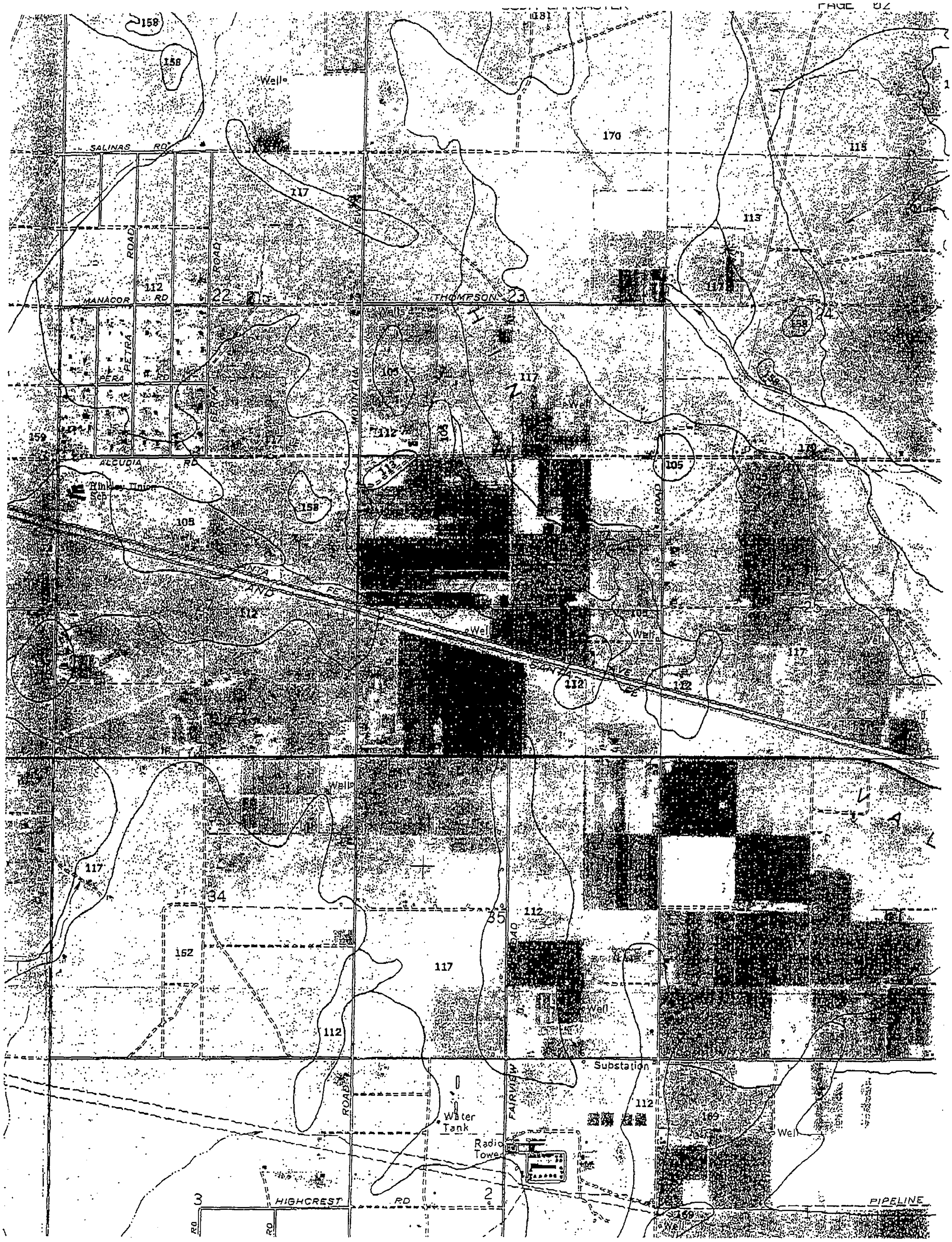

SALINAS RD
MANACOR RD
THOMPSON
PERA RD
PETRA
ROAD
ALCUDIA RD
Hinkley Union Sch
Well
22
23
24
34
35
3
2
HIGHCREST RD
Substation
Water Tank
Radio Tower
PIPELINE
FAIRVIEW ROAD
112
117
105
158
170
162
169

TABLE 11.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
100----------	0-15	Gravelly loamy sand.	SP-SM, SM	A-1	0-5	55-80	50-75	25-50	5-20	---	NP
Arizo	15-60	Very gravelly loamy coarse sand.	GP-GM, GP	A-1	5-25	40-60	35-55	15-35	5-15	---	NP
101*:											
Arrastre----------	0-6	Sandy loam--------	SM	A-2, A-4	0	85-95	80-90	50-60	30-40	20-25	NP-5
	6-26	Sandy loam, gravelly sandy loam.	SM	A-1, A-2	0	70-95	60-85	40-60	20-35	20-25	NP-5
	26	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
102*:											
AVawatz----------	0-15	Sandy loam--------	SM	A-2	0	80-100	75-95	50-70	25-35	20-25	NP-5
	15-60	Loamy sand--------	SM, SP-SM	A-1, A-2	0	80-100	75-95	40-60	5-25	---	NP
Oak Glen----------	0-22	Sandy loam--------	SM	A-2, A-4	0-5	90-100	75-95	50-80	30-50	20-25	NP-5
	22-60	Fine sandy loam, sandy loam, coarse sandy loam.	SM	A-2, A-4	0	90-100	75-95	50-80	30-50	20-25	NP-5
103*. Badland											
104----------	0-5	Clay--------------	CL, CH	A-7	0	100	100	90-100	80-95	40-60	20-35
Bousic	5-42	Clay, silty clay	CL, CH	A-7	0	100	100	90-100	80-95	40-60	20-35
	42-60	Clay, silty clay	CH	A-7	0	100	100	90-100	80-95	50-75	25-45
105----------	0-9	Loamy fine sand	SM	A-1, A-2	0-5	85-100	85-95	45-65	15-35	---	NP
Bryman	9-12	Sandy loam--------	SM	A-2, A-4	0	95-100	90-100	55-65	25-40	20-25	NP-5
	12-32	Sandy clay loam, clay loam.	SC, CL	A-6	0	95-100	90-100	70-90	35-70	25-40	10-20
	32-46	Sandy loam, loam	SM	A-2, A-4	0	95-100	90-100	55-65	25-50	20-25	NP-5
	46-99	Loamy sand, sand, coarse sandy loam.	SM, SP-SM	A-1, A-2, A-3	0	85-100	85-95	40-60	5-25	---	NP
106----------	0-9	Loamy fine sand	SM	A-1, A-2	0-5	85-100	85-95	45-65	15-35	---	NP
Bryman	9-43	Sandy clay loam, clay loam.	SC, CL	A-6	0	95-100	90-100	70-90	35-70	25-40	10-20
	43-60	Sandy loam, loam	SM	A-2, A-4	0	95-100	90-100	55-65	25-50	20-25	NP-5
107, 108----------	0-9	Loamy fine sand	SM	A-1, A-2	0-5	85-100	85-95	45-65	15-35	---	NP
Bryman	9-39	Sandy clay loam, clay loam.	SC, CL	A-6	0	95-100	90-100	70-90	35-70	25-40	10-20
	39-60	Loamy sand, sand, coarse sandy loam.	SM, SP-SM	A-1, A-2, A-3	0	85-100	85-95	40-60	5-25	---	NP
109----------	0-6	Sandy clay loam	SC, SM-SC	A-6, A-2, A-4	0	95-100	95-100	70-90	30-50	25-40	5-15
Bryman	6-44	Sandy clay loam	SC	A-6	0	95-100	95-100	80-90	35-50	25-40	10-20
	44-60	Loamy sand, sand	SM, SP-SM	A-1, A-2, A-3	0	85-95	80-90	40-70	5-25	---	NP

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
110*:											
Bryman	0-6	Stony sand	SP-SM	A-1	5-10	65-85	65-75	35-50	5-10	---	NP
	6-31	Gravelly sandy clay loam.	SC	A-6, A-2	0	70-85	60-75	50-65	25-40	25-40	10-20
	31-51	Gravelly sandy loam.	SM	A-2, A-1	0	70-90	60-75	35-50	15-30	20-25	NP-5
	51-60	Gravelly coarse sand.	SP-SM	A-1	5-10	60-80	60-70	30-50	5-10	---	NP
Cajon	0-6	Gravelly sand	SM, SP-SM	A-1, A-2, A-3	0	55-80	50-75	25-55	5-25	---	NP
	6-60	Gravelly sand, gravelly fine sand.	SM, SP-SM	A-1, A-2, A-3	0	55-80	50-75	25-55	5-25	---	NP
111*:											
Bull Trail	0-4	Sandy loam	SM	A-2, A-4	0-10	100	75-100	40-60	30-40	25-30	NP-5
	4-19	Sandy clay loam, loam, gravelly sandy clay loam.	SC, CL, SM-SC, CL-ML	A-4, A-6	0	80-100	65-95	50-80	30-60	25-35	5-15
	19-60	Stratified loamy sand to loam.	SM	A-2	0-5	80-100	75-95	40-60	25-35	25-30	NP-5
Typic Xerorthents.											
112 Cajon	0-7	Sand	SM, SP-SM	A-1, A-2, A-3	0	95-100	75-100	40-60	5-25	---	NP
	7-25	Sand, fine sand	SM, SP-SM	A-1, A-2, A-3	0	95-100	75-100	40-60	5-25	---	NP
	25-45	Gravelly sand, gravelly loamy sand.	SM, SP-SM	A-1	0	60-85	50-75	25-50	5-20	---	NP
	45-60	Stratified sand to loamy fine sand.	SM, SP-SM	A-1, A-2, A-3	0	95-100	75-100	40-60	5-25	---	NP
113 Cajon	0-6	Sand	SM, SP-SM	A-1, A-2, A-3	0	95-100	75-100	40-60	5-25	---	NP
	6-25	Sand, fine sand	SM, SP-SM	A-1, A-2, A-3	0	95-100	75-100	40-60	5-25	---	NP
	25-60	Gravelly sand, gravelly loamy sand.	SM, SP-SM	A-1	0	60-85	50-75	25-50	5-20	---	NP
114 Cajon	0-6	Sand	SM, SP-SM	A-1, A-2, A-3	0	95-100	75-100	40-60	5-25	---	NP
	6-42	Sand, fine sand	SM, SP-SM	A-1, A-2, A-3	0	95-100	75-100	40-60	5-25	---	NP
	42-60	Gravelly sand, gravelly loamy sand.	SM, SP-SM	A-1	0	60-85	50-75	25-50	5-20	---	NP
115 Cajon	0-8	Gravelly sand	SM, SP-SM	A-1, A-2, A-3	0	55-80	50-75	25-55	5-25	---	NP
	8-60	Gravelly sand, gravelly fine sand.	SM, SP-SM	A-1, A-2, A-3	0	55-80	50-75	25-55	5-25	---	NP
116 Cajon	0-6	Loamy sand	SM	A-2	0	95-100	75-100	50-80	10-30	---	NP
	6-30	Loamy sand, loamy fine sand, loamy coarse sand.	SM	A-2	0	95-100	75-100	50-80	10-30	---	NP
	30-60	Gravelly sand, gravelly loamy sand.	SM, SP-SM	A-1	0	60-85	50-75	25-50	5-20	---	NP

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
117---------- Cajon	0-7	Loamy sand-------	SM	A-1, A-2	0	95-100	75-100	40-60	10-30	---	NP
	7-20	Sand, fine sand	SM, SP-SM	A-1, A-2, A-3	0	95-100	75-100	40-60	5-25	---	NP
	20-42	Loamy sand, loamy fine sand, loamy coarse sand.	SM	A-2	0	95-100	75-100	50-80	10-30	---	NP
	42-60	Stratified sand to clay loam.	SM	A-2, A-4	0	100	100	50-70	30-50	20-25	NP-5
118*:											
Cajon----------	0-6	Gravelly sand----	SM, SP-SM	A-1, A-2, A-3	0	55-80	50-75	25-55	5-25	---	NP
	6-60	Gravelly sand, gravelly fine sand.	SM, SP-SM	A-1, A-2, A-3	0	55-80	50-75	25-55	5-25	---	NP
Arizo----------	0-6	Gravelly loamy sand.	SP-SM, SM	A-1	0-5	55-80	50-75	25-50	5-20	---	NP
	6-60	Very gravelly loamy coarse sand.	GP-GM, GP	A-1	0-10	35-55	30-50	15-30	5-15	---	NP
119*:											
Cajon----------	0-8	Sand----------	SM, SP-SM	A-1, A-2, A-3	0	95-100	75-100	40-60	5-25	---	NP
	8-60	Sand, fine sand	SM, SP-SM	A-1, A-2, A-3	0	95-100	75-100	40-60	5-25	---	NP
Wasco----------	0-7	Sandy loam-------	SM	A-2, A-4	0	80-100	75-100	45-65	25-40	20-25	NP-5
	7-60	Sandy loam-------	SM	A-2, A-4	0	80-100	75-100	45-65	25-40	20-25	NP-5
120----------	0-14	Loam----------	CL-ML	A-4	0-5	80-100	75-95	65-90	50-70	25-30	5-10
Cave	14-21	Indurated-------	---	---	---	---	---	---	---	---	---
	21-66	Stratified sand to loam.	SM	A-2, A-4	0	90-100	75-100	45-65	25-40	20-25	NP-5
121*:											
Crafton----------	0-10	Sandy loam-------	SM	A-2, A-4	0	90-100	75-95	50-70	25-50	20-30	NP-5
	10-35	Sandy loam, fine sandy loam, gravelly sandy loam.	SM	A-2, A-4	0-5	90-100	70-95	45-70	25-50	20-30	NP-5
	35	Weathered bedrock	---	---	---	---	---	---	---	---	---
Sheephead-------	0-18	Gravelly sandy loam.	SM	A-2, A-1	0-15	80-95	60-75	35-55	15-35	20-25	NP-5
	18	Weathered bedrock	---	---	---	---	---	---	---	---	---
Rock outcrop.											
122*:											
Cushenbury------	0-14	Loamy sand-------	SM	A-1	0-5	95-100	75-90	35-50	10-25	---	NP
	14-27	Sandy loam-------	SM	A-2	0-5	95-100	75-90	45-65	25-35	---	NP
	27-39	Gravelly sandy loam, sandy loam.	SM	A-1, A-2	0-5	75-100	60-85	40-65	20-35	---	NP
	39	Weathered bedrock	---	---	---	---	---	---	---	---	---
Crafton----------	0-10	Sandy loam-------	SM	A-2, A-4	0	90-100	75-95	50-70	25-50	20-30	NP-5
	10-35	Sandy loam, fine sandy loam, gravelly sandy loam.	SM	A-2, A-4	0-5	90-100	70-95	45-70	25-50	20-30	NP-5
	35	Weathered bedrock	---	---	---	---	---	---	---	---	---
Rock outcrop.											

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
123*. Dune land											
124*. Fluvents											
125---------- Glendale Variant	0-11	Silt loam--------	ML	A-4	0	100	100	90-100	70-90	30-40	5-10
	11-40	Silty clay loam	ML	A-6, A-7	0	100	100	95-100	85-95	35-50	10-20
	40-60	Stratified loam to silty clay loam.	ML, CL-ML	A-4, A-6, A-7	0	100	100	85-95	65-80	25-45	5-15
126*: Gullied land.											
Haploxeralfs.											
127---------- Halloran	0-2	Sand----------	SP-SM, SP	A-1, A-2, A-3	0	95-100	90-100	45-70	0-10	---	NP
	2-21	Sandy loam-------	SM-SC	A-2	0	95-100	90-100	55-65	25-35	15-25	5-10
	21-33	Loamy sand-------	SM	A-1, A-2	0	95-100	90-100	45-70	15-25	---	NP
	33-60	Stratified sand to sandy loam.	SM	A-1, A-2	0	95-100	90-100	45-70	10-25	---	NP
128*: Halloran--------	0-2	Sand----------	SP-SM, SP	A-1, A-2, A-3	0	95-100	90-100	45-70	0-10	---	NP
	2-21	Sandy loam-------	SM-SC	A-2	0	95-100	90-100	55-65	25-35	15-25	5-10
	21-33	Loamy sand-------	SM	A-1, A-2	0	95-100	90-100	45-70	15-25	---	NP
	33-60	Stratified sand to sandy loam.	SM	A-1, A-2	0	95-100	90-100	45-70	10-25	---	NP
Dune land.											
129---------- Hanford	0-12	Sandy loam-------	SM	A-2, A-4	0	85-100	75-100	50-75	20-50	20-25	NP-5
	12-60	Fine sandy loam, sandy loam, coarse sandy loam.	SM	A-2, A-4	0	85-100	75-100	50-75	20-50	20-25	NP-5
130*: Haplargids.											
Calciorthids.											
131, 132---------- Helendale	0-4	Loamy sand-------	SM	A-1, A-2	0-5	80-100	75-95	40-60	15-25	---	NP
	4-30	Sandy loam, fine sandy loam.	SM	A-2	0	80-100	75-95	45-55	25-30	20-25	NP-5
	30-66	Sandy loam, loamy fine sand.	SM	A-1, A-2	0	80-100	75-95	40-60	15-25	---	NP
	66-106	Loamy sand, loamy fine sand, sandy loam.	SM	A-1, A-2	0	80-100	75-95	40-60	15-25	---	NP
133*: Helendale--------	0-6	Loamy sand-------	SM	A-1, A-2	0-5	80-100	75-95	40-60	15-25	---	NP
	6-30	Sandy loam, fine sandy loam.	SM	A-2	0	80-100	75-95	45-55	25-30	20-25	NP-5
	30-66	Sandy loam, loamy fine sand.	SM	A-1, A-2	0	80-100	75-95	40-60	15-25	---	NP
	66-106	Loamy sand, loamy fine sand, sandy loam.	SM	A-1, A-2	0	80-100	75-95	40-60	15-25	---	NP

See footnote at end of table.

TABLE 12.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Clay	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	In/hr	In/in	pH	Mmhos/cm					Pct
100----------	0-15	0-5	>20	0.05-0.07	7.4-8.4	<2	Low-------	0.10	5	8	<.5
Arizo	15-60	0-5	>20	0.04-0.06	7.4-8.4	<2	Low-------	0.10			
101*:											
Arrastre---------	0-6	8-14	2.0-6.0	0.08-0.11	6.1-7.3	---	Low-------	0.32	2	3	<1
	6-26	7-14	2.0-6.0	0.08-0.11	6.1-7.3	---	Low-------	0.24			
	26	---	---	---	---	---	----------	----			
Rock outcrop.											
102*:											
Avawatz----------	0-15	5-10	2.0-6.0	0.09-0.11	6.1-7.3	---	Low-------	0.32	5	3	<1
	15-60	3-10	6.0-20	0.05-0.08	6.6-7.3	---	Low-------	0.28			
Oak Glen---------	0-22	8-18	2.0-6.0	0.11-0.13	6.1-7.3	---	Low-------	0.24	5	3	1-4
	22-60	8-18	2.0-6.0	0.11-0.13	6.1-7.3	---	Low-------	0.28			
103*. Badland											
104----------	0-5	40-55	0.06-0.2	0.08-0.11	7.9-9.0	8-16	High------	0.37	5	4	<1
Bousic	5-42	45-55	0.06-0.2	0.03-0.08	7.9-9.0	>16	High------	0.37			
	42-60	45-70	0.06-0.2	0.03-0.08	7.9-9.0	>8	High------	0.37			
105----------	0-9	4-8	2.0-6.0	0.06-0.12	7.4-8.4	<2	Low-------	0.28	5	2	<.5
Bryman	9-12	7-12	2.0-6.0	0.10-0.13	7.4-8.4	<2	Low-------	0.32			
	12-32	22-30	0.2-0.6	0.13-0.18	7.4-8.4	<2	Moderate	0.32			
	32-46	5-10	2.0-6.0	0.10-0.13	7.4-8.4	<2	Low-------	0.22			
	46-99	4-8	6.0-20	0.05-0.07	7.4-8.4	<2	Low-------	0.24			
106----------	0-9	4-8	2.0-6.0	0.06-0.12	7.4-8.4	<2	Low-------	0.28	5	2	<.5
Bryman	9-43	22-30	0.2-0.6	0.13-0.18	7.4-8.4	<2	Moderate	0.32			
	43-60	5-10	2.0-6.0	0.10-0.13	7.4-8.4	<2	Low-------	0.32			
107, 108---------	0-9	4-8	2.0-6.0	0.06-0.12	7.4-8.4	<2	Low-------	0.28	5	2	<.5
Bryman	9-39	22-30	0.2-0.6	0.13-0.18	7.4-8.4	<2	Moderate	0.32			
	39-60	4-8	6.0-20	0.05-0.07	7.4-8.4	<2	Low-------	0.24			
109----------	0-6	20-23	0.2-0.6	0.32-0.18	7.4-8.4	<2	Moderate	0.32	5	5	<.5
Bryman	6-44	25-35	0.2-0.6	0.17-0.19	7.4-8.4	<2	Moderate	0.32			
	44-60	4-8	6.0-20	0.05-0.07	7.4-8.4	<2	Low-------	0.24			
110*:											
Bryman----------	0-6	3-6	6.0-20	0.05-0.06	7.4-8.4	<2	Low-------	0.15	5	7	<.5
	6-31	20-25	0.2-0.6	0.12-0.13	7.4-8.4	<2	Moderate	0.20			
	31-51	6-10	2.0-6.0	0.07-0.09	7.4-8.4	<2	Low-------	0.20			
	51-60	3-6	6.0-20	0.02-0.04	7.4-8.4	<2	Low-------	0.15			
Cajon----------	0-6	0-5	6.0-20	0.04-0.06	7.4-8.4	<2	Low-------	0.10	5	5	<1
	6-60	0-5	6.0-20	0.04-0.06	7.4-8.4	<2	Low-------	0.10			
111*:											
Bull Trail------	0-4	8-15	2.0-6.0	0.10-0.13	6.1-7.3	---	Low-------	0.28	5	3	1-3
	4-19	18-27	0.2-0.6	0.14-0.16	6.6-7.3	<2	Moderate	0.32			
	19-60	8-20	0.2-0.6	0.10-0.13	6.6-7.3	---	Low-------	0.28			
Typic Xerorthents.											
112----------	0-7	0-5	6.0-20	0.06-0.08	7.4-8.4	<2	Low-------	0.15	5	1	<1
Cajon	7-25	0-5	6.0-20	0.06-0.08	7.4-8.4	<2	Low-------	0.15			
	25-45	0-5	6.0-20	0.04-0.08	7.4-8.4	<2	Low-------	0.10			
	45-60	0-5	6.0-20	0.06-0.10	7.4-8.4	<2	Low-------	0.15			

See footnote at end of table.

TABLE 12.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	In/hr	In/in	pH	Mmhos/cm					Pct
113----------	0-6	0-5	6.0-20	0.06-0.08	7.4-8.4	<2	Low--------	0.15	5	1	<1
Cajon	6-25	0-5	6.0-20	0.06-0.08	7.4-8.4	<2	Low--------	0.15			
	25-60	0-5	6.0-20	0.04-0.08	7.4-8.4	<2	Low--------	0.10			
114----------	0-6	0-5	6.0-20	0.06-0.08	7.4-8.4	<2	Low--------	0.15	5	1	<1
Cajon	6-42	0-5	6.0-20	0.06-0.08	7.4-8.4	<2	Low--------	0.15			
	42-60	0-5	6.0-20	0.04-0.08	7.4-8.4	<2	Low--------	0.10			
115----------	0-8	0-5	6.0-20	0.04-0.06	7.4-8.4	<2	Low--------	0.10	5	5	<1
Cajon	8-60	0-5	6.0-20	0.04-0.06	7.4-8.4	<2	Low--------	0.10			
116----------	0-6	0-8	6.0-20	0.06-0.10	7.4-8.4	<2	Low--------	0.15	5	2	<1
Cajon	6-30	0-8	6.0-20	0.06-0.10	7.4-8.4	<2	Low--------	0.15			
	30-60	0-5	6.0-20	0.04-0.08	7.4-8.4	<2	Low--------	0.10			
117----------	0-7	0-8	6.0-20	0.05-0.08	7.4-8.4	<2	Low--------	0.15	5	2	<1
Cajon	7-20	0-5	6.0-20	0.05-0.08	7.4-8.4	2-4	Low--------	0.15			
	20-42	0-8	6.0-20	0.05-0.08	7.4-8.4	2-4	Low--------	0.15			
	42-60	5-15	0.6-2.0	0.09-0.12	7.4-8.4	2-8	Low--------	0.24			
118*:											
Cajon----------	0-6	0-5	6.0-20	0.04-0.06	7.4-8.4	<2	Low--------	0.10	5	5	<1
	6-60	0-5	6.0-20	0.04-0.06	7.4-8.4	<2	Low--------	0.10			
Arizo----------	0-6	0-5	>20	0.05-0.07	7.4-9.0	<2	Low--------	0.10	5	3	<.5
	6-60	0-5	>20	0.04-0.06	7.4-9.0	<2	Low--------	0.10			
119*:											
Cajon----------	0-8	0-5	6.0-20	0.06-0.08	7.4-8.4	<2	Low--------	0.15	5	1	<1
	8-60	0-5	6.0-20	0.06-0.08	7.4-8.4	<2	Low--------	0.15			
Wasco----------	0-7	8-18	2.0-6.0	0.08-0.11	6.1-7.3	---	Low--------	0.32	5	3	<.5
	7-60	8-18	2.0-6.0	0.08-0.11	6.6-8.4	<2	Low--------	0.32			
120----------	0-14	10-15	0.6-2.0	0.14-0.16	7.9-8.4	2-4	Low--------	0.32	1	4L	<.5
Cave	14-21	---	---	---	---	---	----------	-----			
	21-66	2-15	0.6-2.0	0.08-0.14	7.9-8.4	<4	Low--------	0.15			
121*:											
Crafton----------	0-10	8-18	2.0-6.0	0.09-0.12	6.1-6.5	---	Low--------	0.28	2	3	1-2
	10-35	8-18	2.0-6.0	0.09-0.12	6.1-6.5	---	Low--------	0.28			
	35	---	---	---	---	---	----------	-----			
Sheephead--------	0-18	5-15	2.0-6.0	0.07-0.10	6.1-7.3	---	Low--------	0.17	1	8	1-3
	18	---	---	---	---	---	----------	-----			
Rock outcrop.											
122*:											
Cushenbury-------	0-14	4-8	2.0-6.0	0.06-0.10	6.1-7.3	---	Low--------	0.20	2	2	1-2
	14-27	4-10	2.0-6.0	0.08-0.12	6.1-7.3	---	Low--------	0.32			
	27-39	4-10	2.0-6.0	0.06-0.10	6.1-7.3	---	Low--------	0.20			
	39	---	---	---	---	---	----------	-----			
Crafton----------	0-10	8-18	2.0-6.0	0.09-0.12	5.6-6.5	---	Low--------	0.28	2	3	1-2
	10-35	8-18	2.0-6.0	0.09-0.12	5.6-6.5	---	Low--------	0.28			
	35	---	---	---	---	---	----------	-----			
Rock outcrop.											
123*.											
Dune land											
124*.											
Fluvents											

See footnote at end of table.

TABLE 12.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	In/hr	In/in	pH	Mmhos/cm					Pct
125----------	0-11	18-25	0.6-2.0	0.13-0.15	7.9-9.0	>8	Low--------	0.55	5	4L	<.5
Glendale Variant	11-40	27-35	0.2-0.6	0.14-0.16	7.9-9.0	>8	Moderate	0.49			
	40-60	18-30	0.2-0.6	0.13-0.15	7.9-9.0	>4	Low--------	0.55			
126*:											
Gullied land.											
Haploxeralfs.											
127----------	0-2	0-5	6.0-20	0.04-0.07	7.4-8.4	2-4	Low--------	0.15	5	1	<.5
Halloran	2-21	10-18	0.2-0.6	0.05-0.08	>8.4	>4	Low--------	0.32			
	21-33	4-8	2.0-6.0	0.02-0.06	>7.8	4-16	Low--------	0.24			
	33-60	5-15	2.0-6.0	0.02-0.06	>7.8	4-16	Low--------	0.24			
128*:											
Halloran---------	0-2	0-5	6.0-20	0.04-0.07	7.4-8.4	2-4	Low--------	0.15	5	1	<.5
	2-21	10-18	0.2-0.6	0.05-0.08	>8.4	>8	Low--------	0.32			
	21-33	4-8	2.0-6.0	0.02-0.06	>7.8	4-16	Low--------	0.24			
	33-60	5-15	2.0-6.0	0.02-0.06	>7.8	4-16	Low--------	0.24			
Dune land.											
129----------	0-12	7-18	2.0-6.0	0.10-0.15	6.1-7.3	---	Low--------	0.32	5	3	.5-1
Hanford	12-60	7-18	2.0-6.0	0.10-0.15	6.6-7.8	---	Low--------	0.32			
130*:											
Haplargids.											
Calciorthids.											
131, 132----------	0-4	4-8	6.0-20	0.06-0.09	7.4-8.4	<2	Low--------	0.28	5	2	<1
Helendale	4-30	8-18	2.0-6.0	0.09-0.13	7.4-8.4	<2	Low--------	0.32			
	30-66	4-12	2.0-6.0	0.07-0.11	7.4-8.4	<2	Low--------	0.32			
	66-106	4-8	6.0-20	0.06-0.09	7.4-8.4	<2	Low--------	0.28			
133*:											
Helendale---------	0-6	4-8	6.0-20	0.06-0.09	7.4-8.4	<2	Low--------	0.28	5	2	<1
	6-30	8-18	2.0-6.0	0.09-0.13	7.4-8.4	<2	Low--------	0.32			
	30-66	4-12	2.0-6.0	0.07-0.11	7.4-8.4	<2	Low--------	0.32			
	66-106	4-8	6.0-20	0.06-0.09	7.4-8.4	<2	Low--------	0.28			
Bryman----------	0-8	4-8	2.0-6.0	0.06-0.12	7.4-8.4	<2	Low--------	0.28	5	2	<.5
	8-12	7-12	2.0-6.0	0.10-0.13	7.4-8.4	<2	Low--------	0.32			
	12-44	22-30	0.2-0.6	0.13-0.18	7.4-8.4	<2	Moderate	0.32			
	44-60	4-8	6.0-20	0.05-0.07	7.4-8.4	<2	Low--------	0.24			
134----------	0-6	5-10	6.0-20	0.08-0.10	7.4-8.4	---	Low--------	0.24	5	2	<.5
Hesperia	6-60	8-18	2.0-6.0	0.08-0.11	7.4-8.4	<2	Low--------	0.28			
135----------	0-3	10-20	0.6-2.0	0.12-0.16	7.4-8.4	<2	Low--------	0.43	5	7	<.5
Joshua	3-20	18-30	0.2-0.6	0.06-0.13	7.4-8.4	4-16	Moderate	0.20			
	20-55	5-10	0.06-0.2	0.01-0.05	7.4-8.4	4-16	Low--------	0.17			
136----------	0-5	10-20	0.6-2.0	0.12-0.16	7.4-8.4	<2	Low--------	0.43	5	7	<.5
Joshua	5-19	18-30	0.2-0.6	0.06-0.13	7.4-8.4	4-16	Moderate	0.20			
	19-50	5-10	0.06-0.2	0.01-0.05	7.4-8.4	4-16	Low--------	0.17			
137----------	0-7	5-10	2.0-6.0	0.07-0.10	7.9-8.4	<2	Low--------	0.28	5	2	<1
Kimberlina	7-51	6-18	2.0-6.0	0.10-0.13	7.9-8.4	<4	Low--------	0.32			
	51-60	10-25	0.6-2.0	0.13-0.17	7.9-8.4	<4	Moderate	0.32			
138----------	0-7	5-10	2.0-6.0	0.07-0.10	7.9-8.4	<2	Low--------	0.28	5	2	<1
Kimberlina	7-60	6-18	2.0-6.0	0.10-0.13	7.9-8.4	<4	Low--------	0.32			
139----------	0-7	6-18	2.0-6.0	0.08-0.12	7.9-8.4	<2	Low--------	0.20	5	7	<1
Kimberlina	7-60	6-18	2.0-6.0	0.09-0.12	7.9-8.4	<4	Low--------	0.20			

See footnote at end of table.

brown clay that includes soft lime masses and hard concretions below a depth of 40 inches. These lime masses and concretions form a discontinuous caliche layer that extends to a depth of 60 inches or more. The clay content increases as depth increases. Reaction is moderately alkaline or strongly alkaline. The upper 36 inches is strongly saline and strongly alkali. In some areas of similar included soils, the surface layer is silty clay loam to silty clay.

Included in this unit are small areas of Peterman clay on basin rims.

Permeability of this Bousic soil is slow. Available water capacity is very low or low because of the content of salts and alkali, but it is high in areas where the soil has been reclaimed. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is slight. Effective rooting depth is 60 inches or more. The soil is subject to rare periods of flooding.

This unit is used mainly as wildlife habitat. Small areas have been reclaimed and are used for irrigated crops such as alfalfa, small grain hay, and pasture. This unit is also used for grazing.

This unit is poorly suited to irrigated crops unless it has been reclaimed. It is limited mainly by the high content of salts and alkali in areas that have not been reclaimed. In reclaimed areas, estimated yields for the crops grown are: alfalfa 5 to 7 tons, small grain hay 1.5 to 2.5 tons, and pasture 8 to 10 animal-unit-months.

The fine texture of the soil, slow permeability, and the problem of obtaining high quality water for leaching limit reclamation. The content of salts and alkali in the soil can be reduced by leaching, applying proper amounts of soil amendments, and returning crop residue to the soil. Generally, there is gypsum in this soil, which aids in the reclamation process. Subsoiling breaks up restrictive layers and allows water and salts to move out of the root zone. During reclamation, only highly salt tolerant plants should be grown. In areas where this soil has been irrigated for a long time, the content of salts in the upper 24 to 30 inches has been lowered to a satisfactory level for common salt tolerant plants. Grain can be seeded simultaneously with alfalfa or pasture plants to aid in establishing new seedlings. Returning crop residue to the soil reduces surface crusting and increases water infiltration.

Border and sprinkler irrigation systems are suited to this soil. Before reclamation has been completed, however, the use of sprinklers on this soil is limited by the slow water intake rate, fine surface texture, and muddiness. Muddiness hinders the movement of sprinkler equipment. Enough water must be applied to satisfy the needs of the crop and to leach the salts and alkali out of the root zone. In most areas the soil should be leveled and smoothed to obtain uniform distribution of water and to prevent salts from accumulating in high spots. Sprinkler systems should be designed so that the water is applied at a rate that does not exceed the water intake rate of the soil.

If this unit is used for grazing, the main limitation is the high content of salts and alkali. Grazing is limited to a few weeks in spring when plant growth is at its peak. Areas of this unit have been cleared for cultivation, causing a permanent removal of many perennial plant species. Major forage species are shadscale, fiddleneck, and filaree.

If this unit is used for homesite development, the main limitations are the hazard of flooding, high shrink-swell potential, slow permeability, and high content of salts and alkali.

Dikes and diversions that have outlets designed to bypass floodwater can be used to protect buildings and onsite sewage disposal systems from flooding. The effects of shrinking and swelling can be minimized by using an appropriate engineering design and by backfilling with material that has low shrink-swell potential. If this unit is used for septic tank absorption fields, longer absorption lines and the use of sandy backfill for the trench help to compensate for the slow permeability.

Landscaping plants that are salt and alkali tolerant should be used. Drainage, irrigation water management, and addition of soil amendments can reduce the content of salts and alkali.

This unit is suited to wetland wildlife developments such as fishponds or duckponds. It is limited by the high clay content, which makes the soil difficult to pack.

This map unit is in capability unit IVs-6 (30), irrigated, and capability subclass VIIs (30), nonirrigated.

105 Bryman loamy fine sand, 0 to 2 percent slopes. This very deep, well drained soil is on terraces and old alluvial fans. It formed in alluvium derived dominantly from granitic material. Slopes are broad, smooth, slightly convex, and nearly level. Most areas are dissected by shallow intermittent drainageways. The natural vegetation is mainly yucca, desert shrubs, grasses, and forbs. Elevation is 2,800 to 3,200 feet.

Typically, the surface layer is pale brown and light yellowish brown loamy fine sand about 9 inches thick. The upper part of the subsoil is brown sandy loam 3 inches thick over reddish brown sandy clay loam about 20 inches thick, the next part is pink sandy loam about 14 inches thick, and the lower part is light brown loamy sand about 34 inches thick. The substratum to a depth of 99 inches is light yellowish brown sand. Depth to the pink sandy loam is 30 to 63 inches. In some areas of similar included soils, the surface layer is loamy sand or coarse sand.

Included in this unit are small areas of Cajon sand on recent fans, Helendale loamy sand on old fans, Mohave Variant loamy sand on terraces near the Mojave River, and Bryman soils that have slopes of 3 to 4 percent.

Also included are small areas of soils that have pebbles and cobbles on the surface.

Permeability of this Bryman soil is moderately slow. Available water capacity is moderate or high. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high. Effective rooting depth is 60 inches or more.

This unit is used mainly for irrigated crops. The main crops are alfalfa, small grain hay, and pasture. The unit is also used for grazing and homesite development and as wildlife habitat.

This unit is suited to irrigated crops. Estimated yields for the crops grown are: alfalfa 6 to 8 tons, small grain hay 1.5 to 2.5 tons, and pasture 10 to 12 animal-unit-months. This unit is limited by the hazard of soil blowing, the high water intake rate, and low fertility. Sprinkler irrigation is better suited to this unit than most other methods because of the high water intake rate. Sprinkler systems, if properly designed, insure better distribution of water on soils that have a sandy surface layer. Border irrigation is also suited to this unit. In designing either type of irrigation system, the moderately slow permeability of the subsoil and the moderate or high available water capacity should be considered in determining the rate and frequency of application and the amount of the water to use. Irrigation water should be managed to meet the needs of the crop and to conserve water.

Returning crop residue to the soil and leaving stubble on the surface reduce soil blowing and increase the organic matter content. New alfalfa seedlings can be protected by fall seeding the alfalfa in standing grain or sudangrass stubble. Grain can be seeded simultaneously with alfalfa or pasture plants to protect seedlings from wind damage.

Planting windbreaks around fields also reduces soil blowing. Among the trees most suitable for use in windbreaks are Arizona cypress, aleppo pine, and Athel.

If this unit is used for homesite development, it is limited by the moderate shrink-swell potential, low strength, the hazard of sloughing, the moderately slow permeability of the subsoil, the rapid permeability of the substratum, and the hazard of soil blowing. Buildings and roads should be designed to offset the effects of shrinking and swelling. If the unit is used as a base for roads, the upper part of the soil can be mixed with the underlying sand to increase its strength and stability. Cutbanks in the sandy part of the subsoil and of the substratum are subject to sloughing. Shoring should be considered to protect personnel working in trenches.

The limitation of moderately slow permeability in the subsoil can be overcome by increasing the size of the septic tank absorption field or by placing the filter tile below the restrictive layer. Because of the rapid permeability of the substratum, however, unfiltered effluent can contaminate the ground water.

As much existing natural vegetation as feasible should be left around homesites to reduce soil blowing. Areas disturbed during construction should be revegetated as soon as feasible. Windbreaks can be used around homesites to provide protection from the wind and reduce soil blowing. Establishing and maintaining landscaping plants can be achieved by properly fertilizing, mulching, and irrigating.

If this unit is used for grazing, the main limitations are low precipitation and the hazard of soil blowing. Grazing is limited to a few weeks in spring when plant growth is at its peak. Areas of this unit have been cleared for cultivation, causing a permanent removal of many perennial species. Clearing, or any other disturbance that destroys the soil structure and vegetation, can result in increased soil blowing, barren areas, and lower overall production. In some areas historical clearing has contributed to an increase of Indian ricegrass. Major forage species are Indian ricegrass, desert needlegrass, and filaree.

This map unit is in capability unit IIe-1 (30), irrigated, and in capability subclass VIIe (30), nonirrigated.

106 Bryman loamy fine sand, 2 to 5 percent slopes. This very deep, well drained soil is on terraces. It formed in alluvium derived dominantly from granitic material. Slopes are broad, smooth, convex, and gently sloping or undulating. Most areas are dissected by moderately deep intermittent drainageways. The natural vegetation is mainly yucca, desert shrubs, grasses, and forbs. Elevation is 3,000 to 3,400 feet.

Typically, the surface layer is pale brown loamy fine sand about 9 inches thick. The upper part of the subsoil is reddish brown sandy clay loam about 34 inches thick, and the lower part to a depth of 60 inches or more is pink sandy loam. Depth to the sandy loam layer of the subsoil ranges from 30 to 63 inches. In some areas of similar included soils, the surface layer is loamy sand.

Included in this unit are small areas of Cajon sand on recent fans, Helendale loamy sand on old fans, and Mohave Variant loamy sand on terraces near the Mojave River. Also included are small areas of soils that have pebbles and cobbles on the surface.

Permeability of this Bryman soil is moderately slow. Available water capacity is moderate or high. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high. Effective rooting depth is 60 inches or more.

This unit is used mainly as wildlife habitat and for grazing. It is also used for irrigated crops such as alfalfa, small grain hay, and pasture. A few areas are used for homesite development.

If this unit is used for grazing, the main limitations are low precipitation and the hazard of soil blowing. Grazing is limited to a few weeks in spring when plant growth is at its peak. Areas of this unit have been cleared for cultivation, causing a permanent removal of many

If this unit is used for grazing, the main limitations are low precipitation, the hazard of soil blowing, and the hazard of water erosion. Grazing is limited to a few weeks in spring when plant growth is at its peak. Grazing should be managed to protect the unit from excessive water erosion and soil blowing. Plants having low forage importance but having wildlife habitat and esthetic significance are Joshua-tree and creosotebush. Major forage species are Indian ricegrass, filaree, and saltbush.

This map unit is in capability subclass VIIe (30), nonirrigated.

131 Helendale loamy sand, 0 to 2 percent slopes. This very deep, well drained soil is on alluvial fans and terraces. It formed in alluvium derived dominantly from granitic material. Slopes are broad, smooth, slightly convex, and nearly level. Many areas are dissected by shallow intermittent drainageways. The natural vegetation is mainly yucca, desert shrubs, grasses, and forbs. Elevation is 2,500 to 3,500 feet.

Typically, the surface layer is very pale brown loamy sand about 4 inches thick. The subsoil and the upper part of the substratum are brown, yellowish brown, and light yellowish brown sandy loam about 62 inches thick. The lower part of the substratum is yellow loamy sand to a depth of 106 inches. Clay content decreases below a depth of 30 inches. In some areas of similar included soils, the surface layer is sandy loam.

Included in this unit are small areas of Bryman loamy fine sand on terraces, Kimberlina loamy fine sand, and Cajon sand on recent fans. Also included are small areas of soils that have pebbles on the surface and small areas of soils that have slopes of as much as 3 percent.

Permeability of this Helendale soil is moderately rapid in the subsoil and upper part of the substratum, and it is rapid in the lower part of the substratum. Available water capacity is low or moderate. Runoff is medium, and the hazard of soil blowing is high. Effective rooting depth is 60 inches or more.

This unit is used mainly for irrigated crops. The main crops are alfalfa, small grain hay, and pasture (fig. 9). The unit is also used for homesite development, livestock grazing, and wildlife habitat.

This unit is suited to irrigated crops. Estimated annual yields per acre of the crops grown are: alfalfa 6 to 8 tons, small grain hay 1.5 to 2.5 tons, and pasture 8 to 10 animal-unit-months. The unit is limited by the hazard of soil blowing, high water intake rate, low or moderate available water capacity, and low fertility. Sprinkler irrigation is better suited to this unit than most other methods because of the high water intake rate and low available water capacity. Sprinkler systems, if properly designed, insure better distribution of water on soils that have a sandy surface. Irrigation water should be properly managed. Light, frequent applications of water are needed to meet the needs of the crop and to conserve water.

Returning crop residue to the soil and leaving stubble on the surface reduce soil blowing and increase the organic matter content. Alfalfa seedlings can be protected by seeding the alfalfa in the fall in standing grain or sudangrass stubble. Grain can be seeded simultaneously with alfalfa or pasture plants to protect seedlings from soil blowing.

Planting windbreaks around fields also reduces soil blowing. Among the trees most suitable for use in windbreaks are Arizona cypress, aleppo pine, and Athel.

If this unit is used for homesite development, it is limited by the hazards of soil blowing and contaminating the ground water if septic tanks are used and by the hazard of sloughing. Because of the rapid permeability of the lower part of the substratum, unfiltered effluent can contaminate the ground water. Because of the sandy texture of the substratum, cutbanks are not stable and are subject to sloughing. Shoring can be used to prevent trenches from caving in.

As much of the existing natural vegetation as feasible should be left around homesites to reduce soil blowing. Areas disturbed during construction should be revegetated as soon as feasible. Windbreaks can be used to provide protection from the wind and reduce soil blowing. Establishing and maintaining landscaping plants can be achieved by properly fertilizing, mulching, and irrigating.

If this unit is used for grazing, the main limitations are low precipitation and the hazard of soil blowing. Grazing is limited to a few weeks in spring when plant growth is at its peak. Areas of this unit have been cleared for cultivation, causing a permanent removal of many perennial species. Clearing, or any other disturbance that destroys the soil structure and vegetation, can result in increased soil blowing, barren areas, and lower overall production. In some areas historical clearing has contributed to an increase of Indian ricegrass. Major forage species are Indian ricegrass, red brome, and filaree.

This map unit is in capability unit IIe-1 (30), irrigated, and in capability subclass VIIe (30), nonirrigated.

132 Helendale loamy sand, 2 to 5 percent slopes. This very deep, well drained soil is on alluvial fans and terraces. It formed in alluvium derived dominantly from granitic material. Slopes are broad, smooth, convex, and gently sloping. Most areas are dissected by moderately deep intermittent drainageways. The natural vegetation is mainly yucca, desert shrubs, grasses, and forbs. Elevation is 2,700 to 3,800 feet.

Typically, the surface layer is very pale brown loamy sand about 4 inches thick. The subsoil and the upper part of the substratum are brown, yellowish brown, and light yellowish brown sandy loam about 62 inches thick. The lower part of the substratum is yellow loamy sand to

California juniper. Brush management that includes properly designed firebreaks, livestock trails, and access roads is necessary to limit wildfires and soil erosion. Natural terrain barriers associated with this unit should be used as livestock management area boundaries. Major forage species for wildlife and livestock are bluegrass, desert needlegrass, and brome.

The Bull Trail soil is in capability subclass VIIe (20), nonirrigated. Typic Xerorthents are in capability subclass VIIIe (20), nonirrigated.

112 Cajon sand, 0 to 2 percent slopes. This very deep, somewhat excessively drained soil is on alluvial fans. It formed in alluvium derived dominantly from granitic material. Slopes are broad, long, smooth, and nearly level. Most areas are dissected by long, shallow intermittent drainageways. The natural vegetation is mainly yucca, desert shrubs, grasses, and forbs. Elevation is 1,800 to 3,200 feet.

Typically, the surface layer and upper part of the underlying material are very pale brown sand about 7 inches thick. The next 18 inches of the underlying material is very pale brown sand, the next 20 inches is very pale brown gravelly sand, and the lower part to a depth of 60 inches or more is very pale brown sand. In some areas of similar included soils, the surface layer is loamy sand.

Included in this unit are small areas of Helendale loamy sand on old fans, Kimberlina loamy fine sand, and Manet coarse sand on recent fans.

Permeability of this Cajon soil is rapid. Available water capacity is low. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high. Effective rooting depth is 60 inches or more.

This unit is used mainly for irrigated crops and homesite development. The main crops are alfalfa, small grain hay, and pasture. It is also used for grazing and wildlife habitat.

This unit is suited to irrigated crops. Estimated annual yields per acre of the crops grown are: alfalfa 5 to 7 tons, small grain hay 1.5 to 2.5 tons, and pasture 7 to 9 animal-unit-months. The unit is limited by the hazard of soil blowing, high water intake rate, low available water capacity, and low fertility. Sprinkler irrigation is better suited to this unit than most other methods because of the high water intake rate and low available water capacity. Sprinkler systems, if properly designed, insure better distribution of water. Irrigation water should be properly managed. Light, frequent applications of water are needed to meet the needs of the crop and to conserve water.

Returning crop residue to the soil and leaving stubble on the surface reduce soil blowing and increase the organic matter content. Alfalfa seedlings can be protected by seeding the alfalfa in fall in standing grain or sudangrass stubble. Grain can be seeded simultaneously with alfalfa or pasture plants to protect seedlings from soil blowing. Planting windbreaks around fields also reduces soil blowing. Among the trees most suitable for use in windbreaks are Arizona cypress, aleppo pine, and Athel.

If this unit is used for homesite development, the main limitations are the rapid permeability if septic tanks are used, the low available water capacity, the hazard of sloughing, and the hazard of soil blowing. Because of the rapid permeability, septic tank absorption fields function well; however, unfiltered effluent can contaminate the ground water. Because of the sandy texture of the soil, cutbanks are not stable and are subject to sloughing. Shoring can be used to prevent trenches from caving in.

As much of the existing natural vegetation as feasible should be left around homesites to provide protection from the wind and reduce soil blowing. Areas disturbed during construction should be revegetated as soon as feasible. Windbreaks can be used to provide protection from the wind and reduce soil blowing. Establishing and maintaining landscaping plants can be achieved by fertilizing, mulching, and irrigation.

If this unit is used for grazing, the main limitations are low precipitation and the hazard of soil blowing. Grazing is limited to a few weeks in spring when plant growth is at its peak and should be managed to protect the unit from excessive water erosion. Major forage species are Indian ricegrass, saltbush, and filaree.

This map unit is in capability unit IIIe-1 (30), irrigated, and in capability subclass VIIe (30), nonirrigated.

113 Cajon sand, 2 to 9 percent slopes. This very deep, somewhat excessively drained soil is on alluvial fans. It formed in alluvium derived dominantly from granitic material. Slopes are long, smooth, and gently sloping to moderately sloping. Most areas are dissected by long, shallow, intermittent drainageways. The natural vegetation is mainly yucca, desert shrubs, grasses, and forbs. Elevation is 1,800 to 3,500 feet.

Typically, the surface layer is very pale brown sand about 6 inches thick. The upper 19 inches of the underlying material is very pale brown sand, and the lower part to a depth of 60 inches or more is very pale brown gravelly sand that has a strata of sand.

Included in this unit are small areas of Helendale loamy sand on old fans and Kimberlina loamy fine sand on recent fans. Also included are small areas of soils that have pebbles on the surface.

Permeability of this Cajon soil is rapid. Available water capacity is low. Runoff is slow, and the hazard of water erosion is slight or moderate. The hazard of soil blowing is high. Effective rooting depth is 60 inches or more.

This unit is used mainly for wildlife habitat and homesite development. It is also used for irrigated crops, mainly alfalfa, pasture and small grain hay, and for grazing.